Optima CT520 Series with DoD16
Optima Advance
Installation Manual

Book 1 of 2: Mechanical Installation

OPERATING DOCUMENTATION

5446023-1EN
Rev 11

Book 1 of 2: Mechanical Installation

Pages 1 - 296

Effectivity:

The information in this manual applies to the following Optima CT520 Series and Optima Advance CT Systems:

- Optima CT520
- Optima CT520 Pro
- Optima Advance

IMPORTANT PRECAUTIONS

LANGUAGE

ПРЕДУПРЕЖДЕНИЕ (BG)	Това упътване за работа е налично само на английски език. • Ако доставчикът на услугата на клиента изиска друг език, задължение на клиента е да осигури превод. • Не използвайте оборудването, преди да сте се консултирали и разбрали упътването за работа. • 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.
警告 (ZH-CN)	本维修手册仅提供英文版本。 • 如果客户的维修服务人员需要非英文版本，则客户需自行提供翻译服务。 • 未详细阅读和完全理解本维修手册之前，不得进行维修。 • 忽略本警告可能对维修服务人员、操作人员或患者造成电击、机械伤害或其他形式的伤害。
警告 (ZH-HK)	本服務手冊僅提供英文版本。 • 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。 • 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。 • 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、機械性或其他的危險。
警告 (ZH-TW)	本維修手冊僅有英文版。 • 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。 • 請勿試圖維修本設備，除非 您已查閱並瞭解本維修手冊。 • 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。
UPOZORENJE (HR)	Ovaj servisni priručnik dostupan je na engleskom jeziku. • Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod. • Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik. • Zanemarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.
VÝSTRAHA (CS)	Tento provozní návod existuje pouze v anglickém jazyce. • V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka. • Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah. • 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.

ADVARSEL (DA)	Denne servicemanual findes kun på engelsk. • Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse. • Forsøg ikke at servicere udstyret uden at læse og forstå denne servicemanual. • Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for teknikeren, operatøren eller patienten.
WAARSCHUWING (NL)	Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar. • Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan. • Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is. • 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.
WARNING (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.
HOIATUS (ET)	See teenindusjuhend on saadaval ainult inglise keeles • Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest. • Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist. • Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.
VAROITUS (FI)	Tämä huolto-ohje on saatavilla vain englanniksi. • Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla. • Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen. • Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.
ATTENTION (FR)	Ce manuel d’installation et de maintenance est disponible uniquement en anglais. • 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. • Ne pas tenter d'intervenir sur les équipements tant que ce manuel d’installation et de maintenance n'a pas été consulté et compris. • 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.

WARNUNG (DE)	Diese Serviceanleitung existiert nur in englischer Sprache. • Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen. • Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben. • Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.
ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)	Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά. • Εάν ο τεχνικός σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει τις υπηρεσίες μετάφρασης. • Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό αν δεν έχετε συμβουλευτεί και κατανοήσει το παρόν εγχειρίδιο σέρβις. • Αν δεν προσέξετε την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στον τεχνικό σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.
FIGYELMEZTETÉS (HU)	Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el. • Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészíttetése. • Ne próbálja elkezdeni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték. • Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.
AÐVÖRUN (IS)	Þessi þjónustuhandbók er aðeins fáanleg á ensku. • Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálaþjónustu. • Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin. • Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.
AVVERTENZA (IT)	Il presente manuale di manutenzione è disponibile soltanto in lingua inglese. • Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione. • Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto. • 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.
警告 (JA)	このサービスマニュアルには英語版しかありません。 ・ 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。 ・ 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。 ・ 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。

경고 (KO)	본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다 . • 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우 , 번역 서비스를 제공하는 것은 고객의 책임입니다 . • 본 서비스 매뉴얼을 참조하여 숙지하지 않은 이상 해당 장비를 수리하려고 시도하지 마십시오 . • 본 경고 사항에 유의하지 않으면 전기 쇼크 , 기계적 위험 , 또는 기타 위험으로 인해 서비스 제공자 , 사용자 또는 환자에게 부상을 입힐 수 있습니다 .
BRDINJUMS (LV)	Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā. • Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu. • Neveiciet aprīkojuma apkopi bez apkopes rokasgrāmatas izlasīšanas un saprašanas. • Šī brīdinājuma neievērošanas rezultātā var rasties elektriskās strāvas trieciena, mehānisku vai citu faktoru izraisītu traumu risks apkopes sniedzējam, operatoram vai pacientam.
ĮSPĖJIMAS (LT)	Šis eksploatavimo vadovas yra tik anglų kalba. • Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, suteikti vertimo paslaugas privalo klientas. • Nemėginkite atlikti įrangos techninės priežiūros, jei neperskaitėte ar nesupratote šio eksploatavimo vadovo. • Jei nepaisysite šio įspėjimo, galimi paslaugų tiekėjo, operatoriaus ar paciento sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų.
ADVARSEL (NO)	Denne servicehåndboken finnes bare på engelsk. • Hvis kundens serviceleverandør har bruk for et annet språk, er det kundens ansvar å sørge for oversettelse. • Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått. • Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.
OSTRZEŻENIE (PL)	Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim. • Jeśli serwisant klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta. • Nie próbować serwisować urządzenia bez zapoznania się z niniejszym podręcznikiem serwisowym i zrozumienia go. • Niezastosowanie się do tego ostrzeżenia może doprowadzić do obrażeń serwisanta, operatora lub pacjenta w wyniku porażenia prądem elektrycznym, zagrożenia mechanicznego bądź innego.
ATENÇÃO (PT-BR)	Este manual de assistência técnica encontra-se disponível unicamente em inglês. • Se outro serviço de assistência técnica solicitar a tradução deste manual, caberá ao cliente fornecer os serviços de tradução. • Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. • A não observância deste aviso pode ocasionar ferimentos no técnico, operador ou paciente decorrentes de choques elétricos, mecânicos ou outros.

ATENÇÃO (PT-PT)	Este manual de assistência técnica só se encontra disponível em inglês. • Se qualquer outro serviço de assistência técnica solicitar este manual noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução. • Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. • 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.
ATENŢIE (RO)	Acest manual de service este disponibil doar în limba engleză. • Dacă un furnizor de servicii pentru clienţi necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere. • Nu încercaţi să reparaţi echipamentul decât ulterior consultării şi înţelegerii acestui manual de service. • Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.
ОСТОРОЖНО! (RU)	Данное руководство по техническому обслуживанию представлено только на английском языке. • Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует самостоятельно обеспечить перевод. • Перед техническим обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения. • Несоблюдение требований данного предупреждения может привести к тому, что специалист по техобслуживанию, оператор или пациент получит удар электрическим током, механическую травму или другое повреждение.
UPOZORENJE (SR)	Ovo servisno uputstvo je dostupno samo na engleskom jeziku. • Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge. • Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo. • Zanemarivanje ovog upozorenja može dovesti do povređivanja servisera, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.
UPOZORNENIE (SK)	Tento návod na obsluhu je k dispozícii len v angličtine. • Ak zákazníkov poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka. • Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obluhu a neporozumiete mu. • Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.

ATENCION (ES)	Este manual de servicio sólo existe en inglés. • 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. • No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio. • 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.
VARNING (SV)	Den här servicehandboken finns bara tillgänglig på engelska. . • Om en kunds servicetekniker har behov av ett annat språk än engelska, ansvarar kunden för att tillhandahålla översättningstjänster. • Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken. • 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.
OPOZORILO (SL)	Ta servisni priročnik je na voljo samo v angleškem jeziku. • Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod. • Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli. • Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.
DIKKAT (TR)	Bu servis kılavuzunun sadece ingilizcesi mevcuttur. • Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer. • Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz. • Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

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 GE 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
- Contact your local service coordinator for more information on this process.

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 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 GE Company, 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 GE Company, 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 replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

OMISSIONS & ERRORS

Customers, please contact your GE Sales or Service representatives.

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

Table of Contents: Book 1

Chapter 2
Position Subsystems with Install/Align Tool 99

This Page Intentionally Blank.

Revision History

Revision	Date	Reason for change
11	10/31/21	**Chapter 2** • Update Dale 600/601 to Fluke ESA612. **Chapter 3** • Update Figure 3-3/3-18 Keyboard Overlay and Warning Label Attached (English). • Add EIZO S1934 LCD monitor information. **Chapter 6** • Update external axial to internal axial distance to 240.0 mm +/- 1mm.
10	05/28/20	Add Chapter for Position Subsystems with the new Install/Align service tool. **Chapter 1** • Update Figure 1-2 Gantry Tube Change Cart. • Update the incorrect floor levelness from 3.5m to 3.05m to meet PIM. • Add Sections for table shipping dollies and rear entry cable box. • Update PDU Contactors torque value and add model ABB info. • Update A1 EMEA information. • Add Console unpacking information. • Update Console and PDU seismic information. **Chapter 2** • Add OpenOC w/Z8G4 information. • Add information for Optional Long Cable Connections • Update PDU Contactors torque value and add model ABB info. **AppendixA** • Add OpenOC Console cover removal/installation procedure **Chapter 4** • Add OpenOC w/Z8G4 information. • Add information for Optional Long Cable Connections. **Chapter 5** • Update Computer Integration to add TangX information. • update table height w/ tilt gantry to I30. **Chapter 7** • Add RSvP information.
9	06/13/19	Add product name: Optima Advance. **Chapter 1, Section 11** • Update gantry anchor leveling pad. **Chapter 1, Section 16** • Update NGPDU dimension of Center-of-Gravity **Chapter 2, Section 4** • Update OpenOC port label.

Revision	Date	Reason for change
8	12/24/18	**Important Precautions** • Update Damage in Transportation. **Chapter 1, Section 16** • Update Console seismic mounting information. **Chapter 2, Section 2** • Update System Interconnect Diagram. **Chapter 2, Section 4** • Update OpenOC LCD monitor cable from DVI-VGA to DVI-DVI. • Update OpenOC Z840 Host Computer port label
7	06/14/17	**Chapter 1, Section 15** • Add wheel brakes for OpenOC16 installation. **Chapter 1, Section 16** • Add OpenOC16 seismic mounting information. **Chapter 2, Section 4** • Update console connections section to add OpenOC16 information. **Chapter 5, Section 2** • Update HIPAA Present information • Add new sections for Data Privacy Configuration and Initial Setup of EA3 Administrator Account. • Add console boot-up flow chart for open chassis, **Chapter 7, Section 1** • Add IEC3.0 option information. **Chapter 7, Section 10** • Update network connection information.
6	14/04/16	**Chapter 2, Section 4.0** • Update Z800 mouse information, from USB mouse to PS2 mouse. • Add keyboard overlay attaching information. • Update GSCB cable connections. • Add PMT22 Media Tower.
5	10/02/15	**Chapter 1, Section 2.0** • Update Installation Support Kit BOM. **Chapter 1, Section 11.0** • Update drill bit from 1/2" to 12mm. **Chapter 2, Section 4.0** • Update Console information for Z820. • Add media tower 5270510-21. **Chapter 4, Section 4.0** • Add QA phantom 5498268 for Image Quality Calibration Tools. **Chapter 5, Section 2.0** • Add Monitor Setup section according to Figure 5-7 Computer Integration Process Overview. **Chapter 8** Update chapter 8, refer to Functional Check of Service Methods to complete procedure of Patient Touch Current Test, Patient Touch Current Test and Ground Current Typical.

Revision	Date	Reason for change
4	03/03/14	**Chapter 1, Section 9.0** • Update bore cover remover procedure, needn't remove bore cover for table/gantry alignment tool installation. **Chapter 1, Section 14** • Update table 1-2 Contractor Connections. **Chapter 1, Section 15** • Add Optima SWS Table (5449758-2) installation and console rubber footer adjustment. **Chapter 2, Section 4.0** • Added GSCB film part 5401237-xxx and update figure 2-4 GSCB and Cables. **Appendix A** • Add section for Gantry Bore Cover removal/installation. **Appendix B** • Add Aurora SWS Table installation procedure. **Chapter 6, Section 5.0** • Update scan parameters for tomographic plane indication. **Chapter 6, Section 6.0** • Updated 20cm QA phantom LCD verification procedure.
3	17/06/13	**Chapter 1** • Update Gantry and Table anchoring because of EOL issue. • Update floor thickness from 4.7" to 4". **Chapter 2, Section 8** • Update door interlock connection. **Appendix A** • Add note for gantry position after the xtream display installation. • Update control panel dip switch. **Chapter 5 and Chapter 6** • Update system state saving procedure.
2	19/03/13	**Cover** • Update product name to Optima CT520 Series with DoD16, and add Optima CT520 Pro in effectivity. **Chapter 2, Section 6** • Update figure 2-14 Gantry Power Pan Connections **Appendix B, Section 2** • Update figure B-1 and B-14. **Chapter 5, Section 1** • Update figure 5-6 Emergency Stop button positions **Chapter 5, Section 2** • **2.6 Reconfig the OC**, add note "You must reconfig the OC with the application software shutdown." **Chapter 7, Section 5** • Update **5.1 Enter Configuration Routine.**
1	17/01/13	Update contents.

This Page Intentionally Blank.

Preface
Publication Conventions

Please become familiar with the conventions used within this publication before proceeding.

Section 1.0
Safety & Hazard Information

1.1 Text and Character Representation

Within this publication, different paragraph and character styles have been used to indicated 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

A few examples are provided that have been adapted form GEMS' global document standard (2119696-100). They include paragraph prefixes and modified text styles.

⚠ **CAUTION**
Pinch Points
Loss of Data
Sharp Objects

Caution is used when a hazard exists that 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**

⚠ **DANGER**
EXCESSIVE VOLTAGE
CRUSH POINT

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

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

⚠ **WARNING**
ROTATING EQUIPMENT
BARE WIRES

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-command motion.

NOTICE
Equipment Damage Possible

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 crash
- Internal mechanical damage, such as to the x-ray tube
- Coasting the rotor through resonance.

It's important that the reader not ignore hazard statements in this document.

1.2 Graphical Representation

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.

ELECTRICAL

MECHANICAL

RADIATION

LASER

HEAT

PINCH

Some others make you aware of specific procedures that should be followed.

AVOID STATIC ELECTRICITY

TAG AND LOCK OUT

WEAR EYE PROTECTION

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 and 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

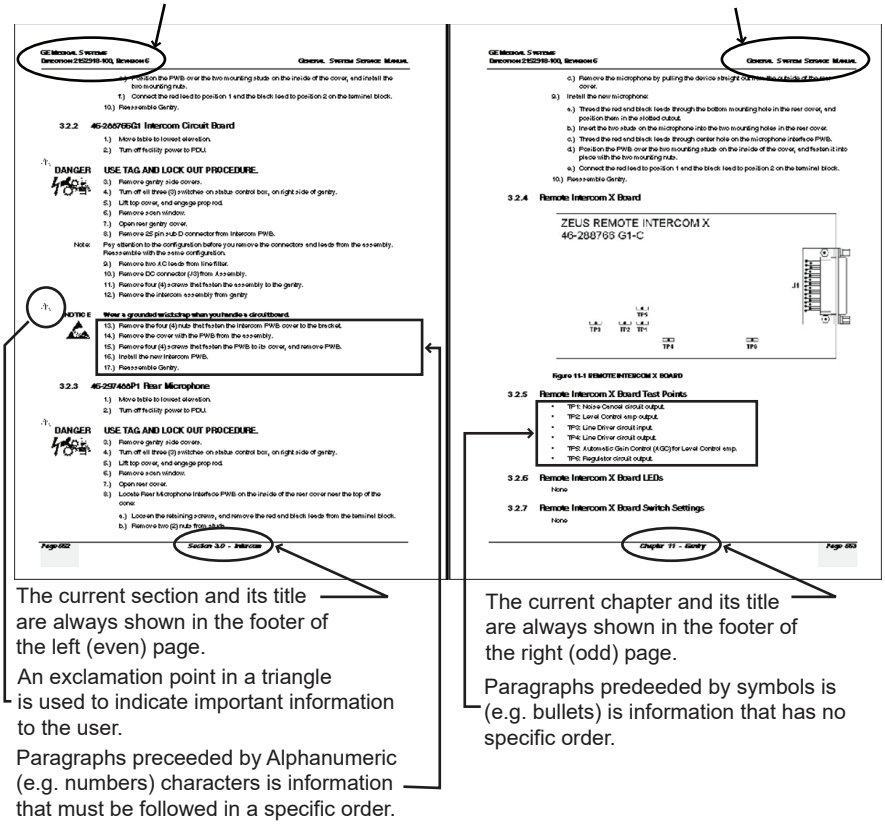
Purpose: Introduces and provides meaning as to the information contained within the chapter, section or subsection, such as used at the beginning this chapter for example.

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.

2.2 Page Layout



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 Character Styles

Within this publication different character styles are used to indicate computer input and output text. Character (input, output, and variable) styles are used and applied to the text within a paragraph so as to indicate directions. Computer screen output and input is also formatted using mono (fixed width) spaced fonts.

Example: Fixed Output — This paragraph denotes computer 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.

Example: Variable Output — *This paragraph denotes computer screen output that is variable. Its output varies from application to application. Variable output is sometimes found placed between greater than and lesser than operators. For example: <variable_ouput>*

Example: Fixed Input — **This paragraph denotes fixed input. It's typed input that will not vary from application to application. Fixed text the user is required to supply as input.**

Example: Variable Input — ***This paragraph denotes computer input that can vary from application to application. Variable text the user is required to supply as input. Variable input sometimes is placed between greater than and lesser than operators. For example: <variable_input>. In these cases, the (<>) operators are dropped prior to input. Exceptions are noted in the text.***

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.

Chapter 1
Position Subsystems with Floor Template

NOTICE

- **Record data collected from procedures in this chapter into Form 4879 when directed.**
- **Only use the Installation manual that existed in SIMS content viewer. Any other revisions of this manual may not exactly match your system.**

Section 1.0
Installer/FE Notices

1.1 General Safety Guidelines

1.) Follow all safety precautions, warnings and instructions in this manual.
2.) Read and obey the warnings and instructions on equipment labels or tags.
3.) Allow only qualified personnel to install, maintain and service this equipment.
4.) While the system is designed to meet all safety requirements applicable to medical equipment, qualified operators must understand the potential safety hazards, and take steps to minimize the risk at all times.
5.) **Never** modify the system in whole or in part without prior written approval by GE.
6.) Do **not** change, add, or remove any system accessory without prior written approval of the vendor's local service manager.
7.) **Never** leave the system in an unsafe condition. Notify the customer that the system is not to be used until a problem is resolved.
8.) Read and follow the precautions described in this manual.

1.2 Shipping, Warehouse, and Transportation Warning

This gantry should be moved using the shipping dollies only. Do not lift or move it using a lift truck under the gantry frame.

1.3 International Shipments

- Use dollies to remove the gantry from the shipping skid and to transport the gantry to the customer's site.
- If lifting is required, instructions are in the *Pre-Installation Manual* for this system.

1.4 On Site Warning

This system requires a gantry bearing gap inspection *before* electrical calibration is started.

1.5 Service Actions

If the bearing inspection fails the FE opens a dispatch and does not continue with the electrical calibration procedures.

Section 2.0 Introduction

This chapter describes how to mount, position, and level the CT Scanner subsystems.

Note: Before you start the installation, make sure the site preparation complies with conditions and instructions found in the *Pre-installation manual* for this system. Failure to comply result in excessive installation delay and potential increased, unrecoverable installation costs. This product is designed to meet specific mechanical installation standards that should be reviewed prior to installing this system.

2.1 Overview

Note: Installation paperwork is required for all installations.

Procedures in this chapter provide detailed instructions to position, level, and anchor the gantry and table securely for operation. The system uses adjustable leveling pads to support the gantry and table. The gantry has four (4) primary leveling pads located on the gantry base. The table has four (4) pads used for leveling it.

The process you will be following is:

1.) Use the room-layout template to determine the general position of the gantry and table.
2.) Move the gantry into position.
3.) Level gantry.
4.) Use the laser tool to position the table relative to the gantry.
5.) Level the table to the gantry, and anchor the system.
6.) Complete the mechanical installation section of GE Form e4879.

Note: Use the template to position the system. Use the gantry and table to locate and drill the anchor holes. Drill the anchor holes with the system in place. Refer to for an example of this procedure.

2.2 Pre-Installation Template

Always use the room-layout template (two pieces), during installation. The gantry and table are not properly aligned if existing holes are used. The template shows the location of the gantry and table anchor holes.

The applicable template (5193991) is shipped with the system. It is located on the middle shelf on the Lean Installation Cart. You can also order it via the web GEMS BUY, from Coakley-Tech.

2.3 Required Common Tools and Supplies

The following tools and supplies should be included in the standard CT installation tool kit. The tools listed represent the minimum tools required for installing this CT scanner.

WRENCHES

- Standard and Metric combination wrench sets
- Standard and Metric Hex Key (Allen wrench) sets
- ½" and 3/8” drive torque wrench: 0-100 N-m (0-100 ft.-lb.) Must be calibrated yearly.

SOCKETS AND EXTENSIONS

- 3/8" and ½" drive ratchet wrenches
- ½" drive 3" & two 6" long extensions
- 3/8” drive 12" long extension
- Standard & Metric 3/8” drive socket sets
- ¾” deep well socket 3/8”
- 1", 1-1/8”, 1-¼" & 1-½" sockets for ½" drive
- 3/8” drive universal joint
- Metric hex bit set ¼" or 3/8” drive, including:
  - 14mm hex bit 3/8" or ½" drive (14mm ball hex helpful)
  - 10mm hex bit 3/8" drive

SCREW DRIVERS

- Phillips screwdriver set (small, medium, and large)
- Straight blade screwdriver set (small, medium, and large)

DRILL BITS

- Complete set of standard (U.S.) drill bits
- Metric tap set
- 12 mm concrete drill bit (2203081: HILTI, TE-CX 12/17 or equivalent)
- ½" masonry bit, min. 8" long USA – 18" optional (for rear table hole)
- 3" (76mm) hole saw with 1/4" (6mm) masonry bit (to remove flooring)

POWER TOOLS

- 3/8” or ½" drill, cordless or electric
- Reciprocating Saw (Sawzall or equivalent) and assorted blades.
- Hammer Drill & BIt (8" min, 12" max)
- Sears 17740 Shop vacuum or equivalent, with “**HEPA**” or dry wall dust filter (Sears part number 17918) or equivalent
- 25’ Extension power cords

HAND TOOLS

- Ball-Peen Hammer (1lb or 2lb)
- Tongue & Groove Pliers (large)
- Diagonal Cutting Pliers, Large (to cut 1/0 ground)
- Framing Square (e.g., Empire 16" x 24" aluminum square)
- Diagonal Cutting Pliers, Small
- Large pry bar
- 4', 2’ & 9" torpedo levels (see Table 1-1: Recommended Levels)
- Laser level (see Table 1-1: Recommended Levels)

Table 1-1 Recommended Levels

9"	Johnson Magnetic Level, model 7500M*
	Johnson Magnetic Level, model 4500
	Stanley Magnetic Level
2’	Johnson Professional Box Beam Level, model 9624*
	Empire Titan Professional Box Beam Level, model 900 series
4’ (nominal)	48" Johnson Professional Box Beam Level*
	42" Stanley Contractor Grade Level
	48" Empire Titan Professional Box Beam Level, model 900 series
	48" Stabila Aluminum Box Beam Level, Kit 24816
Laser**	Sears Laser Level Tool ($40)

* Preferred levels
** Laser level is required for table cradle alignment. Using this tool reduces the alignment procedure by 1 man-hour. New tables have a cradle center line to be used with the laser level.

ELECTRICAL TOOLS

- DVM capable of reading 0.5 ohms or less
- Continuity tester
- Dale 600 or 601 Leakage meter (The Fluke ESA612 be used globally when the Dale analyzer is not available)
- Temperature/humidity tool: Oregon Scientific Wireless Weather Station Model BAR608HGA or equivalent

PERSONAL SAFETY EQUIPMENT

- Safety shoes*
- Safety glasses*
- Gloves
- Knee pads or kneeling pad
- LOTO Kit (supplied)*
- Hearing Protection*
- 2 m (6 ft.) or 4 m (8 ft.) step ladder or equivalent
- Face Shield

* These PPE items are absolutely required for every installation job, with NO exceptions.

SYSTEM CLEANERS

Purchase Locally:

- Glass Cleaner or equivalent
- Scrubbing Bubbles Bathroom Cleaner or equivalent
- Grease Cutting Cleaner or equivalent

GE TOOLS

- 5272090 (Laser Alignment Tool for VCT, BrightSpeed Select and RT16)
  - 5148193 (Alignment Kit)
  - 5180876 (Target Table Alignment)
  - 5129589-2 (Laser Bar, Gantry Alignment)

Note: A box labeled Installation Support Kit is shipped with each system. It contains some materials needed to install this CT scanner.

Section 3.0
Delivery Procedure

3.1 System Transportation - Temperature Extremes

When transporting the CT system, ensure that the system is not exposed to temperatures or humidity outside the following specifications.

- Temperature: -40º to +158º F (-40º to +70º C)
- Humidity: 10% to 100%, including condensing
- Altitude: -1,800ft to 18,000ft

⚠

NOTICE **Component Freezing occurs if CT system is exposed to temperatures below 0º F (-18º C) for a period longer than two days.**

Allow a minimum of 12 hours for the CT system to adjust to ambient room temperature, prior to installation.

Inspect for visible condensation and allow all moisture to evaporate before starting the installation.

3.2 Stored Systems

If your system was stored for more than three months:

- Complete a visual inspection, looking for damage due to improper storage.
- Check for the latest software revisions, options, and component changes.
- Contact the OLC for support.
- Movers are required to move the equipment to the scan room.

3.3 Construction Site Storage

When storing the CT system at a construction site, be sure to adhere to the following storage requirements:

- Construction site packaging must be ordered and the system shipped packaged for storage.
- Do not damage or puncture the shipping crate.
- Do not remove packaging until the completion of all construction at the site and the removal of all dust created by the construction.
- Maintain a storage temperature within the range of 50º to 90º F (10º to 32º C)
- Maintain a relative humidity (non-condensing) between 20% to 70%.

3.4 Construction Site Installations

A construction installation describes installations at sites without an occupancy permit, or ongoing construction. In general, construction sites fail to meet the required specifications for system delivery, and GE does not recommend such installations, as they can result in delays, increased costs, and possible damage to the system. When construction-site delivery proves unavoidable, the installation fails into one of two categories:

- Full construction site with completed radiology area.
- Full construction site with limited delivery access.

Review these categories to determine which most closely matches the condition of the planned installation site.

3.4.1 Construction Site with completed Radiology Area

This type of site consists of a finished, dust-free, occupancy-ready radiology suite at a site with ongoing construction in other areas, but with no remaining construction in or around the scan suite area. At the time of delivery such sites feature:

- Dust control measures deployed in the radiology suite area.
- Scan suite access limited to a single entrance.
- Radiology suite sealed off from the remaining construction area.
- Operational HVAC, with a positive air pressure within the radiology suite.

In addition, the radiology suite at such a site REMAINS in a dust-free, occupancy-ready state after delivery and throughout the remaining construction phase.

For more details, refer to the *Pre-Installation Manual*.

3.4.2 Full Construction Site with Limited Delivery Access

This type of site allows delivery during ongoing construction of the radiology suite area.

Construction site packaging must be ordered and the system is delivered packed for construction site storage. Packaging cannot be added during the delivery.

At Full Construction sites, delivery occurs prior to site completion, but the product remains stored until the completion of a finished, dust-free, occupancy-ready radiology suite area. This system is delivered in sealed package with dollies. Delivery to the storage area requires a lift truck or riggers. Installation work can begin **only** when the site reaches the completed, dust-free, occupancy-ready radiology suite requirement.

3.4.3 Construction Site Unpacking

If room is not completed, following escalation process. Pre-installation escalation is the process used to consult CT Engineering, the Design Center, or EHS to resolve pre-installation issues related to siting concerns and requirements.

A typical construction site package consists of 8-12 packages. Each package is plastic-wrapped in dust-free packaging. Each package must be vacuumed to remove construction dust prior to moving components into the CT scan room. This process can add approximately two hours to your installation time.

Typical components are:

- Gantry
- Table
- Console
- NGPDU
- UPS
- Lean Cover Cart
- Lean Install Cart
- Chair
- Service Cabinet (Option)

3.5 Working with the Mover

- System is shipped lean-packed in North America.
- Ensure that the installation lean cart is the first item moved into the room.

3.5.1 Delivery Dolly Options:

- Gantry Mini Dolly - ordered from UMI at http://www.umi-dollyshop.com

Follow the instructions provided by your Project Manager of Installation regarding working with equipment movers. Help direct movers as to where to place equipment and which items are needed first.

Movers should move all equipment into the customer's room. Door removal and other site changes to move equipment should be done only as directed by the Project Manager of Installation.

For component sizes and weights, refer to the *Pre-installation Manual* for this system.

Note: Do not place equipment in its final location at this time. Templates must be laid first.

Note: If you have to remove the gantry covers in order to move the gantry into the room, please read the notice statement on Appendix A Removal & Installation of Covers before removing the gantry covers.

3.5.2 Equipment Delivery Route

Prior to equipment delivery, review the delivery route with the movers. Refer to the Project Manager of Installation for any additional delivery instructions.

3.5.3 Floor Protection

Movers should use floor protection. Most equipment movers can provide floor protection during the equipment delivery. Installers should provide floor protection for the room.

3.5.4 Removing Gantry Dollies and Covers

- Gantry components cannot be removed to reduce the dimensions.
- Zero clearance dollies are available from UMI at http://www.umi-dollyshop.com
- Please read the notice statement on page 166 before removing the gantry covers.

3.6 Damage In Transportation

Check for damage to property that may have occurred at the site during delivery, such as damage to floors, door frames or walls. If damage is found, notify the Project Manager of Installation.

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 GE representative or a hospital receiving agent. Whether noted or concealed, damage shall 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
- Contact your local service coordinator for more information on this process.

3.7 A1 Breaker

NOTICE

- **All sites must have a main disconnect with Lockout/Tagout capability.**
- **Non GE-supplied breakers must have/provide under-voltage protection. For more information, refer to the *Pre-Installation Manual* for this system.**
- **A LICENSED ELECTRICIAN shall install and make connections inside the main disconnect.**

Lock-out and tag-out the PDB breaker now.

Figure 1-1 Sample PDB Breaker

A1 BREAKER		UPS (Optional Partial, 2ph UPS & Hardware Kit)
GLOBAL EXCEPT EMEA	**EMEA**	
E4502AB / E4502BB (90A) (incl.Auo Restart & Integrated UPS Control)	E46001AC / E45021BB (125A) (incl.Auo Restart & Integrated UPS Control)	**B7999ZA alt. E4502KY** (includes 5169128 9155-10GE model 10kVA) or **B7999ZB alt. E4502KZ** (includes 5820687 Vertiv model 10kVA)
E4502AC / E4502BC (110A) (incl.Auo Restart & Integrated UPS Control)		

Table 1-2 A1 Panel and UPS

3.8 Installation Support Kits

An Installation Support Kit is shipped with every system. Locate this box now and open it. All included materials are to be used during the installation process. These items are to be left ON SITE, for future service needs.

3.9 Installation Conditions

1.) A Final Site Print is REQUIRED. Contact your PMI for a final site print.

2.) The room size must match the print.

Measure the room size. If it does not match the stated size, and is smaller, then check all regulatory clearances. If any regulatory clearance is less than the minimum, then DO NOT continue. Notify the PMI to set up a site escalation.

Note: Service clearances MUST be met to continue.

3.) A customer Anchoring Plan is required if there is anything other than a 102 mm (4 in.) (minimum) concrete floor. GE employees shall only install the anchors supplied with this system.

4.) Complete this section on the GE Form e4879.

5.) Do NOT start the installation process if the site is under construction:

- In the Room
- In the Scan Area
- In addition, the radiology suite at such a site will REMAIN in a dust-free, occupancy-ready state after delivery and throughout the remaining construction phase.

Section 4.0
Layout the Floor Template

4.1 Tools and Test Equipment

- Standard Install Tool Kit
- Install Support Kit
- GE Site Print
- Floor Template for your system
- Chalk line
- China marker or wax marking pencil, or equivalent
- Masking Tape, or equivalent
- PPE (hand protection, foot protection, face shield, eye protection, personal dosimeter)
- Alignment Kit Laser

4.2 Safety

CAUTION **Potential for Injury.**

The gantry presents a variety of mechanical and electrical hazards.

Use appropriate safety procedures when working on the Optima CT520 Series and Optima Advance system.

4.3 Floor Preparation

4.3.1 Preparation

The PMI notifies the installation team if any requirements are not met. It is the purchaser's (buyer) responsibility to provide an approved support structure and an approved method of mounting.

GE is not responsible for any failure of the support structure or method of anchoring.

4.3.2 Flooring

The system has a total floor load of approximately 2822 kg (6221 lbs). A concentrated load of about 2270 kg (5000 lbs), including patient (205 kg (450 lbs)) is found in the table-gantry assembly. For more information, refer to the *Pre-installation Manual* for this system.

Do not place the scanner on any resilient flooring. Resilient tile or carpeting may slowly yield over a period of time and disturb the alignment of the table to the gantry. Refer to the floor template to determine locations where resilient flooring material should be removed.

Limitations include:

- No part of the floor surface within the table, gantry, or the two interface areas between table and gantry should be higher than the support areas for the table and gantry.
- The floor structure must withstand the occupied weight of table and gantry, as well as the individual contact area loading of these components.
- The method and placement of anchors or through bolts must not reduce the structural strength of the floor.In some circumstances, the final floor may not be installed. Refer to Chapter 8.0 in the Pre-Installation Manual for this system.

If you have to remove the gantry covers in order to move the gantry into the room, refer to the cover removal procedure. Please read the notice statement on **Appendix A Removal & Installation of Covers** before removing the gantry covers.

4.4 Room Preparation

- Use the GE print developed for your site to establish the room layout. Make sure all the operating and service clearances shown on the print are observed. Record this information on the GE Form e4879.
- Clean the area. The mounting surface must be free of any material that may interfere with the positioning and leveling of the system.
- Measure and determine ISO using the GE Site print. Using a marker, mark ISO on the floor. Use a chalk line to connect the table center line marks on the floor. This is the line on the print that runs down the center of the table through the gantry. Use this as a reference when positioning the table.

4.5 Procedure

1.) Lay out the two (2) pieces of the floor template. Start with the table template, then place the gantry template over the top of the table template. Align them per the GE print.

2.) Tape the templates together, making sure that the table and gantry center lines are matched. Then tape the template to the floor.

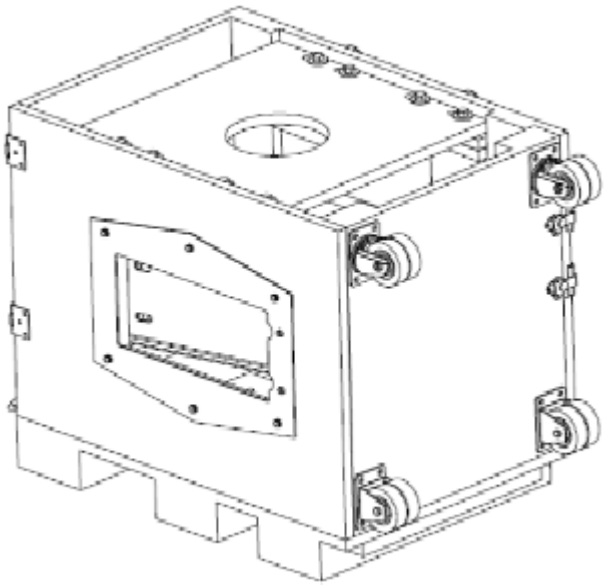
3.) Recheck the position of the gantry in the room per the GE print. If everything matches the GE print, continue. If not, realign the templates to match the print.

4.) Make sure there are no potential clearance issues. **If there are floor obstructions, such as conduits or old anchors, be sure to cut them flush to the floor to prevent the gantry from resting on them. Also, be sure there is at least 102 mm (4 in.) of clearance between any existing floor penetration and the new gantry position.**

Note: There must be clear space without obstructions in order to:

- Change major components, with access to the gantry tube-change (RH) side (See Figure 1-2).

Figure 1-2 Gantry Tube Change Cart



- Allow space for front and rear cover removal

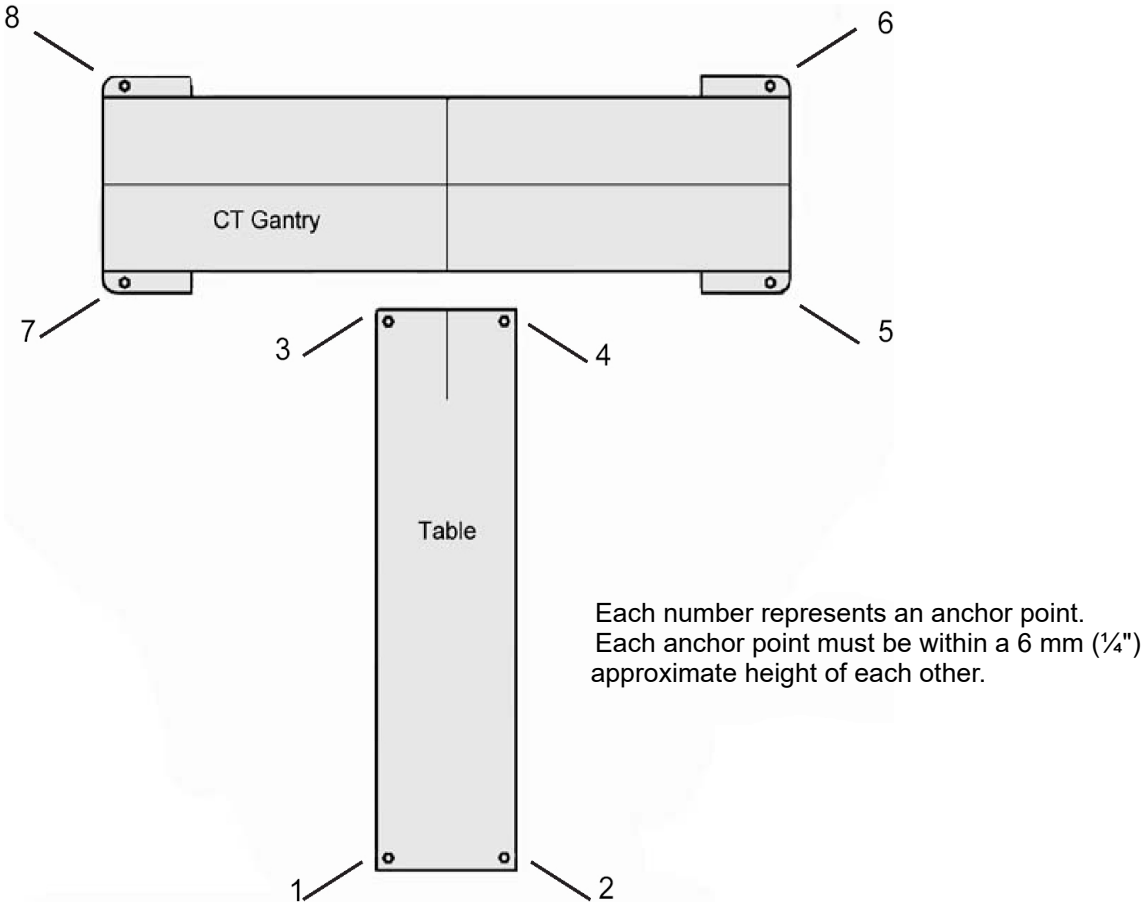
Note: See Service Clearance Section found in the *Pre-Installation Manual*.

5.) Prior to removing this template, check floor levelness, as shown in Figure 1-3.

6.) Position the laser from the install kit on the template behind the table base and turn it on to project a horizontal beam across the floor template area.

7.) Measure the distance from the floor to the laser line at each bolt hole location on the template and record the measurements. Use the measurements to verify the floor is within specification. The floor must meet the minimum levelness specification: 6 mm (1/4 in.) over 3.05 m (10 ft.) between the table and gantry.

Figure 1-3 Check Floor Level



NOTICE **Positioning requires cutting eight (8) holes in the floor covering.**

Before you drill or cut any flooring, make sure that you have discussed this issue with the customer, and that the appropriate hospital personnel have approved the location of the table/gantry.

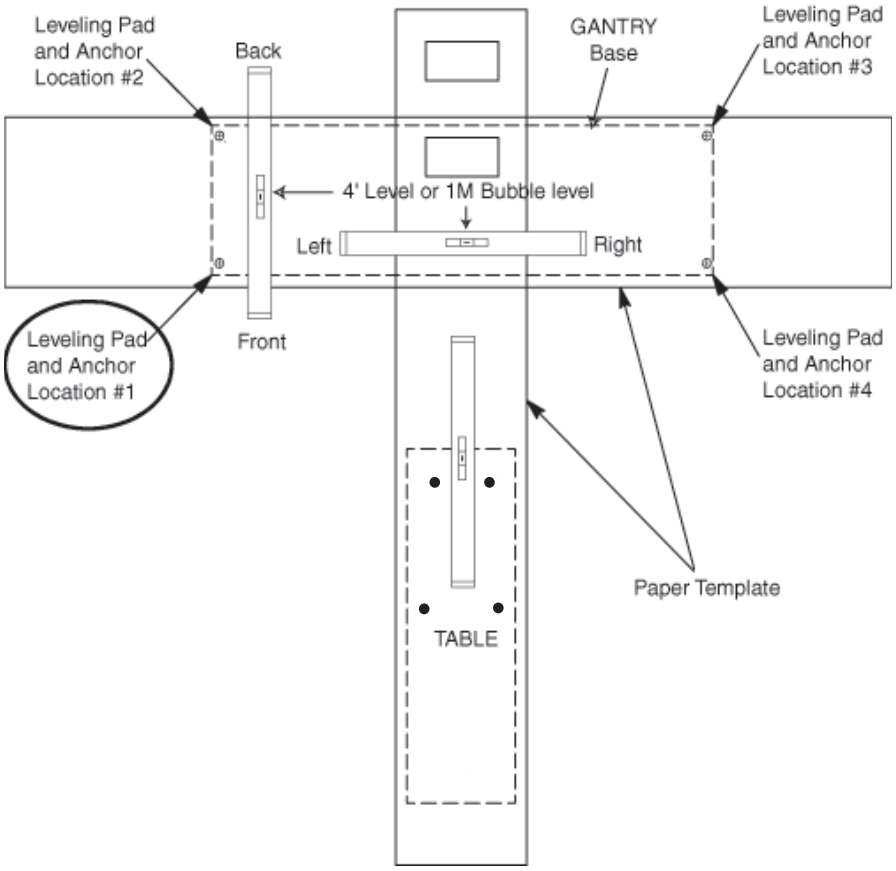
Any repositioning must meet all regulatory requirements to be completed.

- Check that the floor meets the levelness specification. Follow the escalation procedure if the floor does not meet the floor specification.
- If the floor is not level, the system does not meet the table ISO specification. The distance from the table cradle to the floor cannot be greater than 1005 mm (40 in.).

8.) Check with the customer for approval of the gantry/table placement.

9.) Use a center punch to mark hole centers for each of the eight (8) leveling pad/anchor locations per Figure 1-4.

Figure 1-4 Hole Locations



CAUTION **Potential for personal injury.**

Use appropriate safety procedures when drilling the floor holes, especially if there is lead under the floor.

Appropriate PPE is required when working with hazardous materials.

10.) Remove the floor template.

11.) Cut tiles (or other resilient flooring) around all holes punched in the template for the gantry and table. Use a utility knife with a heat gun, a 3" hole saw with a 1/4" masonry bit or other adequate tools to cut the flooring.

12.) Some sites may require sealing of the floor penetrations after the flooring is removed. If this site does, use RTV or other sealant to seal the floor covering as necessary.

NOTICE **All documentation in this manual is based on mounting the table/gantry on a concrete floor.**

13.) Snap a chalk line using the marks that were made on the tape at the ends of the table template.

Section 5.0
Install the Gantry

5.1 Tools and Test Equipment

- Standard Install Tool Kit
- Install Support Kit
- GE Site Print
- Installation Manual
- Gantry Adjuster Tool, P/N 2107863
- Spanner Wrench, P/N 2110003
- PPE (hand protection, foot protection, face shield, eye protection, personal dosimeter)

5.2 Gantry Preparation

Note: Locate and install any required floor protection now.

5.2.1 Gantry Prep - For Access Greater Than 28"

Remove all the transportation packaging from the gantry, except for dollies.

5.2.2 Gantry Prep - For Access Less Than 28"

Measure from the wall or object protruding from the wall to the gantry side cover. The gantry left side cover must be installed for this measurement. When finished, the gantry cannot be closer than 14 in. to the wall or object protruding from the wall.

1.) Remove all the transportation packaging from the gantry, except for dollies.

2.) Remove the blue dolly from the left side of the gantry and install the limited access dolly so that the gantry can be positioned closer to the left side wall:

   a.) Lower the gantry to the floor so that the gantry is resting on the floor.

   b.) Remove the three (3) M14 hex bolts that secure the gantry to the dolly.

   c.) Replace the removed dolly with the shipped black gantry-positioning dolly, and reinstall the three (3) M14 hex bolts.

   d.) Raise the gantry so that it is once again off of the floor.

   The gantry can now be moved up to 14 in. from the wall, measured from the wall or object protruding from the wall to the gantry side cover. Only use the supplied, limited-access dolly for this procedure.

Note: If this procedure cannot be completed, follow the site escalation procedure established for your area.

5.3 Procedure

1.) Position the gantry over the template appropriately.

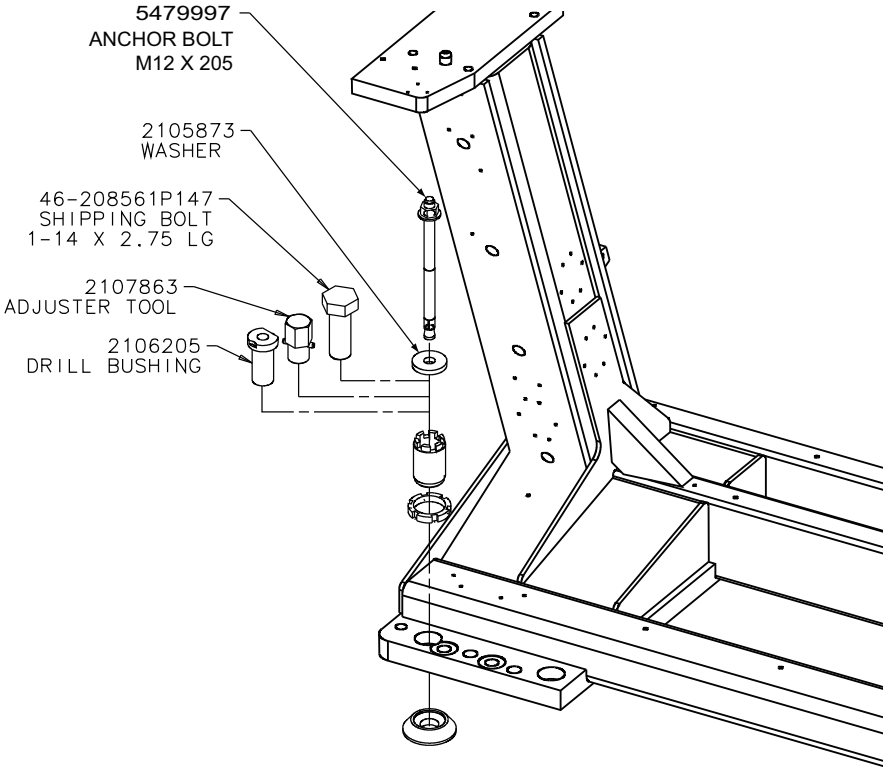
   a.) Use the dolly raise the Gantry and install the adjuster assembly, refer to Figure 1-5.

   b.) Locate the four (4) leveling pads, and position each of them beneath its associated adjuster.

   c.) Use the dollies to evenly lower the gantry, until it is just off of the floor (approximately ½" or 12.7 mm). Use a ½" ratchet to raise and lower the dollies.

d.) Carefully rotate the gantry into the correct position over the template.

Figure 1-5 Gantry Base Installation Hardware



Note: Adjusters are used at each anchor location. Anchor hole ID is 1" (2.5 cm). Void between adjuster and anchor must be filled according to local building codes for seismic application.

2.) Remove the paper templates from the floor and discard properly.

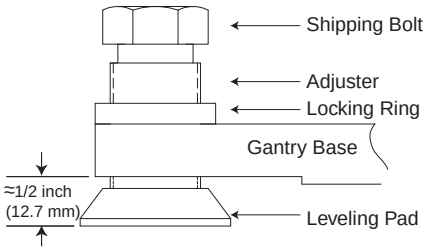
3.) Loosen the locking rings and shipping bolts so you can fine-tune the leveling pads to compensate for slight variations in the floor surface.

4.) Position the gantry so that the adjusters are centered over their respective holes scribed earlier into the floor.

IMPORTANT: Make certain to route the gantry power cord under the two rear gantry rails, before removing the gantry shipping dollies.

5.) Using a ½" ratchet, gently lower the gantry until it rests on the floor, over the marked areas.

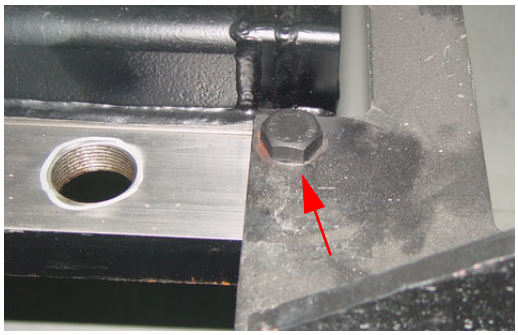
Figure 1-6 Gantry Base Leveling Pads (Starting Positions)



NOTICE Gantry dollies weigh approximately 250 lbs each. Exercise caution when removing dollies so as to not damage the floor covering.

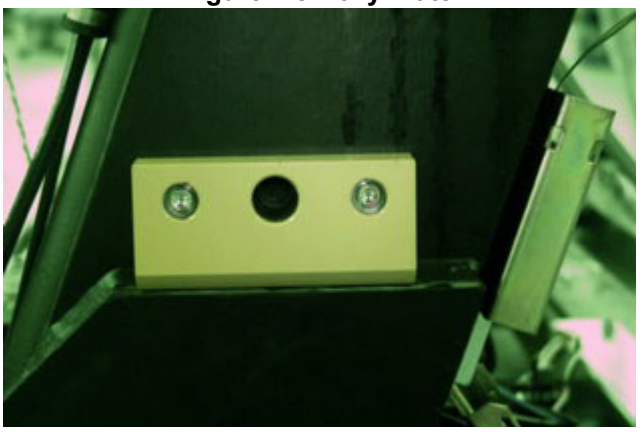
6.) Using a 14mm hex socket, remove the dollies from the gantry by removing the three dolly bolts found at both ends of the gantry (Figure 1-7).

Figure 1-7 Gantry Dolly Bolts



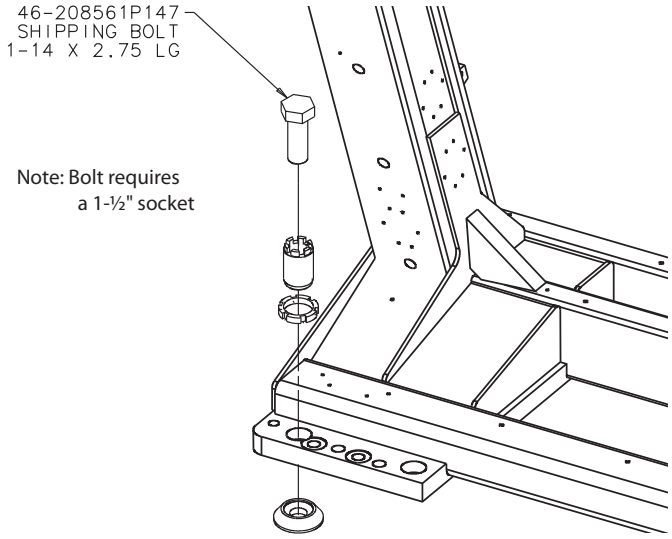
7.) Remove the dolly plates on both sides of the gantry. Retain the dolly plates in the service cabinet at the hospital.

Figure 1-8 Dolly Plate



8.) Remove the (4) gantry shipping bolts, using a 1½" socket.

Figure 1-9 Gantry Shipping Bolts



Section 6.0
Level the Gantry

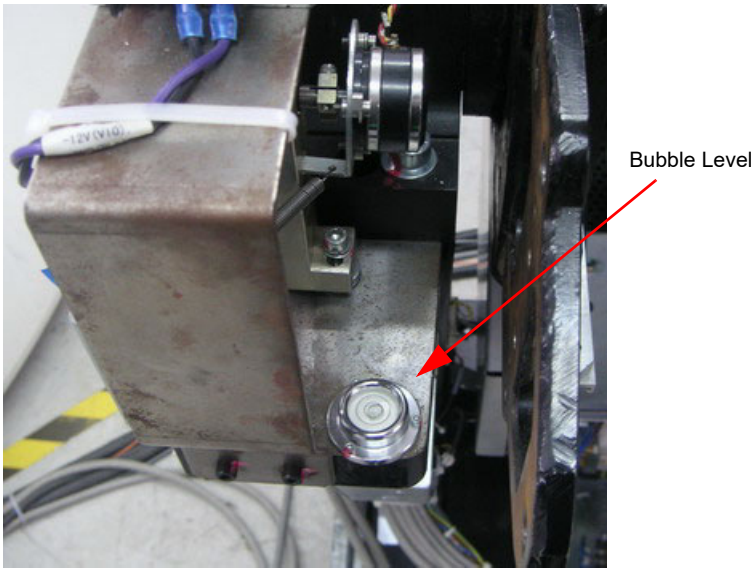
6.1 Tools and Test Equipment

- Standard Install Tool Kit
- Install Support Kit
- GE Site Print
- Gantry Adjuster Tool, P/N 2107863
- Spanner Wrench, P/N 2110003
- PPE

6.2 Procedure

The gantry uses 2 bubble levels that are permanently mounted to machined surfaces on the stationary base to tell when it is level.

Figure 1-10 Gantry Bubble Level



Bubble levels are located on both ends of the gantry stationary base. They're located on the stationary base near a point where the rotating structure pivots mount to the base structure. (See Figure 1-10.) The gantry is properly leveled when the bubble is centered. (See Figure 1-12.)

1.) Loosen all adjuster lock rings (use a spanner wrench or large channel lock pliers).

2.) Systematically turn each of the gantry's adjusters (locations 1, 2, 3 and 4 in Figure 1-11) until both bubble levels are centered left to right, and front to back.

- Begin by turning each adjuster no more than 1 turn at a time.
- Use the adjuster tool, $1^{1}/_{8}$" socket, and the ½" drive ratchet to turn each adjuster. (Refer to Figure 1-12.)

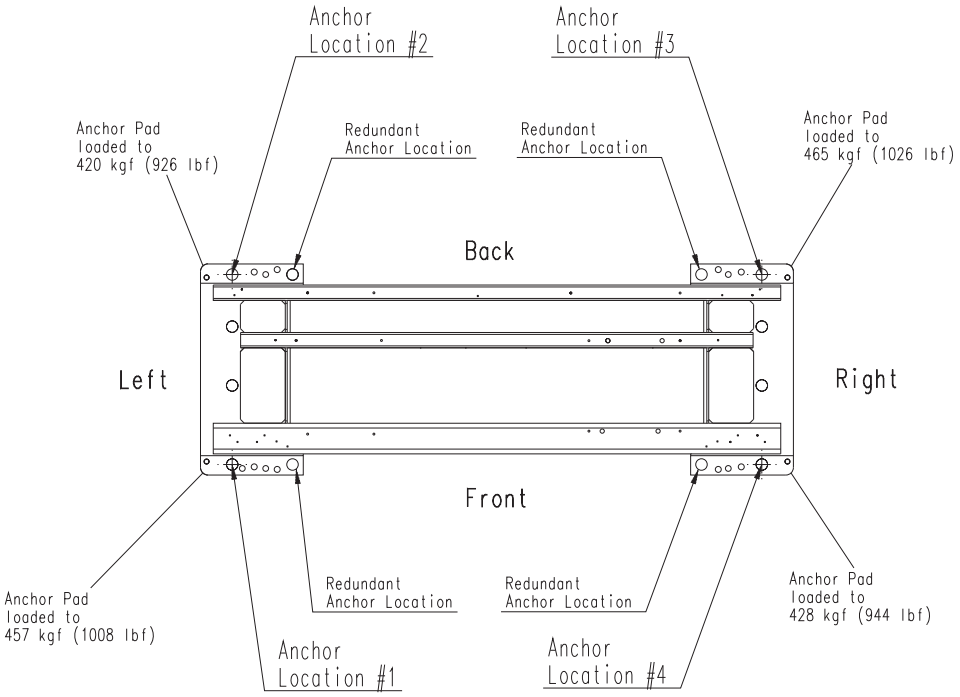
Systematic Procedure for Leveling gantry follows:

1.) Level the left side from front to back by turning adjusters #1 and #2.

2.) Level the right side from front to back by turning adjusters #3 and #4.

3.) Level the side (right or left) that is higher with respect to the other side. Turn both adjusters on a side equally until that side is level. The side should now also be level.

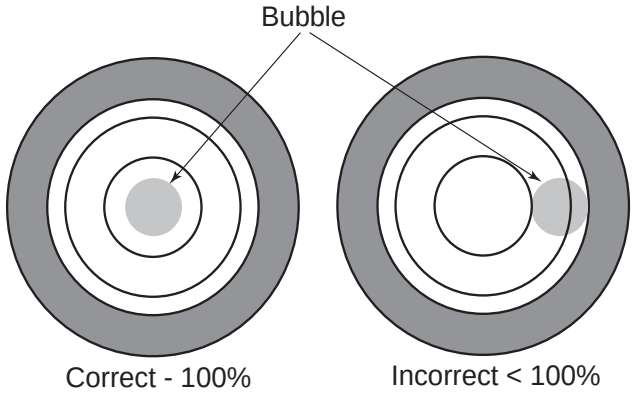
Figure 1-11 Gantry Base "Adjuster" Locations— Top View



Note: Adjusters are used at each anchor location. Anchor hole ID is 1"(2.5cm). Void between adjuster and anchor must be filled according to local building coded for seismic application.

3.) When the bubble levels are centered (Figure 1-12), each of the four (4) leveling pads should be carrying a portion of the gantry weight. Distribution of the gantry weight prevents the base frame from rocking during normal operation. **DO NOT leave any adjuster un-loaded or floating**.

Figure 1-12 Bubble Level Centering



4.) Adjust the distance between floor and gantry base at Anchor location #1 becomes approximately 17.0 mm by turning four (4) adjusters equally.
(Be careful no more than 1 turn at a time.)

Section 7.0
Gantry Bearing Gap Inspection

All CT systems require a Gantry Bearing Gap inspection before starting electrical calibration.
All international gantries are shipped in a wooden shipping crate that should not be removed until it arrives at the installation site. This shipping container is designed to reduce the risk of shipping damage.

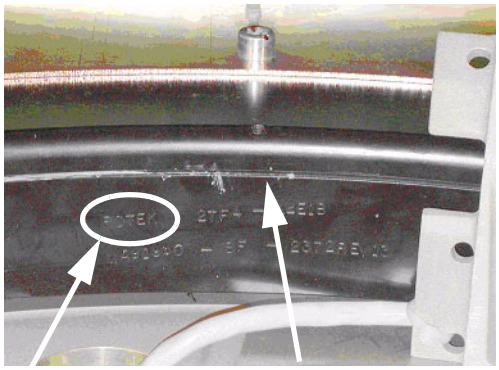
7.1 Tools and Test Equipment

- Standard tool kit
- Inspection document
- 2.5 mm Allen wrench
- Rear cover dollies (2)
- Flashlight

7.2 Preparation: Damage Indicators

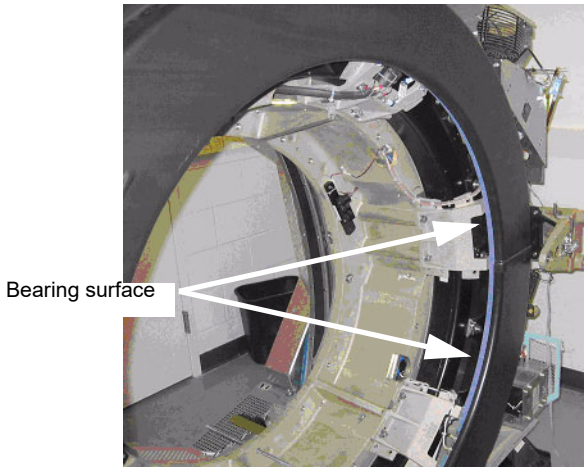
On the inside edge of the black-colored bearing assembly, a mark similar to that shown in Figure 1-13 will be seen, if this is a Rotek bearing.

Figure 1-13 Gantry Bearing - Rotek Label



The mark has a serial number in the same format as:
ROTEK 2TF4-44E1B-MA91960-8F-2372-REV13.
The gap to be inspected is shown in Figure 1-14 next to the serial number.

Figure 1-14 Gantry Bearing



On most systems, a change in the bearing gap does not cause the gantry to make unusual sounds, unless the gap is severe. If the gantry is badly damaged and the gap is severe, it can cause operation issues. Some systems are shipped with shock indicators that must be returned to Milwaukee.

A severe failure may be seen during installation as a problem rotating the gantry.

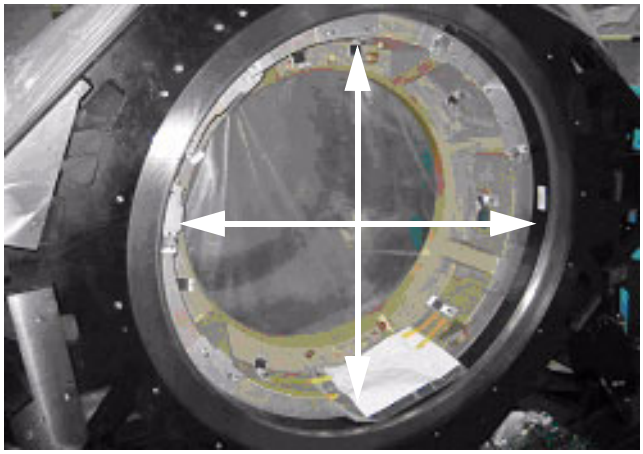
7.3 Procedure

1.) Remove the scan window following the procedure in appendix A, Section 7.0: Gantry Base Covers

2.) Remove the top and rear gantry covers, following the procedures in Appendix A, Section 3.0: Gantry Top Covers and Section 5.0: Gantry Rear Cover

3.) Use a 2.5mm hex wrench as a tool to measure the gap at the positions shown in Figure 1-15. The location of gantry components does not matter. Simply measure four (4) locations 90 degrees apart from each other.

Figure 1-15 Inspection Locations

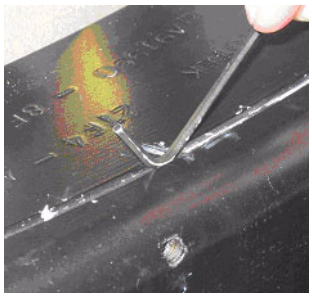


4.) If the 2.5mm hex wrench easily fits without effort in the gap, the gap is out of spec. Figure 1-16 shows a gap that is too large. Figure 1-17 shows a gap that is good. Notice that the hex wrench does not fit in the gap in Figure 1-17 but does in Figure 1-16.

Note: Do not use force when putting the wrench in the gap. Either it slips in or it doesn't.

Figure 1-16 Gap Too Large

Figure 1-17 Gap Is Good



5.) Replace the top and rear gantry covers, following the procedures in Appendix A, Section 3.0: Gantry Top Covers and Section 5.0: Gantry Rear Cover.

6.) Replace the scan window.

7.4 Finalization

7.4.1 Mechanical Installers

If the Bearing Gap Inspection passes, complete the signoff on the GE Form e4879, Installation Data verification form, that this inspection was completed.

If the Bearing Gap Inspection fails, contact your site FE.

7.4.2 FE Service Action Required

If the Bearing Gap Inspection fails, the mechanical installer notifies the site FE that the inspection failed.

The site FE should:

1.) Open a bearing inspection dispatch.

2.) Follow the inspection procedure described in this section.

3.) Record the bearing inspection results.

If no damage is found, close this dispatch and continue with the electrical calibration procedures.

If the system is damaged, go to the Equipment Delivery Quality web site and follow their instructions.

To enter a damaged in shipping claim, go to this web site:

http://egems.med.ge.com/edq/home.jsp

7.4.3 FE Inspection Completion

1.) After the Gantry Bearing Inspection passes, complete the opened service dispatch with the following information:

- Gantry Serial Number
- Gantry Type
- System ID
- Site Name
- Installation date
- Was the Gantry transported to the site in the shipping crate? (Yes/No)
- Was the Gantry lifted or hoisted, were riggers used, or was the Gantry delivered via flatbed wrecker? (Yes/No)
- Number of locations that fail the gap inspection if any: _____

2.) Close the service dispatch.

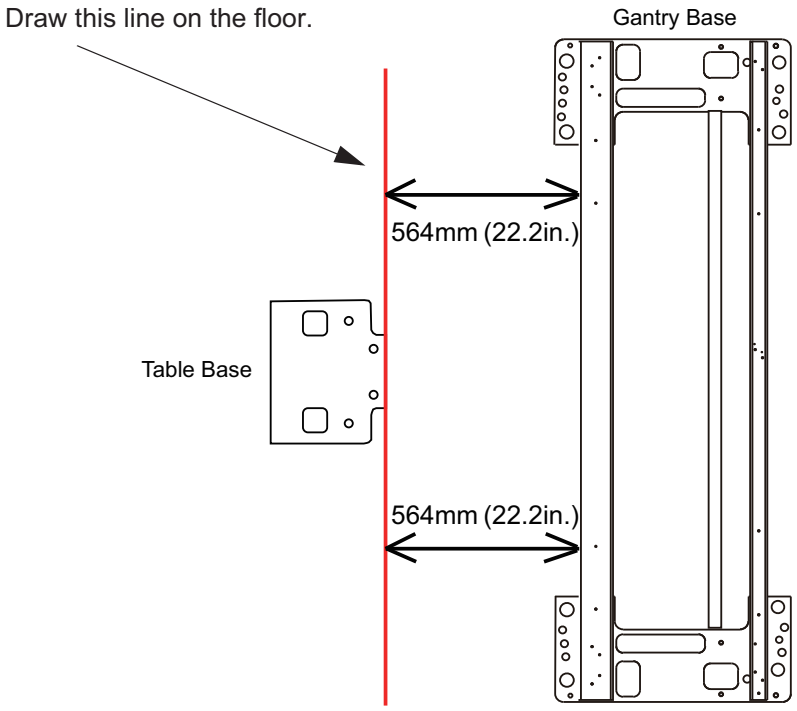
Should any follow-up be required after this inspection, the site engineer will be contacted directly by CT Engineering.

Section 8.0
Table Prep and Setup

8.1 Table Prep

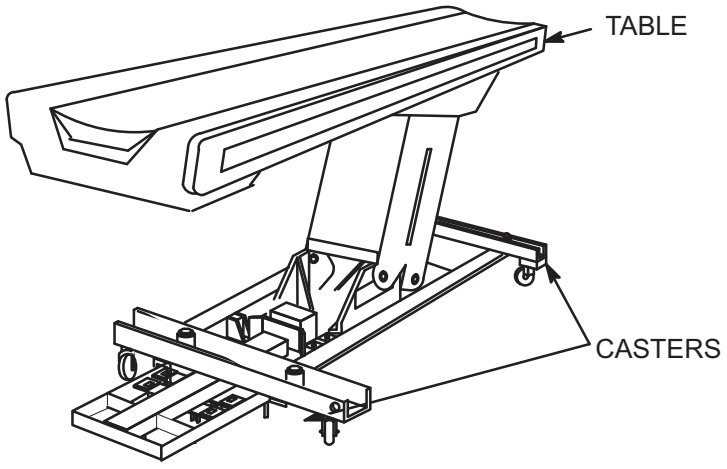
1.) Draw a reference line of 564mm position from Gantry Base on the floor as shown in the Figure 1-18.

Figure 1-18 Draw Reference Line



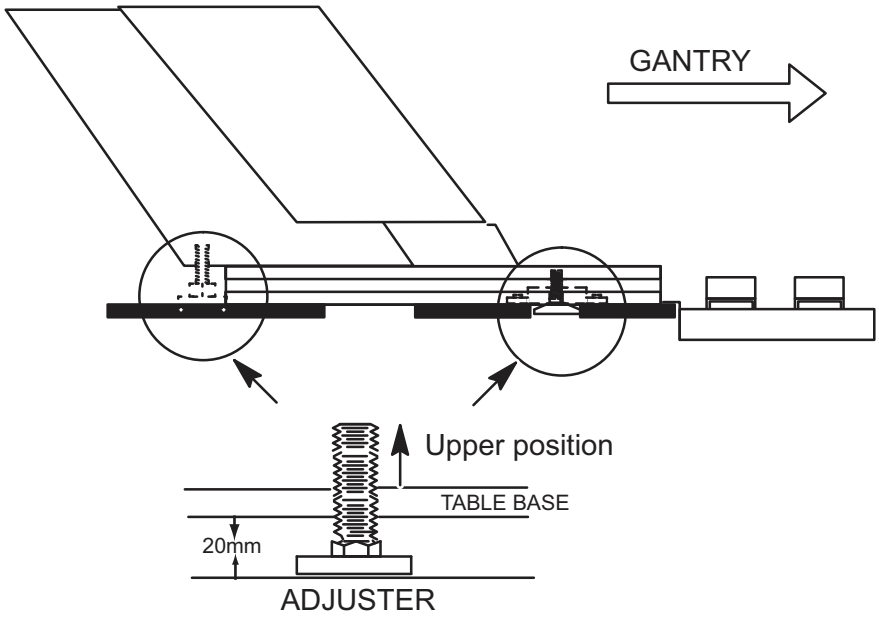
2.) Remove all the transportation packaging and boxes, except dollies, from the table.
3.) Wheel the table to its approximate position relative to the gantry, using the mark made earlier.
4.) Use the dollies to evenly lower the table until it rests on the floor using an 1/2" ratchet.

Figure 1-19 Moving the Table



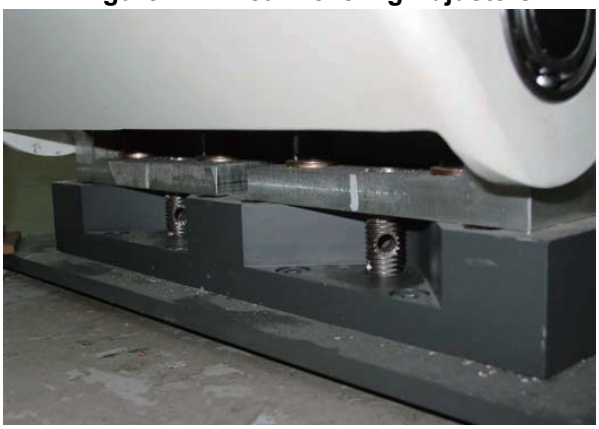
5.) Rotate the four level adjuster until the distance is approximately 20mm (4/5in.) between the bottom surface of the table base and the floor, see Figure 1-20.

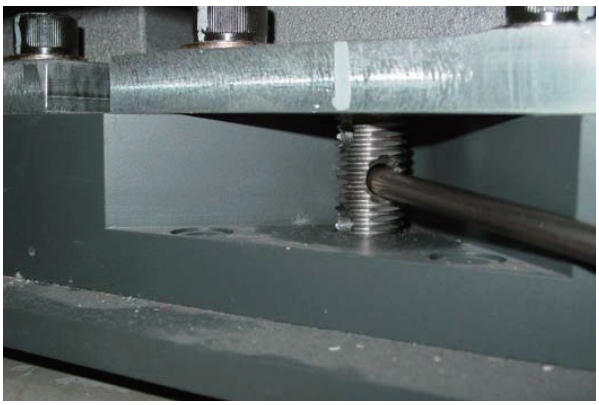
Figure 1-20 Setting the Adjuster



Note: Adjust two rear leveling adjusters by inserting the screw driver into the adjuster hole located on the bolt, see Figure 1-21 Rear Leveling Adjusters.

Figure 1-21 Rear Leveling Adjusters





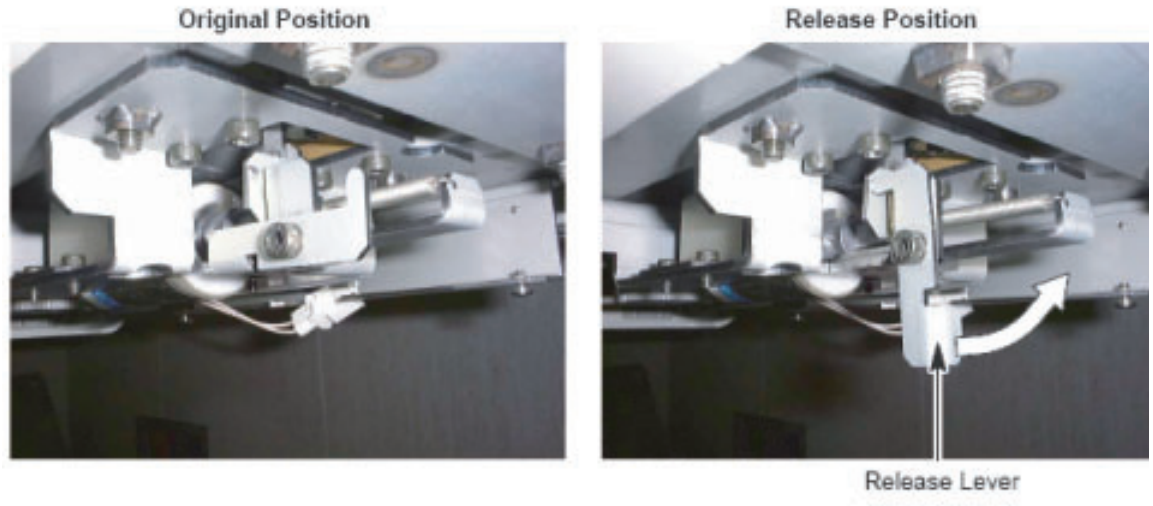
8.2 Cradle Center Procedure

1.) Remove a bottom cover under a cradle handle.

Figure 1-22 Remove Bottom Cover

2.) Release a latch by pushing a bracket to move the cradle by hands, see Figure 1-23.

Figure 1-23 Release the Cradle



3.) Center the cradle on the drive rollers assembly by pushing the cradle into the gantry to its maximum position and back to just before the latch position six times. The cradle should be centered.
You must push and pull a center of cradle hand. See Figure 1-24.

Figure 1-24 Push and Pull Cradle

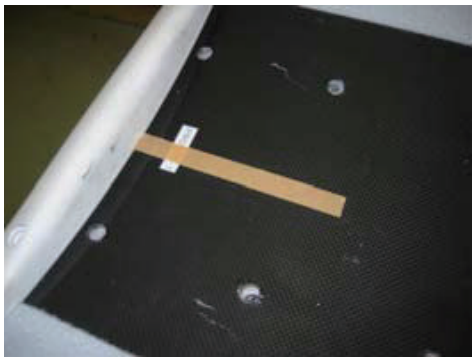
8.3 Center Line on Cradle

1.) If your system has no center line mark on the back of cradle, complete the following procedure to make cradle center-line.

2.) Using a metric tape measure or other suitable measuring device:

a.) Using supplied masking tape, place a 150mm strip on the back of the cradle. See Figure 1-25.

Figure 1-25 Set Strip



b.) Determine the cradle center-line by measuring the cradle width 428mm (16.9in.) (center 214mm (8.4in.)). Make two points on the masking tape and make a line.

Figure 1-26 Making the Marker

Section 9.0
Install Gantry/Table Alignment Laser and Bracket

9.1 Tools and Test Equipment

- Standard tool kit
- Laser Alignment kit (p/n 5272090)
- 9 inch level
- Tape measure
- Masking tape

9.2 Install the Gantry Laser Alignment

NOTICE **Use caution while removing the gantry scan window.**

1.) Rotate the gantry by hand until the collimator face plate is at the 5 o'clock position.

Note: With power OFF, the gantry movement is tight.
DO NOT pin the gantry during this alignment process.

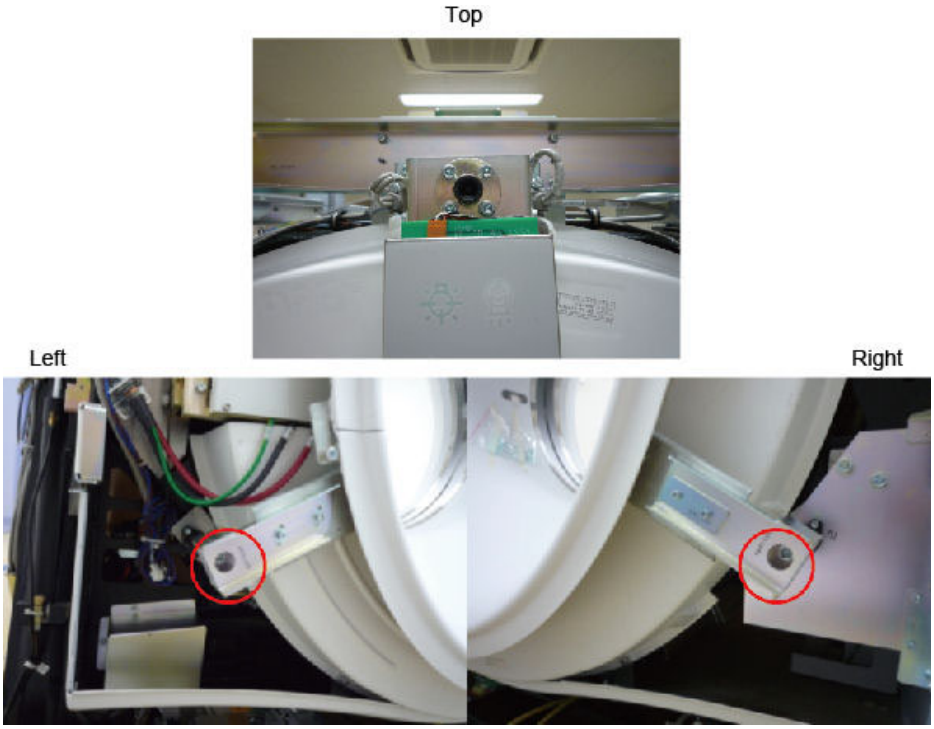
2.) Remove the Gantry side, top, front covers.

3.) Slide out the rear cover.

Figure 1-27 Slide Out Rear Cover

4.) Remove two (2) bottom bore cover screws and loosen the top bore cover screw.

Figure 1-28 Bore Cover Screws



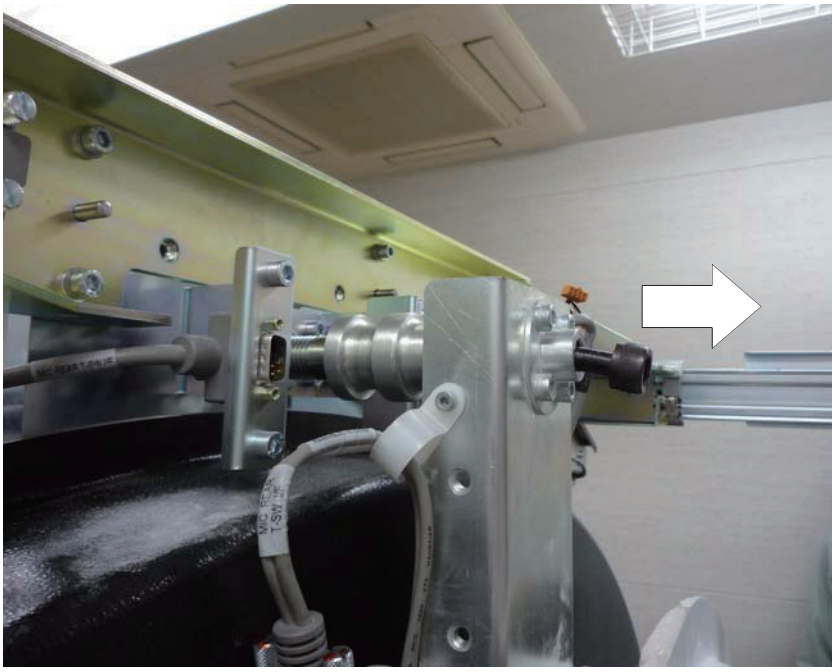
5.) Pull up safety pin small knob on the bore cover top bracket and rotate 1/4 turn to keep the safety pin disengaged.

Figure 1-29 Sliding Bore cover backward

6.) Pull out the bore cover about 5 cm (2 in.) from the top supporting bar so that the laser tool can be attached. At this position, the safety pin should be located to the second slot on the supporting bar.

NOTICE **Smoothly pull out the bore cover to avoid it fully slide out from the top supporting bar.**

Figure 1-30 Pulling Bore cover backward



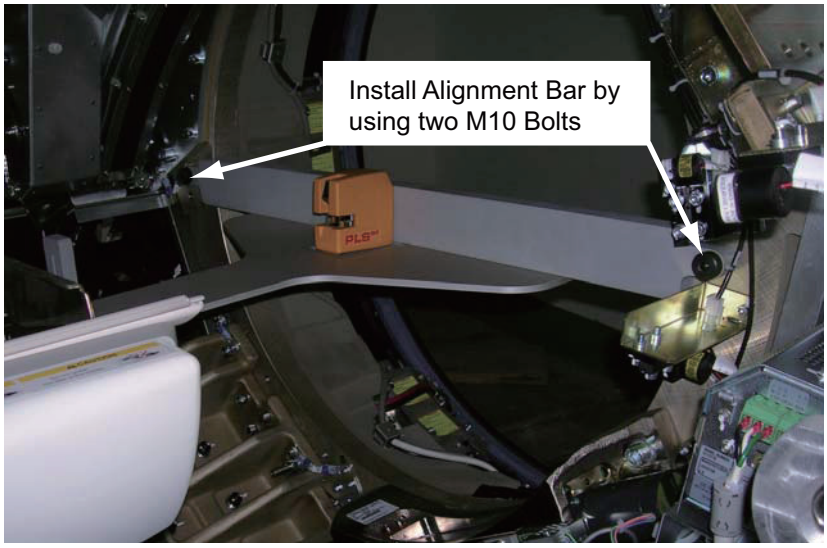
7.) Locate the two M10 bolt holes as shown in Figure 1-31. These bolt holes will be used to attach the laser tool to the gantry.

a.) The bolts can be installed using a 8mm Allen wrench. Be careful not to bump the alignment light; the mounting space is tight near the alignment light. Tighten until both bolts are snug.

b.) Do not drop bolts or the bar on the collimator faceplate. Attach the bar as shown in Figure 1-31.

c.) Use a minimum 223 mm (9 in.) level placed on the attached bar to level the bar by rotating the gantry.

Figure 1-31 Alignment Bar Installation Location



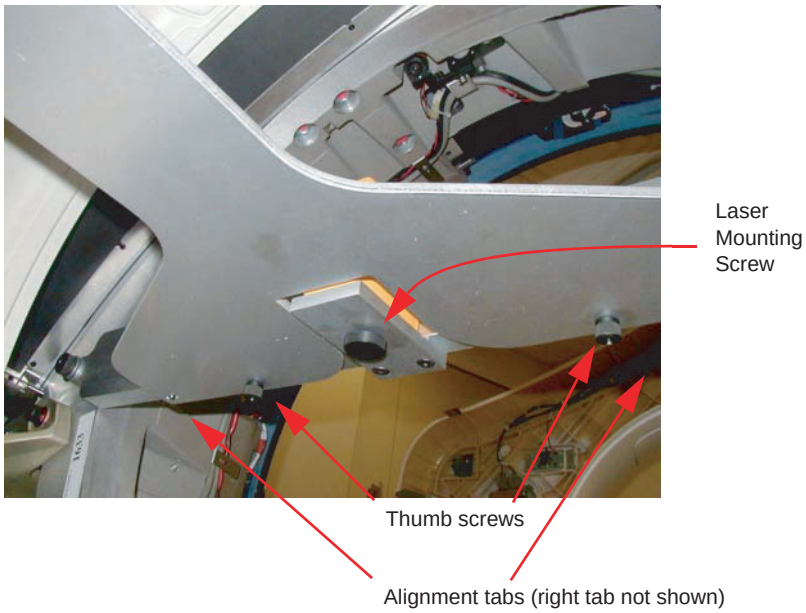
CAUTION **Potential for injury.**

DO NOT look into the laser.

Use appropriate safety procedures when working with lasers.

8.) Attach the laser centering plate onto the laser mounting bar as shown in Figure 1-32. The plate is attached from under the alignment bar using two fixed locators and two thumb screws.

Figure 1-32 Attach Laser Center Plate

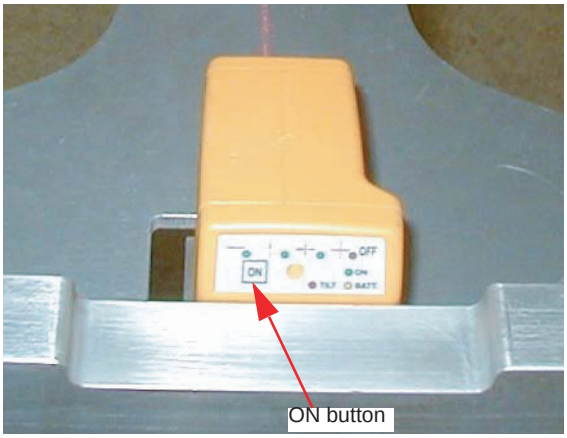


9.) When done, insert the laser and turn on the laser using the controls on the back. If the laser is loose when mounted, use a 2 in. piece of Velcro loop (fuzzy) section and attach it to the alignment plate over the attachment screw. Remount the laser and it should fit snugly without moving.

10.) When pressed, the **ON** button steps through four different beam profiles and “Self-Leveling Off”. Press the **ON** button until the “|” beam shows. It will be used for this operation.

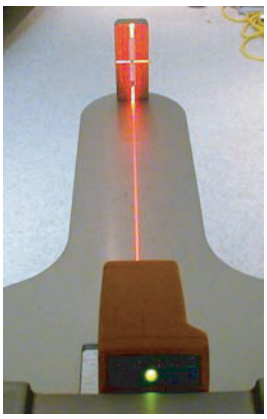
Times pressed	Function	Notes
1	—	Self-leveling on
2	|	
3	+	
4	Self-leveling off	Do not use

Figure 1-33 Laser On Button



11.) Align the laser by carefully rotating the laser base assembly so that the "I" beam shines through the alignment sight mounted on the end of the alignment plate. Use the locking screw on the bottom of the alignment bar to secure the laser to the bar, as shown in Figure 1-34.

Figure 1-34 Laser Centering



Note: When tightening, the laser may move. Use caution to prevent any movement, as this can result in drilling the table anchor holes in the wrong location.

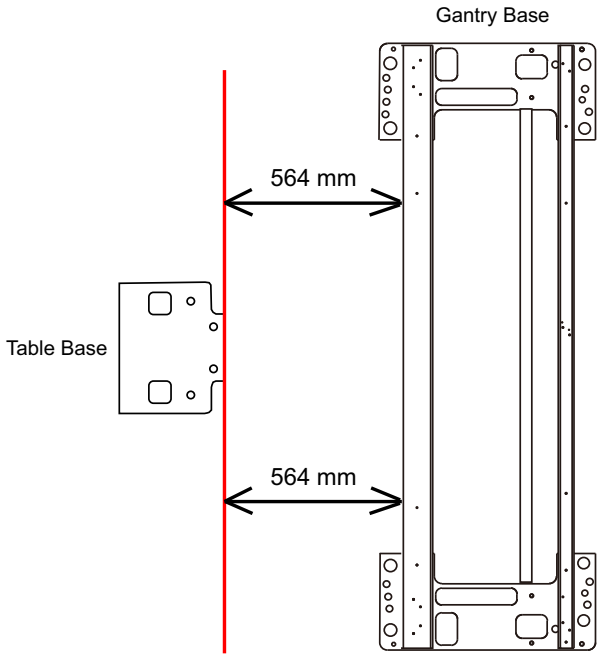
12.) After the laser is centered, notice that the laser beam also appears on the back wall. Place a piece of masking on the wall and carefully mark a line on the tape where the laser appears. This line is later used in the table alignment. This line is also useful in determining if the laser unit moves during the alignment process.

13.) Remove the alignment centering plate and store it in the alignment case.

14.) Using a chalk line, mark a table center line on the floor along the laser light shining on the floor.

15.) Check the reference line for table 564mm (22.2 in.) Z-distance, as shown in Figure 1-35.

Figure 1-35 Checking the reference line



16.) Turn off the laser, but do not remove.

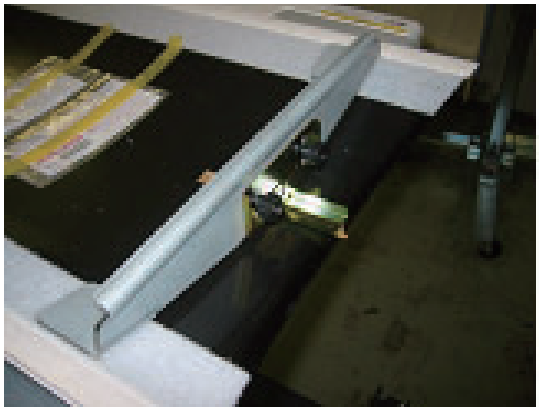
9.3 Install the Table Cradle Laser Alignment Plates

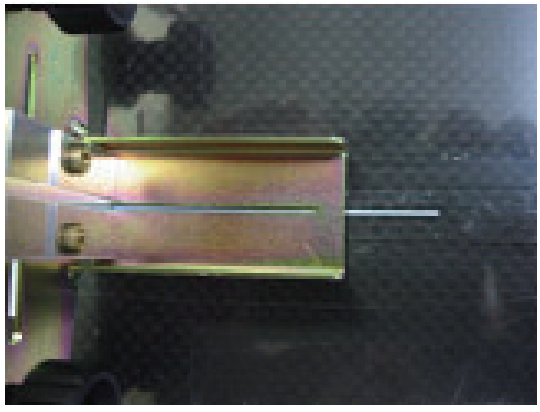
1.) Install the front table laser alignment which has a cross slot to the front of the cradle.

a.) Loose adjustment knob to make the slot plate free.

b.) The slot in the front of the tool should be over the cradle center-line. See Figure 1-36.

Figure 1-36 Front Table Laser Alignment





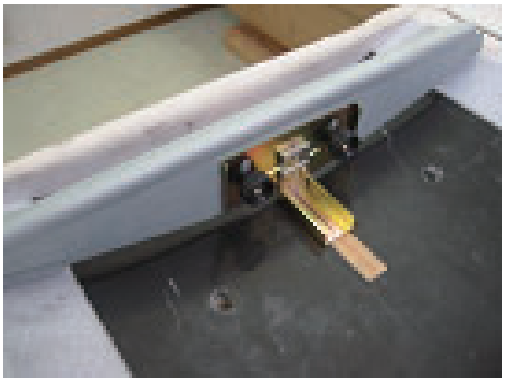
c.) Tighten adjustment knob.

2.) Install the rear table laser alignment which has a cross target to the back of the cradle.

a.) Loose adjustment knob to make the slot plate free.

b.) The slot of the tool should be over the cradle center-line. See Figure 1-37.

Figure 1-37 Rear Table Laser Alignment



c.) Tighten adjustment knob.

3.) Check that table base is centered over the table center line, and the base is on the 564mm (22.2in.) line made on the floor, see Figure 1-35.

Section 10.0
Level and Center the Table to the Gantry

10.1 Required Tools

- 2’ Carpenter’s Square
- 2’ Level
- Masking Tape
- Flat-blade Screwdriver
- 4’ Level
- 9" Level
- Metric Tape Measure
- 1’ Pry Bar
- Craftsman Laser Trac™ Level with Carrying Case and Laser Enhancing Glasses

  Sears item #00948247000
  Mfr. model #48247
  $39.99

10.2 Alignment Conditions

- Before you start, turn on the laser and check that the beam is still on the mark placed on the wall. If not, reset the laser.
- If the mark is not present, use a measuring tape and place a 100 mm piece of masking tape on the cradle at the 1000 mm (39.3 in.) and on the laser line.
- The gantry must be at zero degrees.
- Table base to cradle alignment location is 1005 mm (39.6 in.) from the center of cradle to the floor.

10.3 Alignment Specification

- Table cradle must be level in all directions (centered within the lines on a Johnson Professional level).
- All table adjusters should be preset to 20 mm (3/4 in.) down from the table base to make adjustment easier. Based on floor levelness and your experience, a different preset height may work better. One thread must be showing above all locking rings when leveled.
- Table cannot be higher than 1005 mm (39.6 in.) from floor to cradle.

10.4 Procedures

⚠

NOTICE **Avoid leaning on the cradle during this procedure.**
DO NOT pin the gantry during this alignment process.
This procedure is for systems mounted on 102 mm (4 in.) concrete floors only!

Note: If the floor covering was not properly removed with the glue removed, or the levelers were not centered over the floor cutouts, the leveler may become trapped against the edge of the floor covering, causing the table to become unlevel. If this happens, move the table and enlarge the 102 mm (4 in.) floor cutout for the table. Glue removal is important and aids in moving the table to its final location in accordance with the floor levelness specification.

1.) Place the bubble level on the table base. See Figure 1-38

Figure 1-38 Place Bubble Level

2.) Turn on the laser's "I" beam (vertical beam) by pressing the ON button 2 times

3.) With the laser on, the laser light should shine through the front tool down the cradle connecting the front and rear center lines and onto the center of the rear alignment tool.

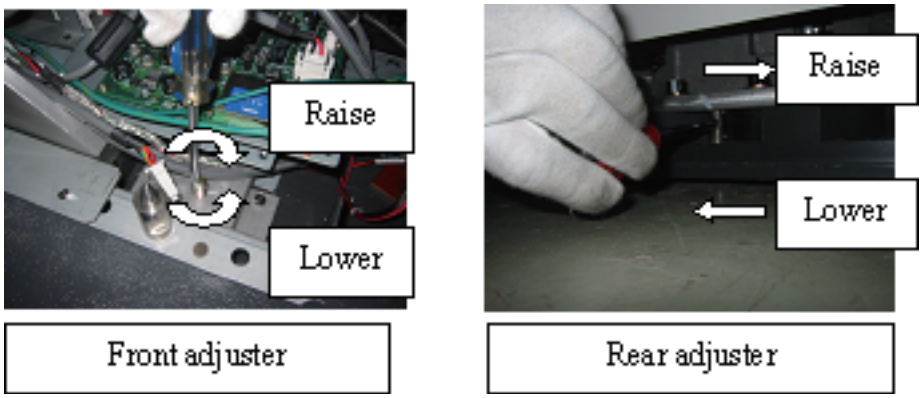
4.) Raise or lower the table as needed using the two front and two rear adjusters so that this line is shining 100% in the machined grooves of each alignment tool.(it is easier to raise, move, and lower the table using the table dolly. This prevents the adjuster levelers from gripping on the floor adhesive, making it difficult to move.)

   a.) The light will shine vertically down the table.

   b.) Both center lines on the cradle front and rear should be connected when done.

   c.) Level of the table influences a center position, The vertical laser alignment light must match and be centered on the white line on the front of the table and in the groove of back alignment plate. See Figure 1-39

Figure 1-39 Front and Rear Adjuster



5.) Be sure that all adjusters bear part of table's load.

Section 11.0
Drill the Anchor Holes

WARNING **POTENTIAL FOR PATIENT INJURY.**

IMPROPERLY SECURED TABLE MAY TIP, DISLODGING PATIENT.

PROPER ANCHORING IS KEY TO MAINTAINING PATIENT SAFETY DURING SYSTEM OPERATION.

11.1 Notes to Mechanical Installers

Note 1: Basic Anchoring Information

GE provided floor anchors are designed for use ONLY on concrete floors that meet the 4-inch concrete floor requirement. Supplied floor anchors must be installed by a trained contractor, and shall be set to a minimum depth of 3 inches at each anchor point. ANY anchors having more than 1-inch of thread showing above the nut, when torque is set to 55 lb.-ft, shall have a second anchor installed in the closest adjacent hole. This is because the minimum anchor engagement length in the concrete was not met. The second anchor shall be installed to the standard depth and torque specification. **Do not cut anchor bolts that extend longer than the 1-inch limit.**

Note 2: Alternate Anchoring

If at least four anchors cannot be set for the gantry, and at least four anchors for the table, then the installer must inform GE that the minimum anchoring cannot be met. Additionally, a structural engineering contractor must be engaged to determine the anchoring method and to certify that their anchoring meets the stated GE minimum load requirement and torque specification.

Note 3: Non-Concrete Floors

All other anchoring methods — on floor types other than the concrete minimum — must be determined at the customer's expense, by a structural engineering contractor. The anchoring method must be certified to meet the stated GE minimum load requirement and torque specification.

Note 4: GE Notification

It is not the role of the mechanical contractor or installer to determine acceptable methods to install or anchor equipment on non-4-inch concrete floors. The appropriate GE contact person shall be notified that the facility's floor type DOES NOT MEET the installation mounting requirement for the installation procedure (described in this Installation Manual), and therefore the table-gantry mounting process CANNOT continue.

11.2 Requirement

Tools Required

- Standard Install Tool Kit
- Hammer Drill
- 12mm Drill Bit (Metric equivalent must not be used)
- ½" Drill Bushing (shipped in install support kit)
- Vacuum with HEPA or drywall dust filter
- Vacuum Hole Attachment - to clean debris from the holes
- PPE

Time and Personnel

- .5 hour labor on site
- 2 Engineers

11.3 Gantry Drilling

1.) Make certain that the gantry scan window is in place, to prevent dust from entering the gantry.

Figure 1-40 Gantry Scan Window

2.) Use a piece of tape to mark the drill bit depth of 170 mm from the tip of the 12mm masonry drill bit.

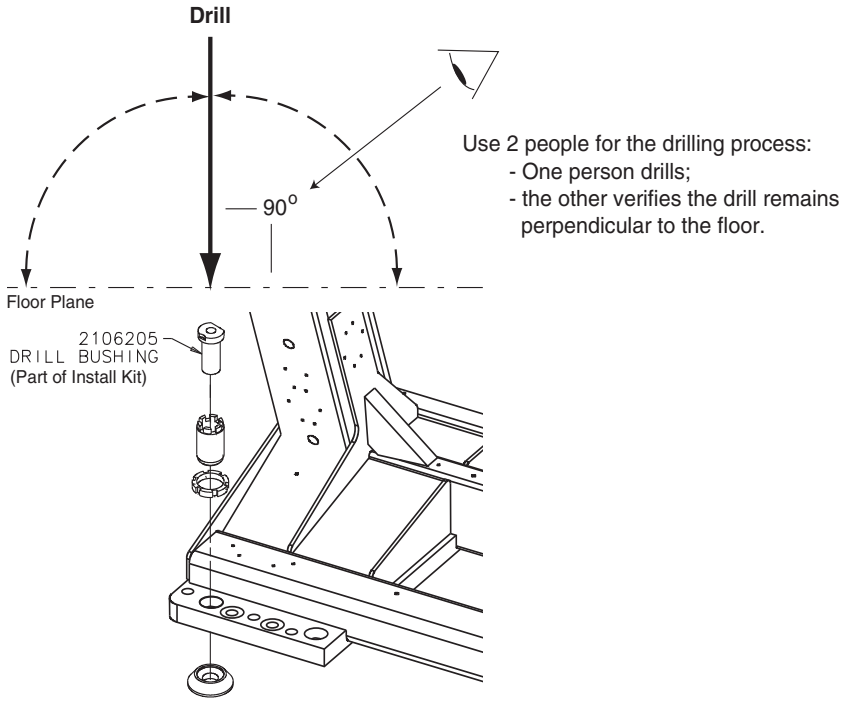
NOTICE **Potential for Equipment Damage from Dust.**

You must cover all electronic assemblies in the table base prior to drilling to prevent damage due to the dust created during drilling.

3.) Use the 12mm (0.47 in.) drill bit to drill all four (4) anchor holes (refer to Figure 1-42 for locations.)

- Review Figure 1-41, prior to drilling.

Figure 1-41 Drilling Position



Note: Recommend first drilling the backward two archors.

- **Important -** Drill the holes perpendicular to the floor. While one person drills the holes, position a second person to watch the relationship between the drill bit and floor. Make sure the bit remains absolutely perpendicular to the floor throughout the drilling operation.

  Always use the mechanical guide supplied with the alignment kit.
- Stop drilling every 15 or 20 seconds and clear the hole of debris. This helps to prevent binding of the drill bit.

a.) Drill each hole until the mark on the drill bit is even with the top of the drill bushing. (195mm)

b.) Place the drill bushing inside each adjuster, to keep the hole vertical, and centered within the adjuster.

* Take care not to injure yourself on the gantry cover brackets.

c.) Stop the drill every 15 or 20 seconds and clear the hole of debris to prevent binding of the drill bit.

4.) Vacuum all debris from the inside of the hole:

Note: A drywall dust filter should be used on the vacuum.

a.) Place the funnel tip inside the hole; place the vacuum hose in the funnel.

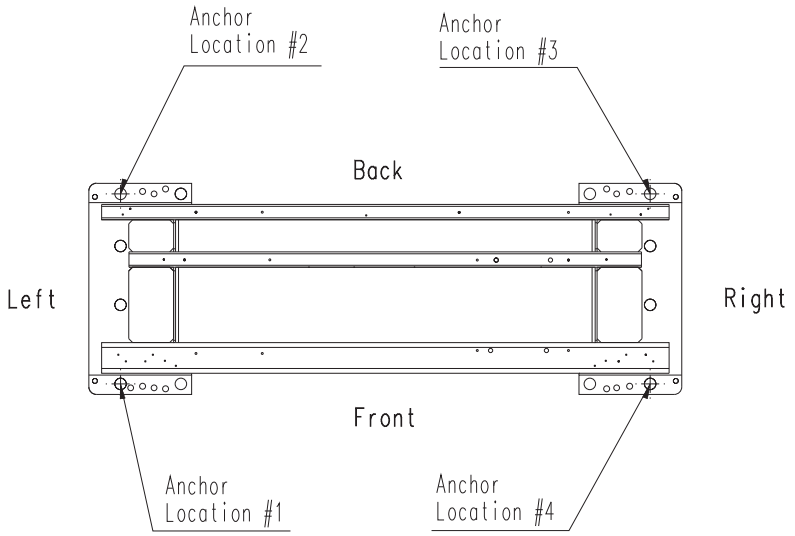
b.) Continue to vacuum while you drill, if you can, to keep gantry and table as free of dust contamination as possible.

c.) When you finish clearing the anchor hole, vacuum the debris from the surrounding area.

d.) Stop drilling frequently to let the drill bit cool.

e.) All holes must be a minimum of 100 mm (3.9 in.) deep (see Figure 1-47, on page 72). Recheck all holes.

Figure 1-42 Anchor Locations, Standard



11.4 Table Drilling and Anchoring

When the room-layout template is used, the anchor bolts have been installed. If it is, perform the following. If it is NOT, perform all procedures of this section.

- Table Leveling (This section)
- Tighten the anchor nuts with the insulating plate and washer.
  TORQUE: Approx. 50 N-m
- Verify that the Table to Gantry Alignment should be correct.

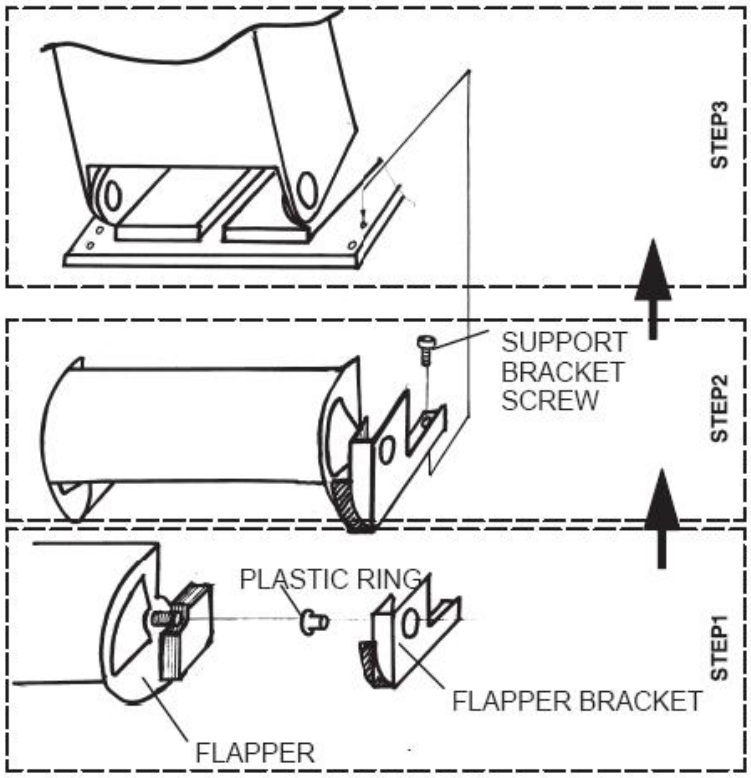
This anchoring procedure is one for the anchor kit shipped with the system.

⚠

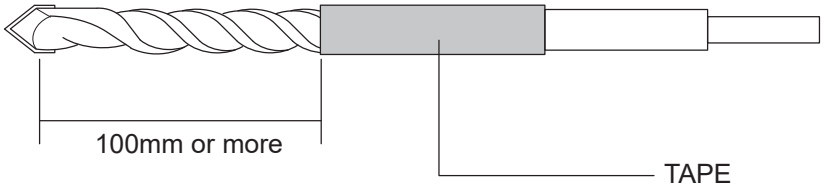
NOTICE The minimum Tensile load strength of the anchor must be 13000 N.

1.) Verify that the table flapper is removed to make space for anchoring. If it is not, remove the table flapper by removing the four flapper assy mounting bolts.

Figure 1-43 Table Flapper



2.) Prepare and tape 12 mm (0.47 in.) concrete drill bit (2203081: HILTI, TE-CX 12/17 or equivalent).



3.) Make holes at the anchor position as shown in Figure 1-46, using electric drill with the bit prepared in the previous step, so that the lower edge of the tape just touch the floor surface.

NOTICE **During drilling, always keep the drill bit perpendicular to the floor. With one person drilling the hole, a second person can visually insure perpendicularity throughout the drilling operation. Clear the hole of debris several times while drilling to prevent the drill bit from binding.**

4.) Attach a piece of tape to the 12 mm (0.47 in.) concrete drill bit (2203081: HILTI, TE®CCX 12/17 or equivalent) in order to assure a minimum of 100 mm depth of anchor hole.

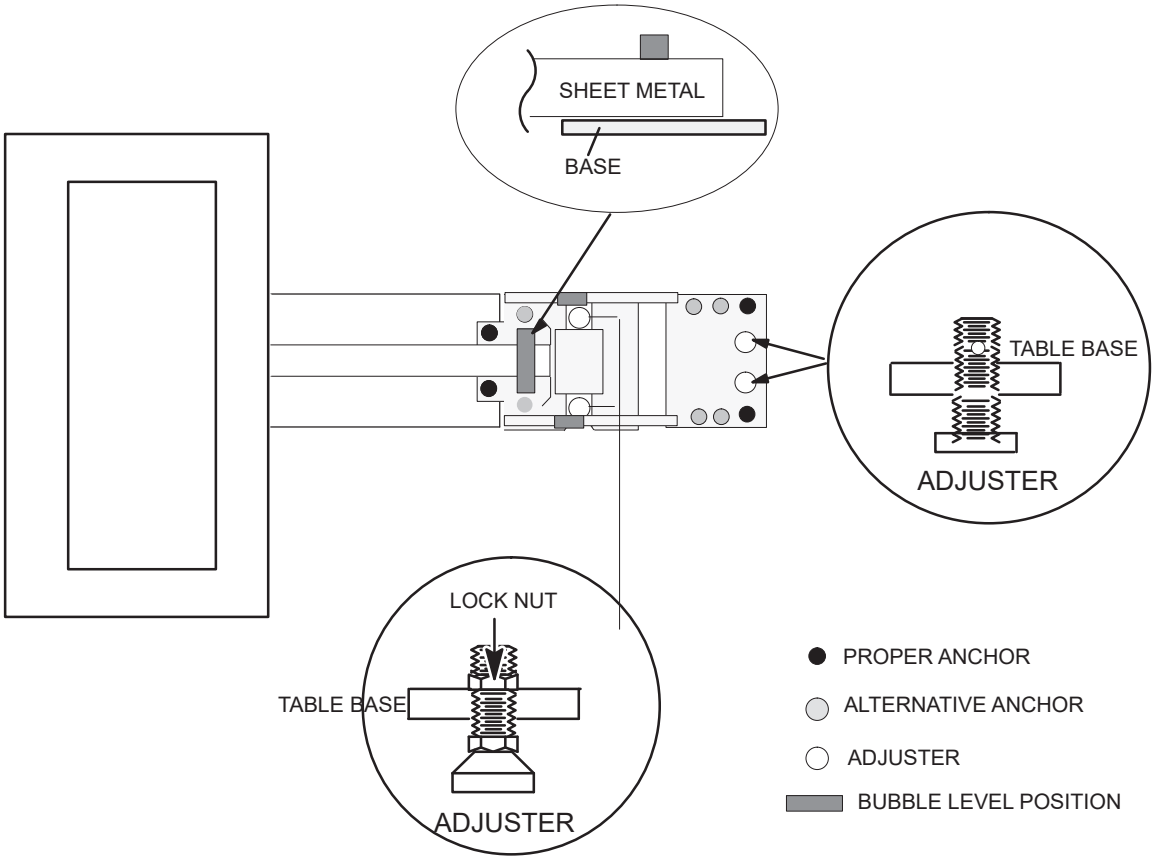
5.) Use the vacuum cleaner to suck up the concrete dust from the hole. Also vacuum dust from the surrounding area when finished.

6.) Place the bubble level at the positions.

7.) Level the Table using the four adjusters. (The front sides of the adjuster contain the lock nut. After level adjustment, tighten the lock nuts securely.)

Level Specification: +/- 0.5 mm/1000 mm (+/- 0.02 in./39.4 in.)

Figure 1-44 Table Adjuster and Bubble Level Position



8.) Check that the Cradle is also leveled.

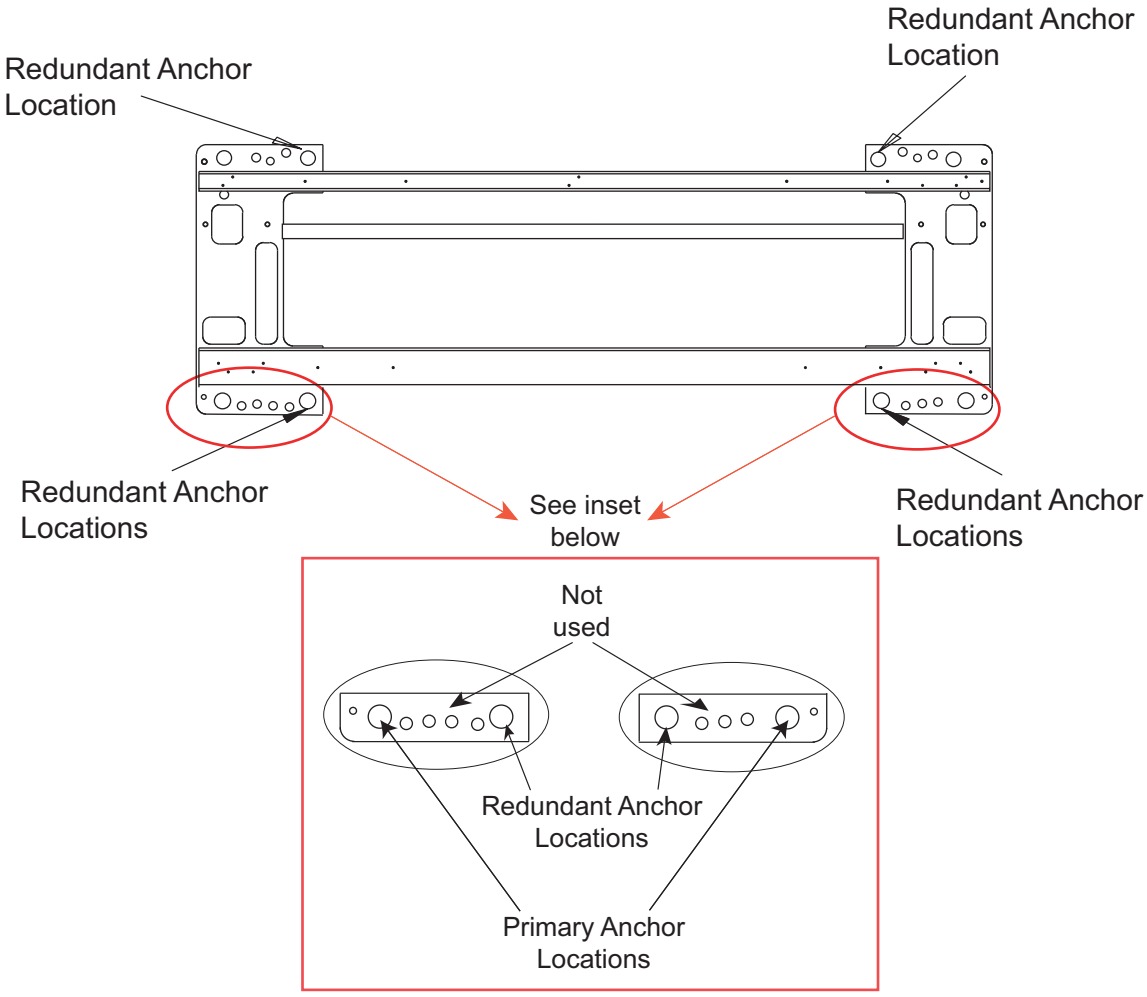
11.5 Gantry & Table Redundant Anchor Holes

If you cannot use one of the adjuster anchor holes due to structural interference, such as reinforcement bars in the concrete, you must use one of the redundant anchor locations, as shown in Figure 1-45.

- The gantry requires a minimum of four (4) anchors, one (1) in each corner of gantry base.
- The table requires a minimum of four (4) anchors, one (1) in each corner of table base.

If you must use a redundant anchor hole in the gantry, you must remove the gantry covers. See Appendix A, for gantry cover removal.

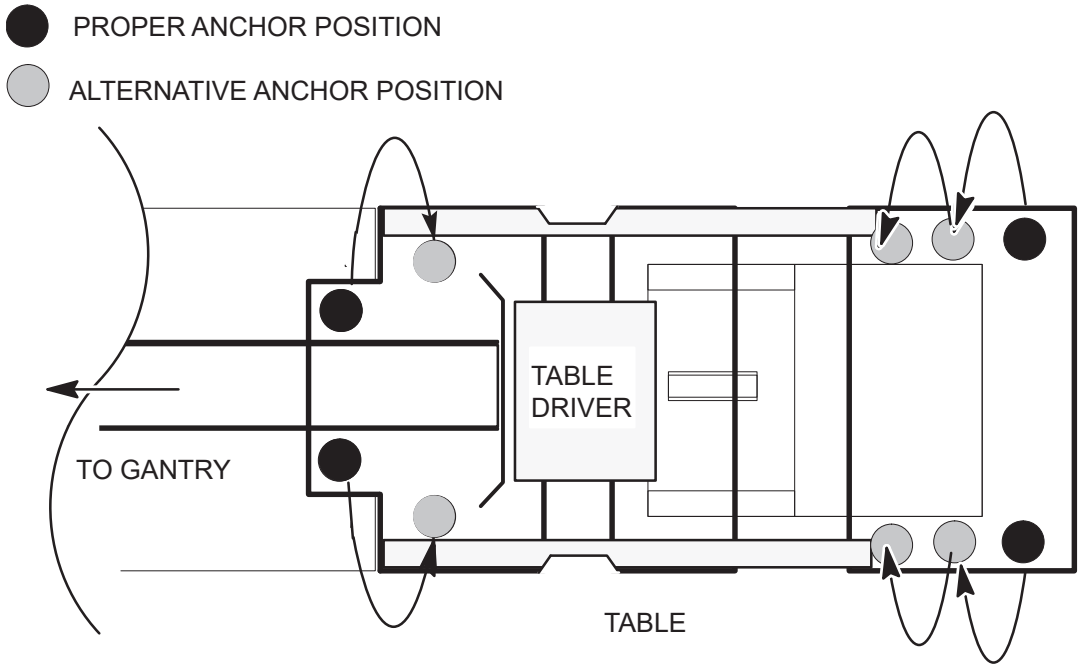
Figure 1-45 Gantry Base Redundant Anchor Locations



Mark the 12 mm (0.47 in.) drill bit with a piece of tape 170 mm ($6^{11}/_{16}$") from the tip of the bit, and follow the instructions in Section Section 11.0: Drill the Anchor Holes.

Note: If any obstruction is found under the proper anchoring position, stop drilling and use the alternate position (see Figure 1-46). Use the alternate positions only when the case its corresponding proper position is not possible.

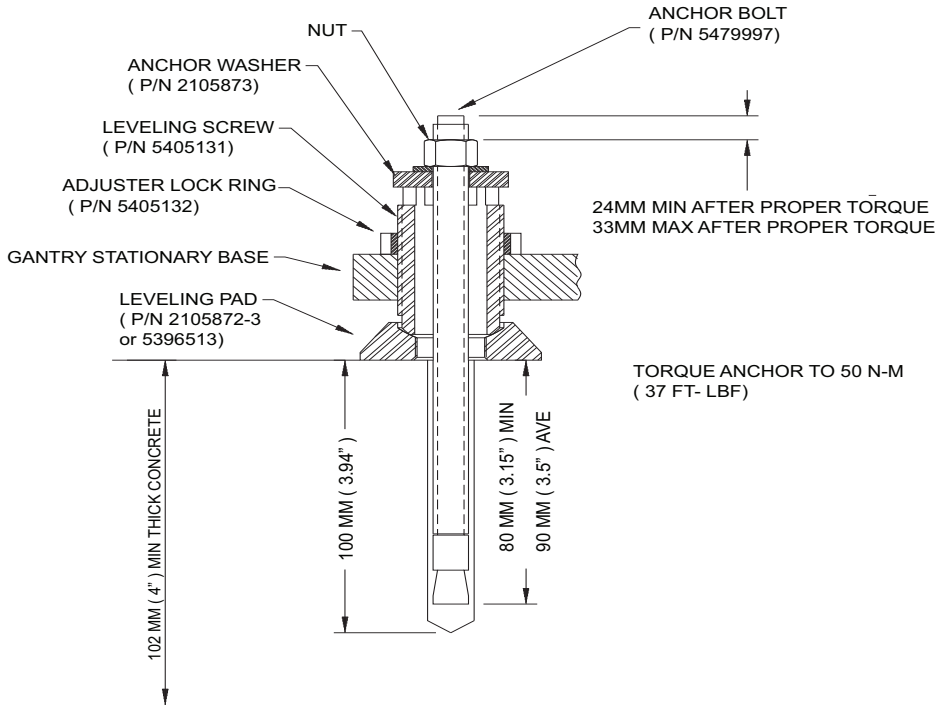
Figure 1-46 Table Anchor Positions (Proper and Alternative)



11.6 Gantry and Table Anchoring

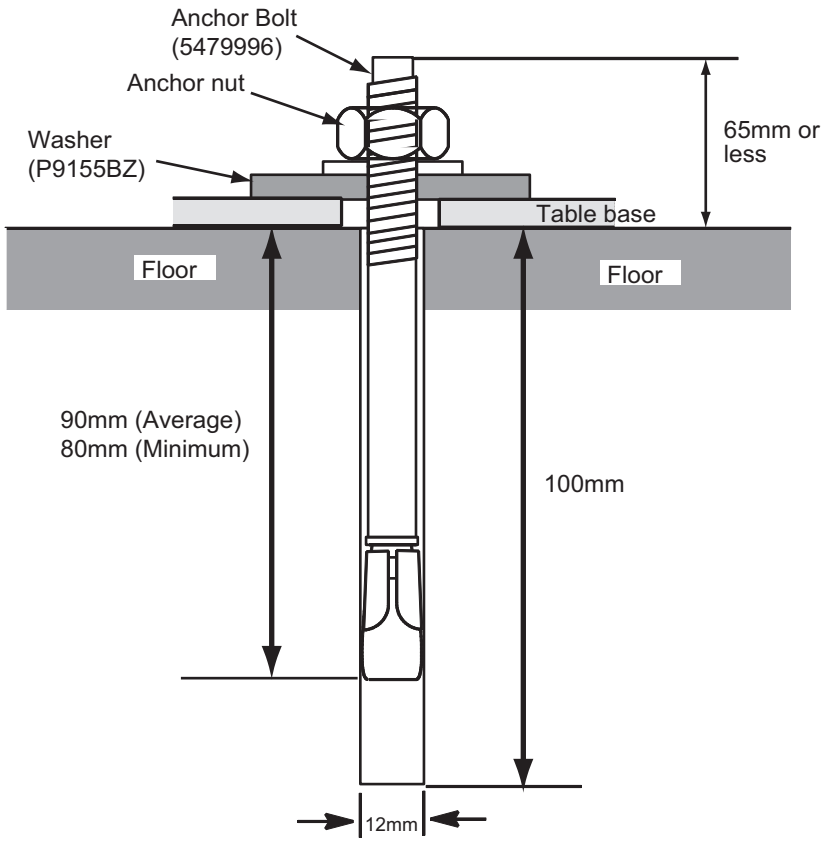
Recommended - gantry anchors P/N 5479997 (12 mm (0.47 in.) dia. by 205 mm (8.1 in.) long) as shipped with the system shipping collector for this procedure.

Figure 1-47 Gantry Anchor Assembly



Recommended - table anchors P/N 5479996 (12 mm (0.47 in.) dia. by 145mm (5.7 in.) long) as shipped with the system shipping collector for this procedure.

Figure 1-48 Table Anchor Assembly



1.) Remove the alignment tool and repack the install kit.

2.) Assemble the anchors before you install them. Refer to Figure 1-47 and Figure 1-48.

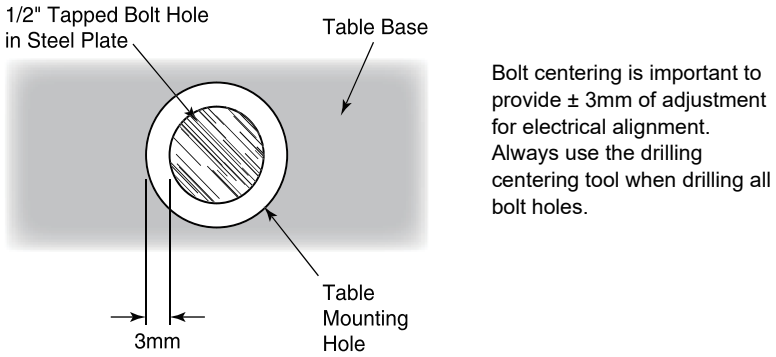
   a.) Remove the nut and washer from the anchor.

   b.) Add a ¼" thick washer (PN 2105873, P9155BZ) under the regular anchor washer.

   c.) Reassemble the anchor washer and nut and position nut so top is flush with threads of anchor before hammering into hole.

3.) Fixed site Installations must be centered under mounting holes in table base, with 3mm of space visible surrounding the tapped bolt hole. Figure 1-49.

Figure 1-49 Center tapped holes under mounting holes in table base



11.7 Alignment Recheck

Note: Alignment is critical. Recheck carefully.

1.) Turn on the alignment tool and recheck alignments. The table alignment must be the same as in Level and Center the Table to the Gantry, on page 63. If re-leveling is required, repeat this procedure. Using the bubble levels, make adjustments as required to maintain required alignment.

2.) Once alignment has been verified, torque all mounting bolts.

* Gantry: Tighten anchors and torque to 74.6 N-m (55 lb.ft)
* Table: Tighten anchors and torque to 50±6 N-m (37±5 lb.ft)

3.) Remove the laser tools.

4.) Reinstall all the removed table panels and hardware.

5.) Reinstall the gantry rear cover.

Note: If you cannot replace the lower table cover because the floor interferes, adjust all of the table and gantry levelers by half-turn increments to raise the table/gantry until the lower table covers clear the floor. Then return to the alignment sections to level the gantry, level the table, and tighten the locking rings, respectively.

Section 12.0
Removing Table shipping Dollies

12.1 Time and Personnel

(FE or mechanical supplier)

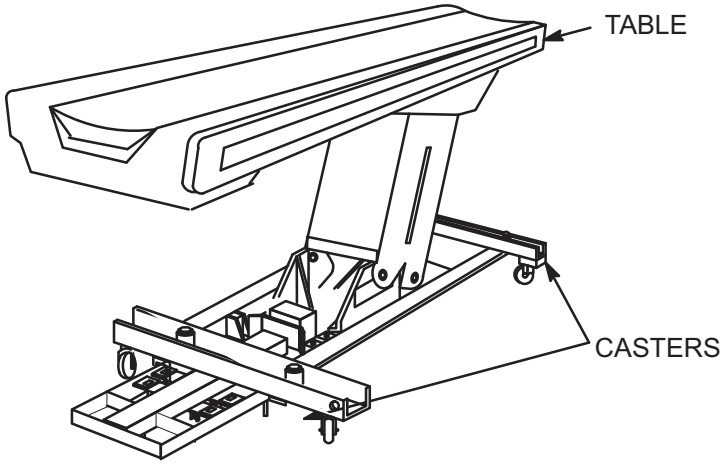
Required Persons	Preliminary Reqs	Procedure	Finalization
1 Electrician		20 min. labor on-site	

12.2 Preparation

- All table mechanical alignment procedures are completed.
- The table is on the floor with at least one anchor in place.

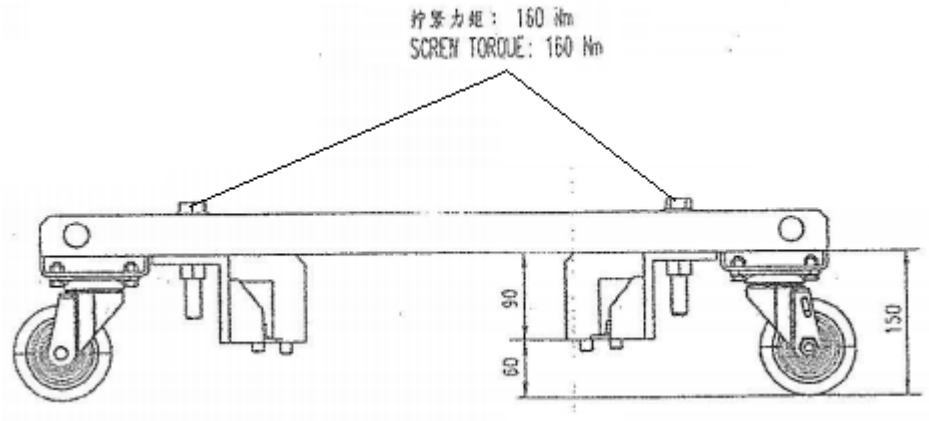
12.3 Procedure

Figure 1-50 Table Dolly



1.) Remove the front and rear caster frames by removing the caster support bolts.

Figure 1-51 Front/Rear Caster Frame



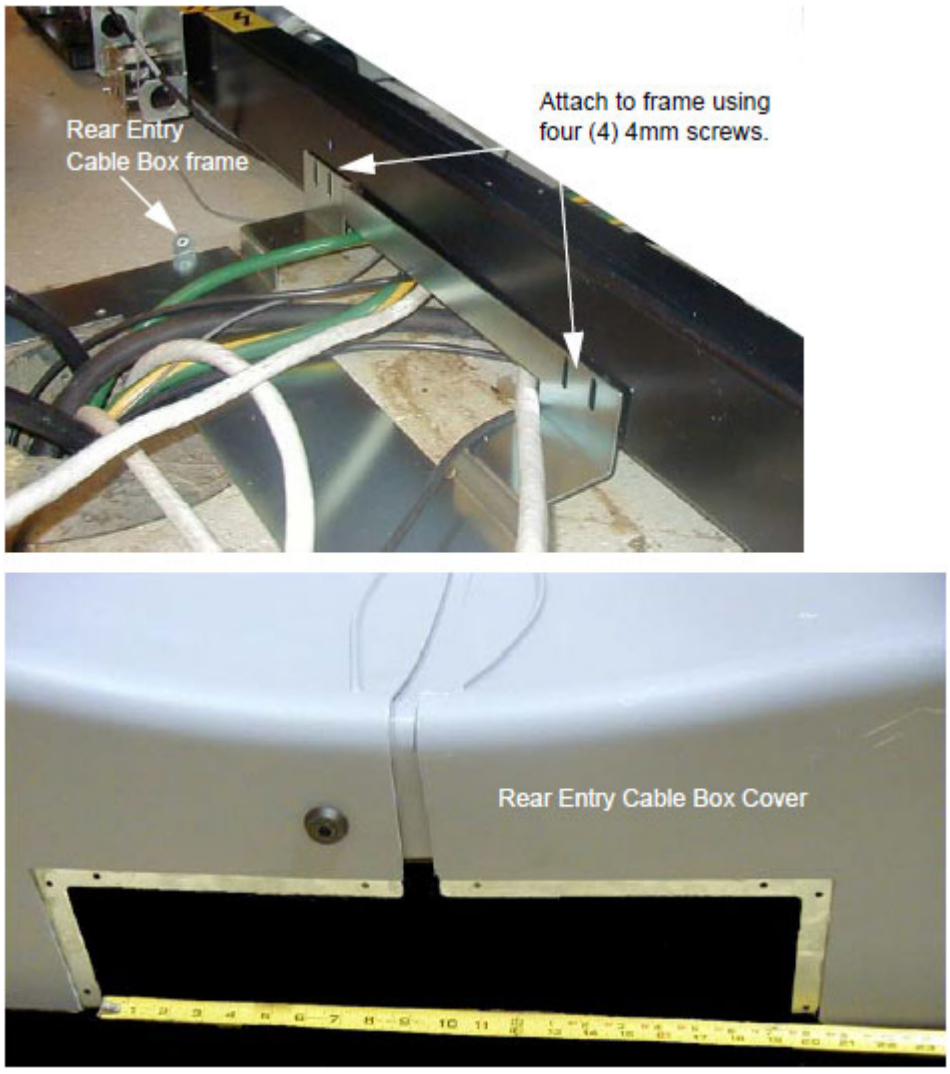
2.) Remove the left and right arms by removing four M12 bolts from the table frame.

Section 13.0
Rear Entry Cable Box

A rear entry cable box (B78032CB & B7850TC) is used when the cables to the gantry cannot be brought up inside the gantry base. The box is not supplied with the system and must be ordered separately.

1.) Attach the rear entry cable box frame to the gantry base using four (4) screws that are shipped with the kit, see Figure 1-52. The assembly can be made to fit floor entrance conduit or surface floor duct.

Figure 1-52 Rear Entry Cable Box



2.) There are three pairs of spacers shipped with this cover. Select the pair that is most appropriate for this site, based on the hardware.

- Solid metal
- Precut L-shaped metal
- Solid plastic - Can be cut

Section 14.0
Install Table Footswitch Assembly

14.1 Tools and Test Equipment

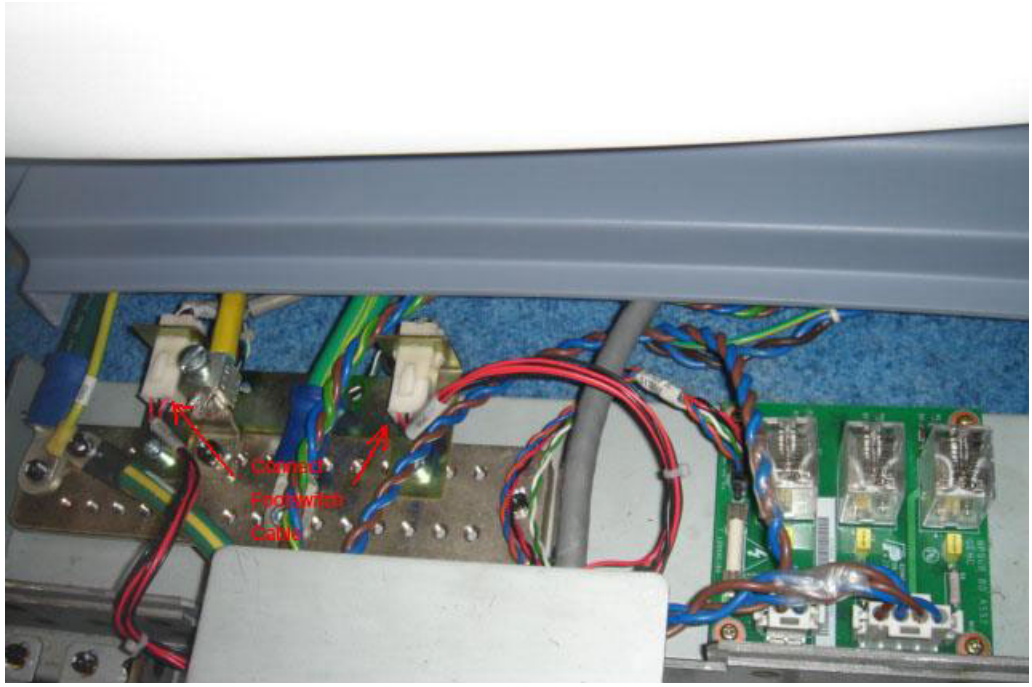
- Standard Install Tool Kit

14.2 Procedure

Install the table foot-switch assembly as shown in Figure 1-53 along with filler strip.

1.) Connect foot-switch cables.

Figure 1-53 Install Table Foot-Switch



2.) Install front bottom cove and footswitch pedals.

Figure 1-54 Install Front Bottom Cover

Figure 1-55 Install Footswitch Pedals

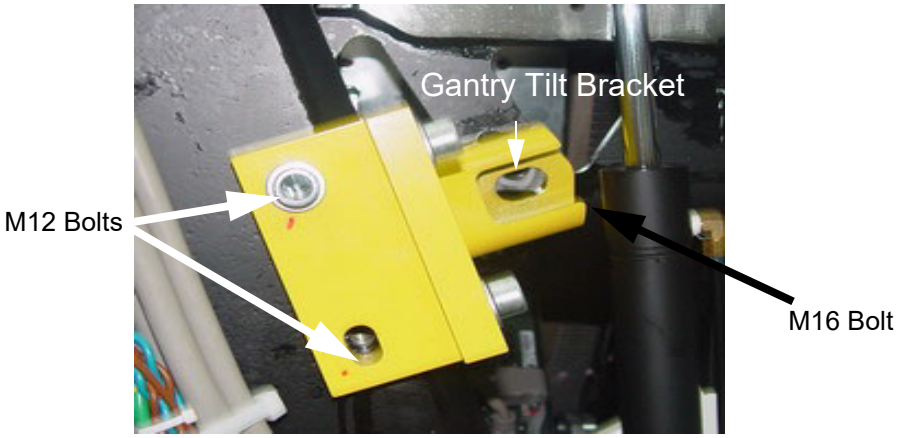
Section 15.0
Remove Gantry Tilt Bracket

15.1 Tools and Test Equipment

- 10 mm Hex wrench
- 14 mm Hex wrench

15.2 Procedure

Figure 1-56 Gantry Tilt Bracket Removal



1.) Refer to Figure 1-56. Remove the M12 bolts using a 10 mm Hex wrench.

2.) Loosen the M16 bolt 1-2 turns and check the Gantry tilt bracket, it should be loose to the touch. If loose continue with step 4.

CAUTION **Potential for personal injury.**

If tilt bracket is not loose, stop and put the M12 bolts back in and tighten tilt bracket back in place. If there is a load on the tilt bracket, removal may cause the gantry to suddenly tilt all the way back due to a possible lack of hydraulic pressure.

3.) Check the hydraulic connections for leaks or lack of fluid. You will have to wait until the system can be energized to use the tilt controls to relieve the load on the tilt bracket prior to removal. Do not use force to remove the bracket.

4.) If the bracket feels loose, remove the M16 bolt using a 16 mm Hex wrench.

5.) Remove the bracket.

6.) Close the gantry covers and reinstall the scan window.

7.) Store brackets in the gantry base.

Section 16.0
Position the Power Distribution Unit

WARNING

LOCKOUT/TAGOUT IS REQUIRED BEFORE PERFORMING THIS TASK.
USE THE SUPPLIED LOTO KIT.
ALL INSTALLATION WORK WITHIN THIS SECTION ON THE POWER DISTRIBUTION UNIT SHOULD BE COMPLETED BY A LICENSED ELECTRICIAN ONLY.

NOTICE

Connecting the primary incoming power is performed by the customer's electrical contractor. The electrician needs to provide a reducing bushing to attach the flexible conduit to the PDU.

1.) Remove all the transportation packaging, delivery the PDU to the scan room or the control room and close to the PDB.

2.) Roll the PDU into position on its permanently mounted casters. Leave at least 15.5 cm (6") between the PDU and back wall to allow cooling air to circulate.

WARNING

WORK WITH THE ELECTRICAL CONTRACTOR TO BE SURE EXTERNAL POWER SOURCE IS TURNED OFF.

Connection or Wall Box	AWG #	Connection From	Connection To PDU	Installed & Checked
TS1	Note 1	PDB-A	TS1-1	
	Note 1	PDB-B	TS1-2	
	Note 1	PDB-C	TS1-3	
	#1/0	GND	N/G **(Do NOT connect anything to neutral point.)**	

Note 1: Refer to Pre-Installation manual.

Table 1-3 PDU TS1 Connections

3.) Run the main input power conductors and ground though flexible metal conduit (attached between the PDU chassis and room duct-work) so you can move the PDU away from the wall during service.

Figure 1-57 Flexible Conduit for PDU Power

4.) Locate the hole cover plate in Box 1 and attach the flexible metal conduit to the PDU.

5.) If present, remove the TS1 panel front cover.

6.) Strip the wires to fit securely on the power block.

7.) Observe incoming phases (L1, L2 and L3) and insert bare leads into each location on TS1. Torque to specification, see Figure 1-58.

Figure 1-58 TS1 Power Torque Values

TS1 (Model-Phoenix)	Bolt/Hex
	12.91 ft-lb (17.5 N-m)
TS1 (Model-ABB)	**Bolt/Hex**
	6.82 ft-lb (9.25 N-m)

8.) Insert vault ground into PDU vault ground plug. Torque to specification, see Figure 1-59.

Figure 1-59 Ground Torque Values

Main Ground	Bolt/Hex
	22.87 ft-lb (31.0 N-m)

9.) Observe cable mark and insert bare leads into each location on TS6. Torque to specification, see Figure 1-60.

Figure 1-60 Warning Light and Door SW Connections

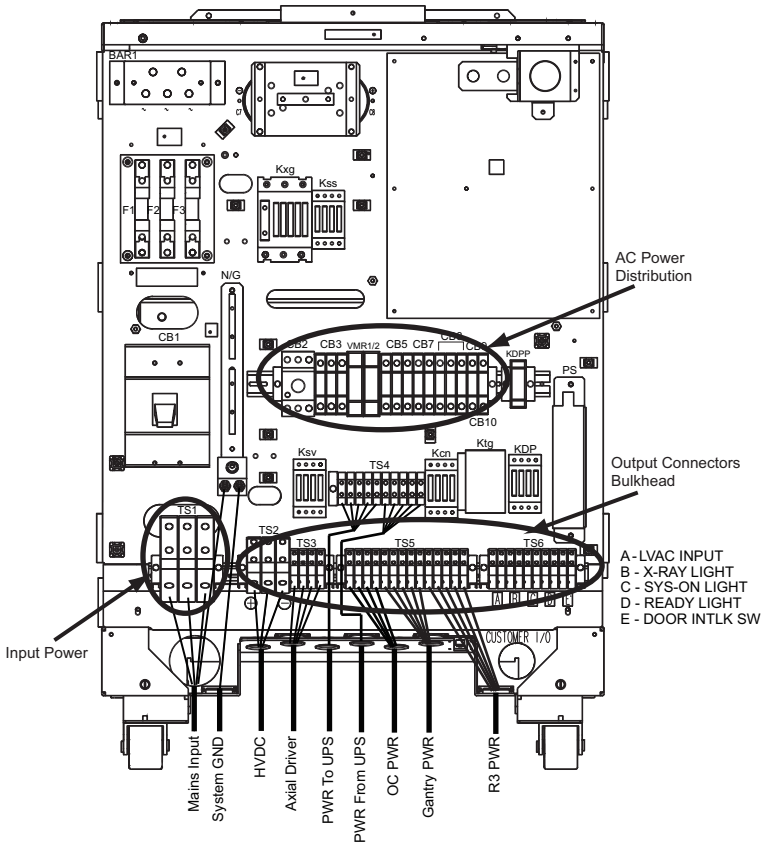
TS6 (Model-Phoenix)	Bolt/Hex
	1.2 ft-lb (1.6N-m)
TS6 (Model-ABB)	**Bolt/Hex**
	1.0ft-lb (1.4N-m)

Connection or Wall Box	AWG #	Connection From	Connection To PDU	Installed & Checked
WL (Warning light)	#14	LV Source -1	TS6 1	
	#14	LV Source -2	TS6 2	
	#14	X-Ray ON Light -1	TS6 3	
	#14	X-Ray ON Light -2	TS6 4	
	#14	Sys-ON Light -1	TS6 5	
	#14	Sys-ON Light -2	TS6 6	
	#14	Ready Light -1	TS6 7	
	#14	Ready Light -2	TS6 8	
DS (Scan Room Door Switch)	#14	Door SW-1	TS6 9	
	#14	Door SW-2	TS6 10	

Table 1-4 PDU TS6 Connections

10.) Tighten all fasteners securely.

Figure 1-61 PDU Area Locations



TERMINAL NO.	MODEL-PHOENIX			MODEL-ABB		
	P/N	MODEL	TORQUE	P/N	MODEL	TORQUE
TS1	5324772	UKH95	12.9ft-lb (17.5N-m)	5795116	ZS95	6.8ft-lb (9.25N-m)
TS2	5324755; 5324758	UKH50; USLKG50	5.2ft-lb (7N-m)	5807667; 5807668	ZS70; ZS70-P	4.8ft-lb (6.5N-m)
				5795117; 5795118	M35/16; M35/16.P	2.2ft-lb (3N-m)
TS3/4/5	5324773; 5324757	UK16N; USLKG16N	1.2ft-lb (1.6N-m)	5795119; 5795120	M16/12; M16/12.P	1.0ft-lb (1.4N-m)
TS6	5324774	UK10N	1.2ft-lb (1.6N-m)	5795121	M10/10	1.0ft-lb (1.4N-m)

Table 1-5 PDU Terminal Torque Values

Section 17.0
Install Operator Console

17.1 Time and Personnel

REQUIRED PERSONS	PRELIMINARY REQS	PROCEDURE	FINALIZATION
1 (FE or mechanical supplier)		Labor on-site	

17.2 Unpack Console

17.2.1 Unpack NIO Console

1.) Remove all items from the console.
2.) Remove all packing materials and discard.
3.) Place the step-board under the front edge of the skid and step on it to raise the front edge of the skid as in Figure 1-62.

Figure 1-62 Step-board used to raise front edge of skid

4.) Remove the two front cushions from the bottom of the skid. Refer to

Figure 1-63 Cushion on bottom of skid

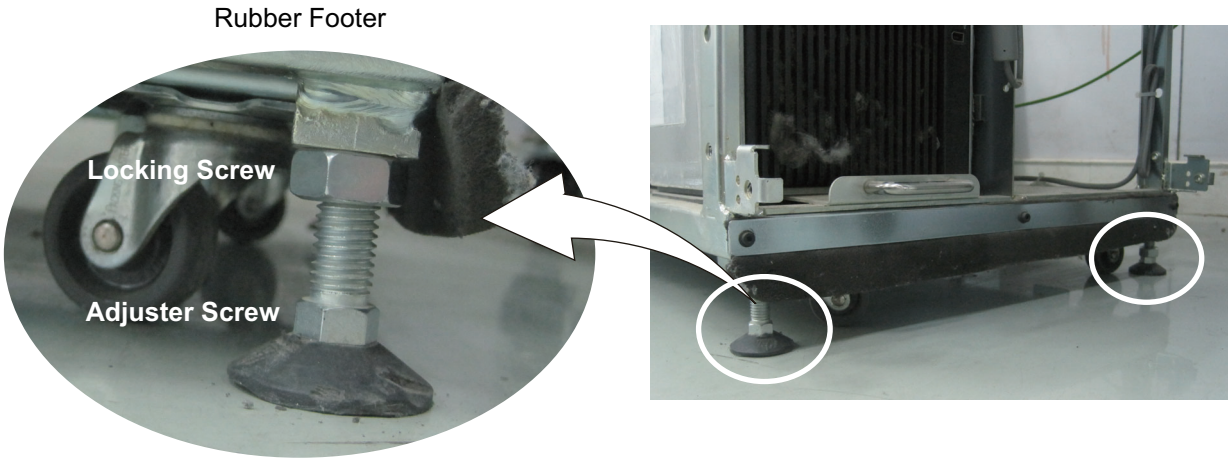
5.) Lift up on the strap on the front of the step-board to lower the skid. Remove the step-board.

6.) Ensure the console stabilizers are in line with the notched portion at the front of the skid. This will allow enough clearance to smoothly roll the console down the ramps.

7.) Move console to installation location.

8.) Adjust two rubber footer to prevent console from sliding.

Figure 1-64 Rubber Footers Adjustment



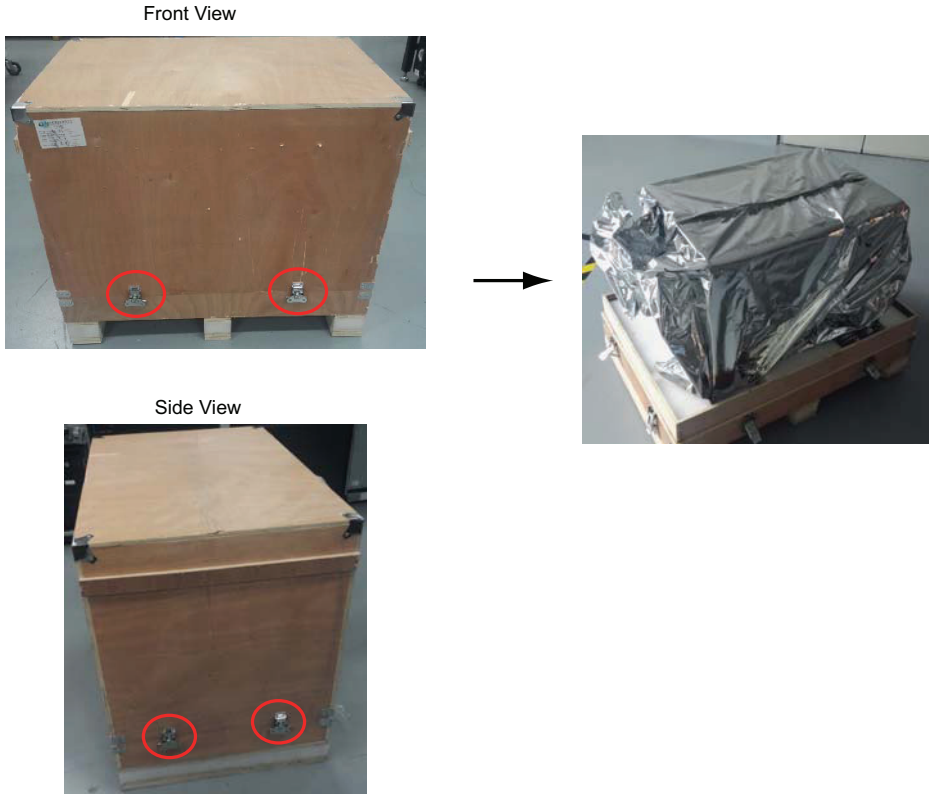
9.) Remove the Host PC Support Bracket from left side of console.

Figure 1-65 Host PC Support Bracket

17.2.2 Unpack OpenOC Console

1.) Release eight latches and remove the packaging covers.

Figure 1-66 OpenOC Packaging Removal

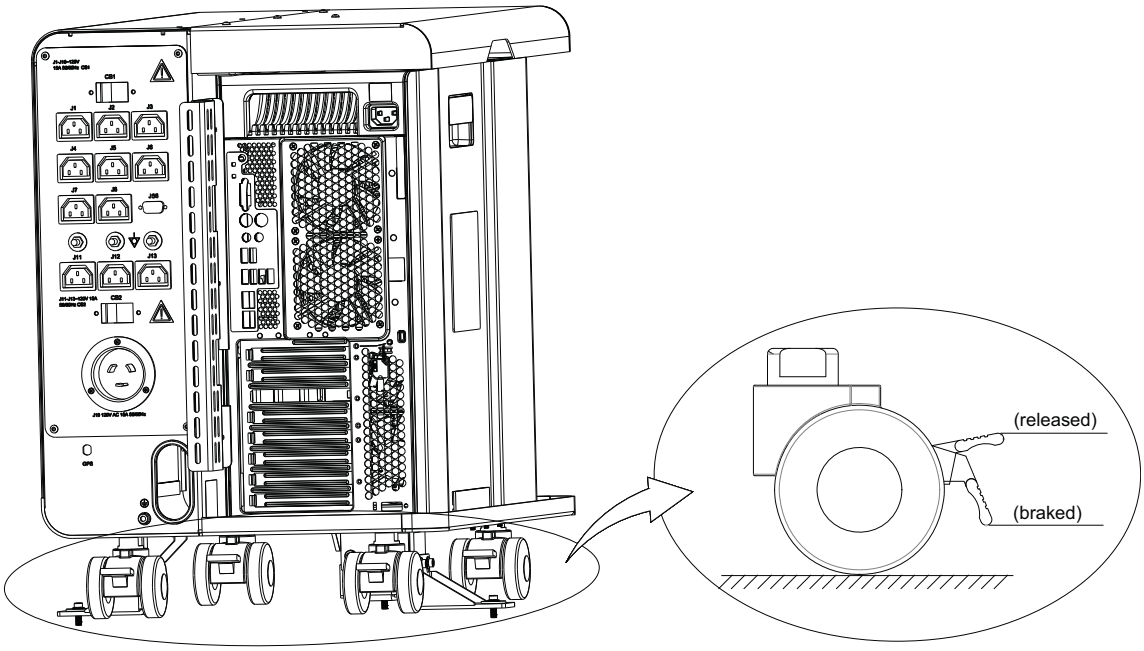


2.) Remove all packaging and discard per local requirement.

3.) Move console to installation location.

4.) Adjust console position, and then pedal four brakes to prevent console from sliding.

Figure 1-67 Brake



5.) Remove the side access panel by unscrewing its three screws from left side of the host computer.

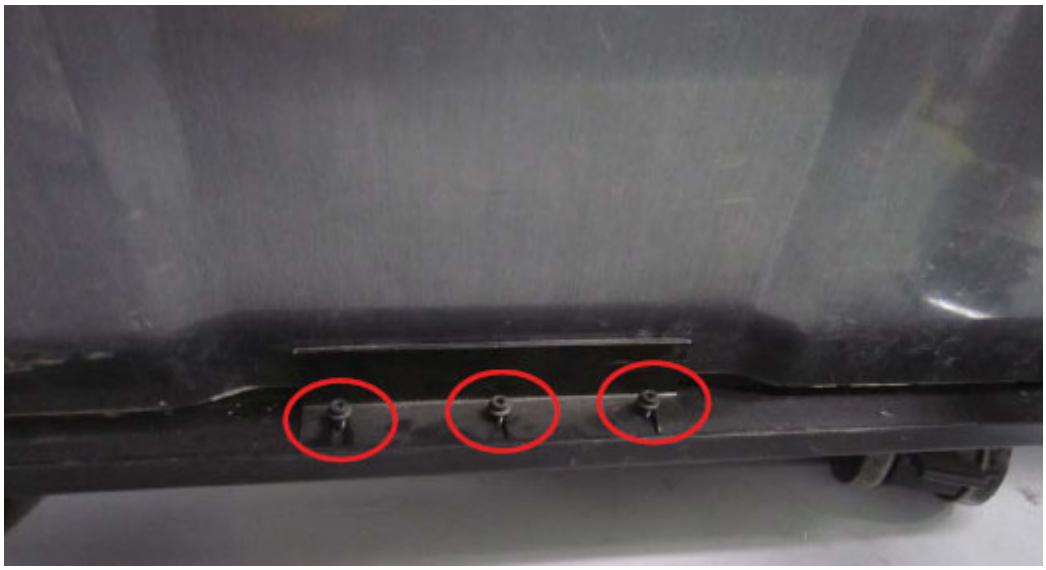


Figure 1-68 Side Access Panel

17.3 Install GPU Card (If applicable)

Install the GPU card in the Host Computer if the site has the option. Refer to Service Methods -> Installation -> Option -> GPU Fluoro Prerequisite Installation Manual.

17.4 Operator Table Installing

17.4.1 Install FWS Table (5168666-3) and Monitor Arms

1.) Assemble FWS table.
Refer to Appendix B for details of FWS and monitor arms assembly.

2.) Install LCD Monitor and install monitor arms.

3.) Place the FWS table at one side of the console.

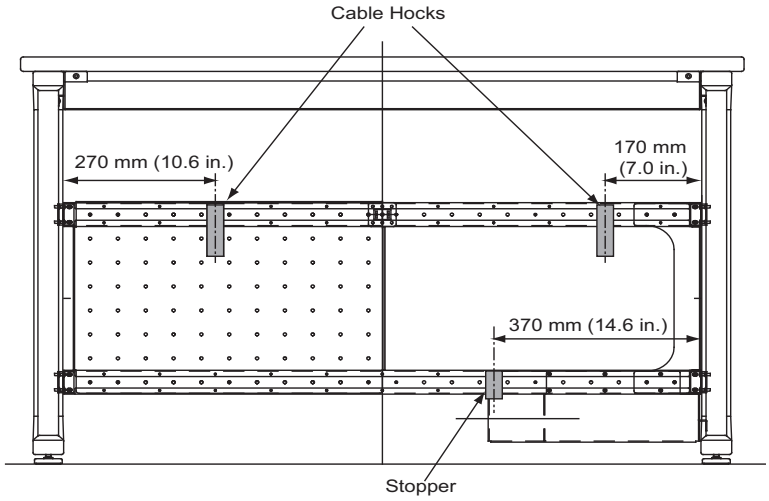
Note: FWS table should be placed side by side with the console considering that the extended cable length used between FWS and Console is limited within 3 metre.

17.4.2 Install Optima Desk (5371587)

1.) If your system has the Optima Desk, place the desk in the control room.

2.) Attache the cable hooks and console stopper by the M4 screws.

Figure 1-69 Cable Hooks and Console Stopper Installation for Optima Desk



17.4.3 Install Aurora SWS Table (5449758-2)

1.) If your system has the SWS Table, assemble SWS table.
Refer to Appendix B for details of SWS.

2.) Place the table in the control room.

17.5 Peripherals Placement

1.) Place keyboard, GSCB.

2.) Locate and unpack the Media tower.

3.) Place the Media tower on the table.

Section 18.0
Seismic Mounting

Before proceeding with seismic mounting for any of the components in this section, be sure to allow sufficient space to unbolt and move the component from its mounted location for service.

- You may need to remove all four mounting bolts.
- If removing the component requires lifting, use an appropriate-sized pry bar to lift each corner of the component.
- Two installers may be required to safely complete this task.
- 5/8 in. anchor for IBC 2007 standards or as provided in the seismic kit.

18.1 Time and Personnel

REQUIRED PERSONS	PRELIMINARY REQS	PROCEDURE	FINALIZATION
1 (FE or mechanical supplier)		Labor on-site	

18.2 Procedure

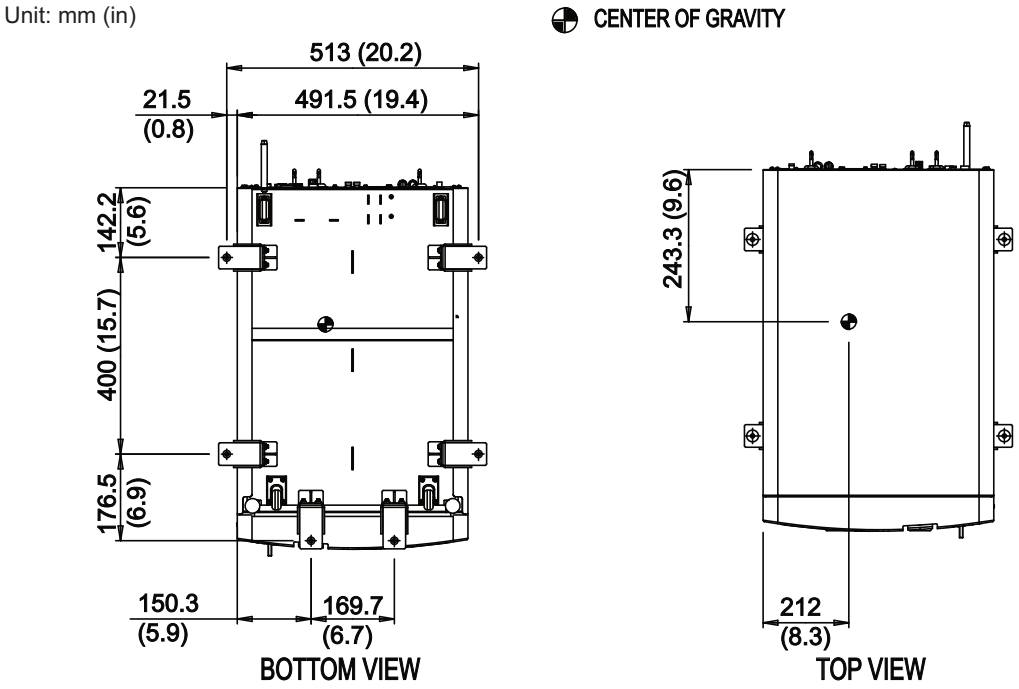
18.2.1 Console

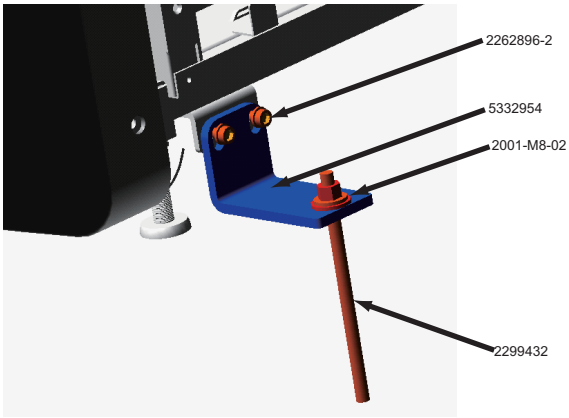
- **NIO16 Console**

If site specifications require seismic mounting, use ½" bolts to mount the brackets to the floor. Refer to Figure 1-70 for hole placement. The console seismic brackets are included in Console Seismic Kit (5394347-2).

Note: If you use the front anchor holes as alternative anchor location, use the Drop-in type anchor.

Figure 1-70 Seismic Console Mounting Hole Locations for NIO16





- **OpenOC16 Console**

If site specifications require seismic mounting, the customer may require different anchoring methods based on local requirements. Anchor type, size and torque shall be defined by the customer. Refer to Figure 1-71 for holes placement. The console seismic brackets (5357148-3), M6 screws (2262896-30) and M8 washers (2001-M8-02) are included in Console Seismic Kit (5812703-2) that is shipped with Console.

Figure 1-71 Seismic Console Mounting Hole Locations for OpenOC with Z840

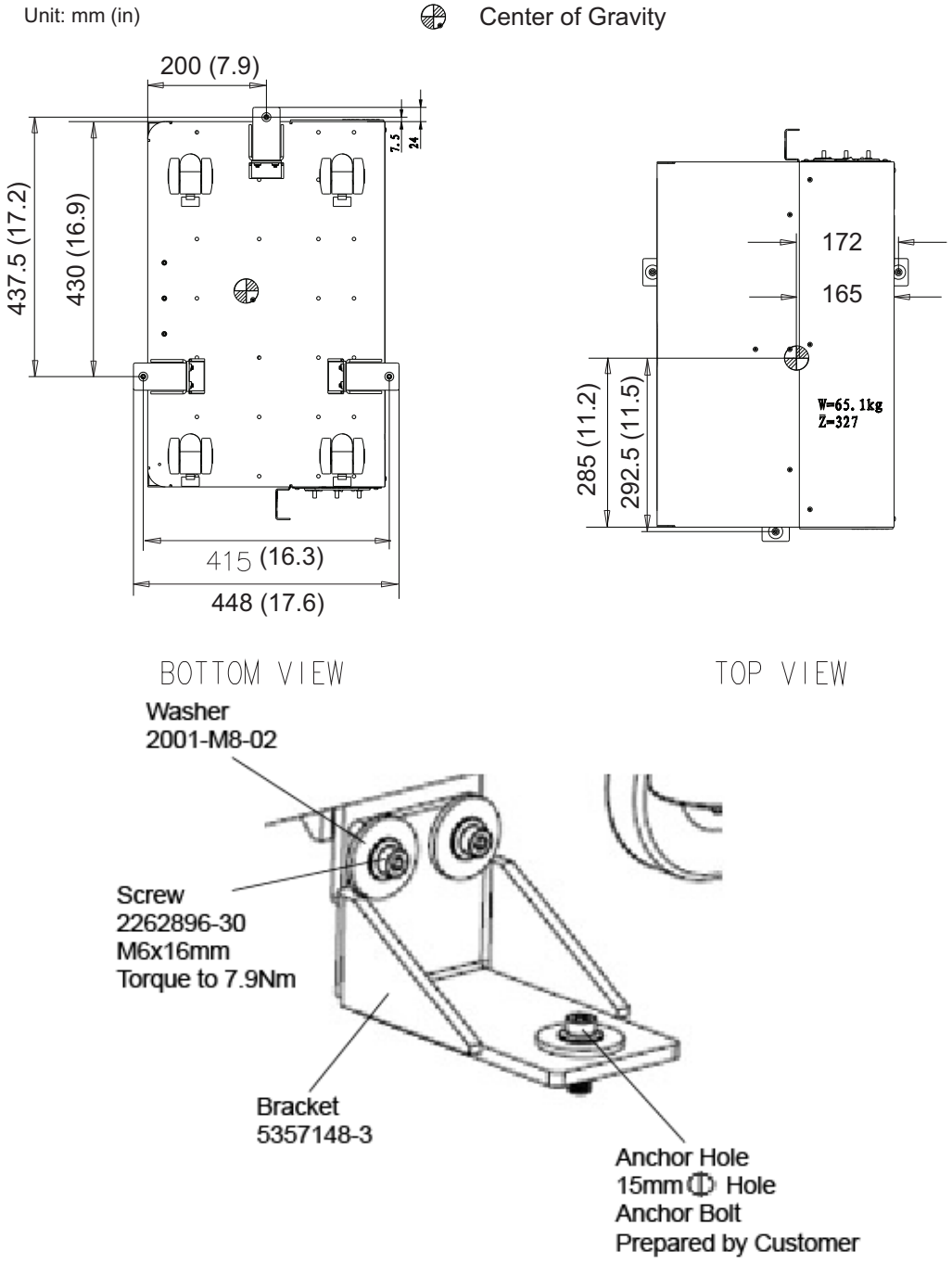
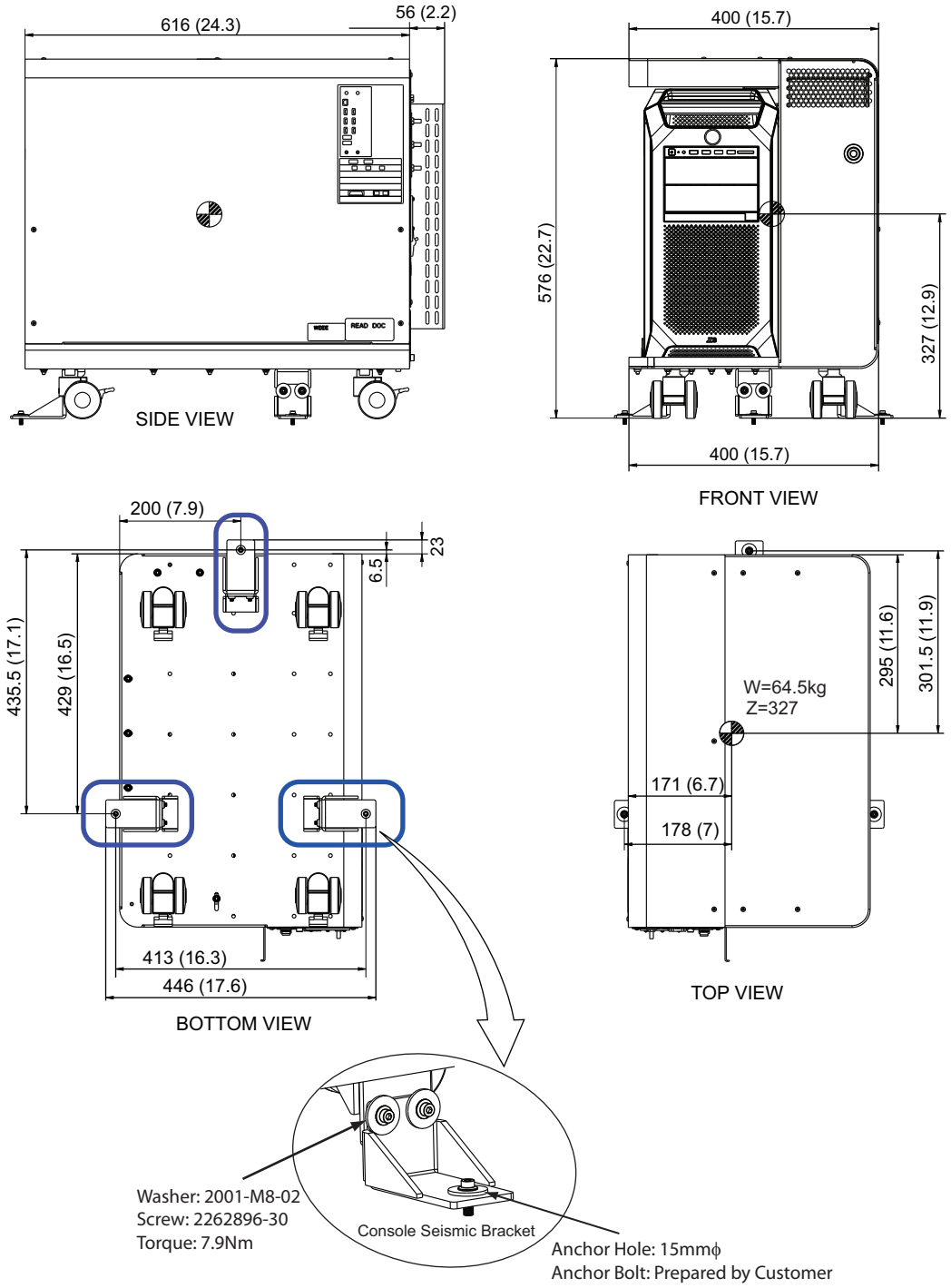


Figure 1-72 Seismic Console Mounting Hole Locations for OpenOC with Z8G4



18.2.2 Power Distribution Unit

If site specifications require seismic mounting, use the PDU seismic brackets (2354563-2) and the PDU shipping kit (5453382-2) that were shipped with PDU. Refer to Figure 1-74 for mounting hole locations, and mount PDU so it can be easily removed for service.

It is the customer's responsibility to provide an appropriate anchor/fastener from the bracket to the floor.

CAUTION **The PDU is very heavy and may present a crush hazard if proper precaution and tools are not used.**

Figure 1-73 PDU Seismic Brackets and Shipping Kit

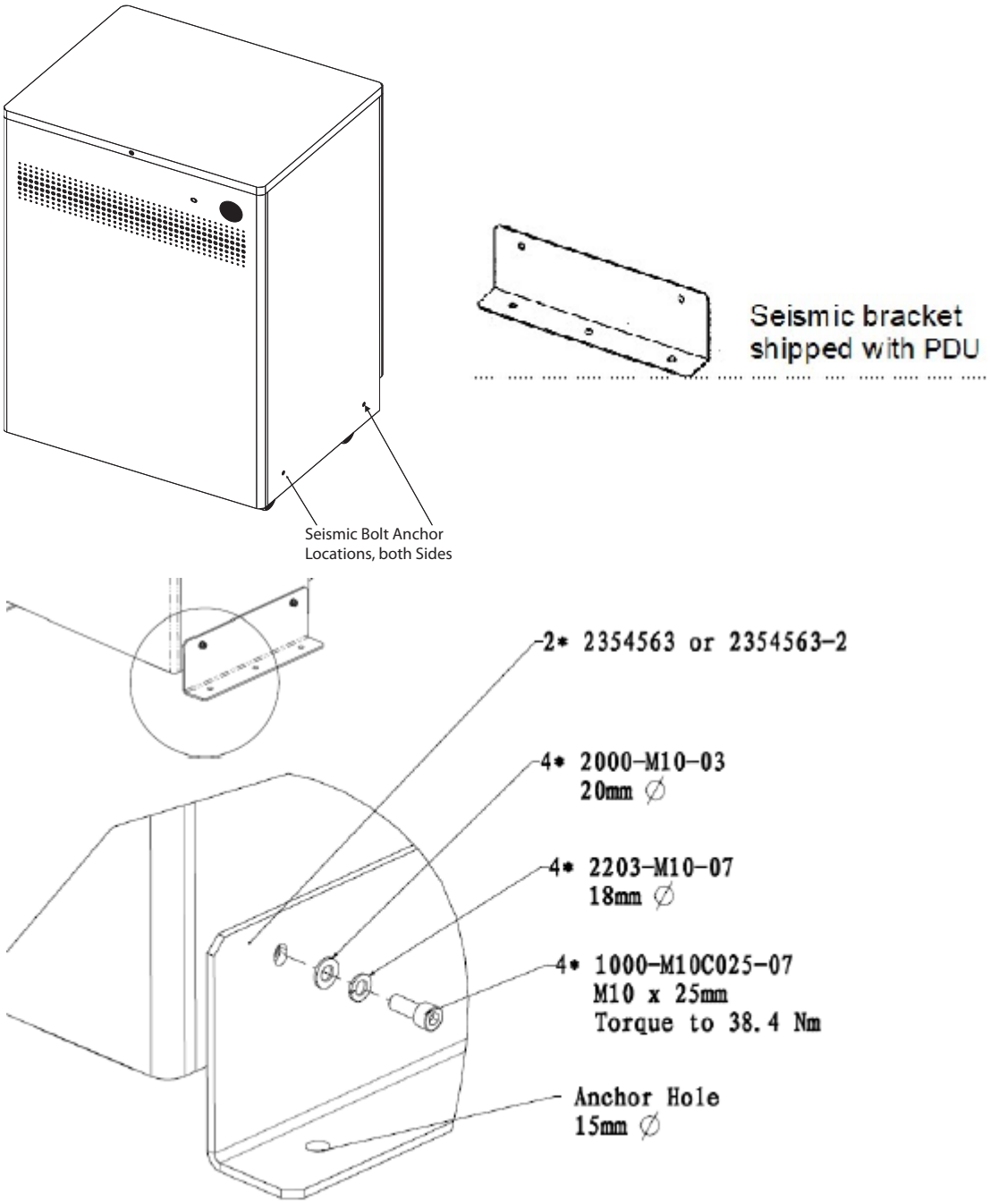
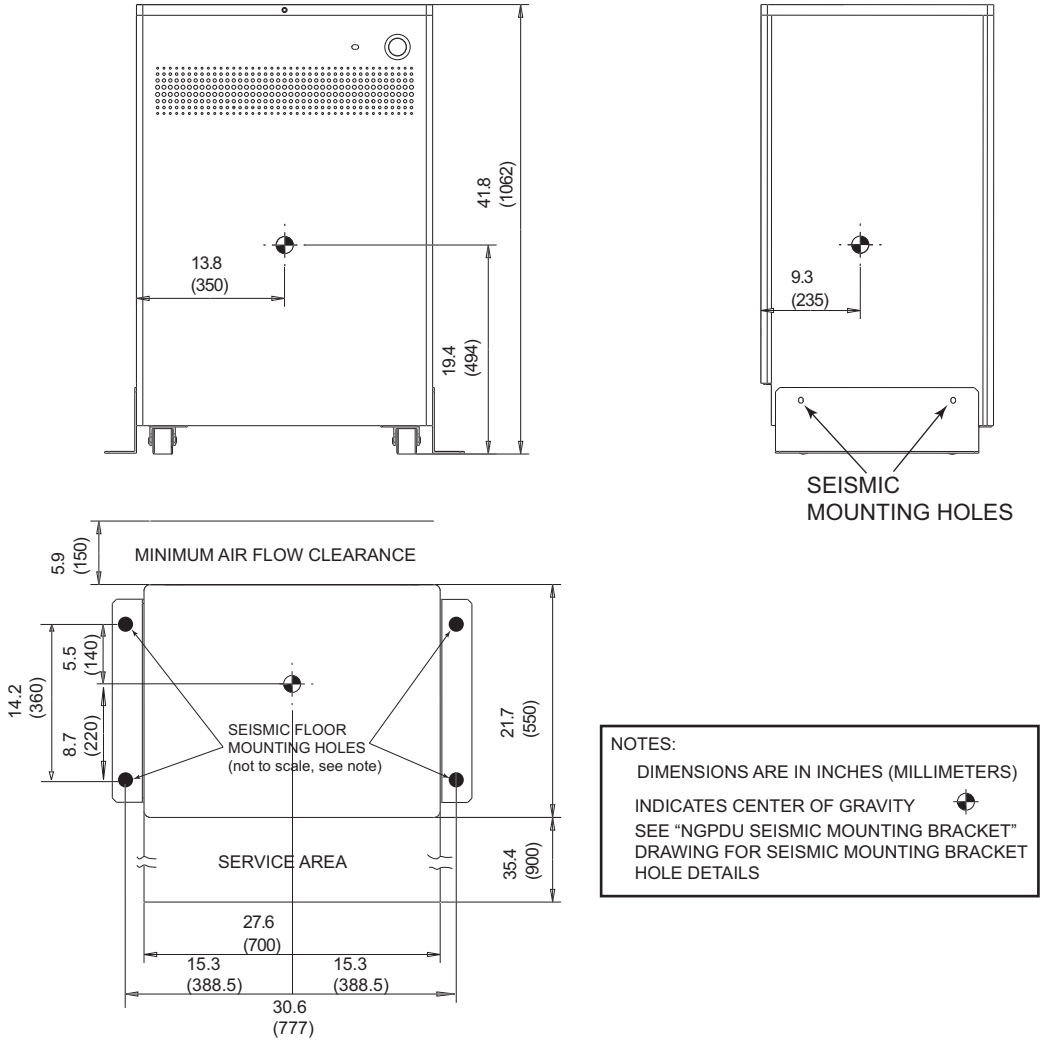


Figure 1-74 Seismic PDU Mounting Hole Locations



This Page Intentionally Blank.

Chapter 2
Position Subsystems with Install/Align Tool

NOTICE

- **Record data collected from procedures in this chapter into Form 4879 when directed.**
- **Only use the Installation manual that existed in SIMS content viewer. Any other revisions of this manual may not exactly match your system.**

Section 1.0
Installer/FE Notices

1.1 General Safety Guidelines

1.) Follow all safety precautions, warnings and instructions in this manual.
2.) Read and obey the warnings and instructions on equipment labels or tags.
3.) Allow only qualified personnel to install, maintain and service this equipment.
4.) While the system is designed to meet all safety requirements applicable to medical equipment, qualified operators must understand the potential safety hazards, and take steps to minimize the risk at all times.
5.) **Never** modify the system in whole or in part without prior written approval by GE.
6.) Do **not** change, add, or remove any system accessory without prior written approval of the vendor's local service manager.
7.) **Never** leave the system in an unsafe condition. Notify the customer that the system is not to be used until a problem is resolved.
8.) Read and follow the precautions described in this manual.

1.2 Shipping, Warehouse, and Transportation Warning

This gantry should be moved using the shipping dollies only. Do not lift or move it using a lift truck under the gantry frame.

1.3 International Shipments

- Use dollies to remove the gantry from the shipping skid and to transport the gantry to the customer's site.
- If lifting is required, instructions are in the *Pre-Installation Manual* for this system.

1.4 On Site Warning

This system requires a gantry bearing gap inspection *before* electrical calibration is started.

1.5 Service Actions

If the bearing inspection fails the FE opens a dispatch and does not continue with the electrical calibration procedures.

Section 2.0 Introduction

This chapter describes how to mount, position, and level the CT Scanner subsystems.

Note: Before you start the installation, make sure the site preparation complies with conditions and instructions found in the *Pre-installation manual* for this system. Failure to comply result in excessive installation delay and potential increased, unrecoverable installation costs. This product is designed to meet specific mechanical installation standards that should be reviewed prior to installing this system.

2.1 Overview

Procedures in this chapter provide detailed instructions to position, level, and anchor the gantry and table securely for operation. The system uses adjustable leveling pads to support the gantry and table. The gantry has four (4) primary leveling pads located on the gantry base. The table has four (4) pads used for leveling it.

The process you will be following is:

1.) Use the gantry-table installation tool (based on CAD drawing) to determine the general position of the gantry and table.
2.) Drill anchor holes of gantry and table.
3.) Move the gantry into position.
4.) Level gantry.
5.) Move the table into position.
6.) Use the gantry-table alignment tool to level the table position.
7.) Complete the mechanical installation section of GE Form e4879.

Note: Use the gantry/table installation tool (based on CAD drawing) to position the system and drill the anchor holes.

2.2 Pre-Installation

Always use the gantry-table installation tool, during installation. The gantry and table are not properly aligned if existing holes are used. The CAD drawing determines the location of the gantry and table anchor holes.

The gantry/table installation tool (5824714) is service tool. You can also order it via the web GEMS BUY, from QZMX.

2.3 Required Common Tools and Supplies

The following tools and supplies should be included in the standard CT installation tool kit. The tools listed represent the minimum tools required for installing this CT scanner.

WRENCHES

- Standard and Metric combination wrench sets
- Standard and Metric Hex Key (Allen wrench) sets
- ½" and 3/8” drive torque wrench: 0-100 N-m (0-100 ft.-lb.) Must be calibrated yearly.

SOCKETS AND EXTENSIONS

- 3/8" and ½" drive ratchet wrenches
- ½" drive 3" & two 6" long extensions
- 3/8” drive 12" long extension
- Standard & Metric 3/8” drive socket sets
- ¾” deep well socket 3/8”
- 1", 1-1/8”, 1-¼" & 1-½" sockets for ½" drive
- 3/8” drive universal joint
- Metric hex bit set ¼" or 3/8” drive, including:
  - 14mm hex bit 3/8" or ½" drive (14mm ball hex helpful)
  - 10mm hex bit 3/8" drive

SCREW DRIVERS

- Phillips screwdriver set (small, medium, and large)
- Straight blade screwdriver set (small, medium, and large)

DRILL BITS

- Complete set of standard (U.S.) drill bits
- Metric tap set
- 12 mm concrete drill bit (2203081: HILTI, TE-CX 12/17 or equivalent)
- ½" masonry bit, min. 8" long USA – 18" optional (for rear table hole)
- 3" (76mm) hole saw with 1/4" (6mm) masonry bit (to remove flooring)

POWER TOOLS

- 3/8” or ½" drill, cordless or electric
- Reciprocating Saw (Sawzall or equivalent) and assorted blades.
- Hammer Drill & BIt (8" min, 12" max)
- Sears 17740 Shop vacuum or equivalent, with “**HEPA**” or dry wall dust filter (Sears part number 17918) or equivalent
- 25’ Extension power cords

HAND TOOLS

- Ball-Peen Hammer (1lb or 2lb)
- Tongue & Groove Pliers (large)
- Diagonal Cutting Pliers, Large (to cut 1/0 ground)
- Framing Square (e.g., Empire 16" x 24" aluminum square)
- Diagonal Cutting Pliers, Small
- Large pry bar
- 4', 2’ & 9" torpedo levels (see Table 2-1: Recommended Levels)
- Laser level (see Table 2-1: Recommended Levels)

9"	Johnson Magnetic Level, model 7500M*
	Johnson Magnetic Level, model 4500
	Stanley Magnetic Level
2’	Johnson Professional Box Beam Level, model 9624*
	Empire Titan Professional Box Beam Level, model 900 series
4’ (nominal)	48" Johnson Professional Box Beam Level*
	42" Stanley Contractor Grade Level
	48" Empire Titan Professional Box Beam Level, model 900 series
	48" Stabila Aluminum Box Beam Level, Kit 24816
Laser**	Sears Laser Level Tool ($40)

* Preferred levels
** Laser level is required for table cradle alignment. Using this tool reduces the alignment procedure by 1 man-hour. New tables have a cradle center line to be used with the laser level.

Table 2-1 Recommended Levels

ELECTRICAL TOOLS

- DVM capable of reading 0.5 ohms or less
- Continuity tester
- Dale 600 or 601 Leakage meter (The Fluke ESA612 be used globally when the Dale analyzer is not available)
- Temperature/humidity tool: Oregon Scientific Wireless Weather Station Model BAR608HGA or equivalent

PERSONAL SAFETY EQUIPMENT

- Safety shoes*
- Safety glasses*
- Gloves
- Knee pads or kneeling pad
- LOTO Kit (supplied)*
- Hearing Protection*
- 2 m (6 ft.) or 4 m (8 ft.) step ladder or equivalent
- Face Shield

* These PPE items are absolutely required for every installation job, with NO exceptions.

SYSTEM CLEANERS

Purchase Locally:

- Glass Cleaner or equivalent
- Scrubbing Bubbles Bathroom Cleaner or equivalent
- Grease Cutting Cleaner or equivalent

GE TOOLS

- 5824714 (System Installation and Alignment Tool)
  (This tool may not be available via the tool pool in some areas.)

Section 3.0
Delivery Procedure

3.1 System Transportation - Temperature Extremes

When transporting the CT system, ensure that the system is not exposed to temperatures or humidity outside the following specifications.

- Temperature: -40º to +158º F (-40º to +70º C)
- Humidity: 10% to 100%, including condensing
- Altitude: -1,800ft to 18,000ft

⚠

NOTICE **Component Freezing occurs if CT system is exposed to temperatures below 0º F (-18º C) for a period longer than two days.**

Allow a minimum of 12 hours for the CT system to adjust to ambient room temperature, prior to installation.

Inspect for visible condensation and allow all moisture to evaporate before starting the installation.

3.2 Stored Systems

If your system was stored for more than three months:

- Complete a visual inspection, looking for damage due to improper storage.
- Check for the latest software revisions, options, and component changes.
- Contact the OLC for support.
- Movers are required to move the equipment to the scan room.

3.3 Construction Site Storage

When storing the CT system at a construction site, be sure to adhere to the following storage requirements:

- Construction site packaging must be ordered and the system shipped packaged for storage.
- Do not damage or puncture the shipping crate.
- Do not remove packaging until the completion of all construction at the site and the removal of all dust created by the construction.
- Maintain a storage temperature within the range of 50º to 90º F (10º to 32º C)
- Maintain a relative humidity (non-condensing) between 20% to 70%.

3.4 Construction Site Installations

A construction installation describes installations at sites without an occupancy permit, or ongoing construction. In general, construction sites fail to meet the required specifications for system delivery, and GE does not recommend such installations, as they can result in delays, increased costs, and possible damage to the system. When construction-site delivery proves unavoidable, the installation fails into one of two categories:

- Full construction site with completed radiology area.
- Full construction site with limited delivery access.

Review these categories to determine which most closely matches the condition of the planned installation site.

3.4.1 Construction Site with completed Radiology Area

This type of site consists of a finished, dust-free, occupancy-ready radiology suite at a site with ongoing construction in other areas, but with no remaining construction in or around the scan suite area. At the time of delivery such sites feature:

- Dust control measures deployed in the radiology suite area.
- Scan suite access limited to a single entrance.
- Radiology suite sealed off from the remaining construction area.
- Operational HVAC, with a positive air pressure within the radiology suite.

In addition, the radiology suite at such a site REMAINS in a dust-free, occupancy-ready state after delivery and throughout the remaining construction phase.

For more details, refer to the *Pre-Installation Manual*.

3.4.2 Full Construction Site with Limited Delivery Access

This type of site allows delivery during ongoing construction of the radiology suite area.

Construction site packaging must be ordered and the system is delivered packed for construction site storage. Packaging cannot be added during the delivery.

At Full Construction sites, delivery occurs prior to site completion, but the product remains stored until the completion of a finished, dust-free, occupancy-ready radiology suite area. This system is delivered in sealed package with dollies. Delivery to the storage area requires a lift truck or riggers. Installation work can begin **only** when the site reaches the completed, dust-free, occupancy-ready radiology suite requirement.

3.4.3 Construction Site Unpacking

If room is not completed, following escalation process. Pre-installation escalation is the process used to consult CT Engineering, the Design Center, or EHS to resolve pre-installation issues related to siting concerns and requirements.

A typical construction site package consists of 8-12 packages. Each package is plastic-wrapped in dust-free packaging. Each package must be vacuumed to remove construction dust prior to moving components into the CT scan room. This process can add approximately two hours to your installation time.

Typical components are:

- Gantry
- Table
- Console
- NGPDU
- UPS
- Lean Cover Cart
- Lean Install Cart
- Chair
- Service Cabinet (Option)

3.5 Working with the Mover

- System is shipped lean-packed in North America.
- Ensure that the installation lean cart is the first item moved into the room.

3.5.1 Delivery Dolly Options:

- Gantry Mini Dolly - ordered from UMI at http://www.umi-dollyshop.com

Follow the instructions provided by your Project Manager of Installation regarding working with equipment movers. Help direct movers as to where to place equipment and which items are needed first.

Movers should move all equipment into the customer's room. Door removal and other site changes to move equipment should be done only as directed by the Project Manager of Installation.

For component sizes and weights, refer to the *Pre-installation Manual* for this system.

Note: Do not place equipment in its final location at this time. Templates must be laid first.

Note: If you have to remove the gantry covers in order to move the gantry into the room, please read the notice statement on Appendix A Removal & Installation of Covers before removing the gantry covers.

3.5.2 Equipment Delivery Route

Prior to equipment delivery, review the delivery route with the movers. Refer to the Project Manager of Installation for any additional delivery instructions.

3.5.3 Floor Protection

Movers should use floor protection. Most equipment movers can provide floor protection during the equipment delivery. Installers should provide floor protection for the room.

3.5.4 Removing Gantry Dollies and Covers

- Gantry components cannot be removed to reduce the dimensions.
- Zero clearance dollies are available from UMI at http://www.umi-dollyshop.com
- Please read the notice statement on page 166 before removing the gantry covers.

3.6 Damage In Transportation

Check for damage to property that may have occurred at the site during delivery, such as damage to floors, door frames or walls. If damage is found, notify the Project Manager of Installation.

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 GE representative or a hospital receiving agent. Whether noted or concealed, damage shall 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
- Contact your local service coordinator for more information on this process.

3.7 A1 Breaker

NOTICE

- **All sites must have a main disconnect with Lockout/Tagout capability.**
- **Non GE-supplied breakers must have/provide under-voltage protection. For more information, refer to the *Pre-Installation Manual* for this system.**
- **A LICENSED ELECTRICIAN shall install and make connections inside the main disconnect.**

Lock-out and tag-out the PDB breaker now.

Figure 2-1 Sample PDB Breaker

A1 BREAKER		UPS (Optional Partial, 2ph UPS & Hardware Kit)
GLOBAL EXCEPT EMEA	**EMEA**	
E4502BB (90A) (incl.Auo Restart & Integrated UPS Control)	E45021BB (125A) (incl.Auo Restart & Integrated UPS Control)	**B7999ZB alt. E4502KZ** (includes 5820687 Vertiv model 10kVA)
E4502BC (110A) (incl.Auo Restart & Integrated UPS Control)		

Table 2-2 A1 Panel and UPS

3.8 Installation Support Kits

An Installation Support Kit is shipped with every system. Locate this box now and open it. All included materials are to be used during the installation process. These items are to be left ON SITE, for future service needs.

3.9 Installation Conditions

1.) A Final Site Print is REQUIRED. Contact your PMI for a final site print.

2.) The room size must match the print.

Measure the room size. If it does not match the stated size, and is smaller, then check all regulatory clearances. If any regulatory clearance is less than the minimum, then DO NOT continue. Notify the PMI to set up a site escalation.

Note: Service clearances MUST be met to continue.

3.) A customer Anchoring Plan is required if there is anything other than a 102 mm (4 in.) (minimum) concrete floor. GE employees shall only install the anchors supplied with this system.

4.) Complete this section on the GE Form e4879.

5.) Do NOT start the installation process if the site is under construction:

- In the Room
- In the Scan Area
- In addition, the radiology suite at such a site will REMAIN in a dust-free, occupancy-ready state after delivery and throughout the remaining construction phase.

Section 4.0
Layout the Room Floor

NOTICE **The System Installation-Alignment Tool (5824714) has been released as service tool, you can order it via the Tool Pool.**

4.1 Safety

CAUTION **Potential for Injury.**

The gantry presents a variety of mechanical and electrical hazards.

4.2 Floor Preparation

4.2.1 Preparation

The PMI notifies the installation team if any requirements are not met. It is the purchaser's (buyer) responsibility to provide an approved support structure and an approved method of mounting.

GE is not responsible for any failure of the support structure or method of anchoring.

4.2.2 Flooring

The system has a total floor load of approximately 2822 kg (6221 lbs). A concentrated load of about 2270 kg (5000 lbs), including patient about 205 kg (450 lbs) is found in the table-gantry assembly. For more information, refer to the *Pre-installation Manual* for this system.

Do not place the scanner on any resilient flooring. Resilient tile or carpeting may slowly yield over a period of time and disturb the alignment of the table to the gantry. Refer to the floor template to determine locations where resilient flooring material should be removed.

Limitations include:

- No part of the floor surface within the table, gantry, or the two interface areas between table and gantry should be higher than the support areas for the table and gantry.
- The floor structure must withstand the occupied weight of table and gantry, as well as the individual contact area loading of these components.
- The method and placement of anchors or through bolts must not reduce the structural strength of the floor.In some circumstances, the final floor may not be installed. Refer to Chapter 8.0 in the Pre-Installation Manual for this system.

If you have to remove the gantry covers in order to move the gantry into the room, refer to the cover removal procedure. Please read the notice statement on **Appendix A Removal & Installation of Covers** before removing the gantry covers.

4.3 Room Preparation

- Use the GE print (CAD drawing) developed for your site to establish the room layout. Make sure all the operating and service clearances shown on the print are observed. Record this information on the GE Form e4879.
- Clean the area. The mounting surface must be free of any material that may interfere with the positioning and leveling of the system.

Section 5.0
Gantry-Table Position Confirmation

5.1 Time & Personnel

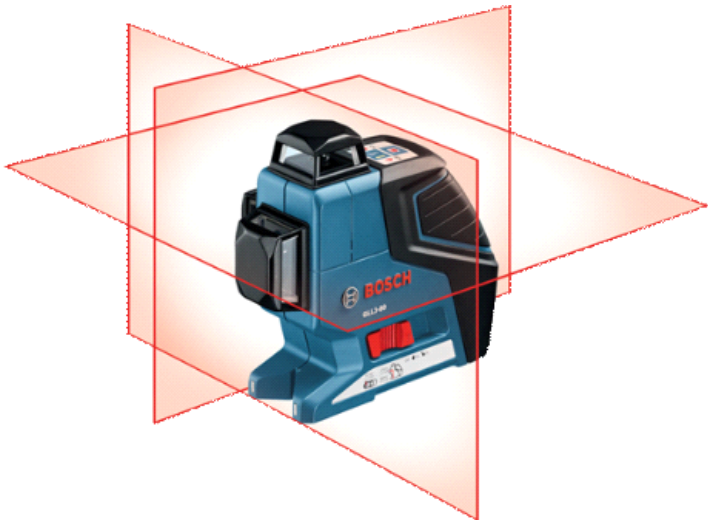
Required Persons	Preliminary Reqs	Procedure	Finalization
2 (FE or mechanical supplier)			

5.2 Tools and Test Equipment

- System Installation/Alignment Tool
- Standard Install Tool Kit
- Install Support Kit
- GE Site Print (CAD drawing)
- Chalk line
- China marker or wax marking pencil, or equivalent
- Masking Tape, or equivalent
- PPE (hand protection, foot protection, face shield, eye protection, personal dosimeter)

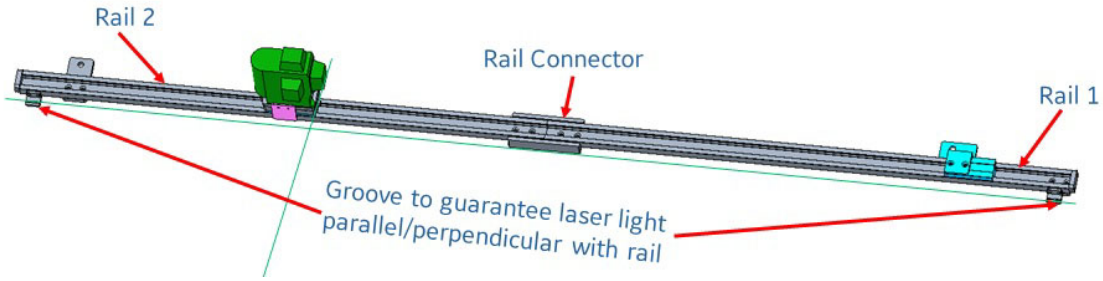
5.3 System Installation/Alignment Tool (5824714 includes:)

- Line Laser (5820779)

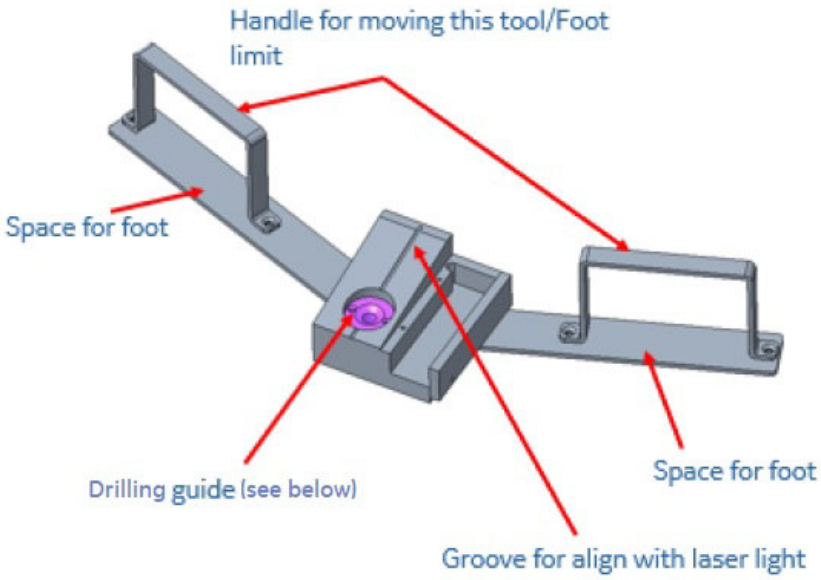


- Laser Measure (5823264)

- Drilling Rail Assembly
  - Rail 1 (5819062)
  - Rail 2 (5819065)
  - Rail Connector (5821014)

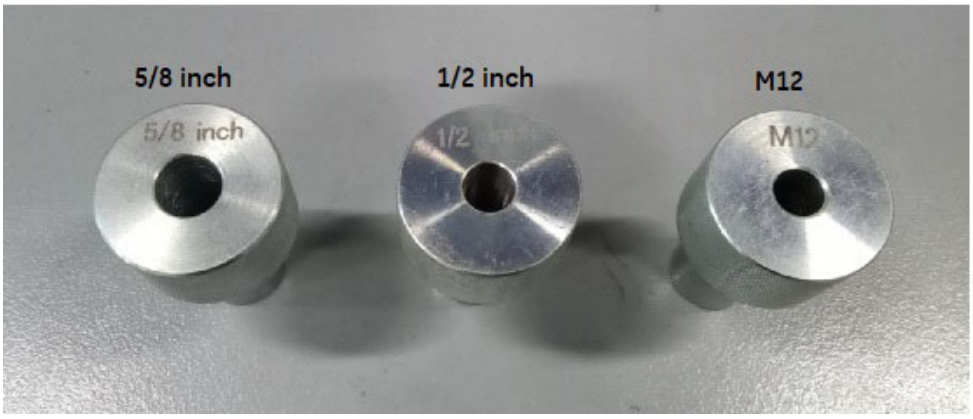


- Drilling Tool Assembly (5821081)



- Drilling Guide/Drilling Bushing
  - Drilling guide for anchor 1/2 inch (5829433)
  - Drilling guide for anchor 5/8 inch (5824151)
  - Drilling guide for anchor M12 (5821085)

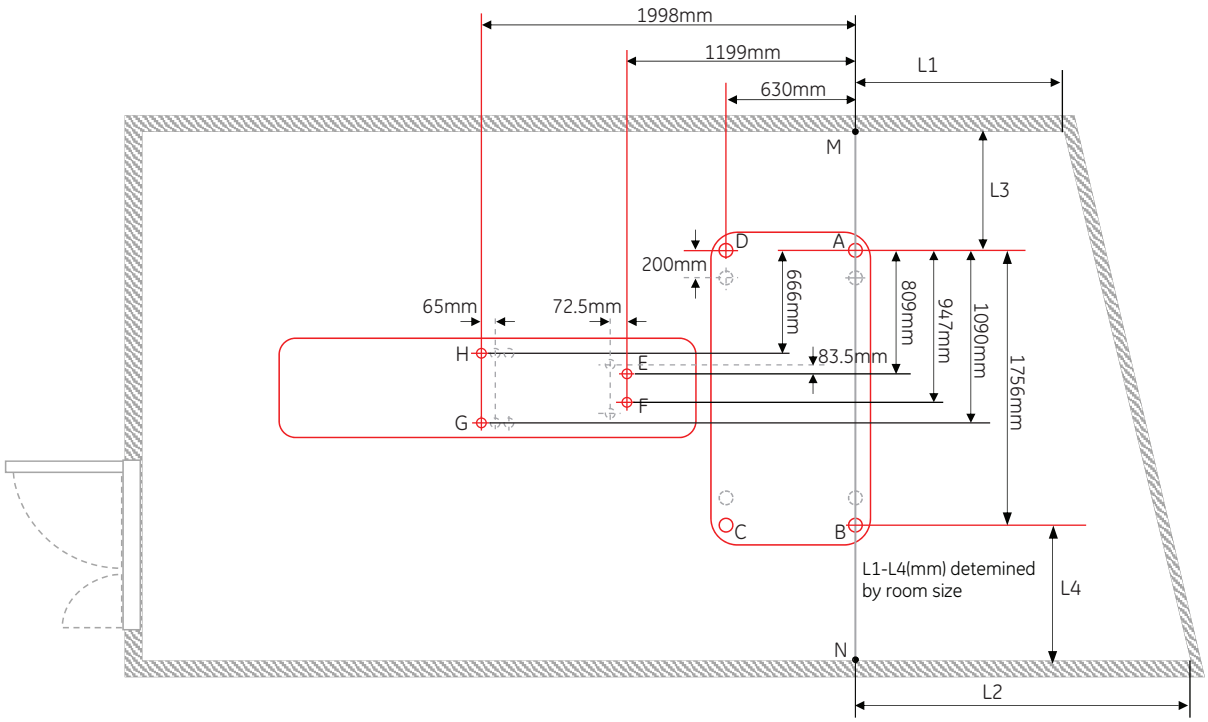
Note: Please select M12 drilling guide/drilling bushing (5821085) for bit drilling guide.



5.4 Preparation

1.) Start to measure the position of the gantry in the room per the GE print.

Figure 2-2 GE Print



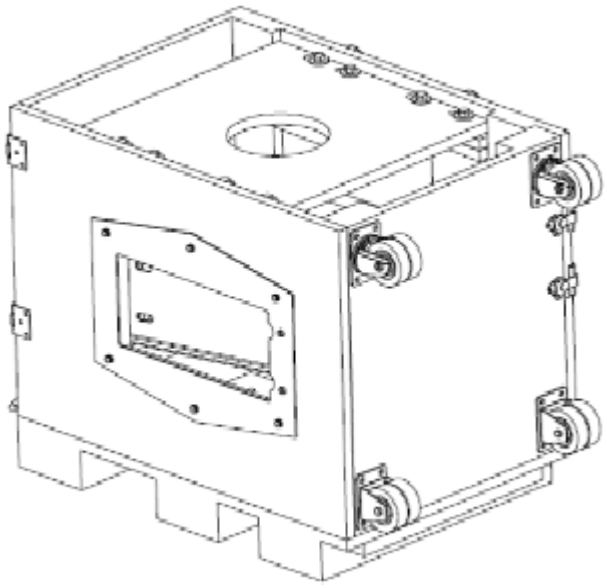
2.) Identify the position of the gantry and table in the room per the GE print (CAD drawing). If everything matches the GE print, continue. If not, please redo two points identification.

3.) Make sure there are no potential clearance issues. If there are floor obstructions, such as conduits or old anchors, be sure to cut them flush to the floor to prevent the gantry from resting on them. Also, be sure there is at least 102 mm (4 in.) of clearance between any existing floor penetration and the new gantry position.

Note: There must be clear space without obstructions in order to:

- Change major components, with access to the gantry tube-change (RH) side (See Figure 2-3).

Figure 2-3 Gantry Tube Change Cart

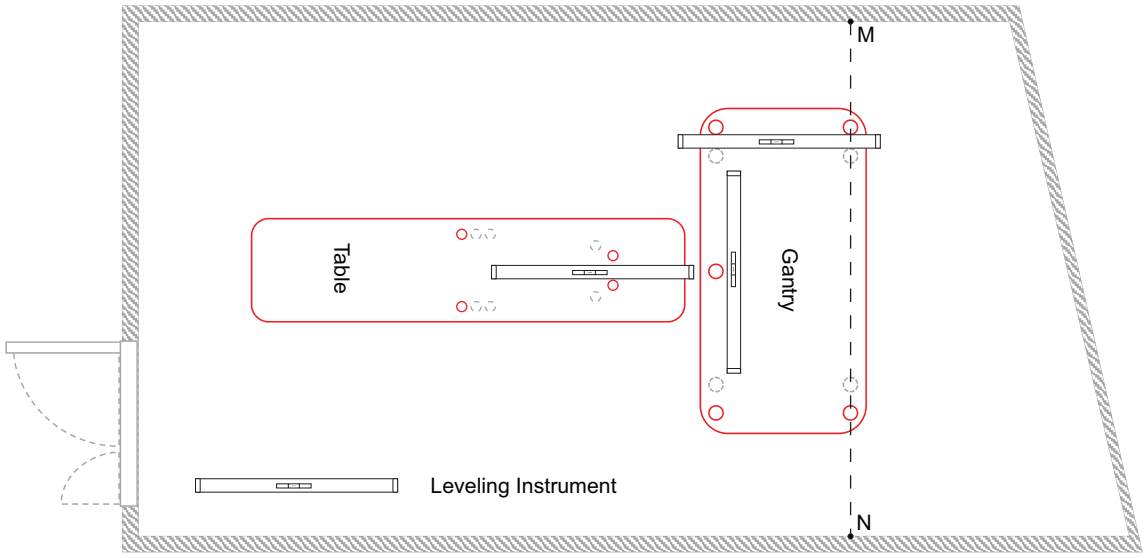


- Allow space for front and rear cover removal

Note: See Service Clearance Section found in the *Pre-Installation Manual*.

4.) Check floor levelness per GE print, as shown in Figure 2-4. The floor must meet the minimum levelness specification: 6 mm (1/4 in.) over 3.05 m (10 ft.) between Table and Gantry.

Figure 2-4 Check Floor Levelness (example)



NOTICE **Positioning requires cutting eight (8) holes in the floor covering.**

Before you drill or cut any flooring, make sure that you have discussed this issue with the customer, and that the appropriate hospital personnel have approved the location of the table/gantry.

Any repositioning must meet all regulatory requirements to be completed.

- Check that the floor meets the levelness specification. Follow the escalation procedure if the floor does not meet the floor specification.
- If the floor is not level, the system does not meet the table ISO specification. The distance from the table cradle to the floor cannot be greater than 1005 mm (40 in.).

5.) Re-check with the customer for approval of the gantry/table placement.

6.) Cut tiles (or other resilient flooring) around all holes punched for the gantry and table.

NOTICE **Some sites require sealing of the floor penetrations after the flooring is removed. If this site does, use RTV or other sealant to seal the floor covering as necessary.**

5.5 Anchor Hole Information

5.5.1 Notes to Mechanical Installers

Note 1: Basic Anchoring Information

GE provided floor anchors are designed for use ONLY on concrete floors that meet the 4-inches concrete floor requirement. Supplied floor anchors must be installed by a trained contractor, and shall be set to a minimum depth of 3-inches at each anchor point. ANY anchors having more than 1-inch of thread showing above the nut, when specified torque is set, shall have a second anchor installed in the closest adjacent hole. This is because the minimum anchor engagement length in the concrete was not met. The second anchor shall be installed to the standard depth and torque specification. Do not cut anchor bolts that extend longer than the 1-inch limit.

Note 2: Alternate Anchoring

If at least four anchors cannot be set for the gantry, and at least four anchors for the table using the alternate anchor holes, then the installer must inform the PMI that the minimum anchoring cannot be met. Additionally, the customer's structural engineering contractor must be engaged to determine the anchoring method, set the anchors, and certify that their anchoring meets the stated GE minimum load requirement and torque specification.

Note 3: Non-Concrete Floors

All other anchoring methods - on floor types other than the concrete minimum - must be determined at the customer's expense by a structural engineering contractor. The anchoring and method must be certified by the customer's contractor to meet the stated GE minimum load requirement and torque specification.

Note 4: GE Notification

It is not the role of mechanical contractors or installers (FEs) to determine acceptable methods to install or anchor equipment on non-4-inch concrete floors. The PMI or appropriate GE contact person shall be notified that the facility's floor type DOES NOT MEET the installation mounting requirement for the installation procedure (described in this Installation Manual), and therefore the table-gantry mounting process CANNOT continue.

5.5.2 Tools Required

- Standard Install Tool Kit
- Drilling Tool Assy and Drilling Guide
- Hammer Drill
- 12 mm concrete drill bit (Imperial equivalent must not be used)
- Vacuum with HEPA or drywall dust filter
- Vacuum Hole Attachment - to clean debris from the holes
- PPE

5.5.3 Gantry and Table Anchors

CAUTION **Potential for personal injury.**

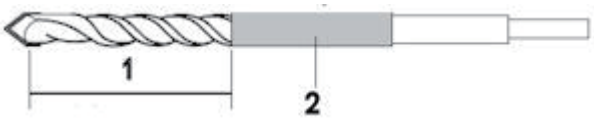
Use appropriate safety procedures when drilling the floor holes, especially if there is lead under the floor.

Appropriate PPE is required when working with hazardous materials.

NOTICE **All documentation in this manual is based on mounting the gantry/table on a 102 mm (4 in.) - 110 mm (4-1/3 in.) concrete floor.**

Apply a piece of adhesive tape (see Figure 2-5) which will then provide a visual means of making sure the proper hole depth has been reached.

Figure 2-5 Drill Bit



Note: Mark 1 is the drilling depth and the drilling guide length (70mm), mark 2 is the adhesive tape.

Mounting Requirements	Gantry Anchor P/N 5479997	Table Anchor P/N 5479996
Minimum Floor Thickness:	102 mm (4 in.)	102 mm (4 in.)
Recommended Drilling Depth:	100 mm (4 in.)	100 mm (4 in.)
Average Anchor Embedment:	90 mm (3.54 in.)	90 mm (3.54 in.)
Minimum Anchor Embedment:	80 mm (3.15 in.)	80 mm (3.15 in.)
Available Alternate Anchor Location	Yes	Yes
Shipped Anchor Size:	205 mm (8.1 in.)	145mm (5.7 in.)
FLoor Levelness Requirement:	6 mm (1/4 in.) over 3.05 m (10 ft.)	6 mm (1/4 in.) over 3.05 m (10 ft.)

Table 2-3 Gantry and Table Anchor Mounting Requirement

Figure 2-6 Gantry Anchor Assembly (P/N 5479997)

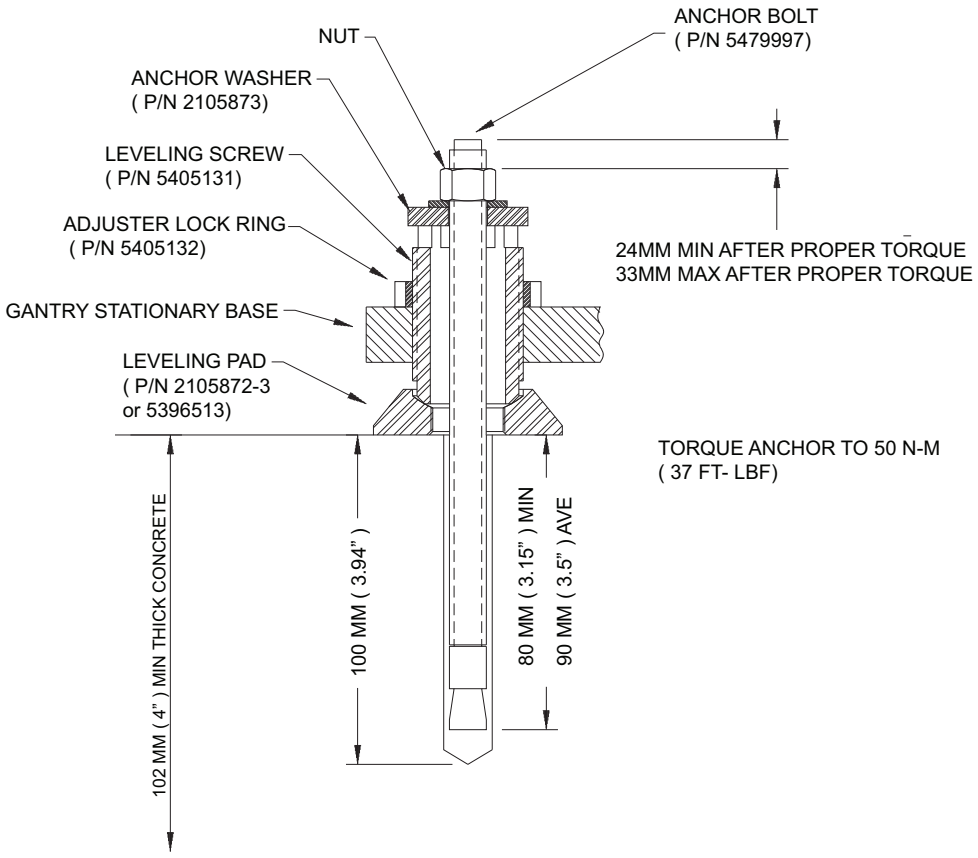
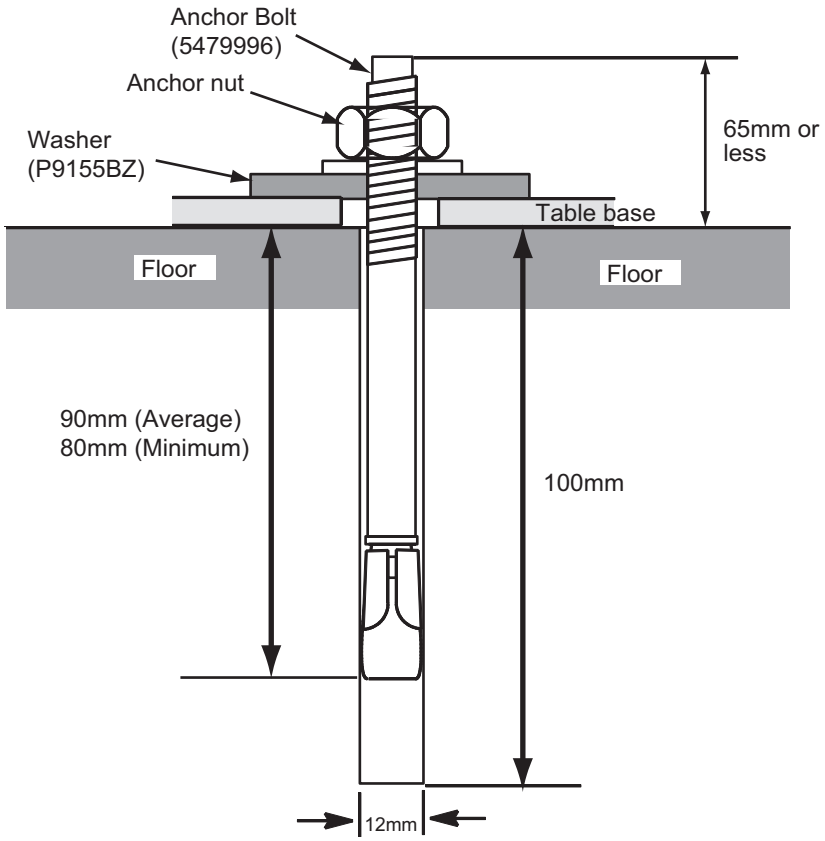


Figure 2-7 Lite Table Anchor Assembly (P/N 5479996)



5.6 Position Gantry and Table

1.) Unpack the System Installation / Alignment Tool Kit (5824714). (See 5.3 System Installation/ Alignment Tool (5824714 includes:))

2.) Follow the GE print drawing, identify two points M & N by using the Laser Measure (5823264), mark two points according to L1 & L2 respectively.

Note: The reading displayed on the Laser Measure includes the distance from the tail of the Laser Measure to the target point.

3.) Turn on the Line Laser (5820779), adjust its position, pass the laser line through two points M and N.

Figure 2-8 Mark M and N (Example)

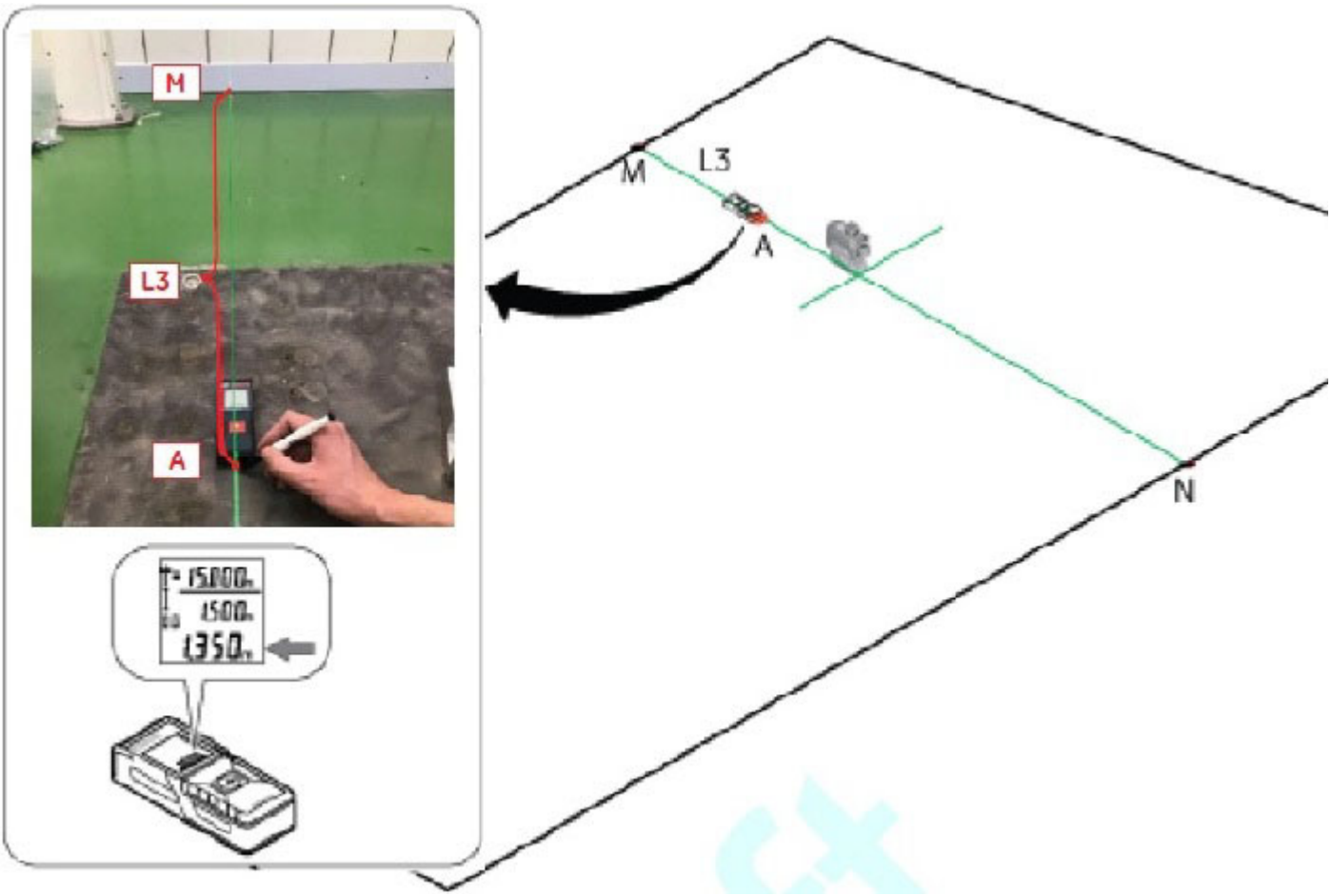
Note: Set the Line Laser switch is " On" (See Figure 2-9) to make sure it is set to self-level.

Figure 2-9 Switch "On"

4.) Align the Laser Measure with the Laser Line, make the value displayed on the Laser Measure is same as L3 to confirm the point A.

Note: L3 is determined by room size.

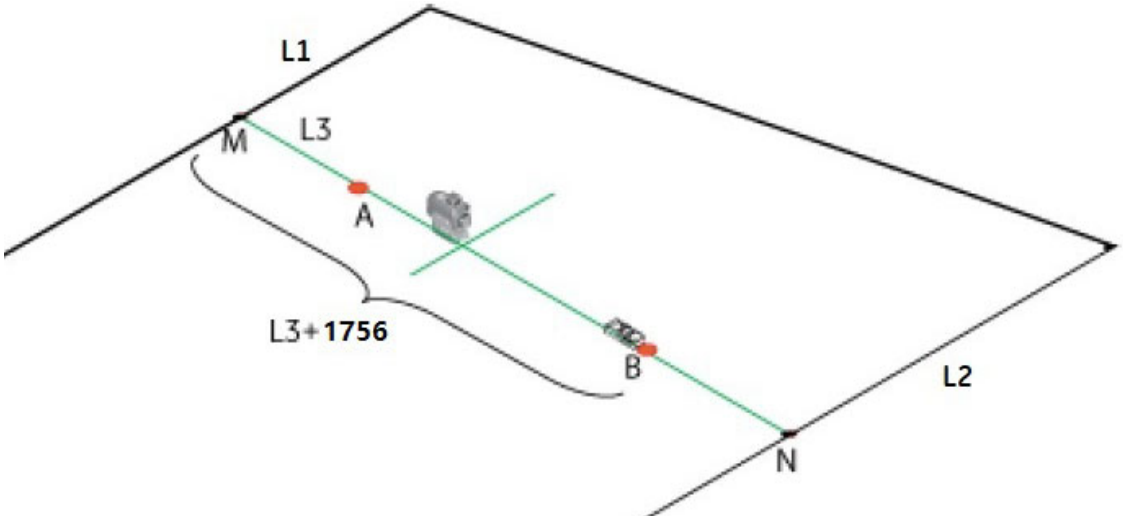
Figure 2-10 Point A Confirmation



Note: The value displayed on the laser measure includes the length of itself.

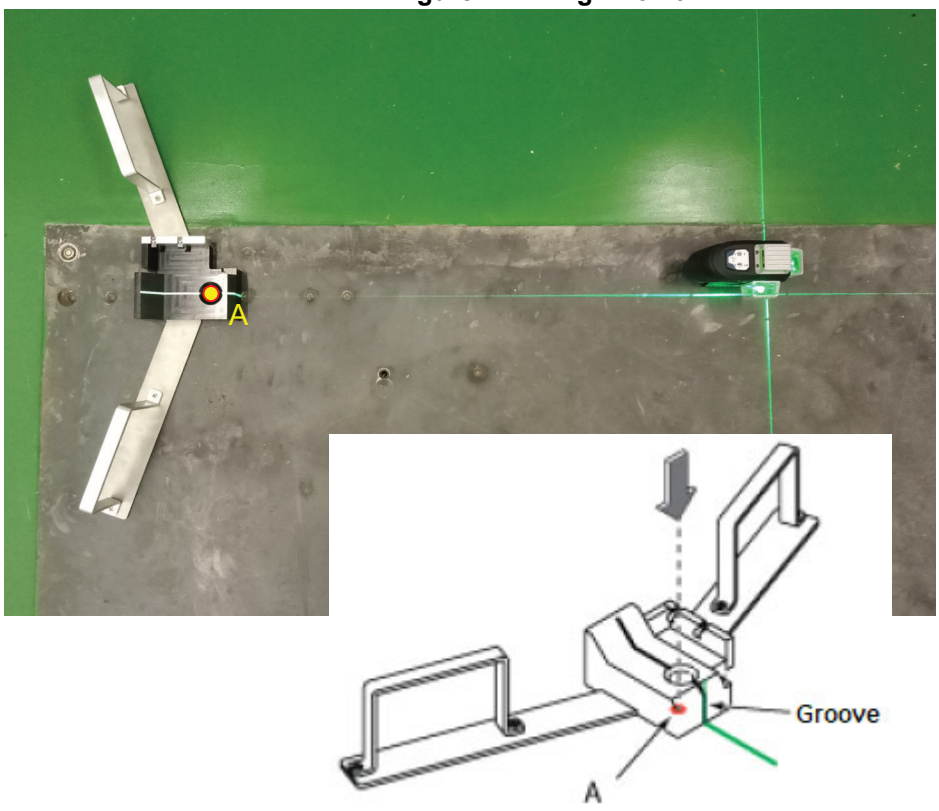
5.) Align the Laser Measure with the Laser Line, make the value displayed on the Laser Measure is same as L3 + 1756mm to confirm the point B.

Figure 2-11 Point B Confirmation



6.) Align the hole of the Drilling Tool Assy with point A and align the center groove with the laser line.

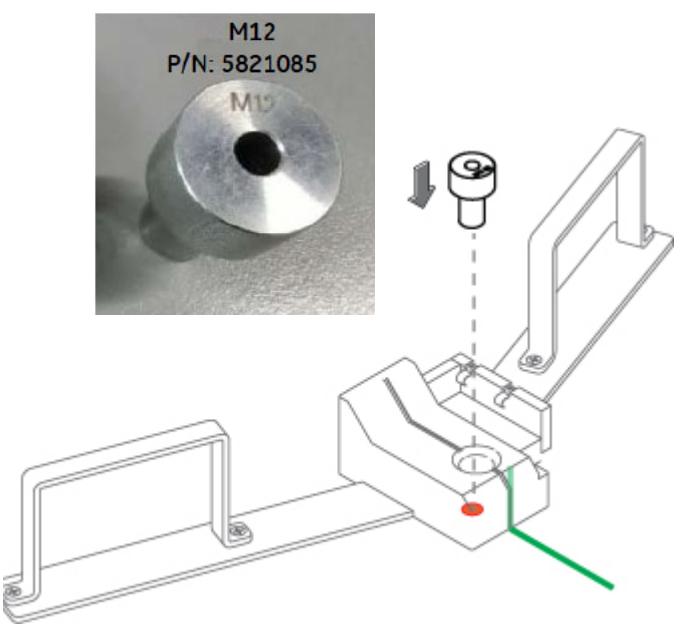
Figure 2-12 Align Point A

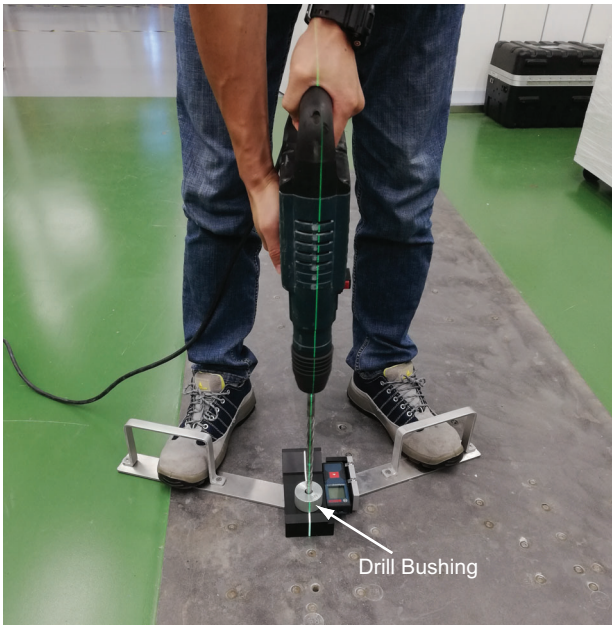


Note: DO NOT move the Line Laser, make sure the laser line is aligned with the mark A before drilling.

7.) Locate the 12mm drill bit, use the drill bushing (12mm) to guide the drill bit and keep the drill bit perpendicular on the floor when drilling the holes.

Figure 2-13 Drill Gantry Anchor Holes A





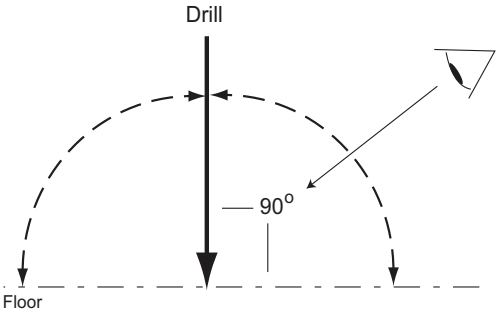
CAUTION **Potential for personal injury.**

Use appropriate safety procedures when drilling the ground holes, especially if there is lead under the ground.

Appropriate PPE is required when working with hazardous materials.

Important - Follow these guidelines when drilling anchor hole:

- During drilling, always keep the drill bit perpendicular to the floor.



- Always use the mechanical guide (drill bushing) when drilling.
- Stop drilling every 15 or 20 seconds and clear the hole of debris. This lets the drill bit cool and helps to prevent binding of the drill bit.
- Vacuum while drilling to keep gantry and table as free of dust contamination as possible. Place the funnel tip or long extension tip inside the hole.

  A drywall dust filter must be used on the vacuum.
- Drill each hole until the mark on the drill bit is even with the Drilling Kit. All holes must be have a depth specified in Table 2-3. Use an upside-down anchor to check the hole depth.

CAUTION **If you cannot drill anchor hole due to structural interference, such as reinforcement bars in the concrete, you must remove the G/T Installation Tool to re-identify points A and B according to GE print.**

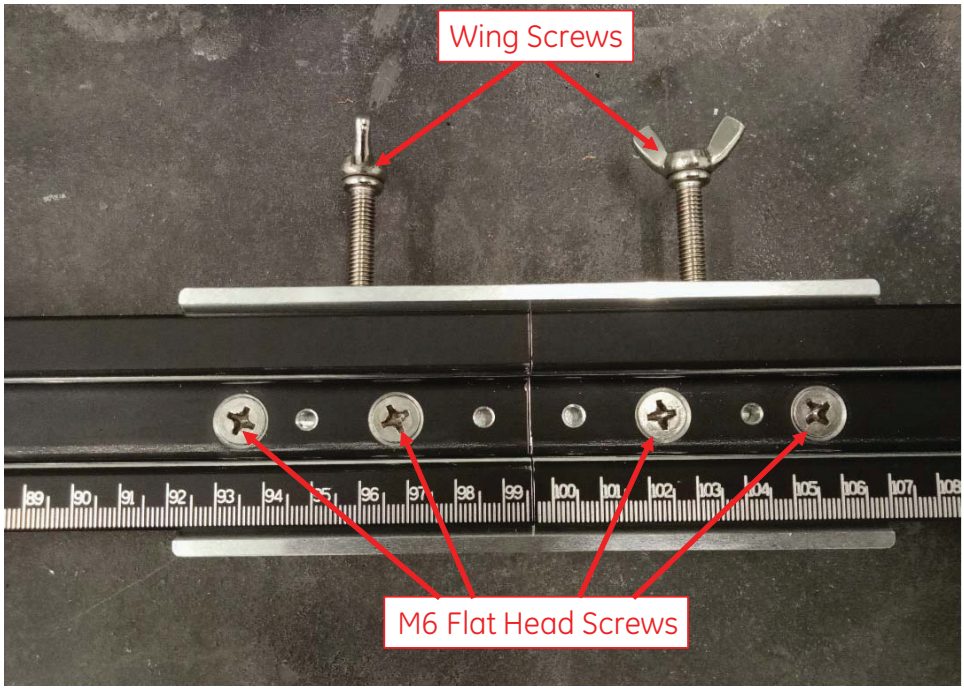
8.) When finished drilling and clearing the anchor hole, vacuum the debris from the inside hole and from the surrounding (floor) area.

9.) Assemble the sliding rail1 and rail2 to the Rail Connector by using four M6 flat head screws, **DO NOT tighten them**. (See Figure 2-14)

10.) Secure two wing screws so that two rails are tight against a side of the rail connector, then tighten four M6 screws.

Note: Pay attention to the direction of two sliding rails, the wing screws of the Rail Connector should be secured in the no-scale side of the sliding rails.

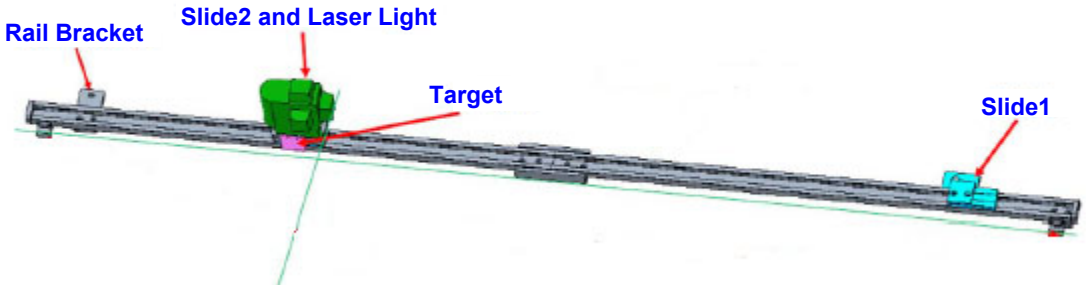
Figure 2-14 Assemble Sliding Rails



11.) Align the hole of the rail bracket with the hole A drilled in Step 7.), then insert a drilling anchor pin found from the tool box (5824714) into the rail bracket and the hole A.

12.) Slide the slide 1 and align the hole of the slide 1 with the hole B marked in Step 5.).

Figure 2-15 Rail Bracket and Slide 1

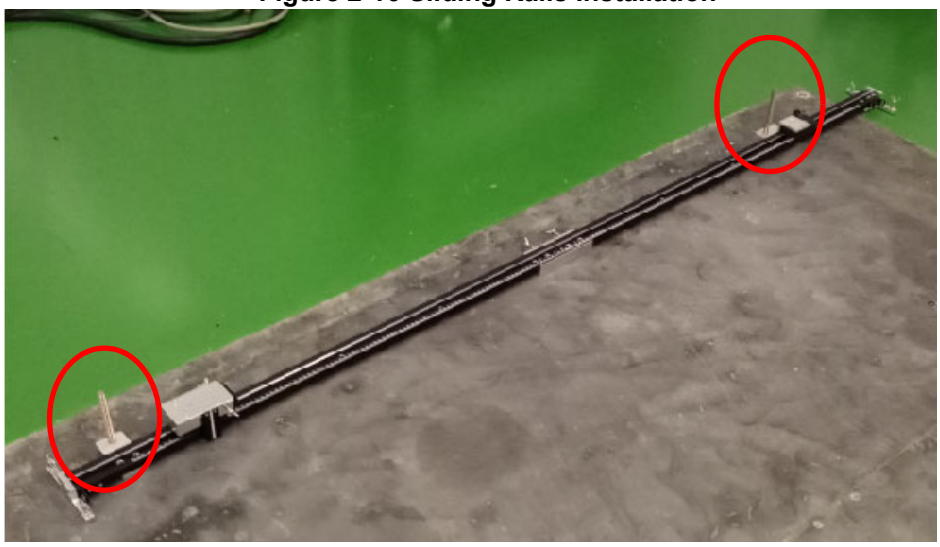


13.) Confirm that the reading on rail is equal to 1756mm ± 2mm between two holes (A and B).

- If no, need to remark the position of the point B.
- If yes, remove the rail assy, then repeat Step 5.) - Step 8.) to drill gantry anchor hole for point B.

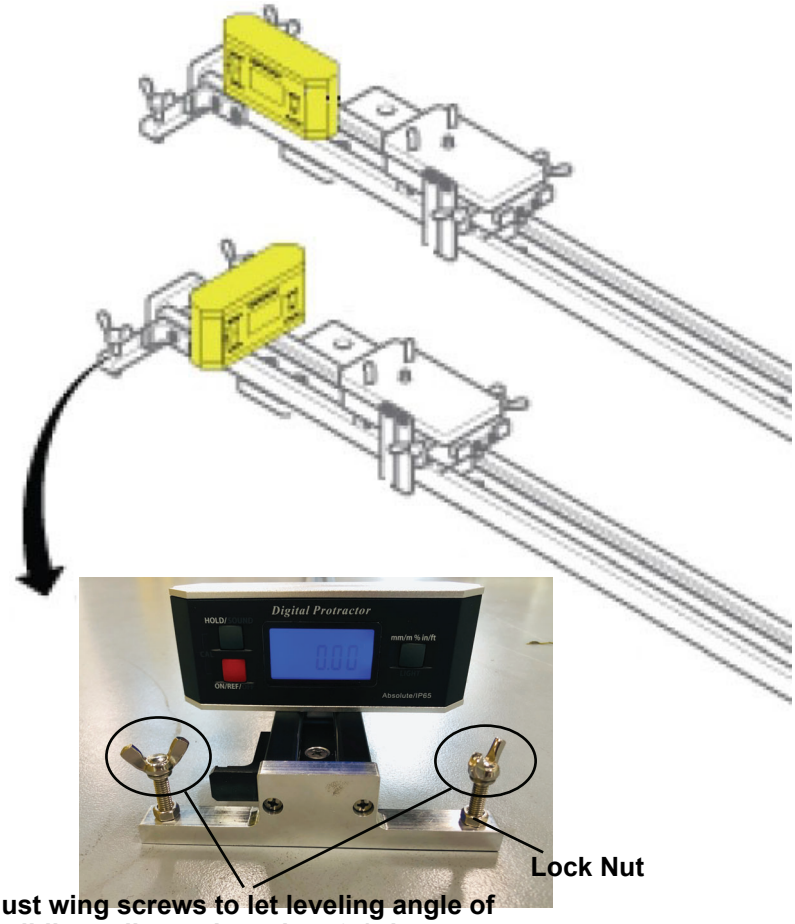
14.) Find the other drilling anchor pin from the tool box (5824714), then insert it into the slide 1 and the hole B to fix the rail assy.

Figure 2-16 Sliding Rails Installation



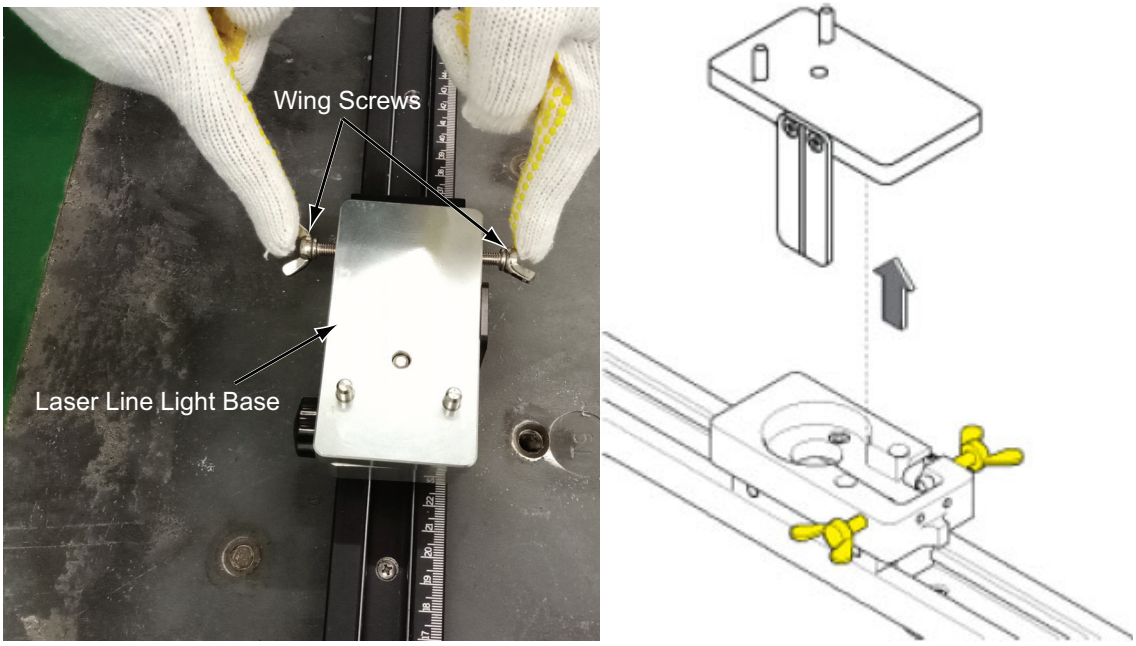
15.) Put the Digital Protractor on the sliding rail assy, adjust the leveling of the sliding rail assy by using four wing screws in both sides. Ensure the angle less than ±0.1 degree in **left / center / right** position of the sliding rail assy respectively, and then tighten the lock nuts.

Figure 2-17 Level the Sliding Rail Assy



16.) Loosen two wing screws to remove the line laser base.

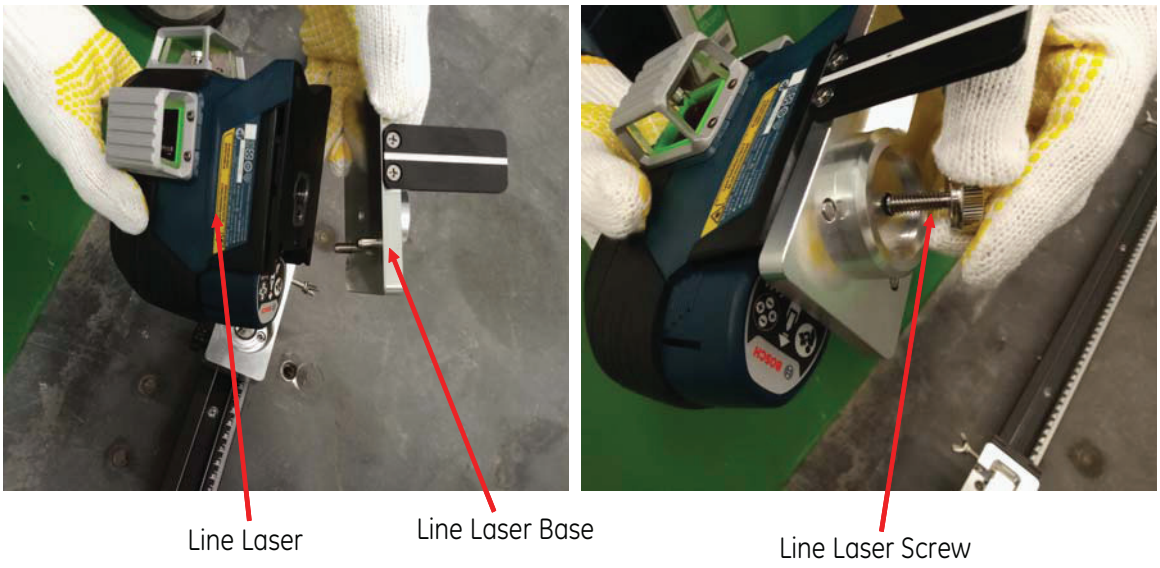
Figure 2-18 Line Laser Base



17.) Find the line laser screw (5824080) from the tool box (5824714).

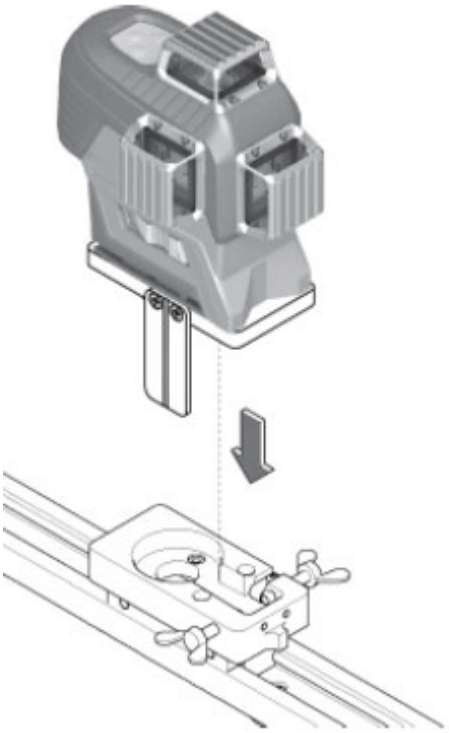
18.) Assemble the line laser base and the Line Laser by using the line laser screw.

Figure 2-19 Assemble the Line Laser Base and the Line Laser



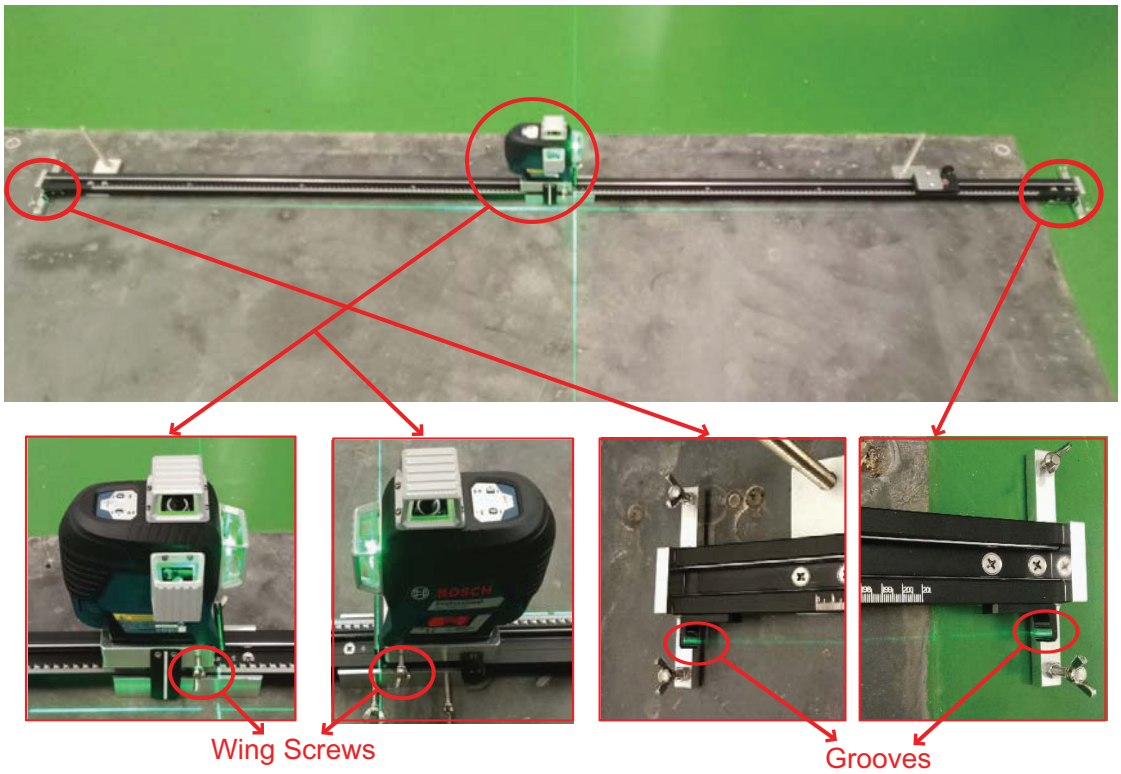
19.) Locate the Line Laser Assy on the sliding rail assy.

Figure 2-20 Line Laser Setup



20.) Slide the Line Laser to the middle of the sliding rail. Adjust the position of the Line Laser using two wing screws so that the laser line is projected on two grooves.

Figure 2-21 Line Laser Adjustment

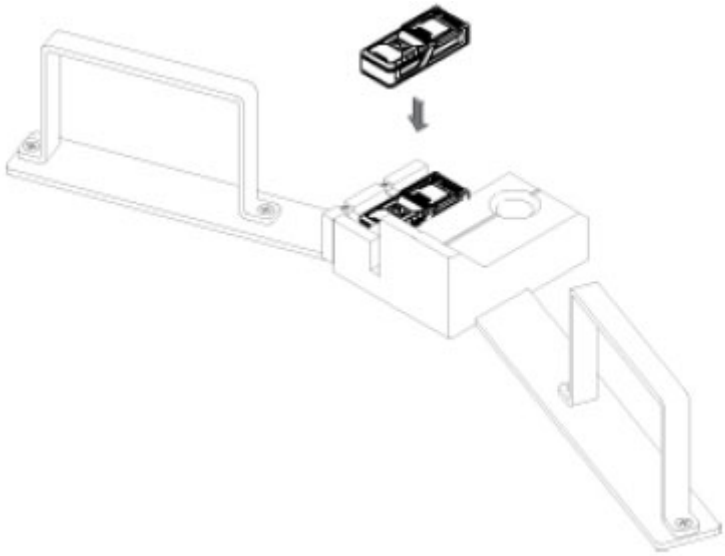


21.) Slide the Line Laser to both ends of the sliding rail assy to double confirm the laser line in the grooves, then tighten two wing screws.

NOTICE **The laser line MUST be aligned with two grooves of the sliding rail assy, because it will affect the accuracy in following steps.**

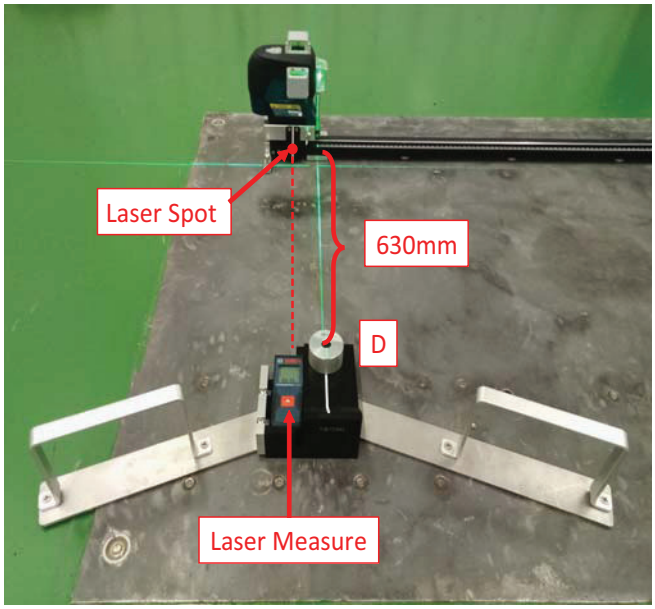
22.) Place the Laser Measure on the Drilling Tool Assy as shown in Figure 2-22, ensure the Laser Measure is flat placed on the Drilling Tool Assy.

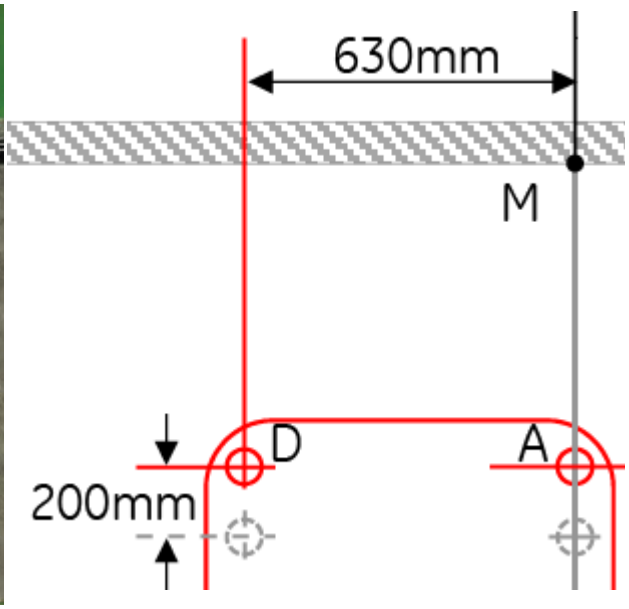
Figure 2-22 Laser Measure Setup



23.) Slide the Line Laser to the left/right-limit of the sliding rail assy, align the laser line with groove of the Drilling Tool Assy, and align the laser spot from the Laser Measure with groove of the Line Laser Base simultaneously. Identify the reading displayed on the Laser Measure is 630mm, mark the point D (C).

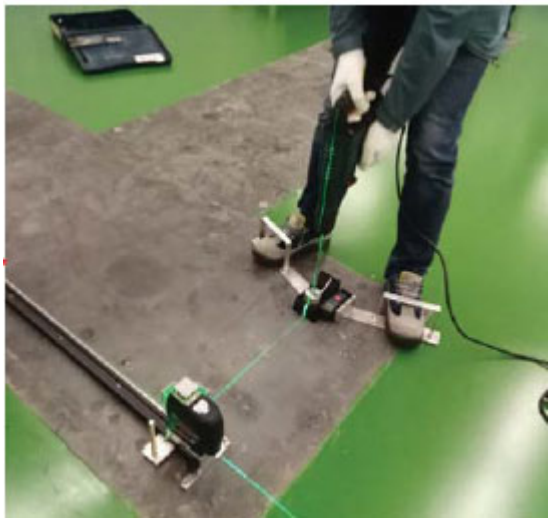
Figure 2-23 Gantry Front Anchor Holes Confirmation





24.) Repeat Step 6.) - Step 8.) to drill gantry anchor holes for point D (C).

Figure 2-24 Drill Point D

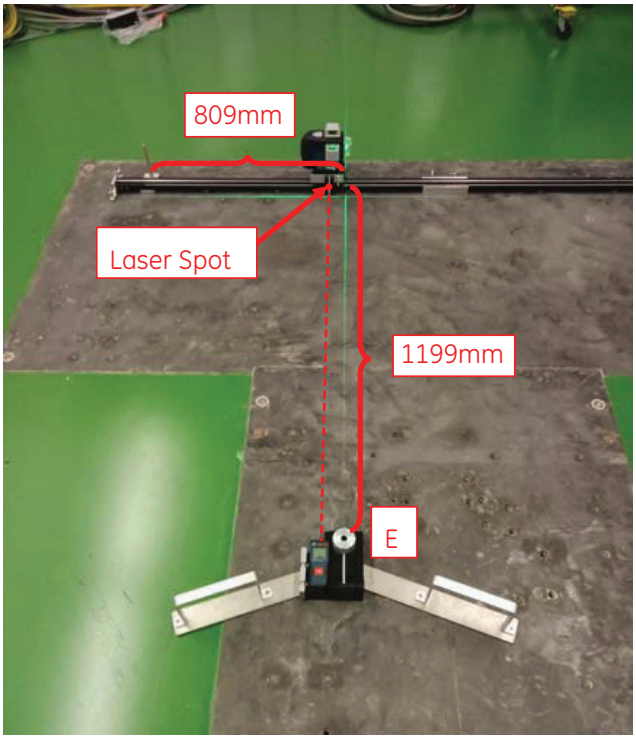


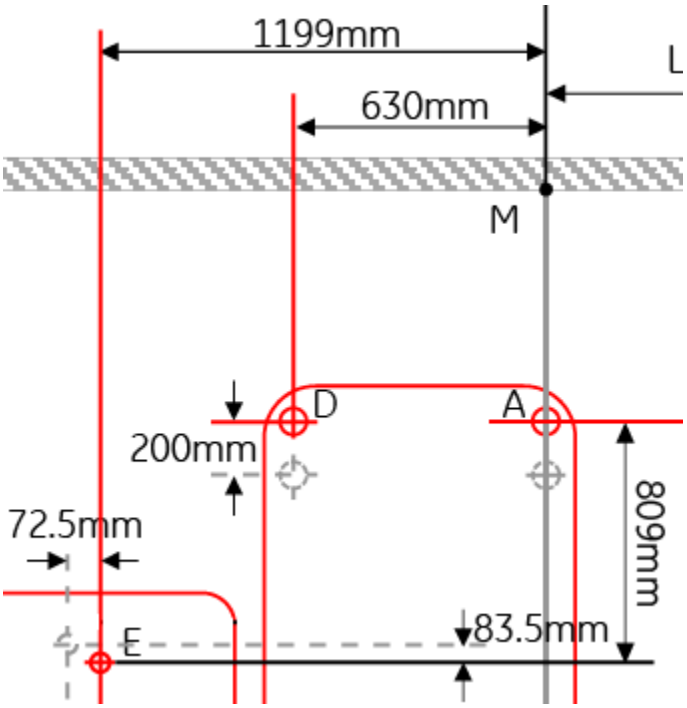
NOTICE **If the master anchor hole is unavailable due to structural interference, such as reinforcement bars in the concrete, you must mark the alternate anchor hole position to re-drill, as shown in Figure 2-2.**

If alternate location(s) are used to anchor the gantry, you must move the respective leveler(s) and pad(s) to the new alternate location(s) and re-drill.

25.) Slide the Line Laser from the left-limit of the sliding rail assy to the position shown in below **Figure 2-25**, align the laser line with groove of the Drilling Tool Assy, and align the laser spot from the Laser Measure with groove of the Line Laser Base simultaneously. Identify the reading displayed on the Laser Measure and mark the point E.

Figure 2-25 Confirm Table Anchors Position





26.) Use the same method (see Step 26) to identify and mark the remaining three points F/G/H.

27.) Repeat Step 6.) - Step 8.) to drill four table anchor holes for point E/F/G/H.

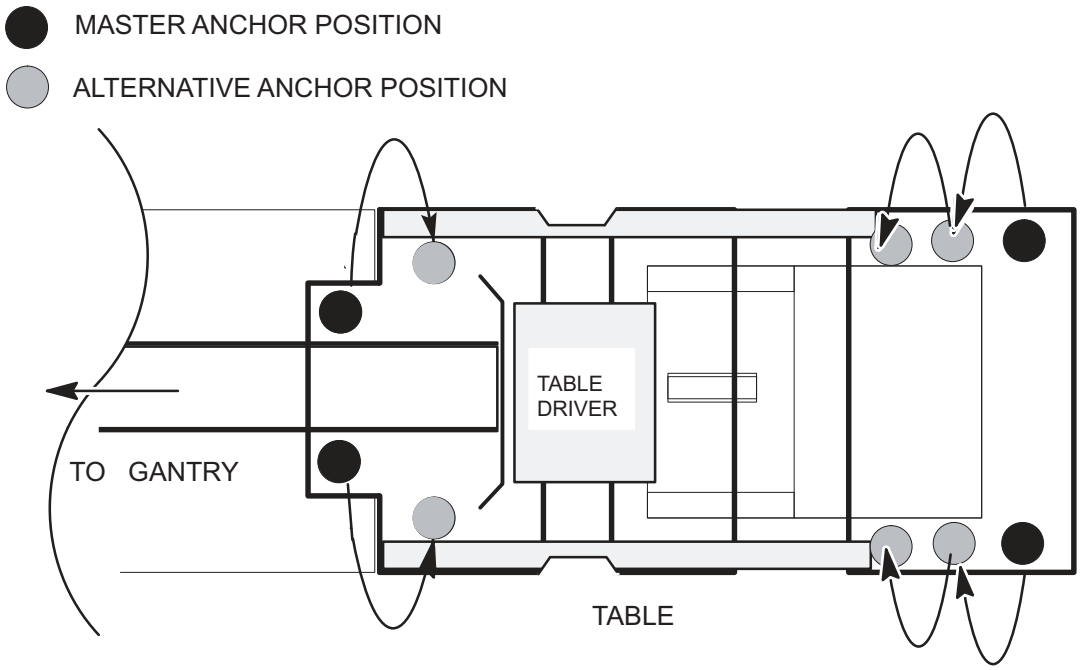
Figure 2-26 Drill Table Anchor Holes

NOTICE

If the master anchor hole is unavailable due to structural interference, such as reinforcement bars in the concrete, you must mark the alternate anchor hole position to re-drill, as shown in Figure 2-2.

If alternate location(s) are used to anchor the table, you must move the respective leveler(s) and pad(s) to the new alternate location(s) and re-drill.

Figure 2-27 Lite Table Anchor Locations



28.) Use the vacuum cleaner to clean the concrete dust around holes.

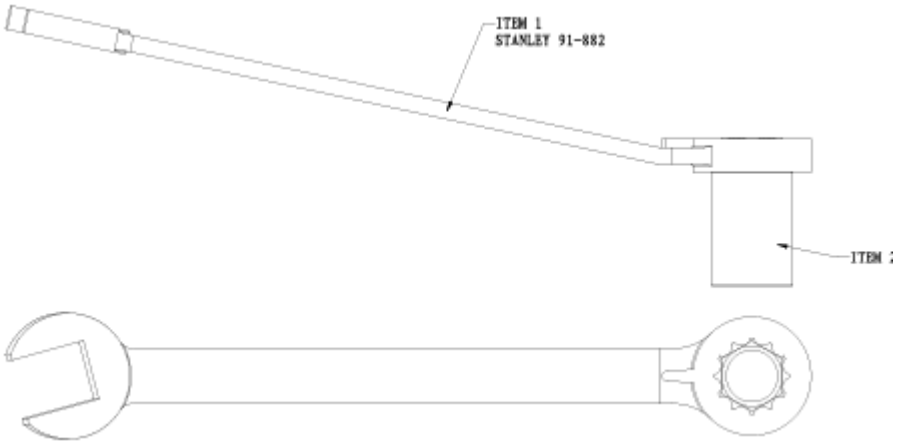
Section 6.0
Install and Level the Gantry

6.1 Tools and Test Equipment

- Standard Install Tool Kit
- Install Support Kit
- GE Site Print
- Leveling Ratchet Wrench 5825033 (included in System Install/Align Tool)
- Installation Manual
- PPE (hand protection, foot protection, face shield, eye protection, personal dosimeter)

6.2 System Installation/Alignment Tool (5824714 includes:)

- Leveling Ratchet Wrench (5825033)



6.3 Gantry Preparation

Note: Some sites require floor protection. Locate and install any required floor protection now.

6.3.1 Access Greater Than 28"

Remove all the transportation packaging from the gantry, except for dollies.

6.3.2 Access Less Than 28"

Measure from the wall or object protruding from the wall to the gantry side cover. The gantry left side cover must be installed for this measurement. When finished, the gantry cannot be closer than 14 in. to the wall or object protruding from the wall.

1.) Remove all the transportation packaging from the gantry, except for dollies.

2.) Remove the blue dolly from the left side of the gantry and install the limited access dolly so that the gantry can be positioned closer to the left side wall:

   a.) Lower the gantry to the floor so that the gantry is resting on the floor.

   b.) Remove the three (3) M14 hex bolts that secure the gantry to the dolly.

c.) Replace the removed dolly with the shipped black gantry-positioning dolly, and reinstall the three (3) M14 hex bolts.

d.) Raise the gantry so that it is once again off of the floor.
The gantry can now be moved up to 14 in. from the wall, measured from the wall or object protruding from the wall to the gantry side cover. Only use the supplied, limited-access dolly for this procedure.

Note: If this procedure cannot be completed, follow the site escalation procedure established for your area.

6.4 Installation Procedure

1.) Delivery the gantry to the scan room.

2.) Hammer the anchor bolts (5479997, shipped with system shipping collector) in the drilled gantry holes (A/B/C/D), and confirm the anchor embedment is 90mm. (See Table 2-3)

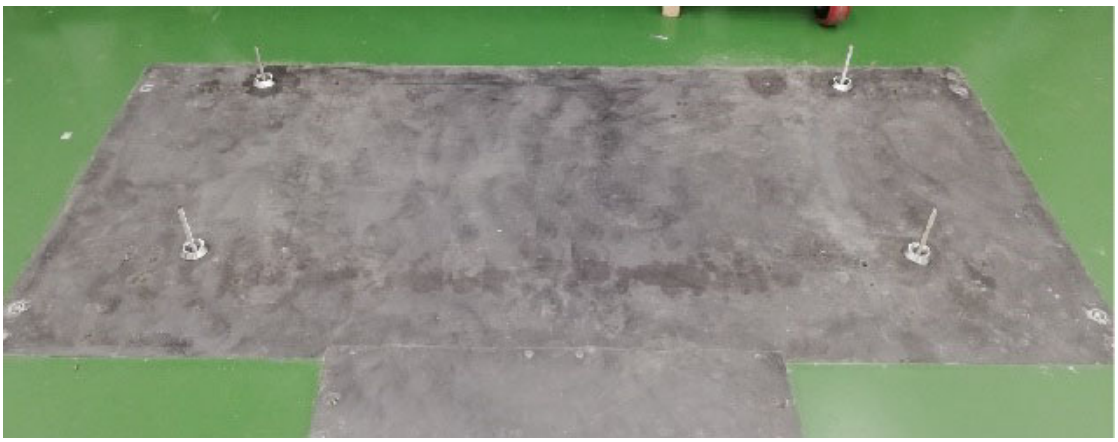
Figure 2-28 Anchor Bolts

3.) Use the gantry dollies to evenly raise the gantry, until it is approximately 5" (127mm) above the floor.

4.) Move the gantry and position it over the anchor bolts.

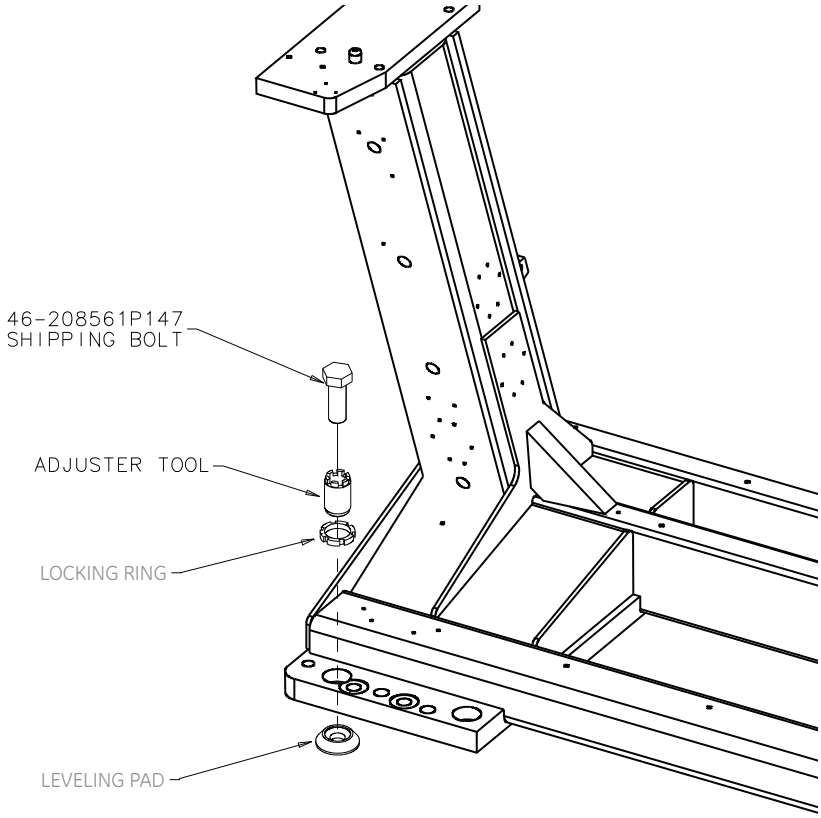
a.) Loosen the locking ring and the shipping bolt to remove four leveling pads from the gantry, then pass them through the four anchor bolts separately on the floor.

Figure 2-29 Gantry Anchor Bolts



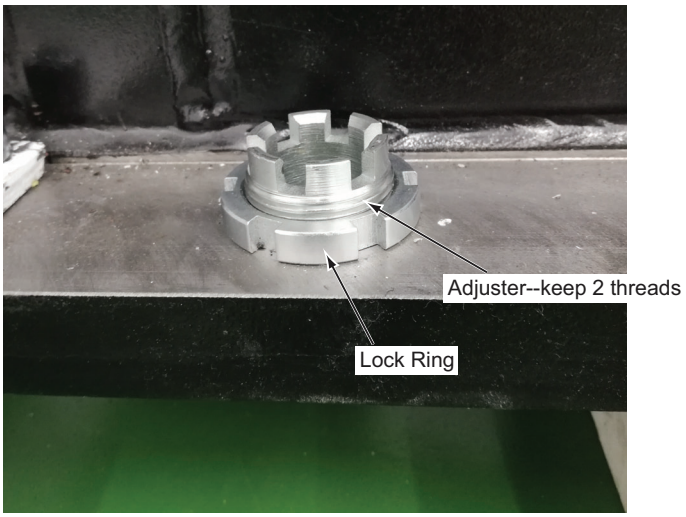
b.) Remove the shipping bolts.

Figure 2-30 Shipping Bolt



c.) Rotate the adjuster so there is 2 threads between the top of the adjuster and the top of the lock ring.

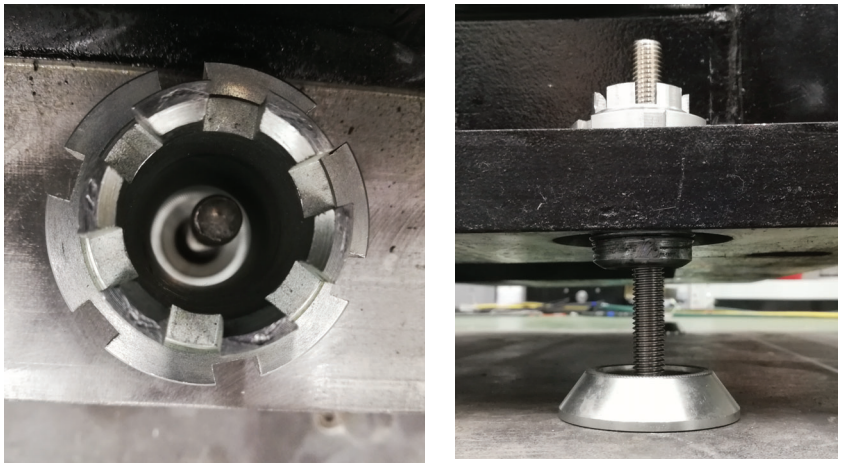
Figure 2-31 Adjuster



d.) Carefully move the gantry to the correct position so that the adjusters are centered over their respective anchor bolts.

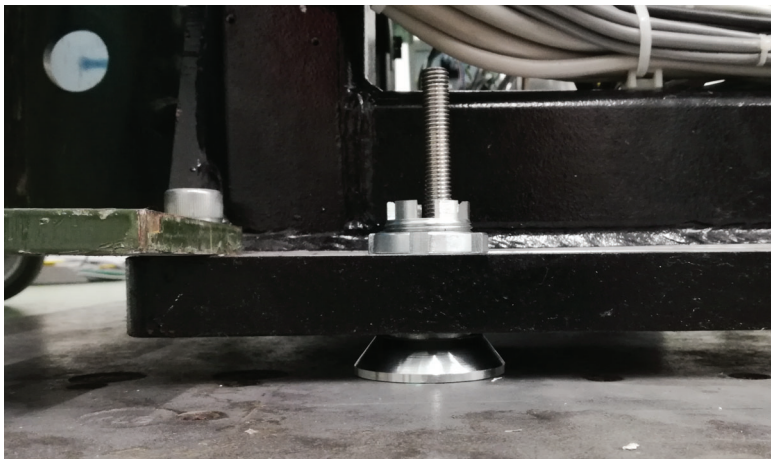
e.) Use the dollies to evenly lower the gantry, pass anchor bolt through the four anchor adjusters separately on the Gantry.

Figure 2-32 Align Center Anchor Bolt



5.) Evenly lower the gantry until the adjuster is fully located the four leveling pads separately.

Figure 2-33 Lower the Gantry

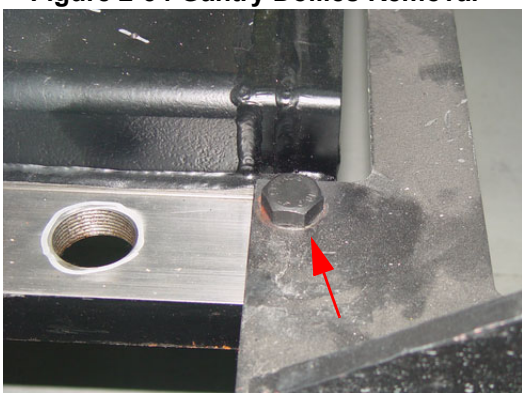


6.) Position each of leveling pads beneath its associated adjuster, fine-tune the leveling pads to compensate for slight variations in the floor surface.

NOTICE **Gantry dollies weight approximately 250 lbs each. Exercise caution when removing dollies so as to not damage the floor covering.**

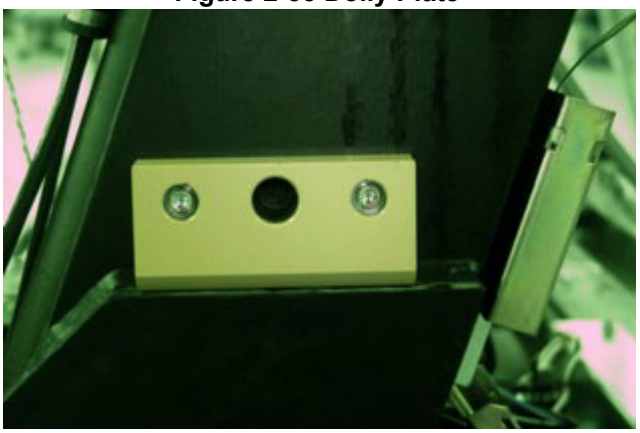
7.) Using a 14mm hex socket, remove the dollies from the gantry by removing the three dolly bolts found at both ends of the gantry.

Figure 2-34 Gantry Dollies Removal



8.) Remove the dolly plates on both sides of the gantry. Retain the dolly plates in the service cabinet at the hospital.

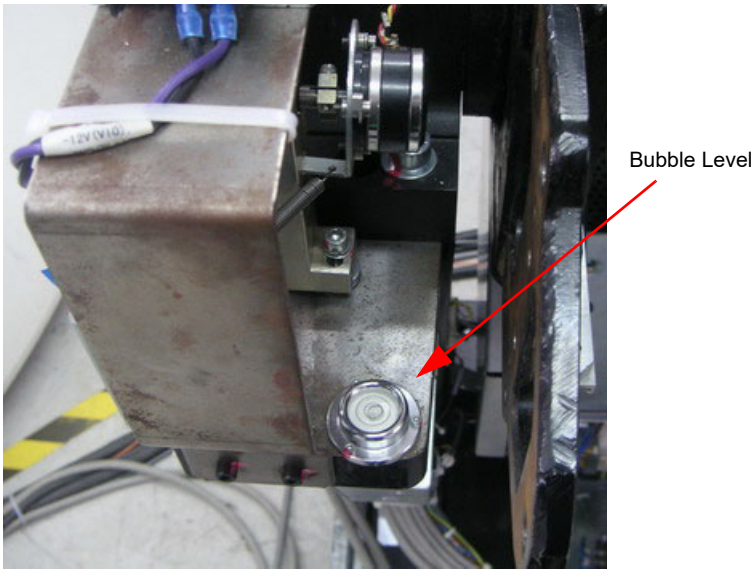
Figure 2-35 Dolly Plate



6.5 Level the Gantry

The gantry uses 2 bubble levels that are permanently mounted to machined surfaces on the stationary base to tell when it is level.

Figure 2-36 Gantry Bubble Level



Bubble levels are located on both ends of the gantry stationary base. They're located on the stationary base near a point where the rotating structure pivots mount to the base structure. (See Figure 2-36.) The gantry is properly leveled when the bubble is centered. (See Figure 2-38.)

1.) Loosen all adjuster lock rings (use a spanner wrench or large channel lock pliers).

2.) Systematically turn each of the gantry's adjusters (locations 1, 2, 3 and 4 in Figure 2-37) by using the leveling ratchet wrench (5825033) until both bubble levels are centered left to right, and front to back.

- Begin by turning each adjuster no more than 1 turn at a time.
- Use the adjuster tool, $1^{1}/_{8}$" socket, and the ½" drive ratchet to turn each adjuster. (Refer to Figure 2-38.)

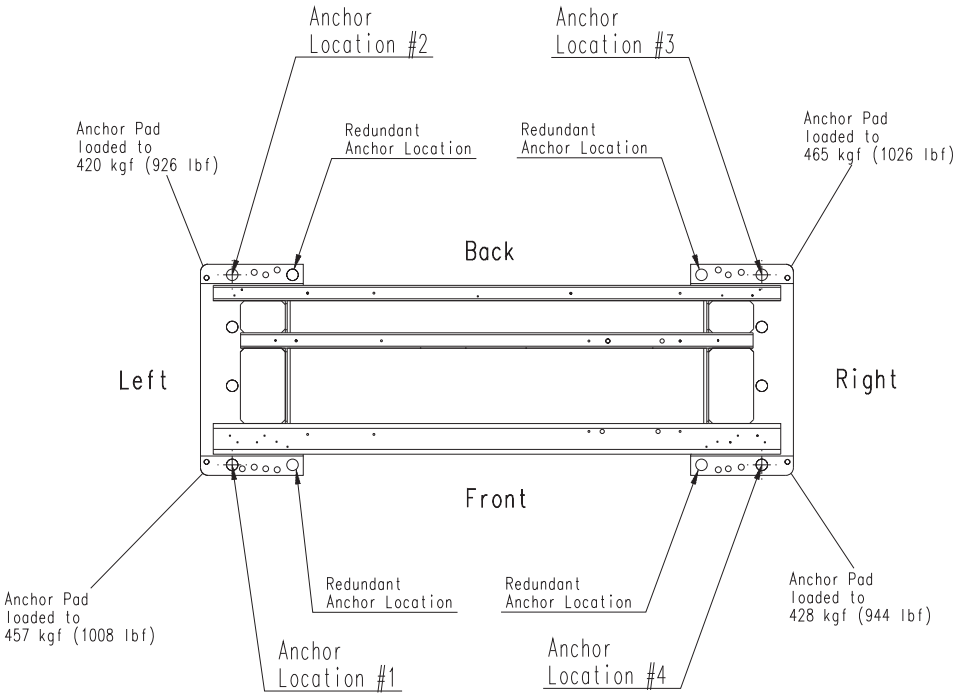
Systematic Procedure for Leveling gantry follows:

a.) Level the left side from front to back by turning adjusters #1 and #2 by using the leveling ratchet wrench.

b.) Level the right side from front to back by turning adjusters #3 and #4 by using the leveling ratchet wrench.

c.) Level the side (right or left) that is higher with respect to the other side. Turn both adjusters on a side equally until that side is level. The side should now also be level.

Figure 2-37 Gantry Base "Adjuster" Locations— Top View



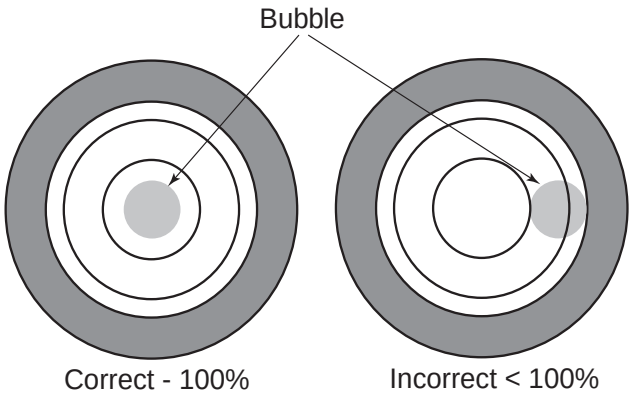
Note: Adjusters are used at each anchor location. Anchor hole ID is 1"(2.5cm). Void between adjuster and anchor must be filled according to local building coded for seismic application.

3.) When the bubble levels are centered (Figure 2-38), each of the four (4) leveling pads should be carrying a portion of the gantry weight. Distribution of the gantry weight prevents the base frame from rocking during normal operation. **DO NOT leave any adjuster un-loaded or floating**.

Figure 2-38 Bubble Level Centering

Correct level is 100% of bubble within small circle

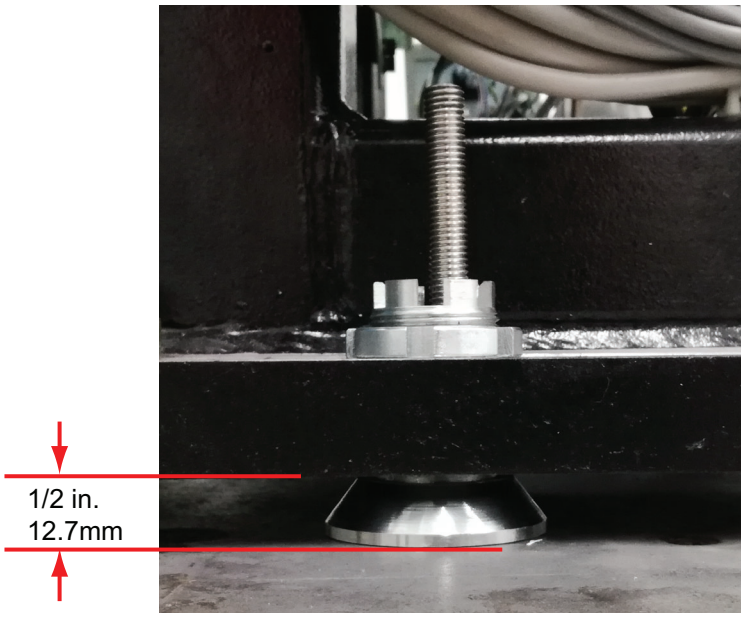
Incorrect Level is less than 100% of bubble within small circle



4.) Use the leveling ratchet wrench (5825033) to adjust the distance between floor and gantry base at Anchor location #1 becomes approximately ½" (12.7mm) by turning four (4) adjusters equally.

(Be careful no more than 1 turn at a time.)

Figure 2-39 Gantry Height



5.) Recheck the bubble level. After the gantry is level, tighten the locking rings on all gantry levelers.

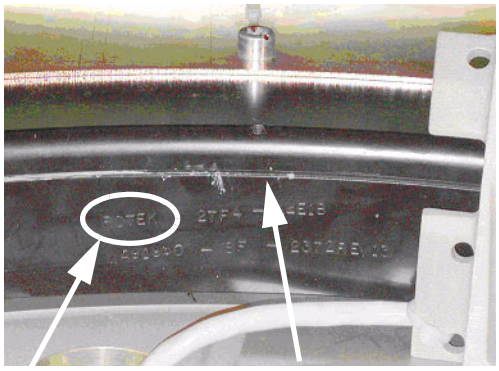
6.6 Gantry Bearing Gap Inspection

All CT systems require a Gantry Bearing Gap inspection before starting electrical calibration. All international gantries are shipped in a wooden shipping crate that should not be removed until it arrives at the installation site. This shipping container is designed to reduce the risk of shipping damage.

6.6.1 Preparation: Damage Indicators

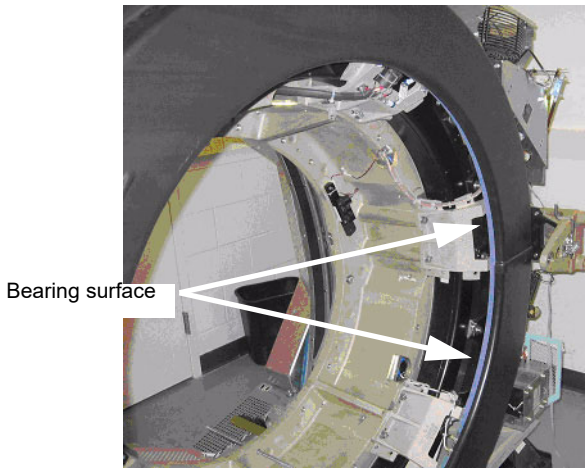
On the inside edge of the black-colored bearing assembly, a mark similar to that shown in Figure 2-40 will be seen, if this is a Rotek bearing.

Figure 2-40 Gantry Bearing - Rotek Label



The mark has a serial number in the same format as:
ROTEK 2TF4-44E1B-MA91960-8F-2372-REV13.
The gap to be inspected is shown in Figure 2-41 next to the serial number.

Figure 2-41 Gantry Bearing

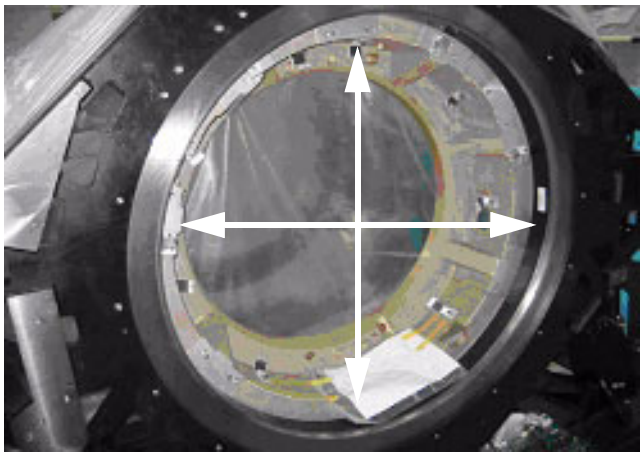


On most systems, a change in the bearing gap does not cause the gantry to make unusual sounds, unless the gap is severe. If the gantry is badly damaged and the gap is severe, it can cause operation issues. Some systems are shipped with shock indicators that must be returned to Milwaukee.
A severe failure may be seen during installation as a problem rotating the gantry.

6.6.2 Procedure

1.) Remove the scan window following the procedure in appendix A, Section 7.0, on page 262
2.) Remove the top and rear gantry covers, following the procedures in Appendix A, Section 3.0, on page 241 and Section 5.0, on page 256
3.) Use a 2.5mm hex wrench as a tool to measure the gap at the positions shown in Figure 2-42. The location of gantry components does not matter. Simply measure four (4) locations 90 degrees apart from each other.

Figure 2-42 Inspection Locations

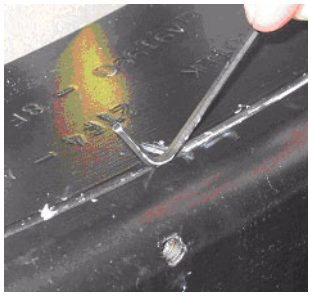


4.) If the 2.5mm hex wrench easily fits without effort in the gap, the gap is out of spec. Figure 2-43 shows a gap that is too large. Figure 2-44 shows a gap that is good. Notice that the hex wrench does not fit in the gap in Figure 2-44 but does in Figure 2-43.

Note: Do not use force when putting the wrench in the gap. Either it slips in or it doesn't.

Figure 2-43 Gap Too Large

Figure 2-44 Gap Is Good



5.) Replace the top and rear gantry covers, following the procedures in Appendix A, Section 3.0, on page 241 and Section 5.0, on page 256.

6.) Replace the scan window.

6.7 Finalization

6.7.1 Mechanical Installers

If the Bearing Gap Inspection passes, complete the signoff on the GE Form e4879, Installation Data verification form, that this inspection was completed.

If the Bearing Gap Inspection fails, contact your site FE.

6.7.2 FE Service Action Required

If the Bearing Gap Inspection fails, the mechanical installer notifies the site FE that the inspection failed.

The site FE should:

1.) Open a bearing inspection dispatch.

2.) Follow the inspection procedure described in this section.

3.) Record the bearing inspection results.

If no damage is found, close this dispatch and continue with the electrical calibration procedures.

If the system is damaged, go to the Equipment Delivery Quality web site and follow their instructions.

To enter a damaged in shipping claim, go to this web site:

6.7.3 FE Inspection Completion

1.) After the Gantry Bearing Inspection passes, complete the opened service dispatch with the following information:

- Gantry Serial Number
- Gantry Type
- System ID
- Site Name
- Installation date
- Was the Gantry transported to the site in the shipping crate? (Yes/No)
- Was the Gantry lifted or hoisted, were riggers used, or was the Gantry delivered via flatbed wrecker? (Yes/No)
- Number of locations that fail the gap inspection if any: _____

2.) Close the service dispatch.

Should any follow-up be required after this inspection, the site engineer will be contacted directly by CT Engineering.

Section 7.0
Position the Table

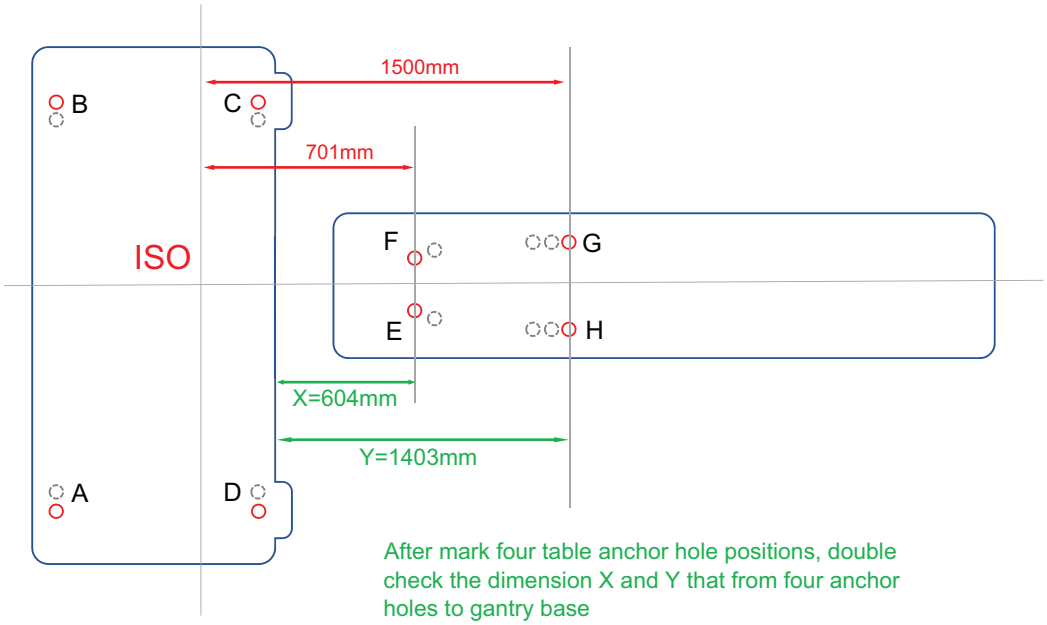
7.1 Tools and Test Equipment

- Standard Install Tool Kit
- Install Support Kit
- Installation Manual
- PPE (hand protection, foot protection, face shield, eye protection, personal dosimeter)

7.2 Table Prep and Setup

1.) Draw two lines through two front points (E and F) and two rear points (G and H), these two lines should be parallel to the gantry base.

Figure 2-45 Draw Reference Line



2.) Use the laser measure to confirm the distance is 604 mm (23.8") and 1403 mm (55.2") from the gantry base reference line as shown in the Figure 2-45.

CAUTION **Potential for Injury.**

Table will tip if not anchored on the dolly.

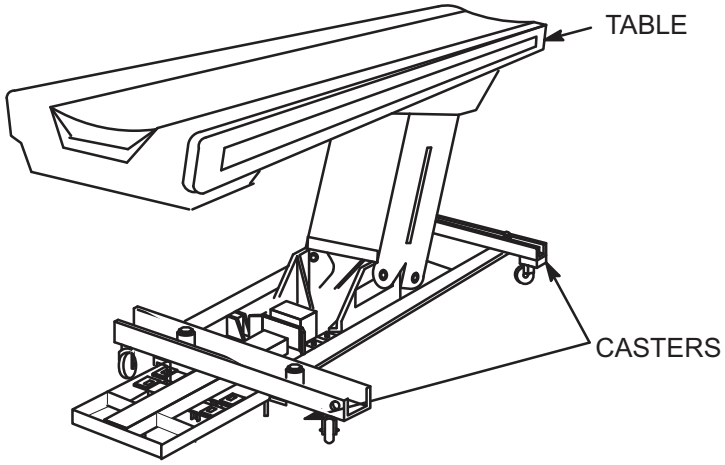
Make certain that Table is adequately secured to the dolly.

3.) Remove all the transportation packaging and boxes, except dollies, from the table.

4.) Wheel the table to its approximate position relative to the gantry, using the mark made earlier.

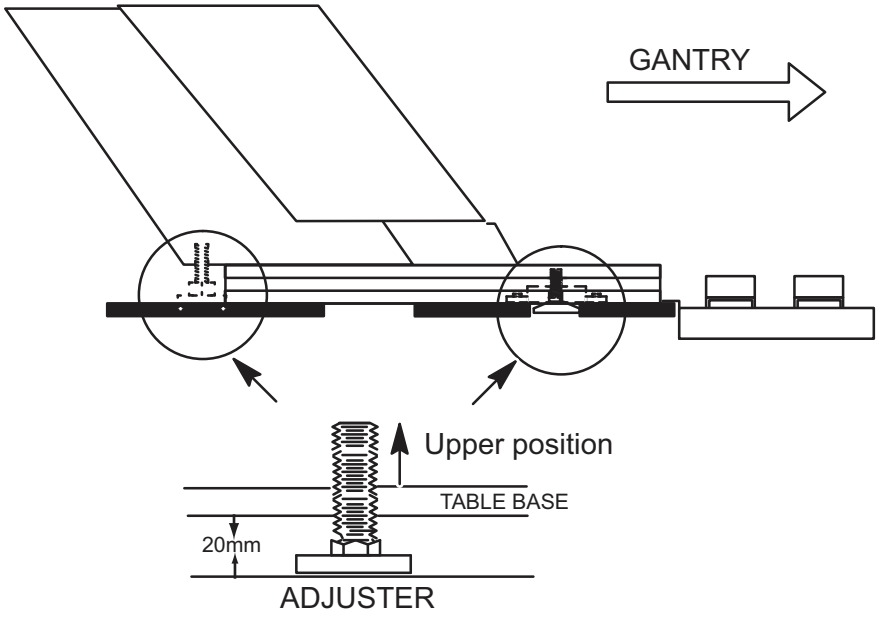
5.) Use the dollies to evenly lower the table until it rests on the floor using an 1/2" ratchet.

Figure 2-46 Moving the Table



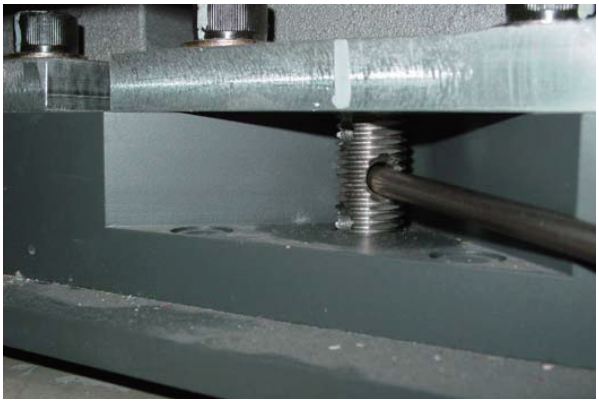
6.) Rotate the four level adjuster until the distance is approximately 20mm (4/5in.) between the bottom surface of the table base and the floor, see Figure 2-47.

Figure 2-47 Setting the Adjuster



Note: Adjust two rear leveling adjusters by inserting the screw driver into the adjuster hole located on the bolt, see Figure 2-48.

Figure 2-48 Rear Leveling Adjusters



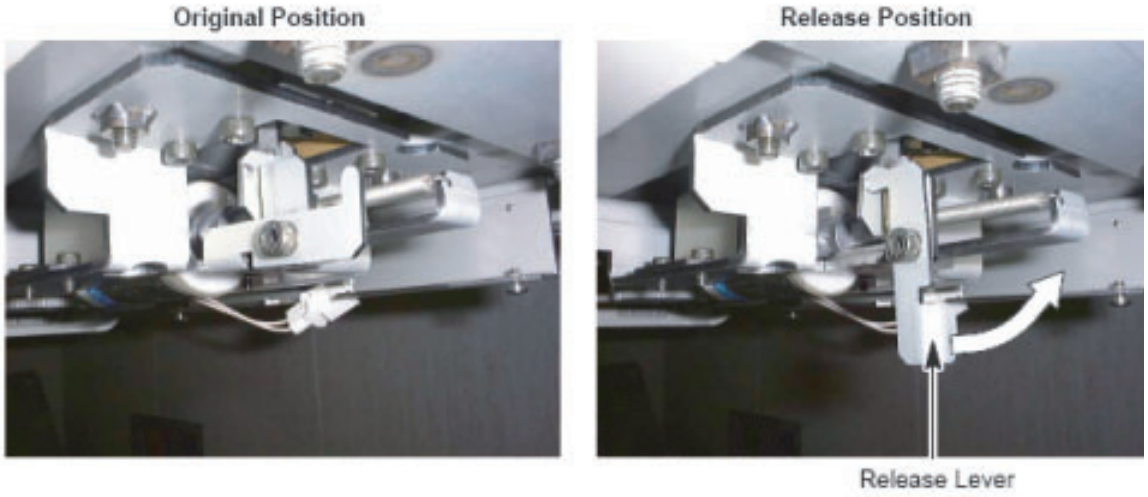
7.3 Cradle Center Procedure

1.) Remove a bottom cover under a cradle handle.

Figure 2-49 Remove Bottom Cover

2.) Release a latch by pushing a bracket to move the cradle by hands, see Figure 2-50.

Figure 2-50 Release the Cradle



3.) Center the cradle on the drive rollers assembly by pushing the cradle into the gantry to its maximum position and back to just before the latch position six times. The cradle should be centered.
You must push and pull a center of cradle hand. See Figure 2-51.

Figure 2-51 Push and Pull Cradle

7.4 Accessory Rail Strip Removal

1.) Remove the accessory mounting strip attached on each side of the cradle using a small flat blade screw driver. The nylon screws are inserted inside the accessory rail on the cradle.

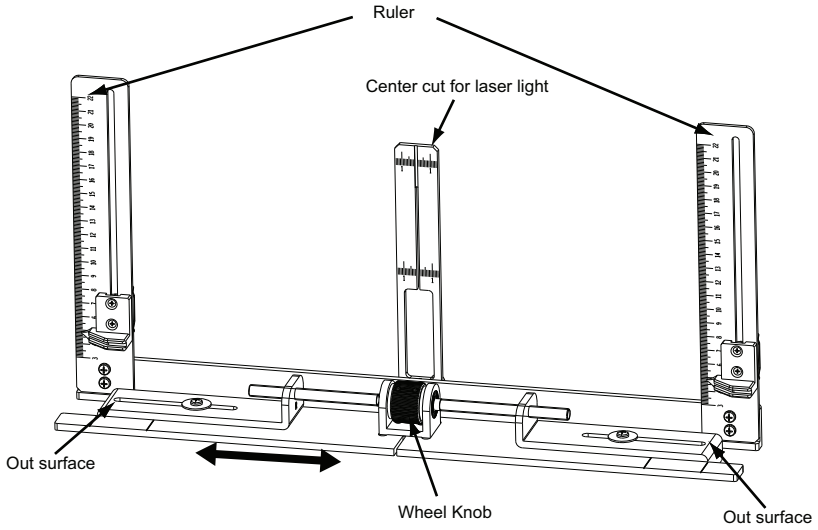
2.) Place the accessory strips on the floor and reinstall the nylon screws into the accessory rail for safe keeping.

Figure 2-52 Accessory Rail Screw

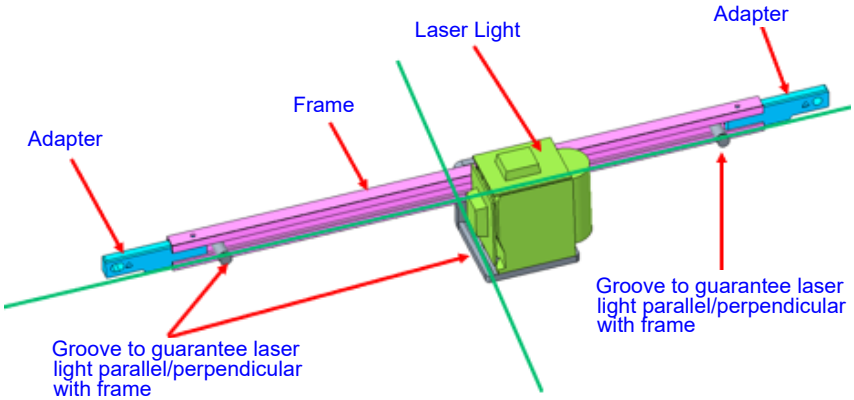
Section 8.0
Gantry-Table Alignment

8.1 System Installation/Alignment Tool (5824714 includes:)

- Table Alignment Tool Assembly (5820676)



- Gantry/Table Alignment Assembly
  - Gantry Side Frame (5819055)



  - Adapter - 80mm Length (5819063/5819066) with M12 bolts
    Adapter - 80mm Length (5820835/5820836) with M6 bolts
    Adapter - 130mm Length (5819068/5819070) with M12 bolts

Note: Please select the Adapter - 80mm length (5819063/5819066) with M12 bolts for gantry frame installation.

8.2 Gantry Alignment Tool Installation

NOTICE **Use caution while removing the gantry scan window.**

1.) Rotate the gantry by hand until the collimator face plate is at the 11 o'clock position.

Note: With power OFF, the gantry movement is tight.
DO NOT pin the gantry during this alignment process.

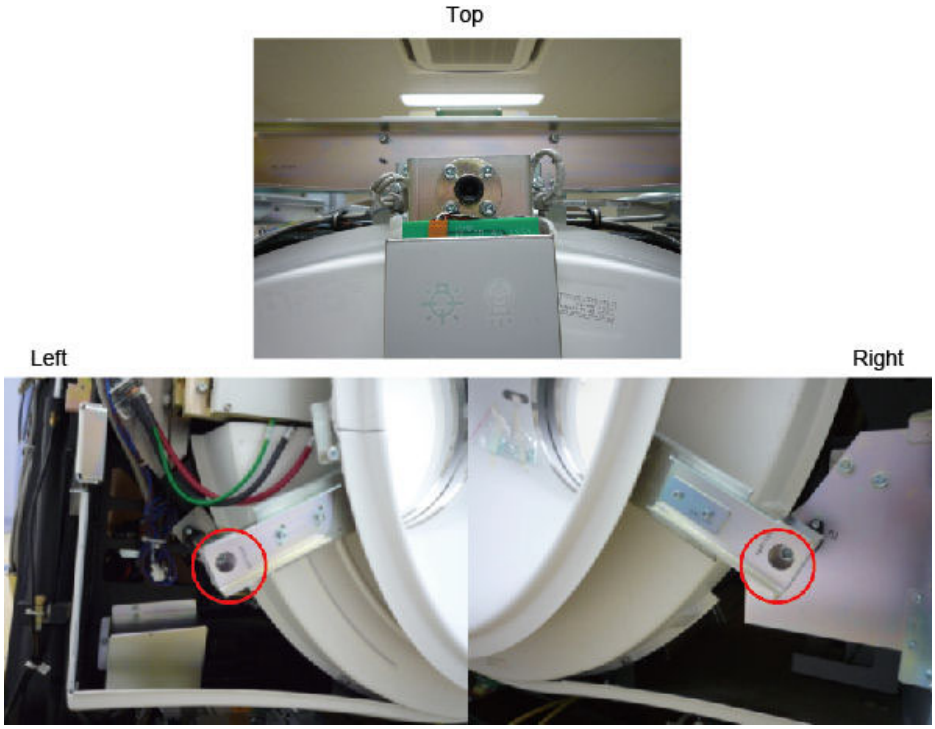
2.) Remove the Gantry top and front covers.

3.) Slide out the rear cover.

Figure 2-53 Slide Out Rear Cover

4.) Remove two (2) bottom bore cover screws and loosen the top bore cover screw.

Figure 2-54 Bore Cover Screws



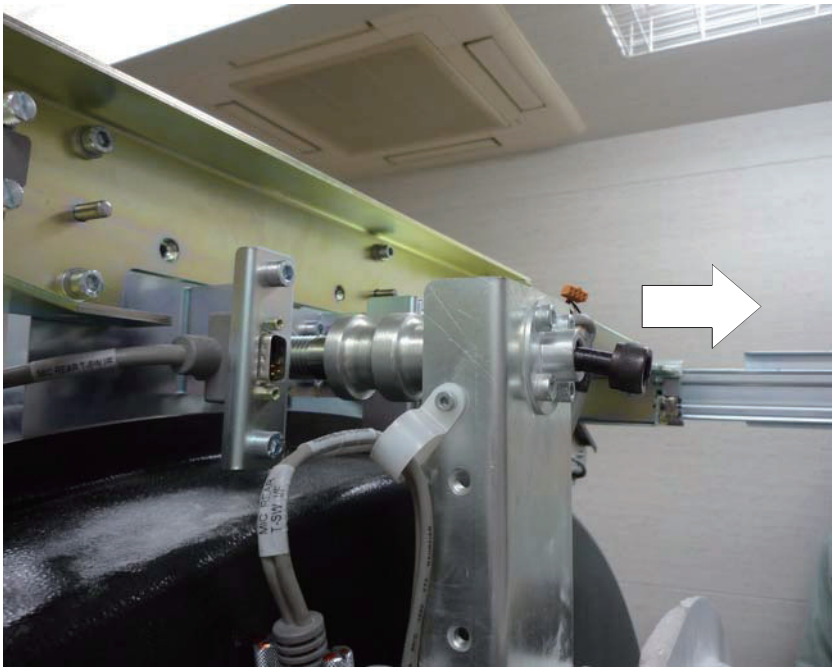
5.) Pull up safety pin small knob on the bore cover top bracket and rotate 1/4 turn to keep the safety pin disengaged.

Figure 2-55 Sliding Bore cover backward

6.) Pull out the bore cover about 5 cm (2 in.) from the top supporting bar so that the laser tool can be attached. At this position, the safety pin should be located to the second slot on the supporting bar.

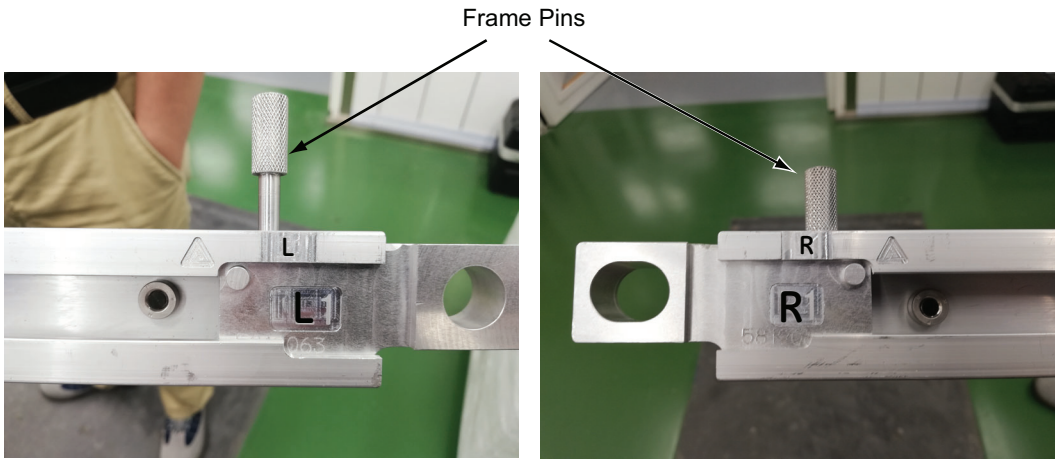
NOTICE **Smoothly pull out the bore cover to avoid it fully slide out from the top supporting bar.**

Figure 2-56 Pulling Bore cover backward



7.) Assemble two adapters (5819063/5819066) to both sides of the gantry alignment frame by using frame pins.

Figure 2-57 Assemble Gantry Alignment Bar

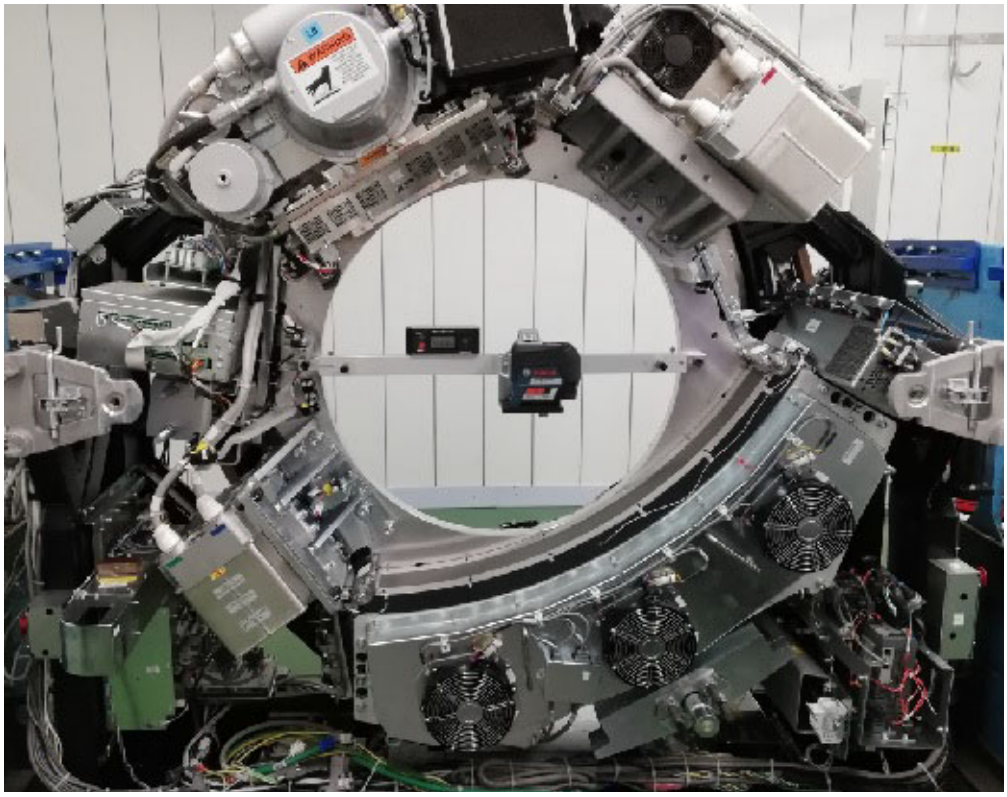


Note: please pay attention to signs (L and R) on adapters and both sides of the gantry alignment frame

8.) Mount the gantry alignment frame to the gantry frame by using two M12 mounting bolts.

NOTICE **Be careful not to bump the alignment light, the mounting space is tight near the alignment light. Tighten two bolts until both are snug.**

Figure 2-58 Mount the Alignment Frame to the Gantry (example)

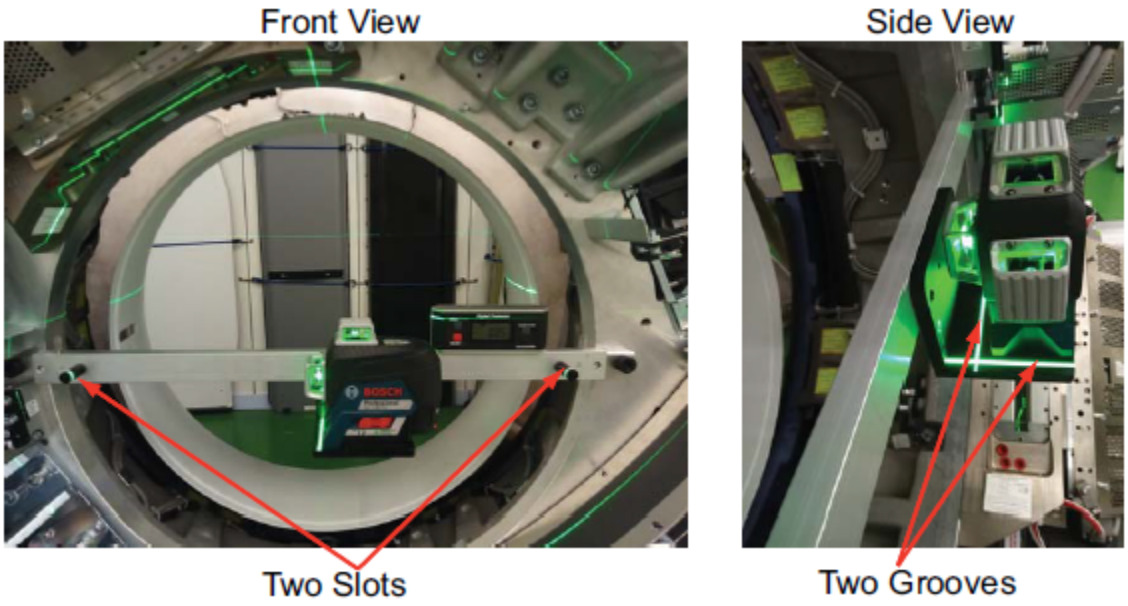


9.) Install the Line Laser on the gantry alignment frame using the Laser Line Light Screw, use the level gauge to level the alignment bar (**Level Specification:** ± **0.1**°) by rotating the gantry manually. (See Figure 2-58)

10.) Install the Line Laser on the gantry alignment frame by using the line laser screw, don't tighten it at this time.

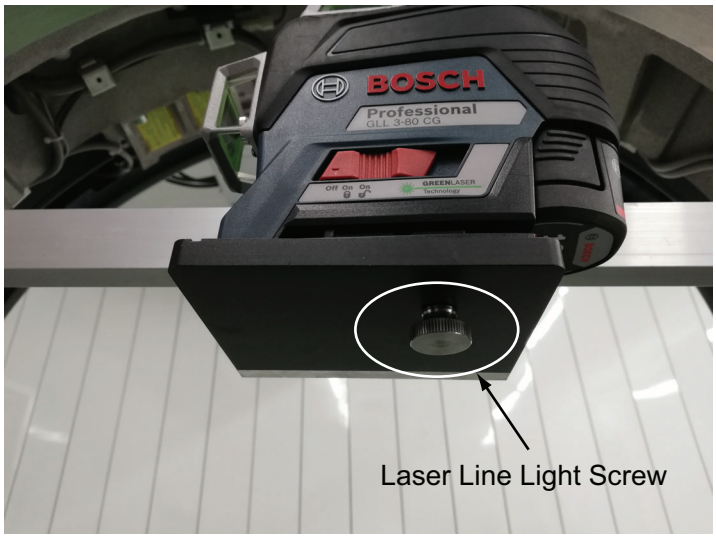
11.) Power on the Line Laser and align the laser lines with two slots and two grooves of the gantry alignment frame simultaneously.

Figure 2-59 Line Laser Alignment



12.) Tighten the Laser Line Light Screw to fix the Line Laser.

Figure 2-60 Fix the Line Laser



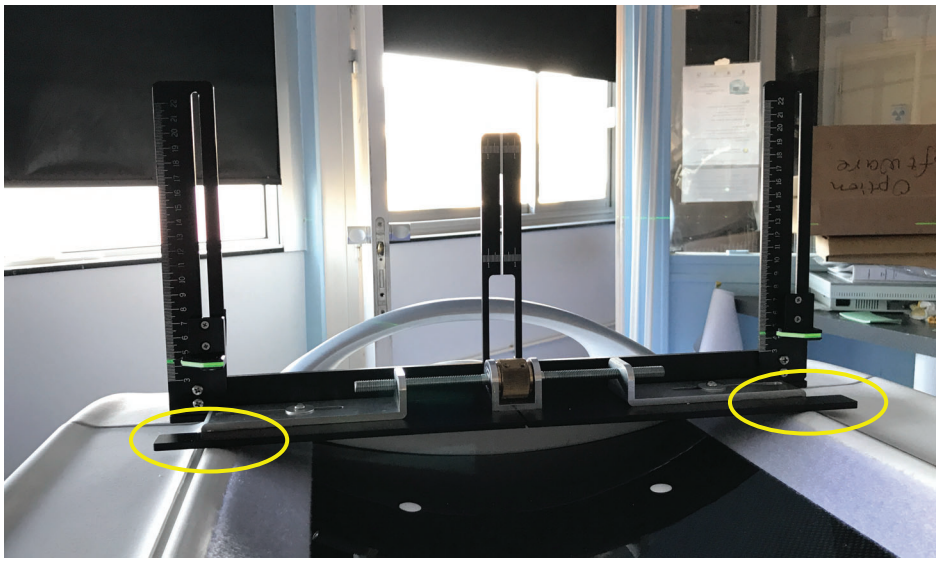
NOTICE **Laser lines MUST be aligned with the slots and grooves of the gantry alignment frame, because it will affect the accuracy of table alignment.**

8.3 Table Alignment Tool Installation

1.) Take out two table alignment tools and set them on the cradle front end and rear end, avoid the interference between the table top cover and the alignment tool.

Note: Make sure that two rail strips are removed from the cradle (see 7.4 Accessory Rail Strip Removal) and the table alignment tool base fits perfectly to the table cover.

Figure 2-61 Table Alignment Tool



Note: Please keep about 20-30cm distance from the cradle front end to the front table alignment tool.

Figure 2-62 25cm Distance from Cradle Front End

2.) Tighten the nut wheel (See Figure 2-63) to fix the table alignment tool on the cradle.

8.4 Level and Center the Table to the Gantry

NOTICE

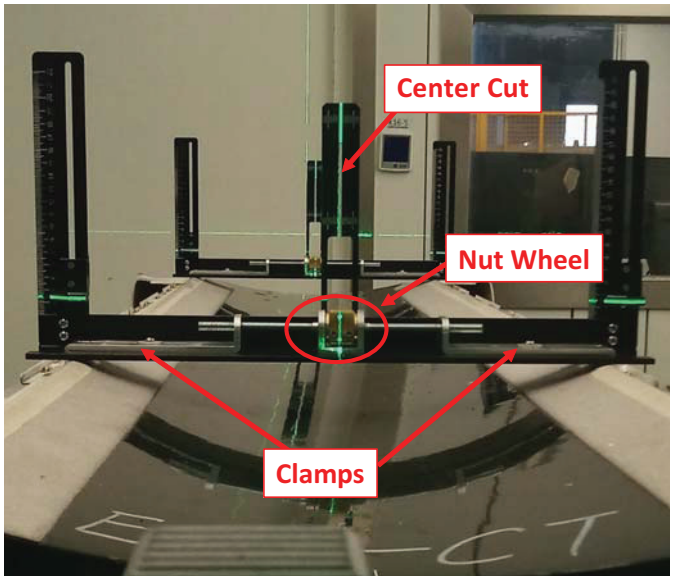
All Table adjusters should be preset to 20 mm (3/4 in.) down from the table base to make adjustment easier. Based on floor levelness and your experience, a different preset height may work better. One thread must be showing above all locking rings when leveled.

Table cannot be higher than 1005mm from the center of cradle to floor.

1.) Power on the Line Laser, use laser lines to align the table position.

a.) Adjust the table position in X-axis direction to mark the laser line cross both center cut of two table alignment tools

Figure 2-63 Table Alignment

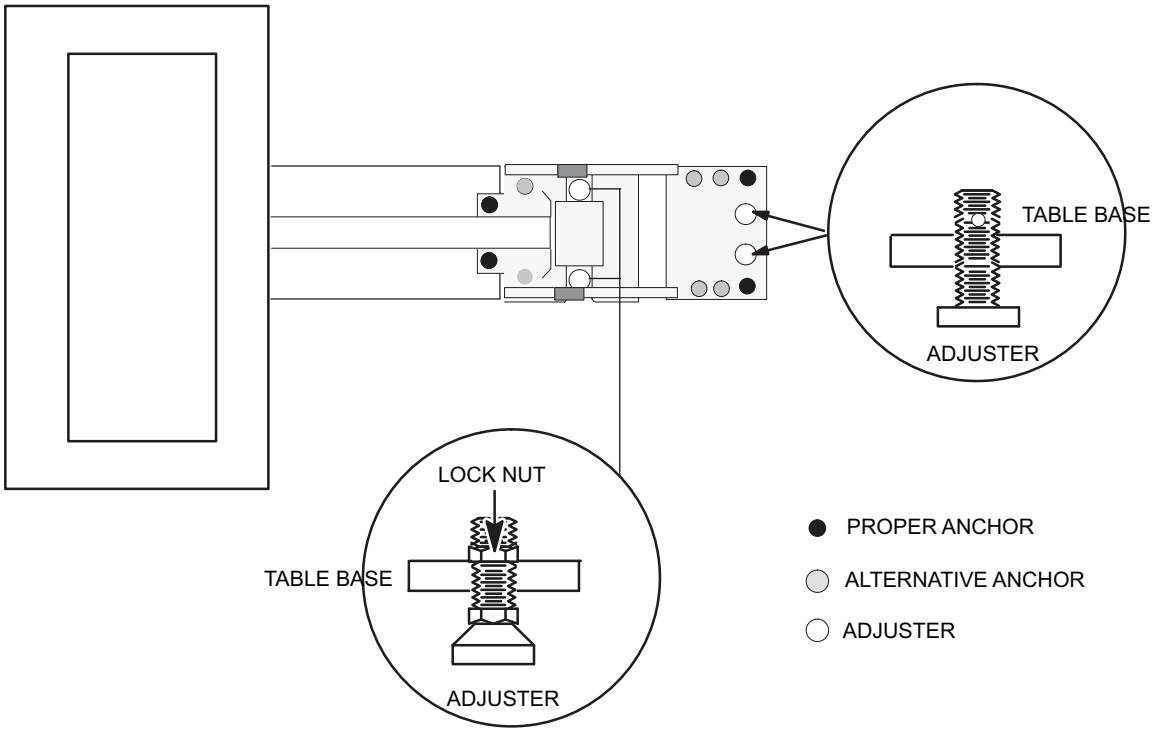


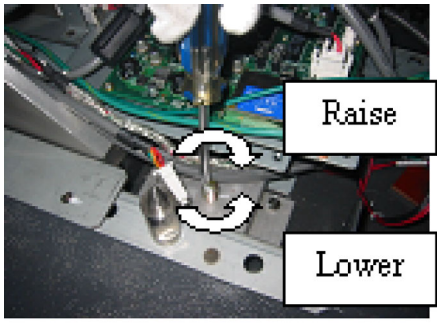
b.) Move four indicators of table alignment tools to 43mm ruler reading.

c.) Adjust the table height position using two front and two rear adjusters to align the laser line with the groove of four indicators (**Specification:** ± **1mm**).
The front sides of the adjuster contain the lock nut. After level adjustment, tighten the lock nuts securely.

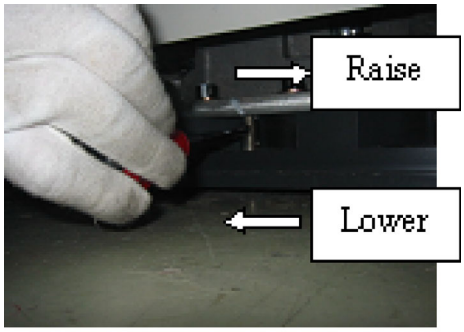
Level Specification: +/- 0.5 mm/1000 mm

Figure 2-64 Table Adjuster



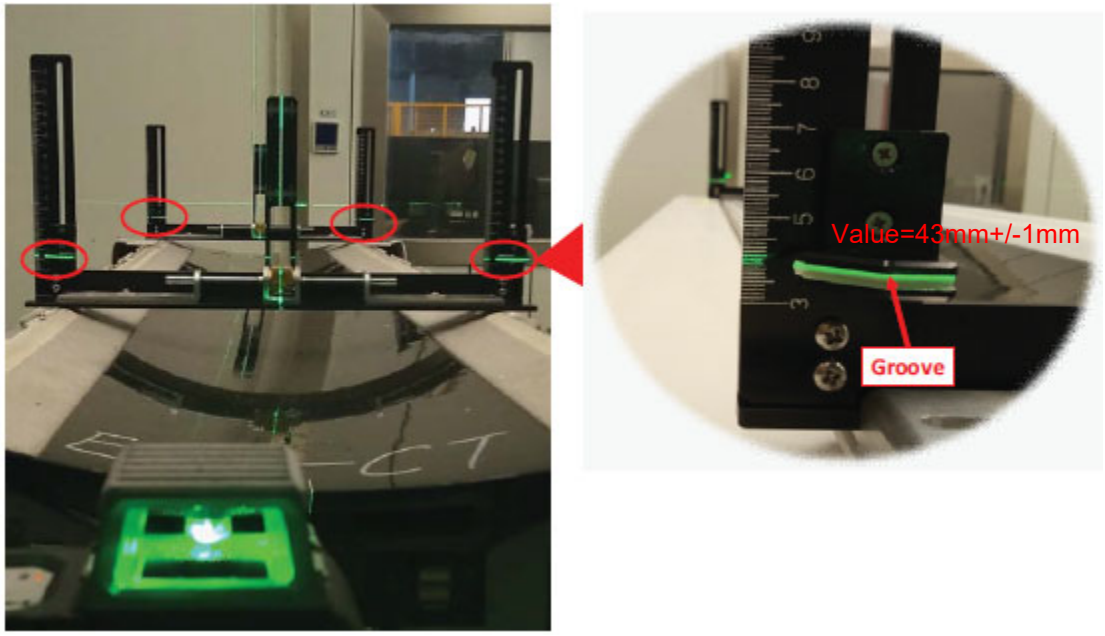


Front adjuster



Rear adjuster

Figure 2-65 Four Indicators



2.) Repeat Step 1.) until the center cuts and the groove of indicators are aligned with laser lines simultaneously.

3.) When completed, turn off the Line Laser.

Section 9.0
Gantry/Table Anchor Holes

WARNING **POTENTIAL FOR PATIENT INJURY.**

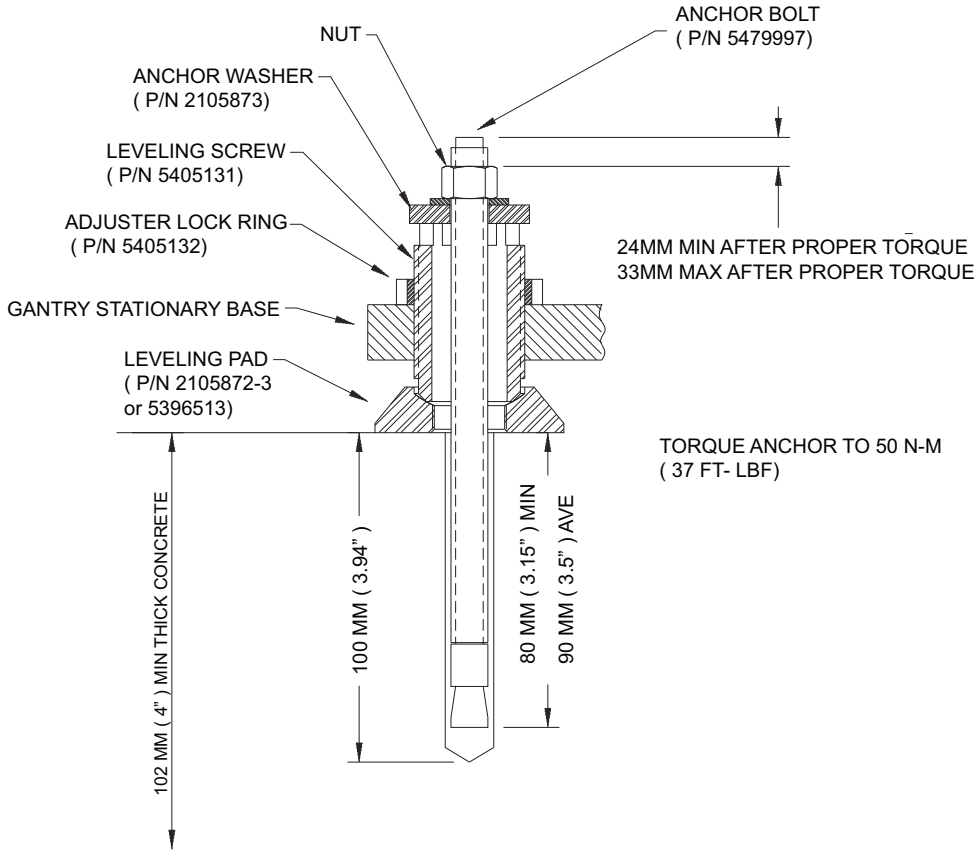
IMPROPERLY SECURED TABLE MAY TIP, DISLODGING PATIENT.

PROPER ANCHORING IS KEY TO MAINTAINING PATIENT SAFETY DURING SYSTEM OPERATION.

9.1 Gantry Anchors

1.) Prepare each anchor by installing the large flat washer and nut on to each anchor.

Figure 2-66 Gantry Anchor Assembly (P/N 5479997)

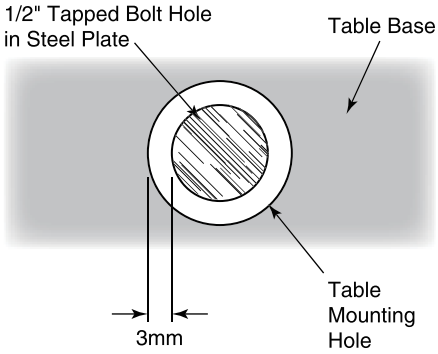


2.) Torque all anchor nuts until tight. **TORQUE: Approx. 50 N-m**

3.) Verify that the Table to Gantry Alignment should be correct.

NOTICE **The minimum Tensile load strength of the anchor must be 13000 N.**

Figure 2-67 Center tapped holes under mounting holes in table base

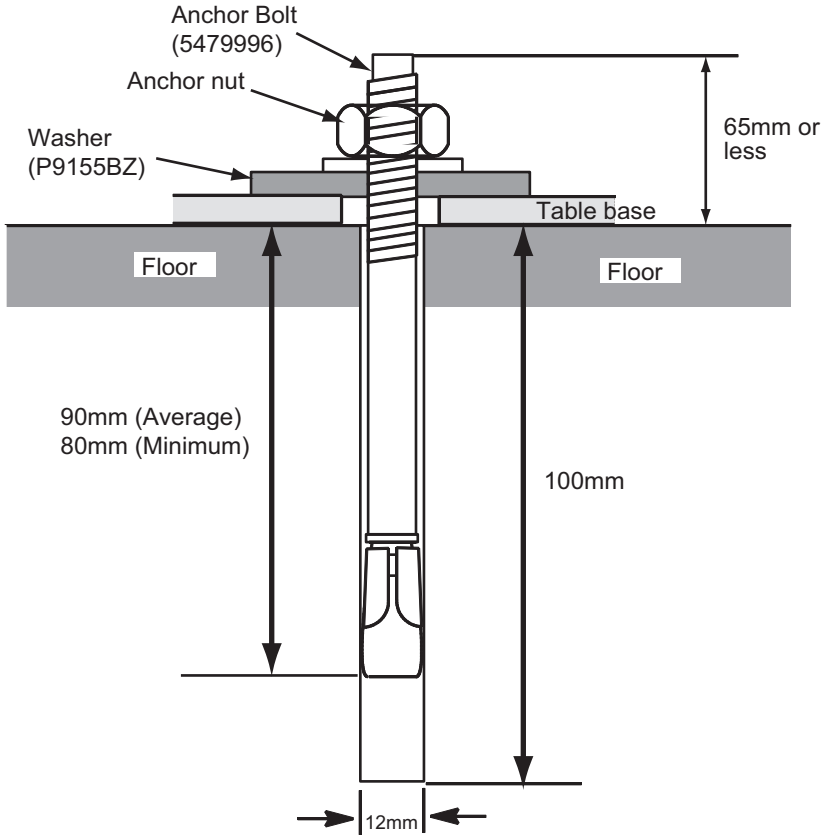


Bolt centering is important to provide ± 3mm of adjustment for electrical alignment. Always use the drilling centering tool when drilling all bolt holes.

9.2 Install the Table Anchors

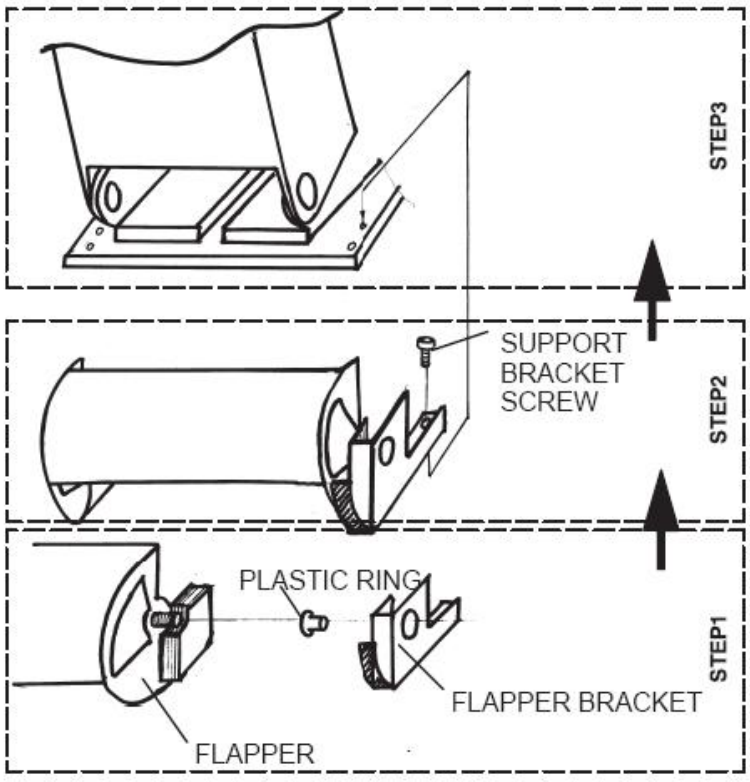
Recommended - Anchors P/N 5479996 12 mm (0.47 in.) dia by 145 mm (5.7 in.) long as shipped with the system shipping collector for this procedure.

Figure 2-68 Lite Table Anchor Assembly



1.) Verify that the table flapper is removed to make space for anchoring. If it is not, remove the table flapper by removing the four flapper assy mounting bolts.

Figure 2-69 Table Flapper



2.) Assemble the anchors before you install them. Refer to Figure 2-68.
   a.) Remove the nut and washer from the anchor.
   b.) Add a ¼" thick washer (PN P9155BZ) under the regular anchor washer.
   c.) Reassemble the anchor washer and nut and position nut so top is flush with threads of anchor.

3.) Insert an anchor into each anchor hole in the Table and set the anchors with a hammer. The washer should touch the leveling screw if the anchor is installed and set properly.

NOTICE **The anchors will bend if they are hit too hard with a hammer. Strike the anchor with sufficient force to drive it down into the hole so the washer touches the leveling screw.**

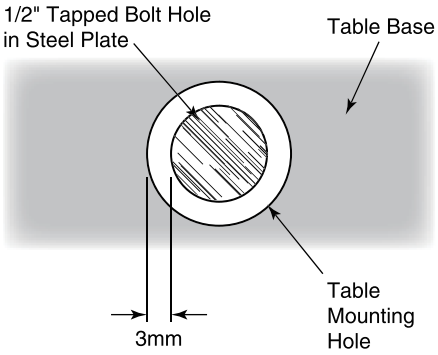
4.) Adjust all anchor nuts until tight.
TORQUE: Approx. 50 N-m

NOTICE **To over-tighten nuts will damage the frame of the Table and also bring an out-of-level Gantry.**

5.) Verify that the Table to Gantry Alignment should be correct.

NOTICE **The minimum Tensile load strength of the anchor must be 13000 N.**

Figure 2-70 Center tapped holes under mounting holes in table base



Bolt centering is important to provide ± 3mm of adjustment for electrical alignment. Always use the drilling centering tool when drilling all bolt holes.

9.3 Alignment Recheck

Note: Alignment is critical. Recheck carefully.

1.) Turn on the alignment tool and recheck alignments. The table alignment must be the same as in 8.4 Level and Center the Table to the Gantry, on page 149. If re-leveling is required, repeat this procedure.

2.) Once alignment has been verified, torque all mounting bolts.
Initially torque at 50 N-m (37 t.-lb.), then loosen until approximately 5 N-m (3.7 ft.-lb.)

3.) Remove the Gantry-Table Alignment tools.

4.) Reinstall all the removed table panels and hardware.

5.) Reinstall the gantry covers.

Note: If you cannot replace the lower table cover because the floor interferes, adjust all of the table and gantry levelers by half-turn increments to raise the table/gantry until the lower table covers clear the floor. Then return to the alignment sections to level the gantry, level the table, and tighten the locking rings, respectively.

9.4 Removing Table Shipping Dollies

9.4.1 Time and Personnel

(FE or mechanical supplier)

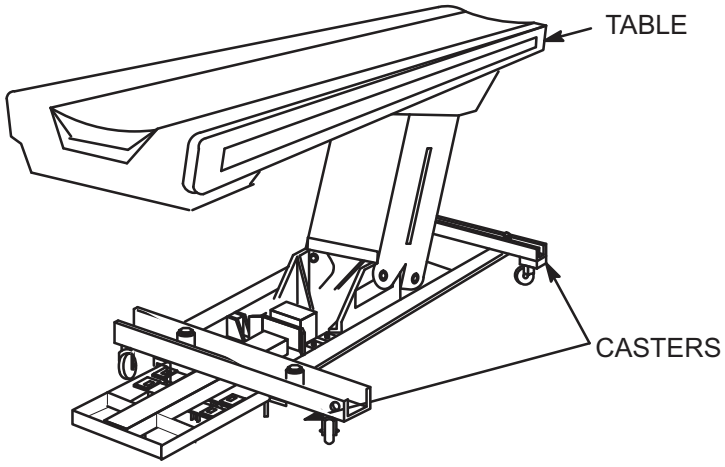
Required Persons	Preliminary Reqs	Procedure	Finalization
1 Electrician		20 min. labor on-site	

9.4.2 Preparation

- All table mechanical alignment procedures are completed.
- The table is on the floor with at least one anchor in place.

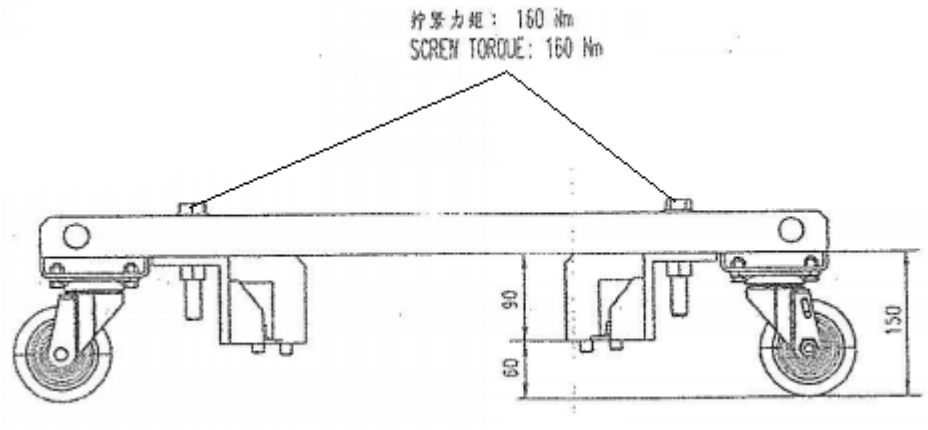
9.4.3 Procedure

Figure 2-71 Table Dolly



1.) Remove the front and rear caster frames by removing the caster support bolts.

Figure 2-72 Front/Rear Caster Frame



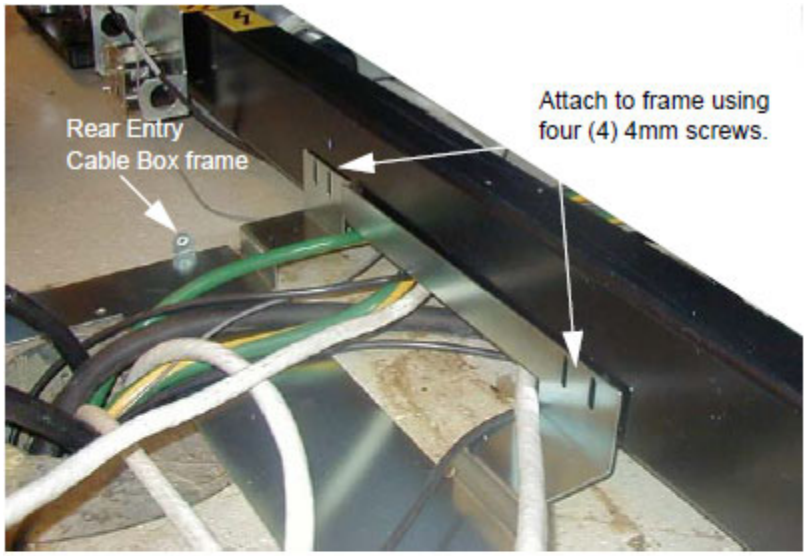
2.) Remove the left and right arms by removing four M12 bolts from the table frame.

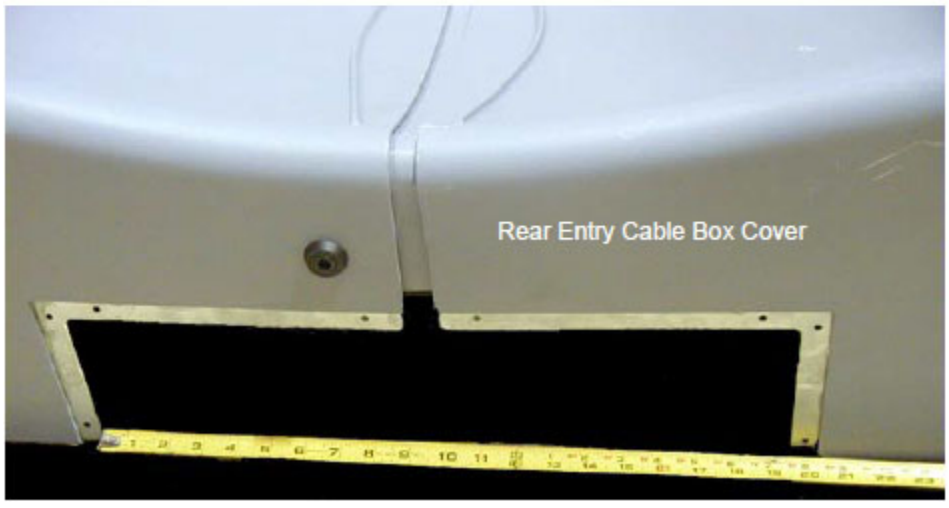
Section 10.0
Rear Entry Cable Box

A rear entry cable box (B78032CB & B7850TC) is used when the cables to the gantry cannot be brought up inside the gantry base. The box is not supplied with the system and must be ordered separately.

1.) Attach the rear entry cable box frame to the gantry base using four (4) screws that are shipped with the kit, see Figure 2-73. The assembly can be made to fit floor entrance conduit or surface floor duct.

Figure 2-73 Rear Entry Cable Box





2.) There are three pairs of spacers shipped with this cover. Select the pair that is most appropriate for this site, based on the hardware.

- Solid metal
- Precut L-shaped metal
- Solid plastic - Can be cut

Section 11.0
Install Table Footswitch Assembly

11.1 Tools and Test Equipment

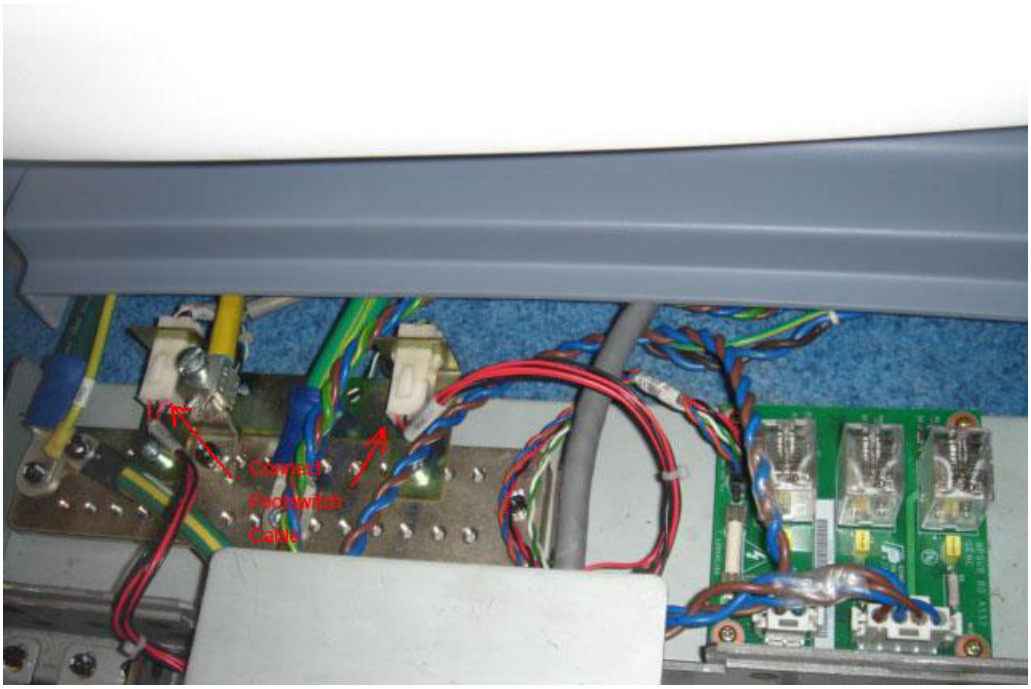
- Standard Install Tool Kit

11.2 Procedure

Install the table foot-switch assembly as shown in Figure 2-74 along with filler strip.

1.) Connect foot-switch cables.

Figure 2-74 Install Table Foot-Switch



2.) Install front bottom cove and footswitch pedals.

Figure 2-75 Install Front Bottom Cover

Figure 2-76 Install Footswitch Pedals

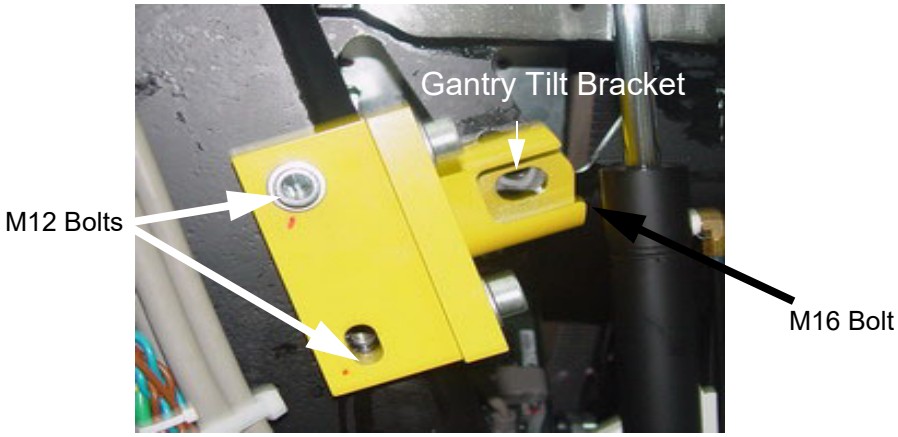
Section 12.0
Remove Gantry Tilt Bracket

12.1 Tools and Test Equipment

- 10 mm Hex wrench
- 14 mm Hex wrench

12.2 Procedure

Figure 2-77 Gantry Tilt Bracket Removal



1.) Refer to Figure 2-77. Remove the M12 bolts using a 10 mm Hex wrench.

2.) Loosen the M16 bolt 1-2 turns and check the Gantry tilt bracket, it should be loose to the touch. If loose continue with step 4.

CAUTION **Potential for personal injury.**

If tilt bracket is not loose, stop and put the M12 bolts back in and tighten tilt bracket back in place. If there is a load on the tilt bracket, removal may cause the gantry to suddenly tilt all the way back due to a possible lack of hydraulic pressure.

3.) Check the hydraulic connections for leaks or lack of fluid. You will have to wait until the system can be energized to use the tilt controls to relieve the load on the tilt bracket prior to removal. Do not use force to remove the bracket.

4.) If the bracket feels loose, remove the M16 bolt using a 16 mm Hex wrench.

5.) Remove the bracket.

6.) Close the gantry covers and reinstall the scan window.

7.) Store brackets in the gantry base.

Section 13.0
Position the Power Distribution Unit

WARNING

LOCKOUT/TAGOUT IS REQUIRED BEFORE PERFORMING THIS TASK.
USE THE SUPPLIED LOTO KIT.
ALL INSTALLATION WORK WITHIN THIS SECTION ON THE POWER DISTRIBUTION UNIT SHOULD BE COMPLETED BY A LICENSED ELECTRICIAN ONLY.

NOTICE

Connecting the primary incoming power is performed by the customer's electrical contractor. The electrician needs to provide a reducing bushing to attach the flexible conduit to the PDU.

1.) Remove all the transportation packaging, delivery the PDU to the scan room or the control room and close to the PDB.

2.) Roll the PDU into position on its permanently mounted casters. Leave at least 15.5 cm (6") between the PDU and back wall to allow cooling air to circulate.

WARNING

WORK WITH THE ELECTRICAL CONTRACTOR TO BE SURE EXTERNAL POWER SOURCE IS TURNED OFF.

Connection or Wall Box	AWG #	Connection From	Connection To PDU	Installed & Checked
TS1	Note 1	PDB-A	TS1-1	
	Note 1	PDB-B	TS1-2	
	Note 1	PDB-C	TS1-3	
	#1/0	GND	N/G **(Do NOT connect anything to neutral point.)**	

Note 1: Refer to Pre-Installation manual.

Table 2-4 PDU TS1 Connections

3.) Run the main input power conductors and ground though flexible metal conduit (attached between the PDU chassis and room duct-work) so you can move the PDU away from the wall during service.

Figure 2-78 Flexible Conduit for PDU Power

4.) Locate the hole cover plate in Box 1 and attach the flexible metal conduit to the PDU.

5.) If present, remove the TS1 panel front cover.

6.) Strip the wires to fit securely on the power block.

7.) Observe incoming phases (L1, L2 and L3) and insert bare leads into each location on TS1. Torque to specification, see Figure 2-79.

Figure 2-79 TS1 Power Torque Values

TS1 (Model-ABB)	Bolt/Hex
	6.82 ft-lb (9.25 N-m)

8.) Insert vault ground in to PDU vault ground lug. Torque to specification, see Figure 2-80.

Figure 2-80 Ground Torque Values

Main Ground	Bolt/Hex
	22.87 ft-lb (31.0 N-m)

9.) Observe cable mark and insert bare leads into each location on TS6. Torque to specification, see Figure 2-81.

Figure 2-81 Warning Light and Door SW Connections

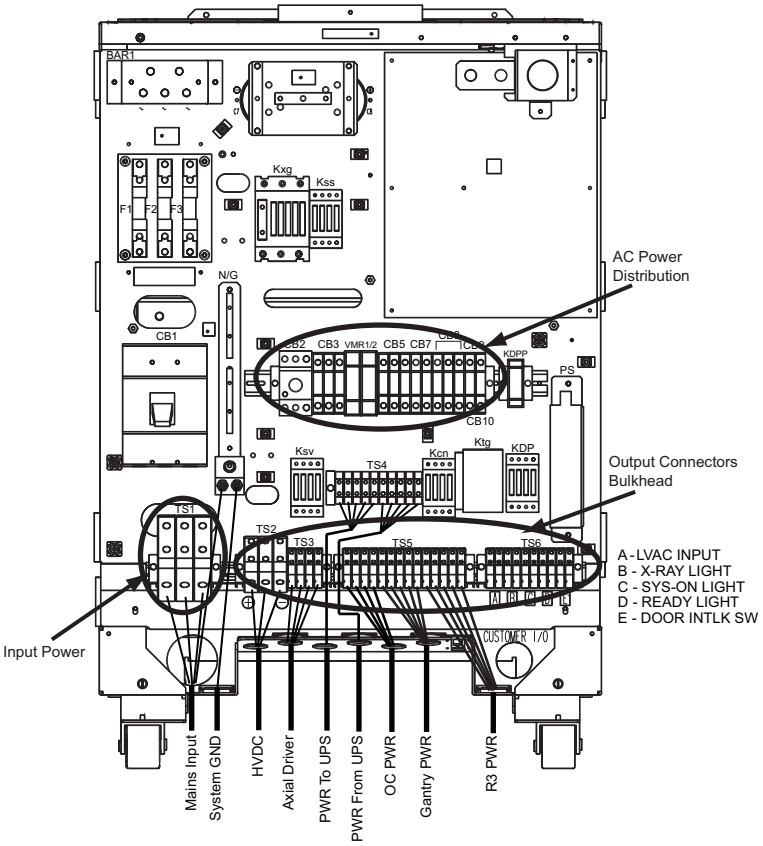
TS6 (Model-ABB)	Bolt/Hex
	1.0ft-lb (1.4N-m)

Connection or Wall Box	AWG #	Connection From	Connection To PDU	Installed & Checked
WL (Warning light)	#14	LV Source -1	TS6 1	
	#14	LV Source -2	TS6 2	
	#14	X-Ray ON Light -1	TS6 3	
	#14	X-Ray ON Light -2	TS6 4	
	#14	Sys-ON Light -1	TS6 5	
	#14	Sys-ON Light -2	TS6 6	
	#14	Ready Light -1	TS6 7	
	#14	Ready Light -2	TS6 8	
DS (Scan Room Door Switch)	#14	Door SW-1	TS6 9	
	#14	Door SW-2	TS6 10	

Table 2-5 PDU TS6 Connections

10.) Tighten all fasteners securely.

Figure 2-82 PDU Area Locations



TERMINAL NO.	MODEL-ABB		
	P/N	MODEL	TORQUE
TS1	5795116	ZS95	6.8ft-lb (9.25N-m)
TS2	5807667; 5807668	ZS70; ZS70-P	4.8ft-lb (6.5N-m)
	5795117; 5795118	M35/16; M35/16.P	2.2ft-lb (3N-m)
TS3/4/5	5795119; 5795120	M16/12; M16/12.P	1.0ft-lb (1.4N-m)
TS6	5795121	M10/10	1.0ft-lb (1.4N-m)

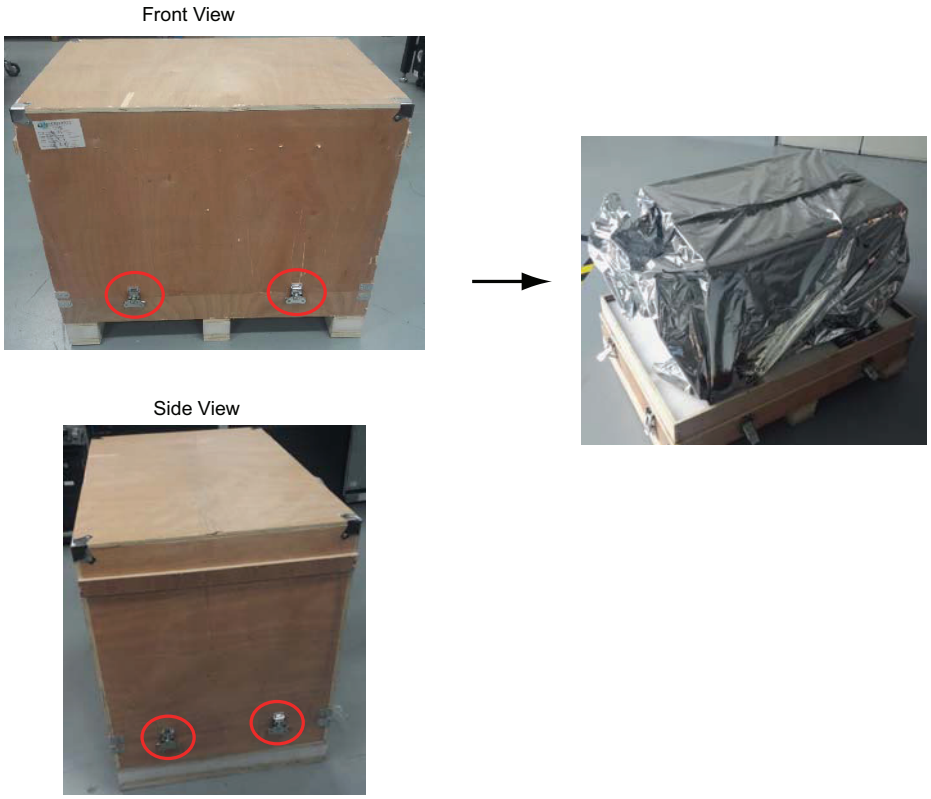
Table 2-6 PDU Terminal Torque Values

Section 14.0
Install Operator Console

14.1 Unpack Console

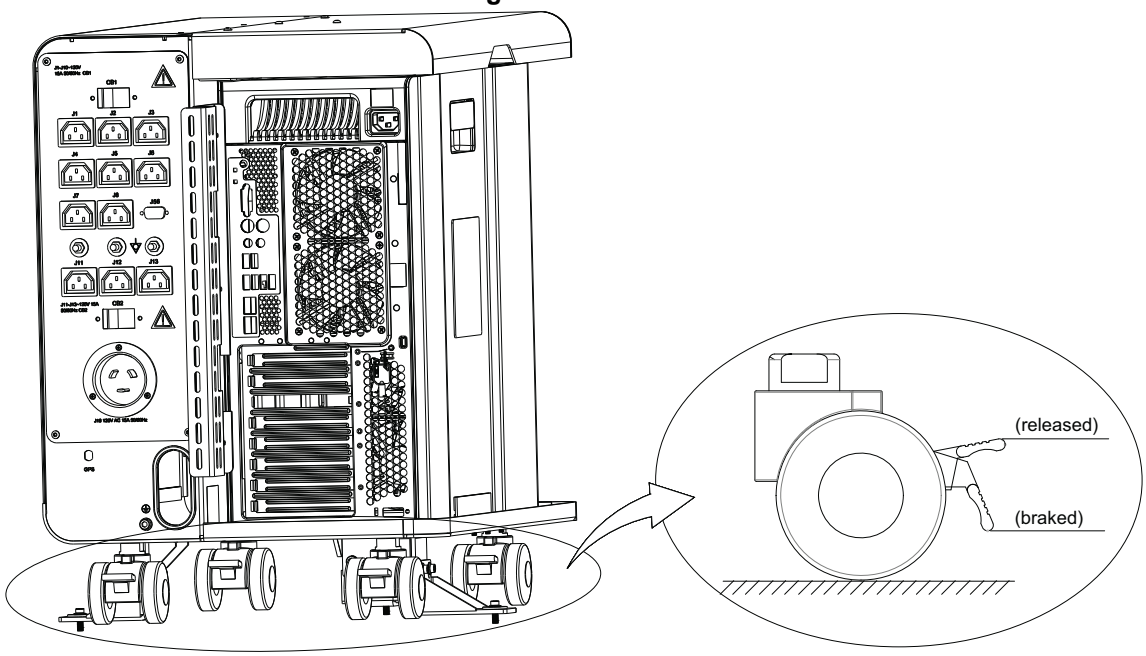
1.) Release eight latches and remove the packaging covers.

Figure 2-83 OpenOC Packaging Removal



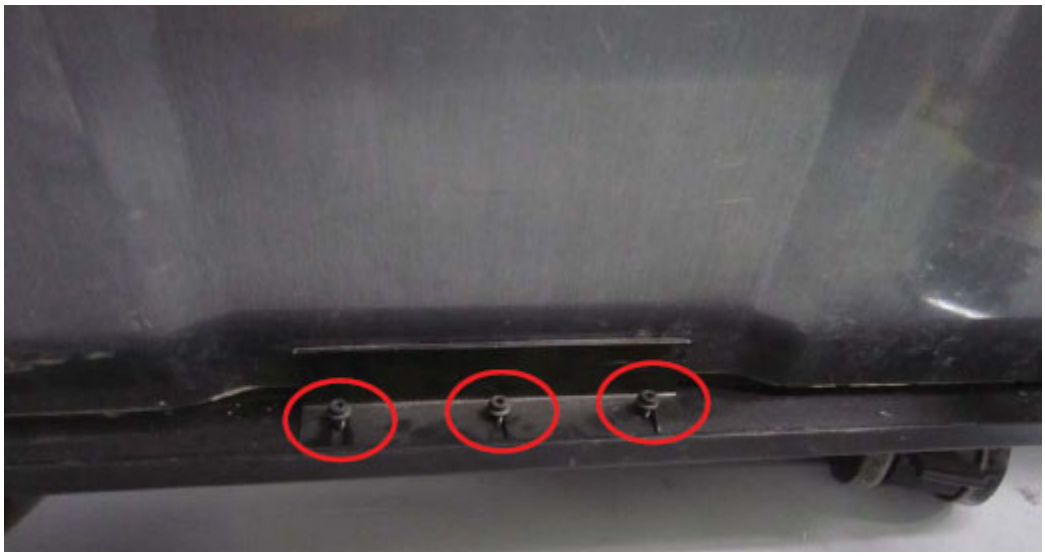
2.) Remove all packaging and discard per local requirement.
3.) Move console to installation location.
4.) Adjust console position, and then pedal four brakes to prevent console from sliding.

Figure 2-84 Brake



5.) Remove the side access panel by unscrewing its three screws from left side of the host computer.

Figure 2-85 Side Access Panel



14.2 Install GPU Card (If applicable)

Install the GPU card in the Host Computer if the site has the option. Refer to Service Methods -> Installation -> Option -> GPU Fluoro Prerequisite Installation Manual.

14.3 Install Aurora SWS Table (5449758-2)

1.) Assembly SWS table, then place it in the control room.
Refer to Appendix B Operating Table Installation and Adjustment for details of SWS Table assembly.

2.) Install LCD Monitor.

14.4 Peripherals Placement

1.) Place keyboard, GSCB.

2.) Locate and unpack the Media tower (option).

Section 15.0
Seismic Mounting

Before proceeding with seismic mounting for any of the components in this section, be sure to allow sufficient space to unbolt and move the component from its mounted location for service.

- You may need to remove all four mounting bolts.
- If removing the component requires lifting, use an appropriate-sized pry bar to lift each corner of the component.
- Two installers may be required to safely complete this task.
- 5/8 in. anchor for IBC 2007 standards or as provided in the seismic kit.

15.1 Time and Personnel

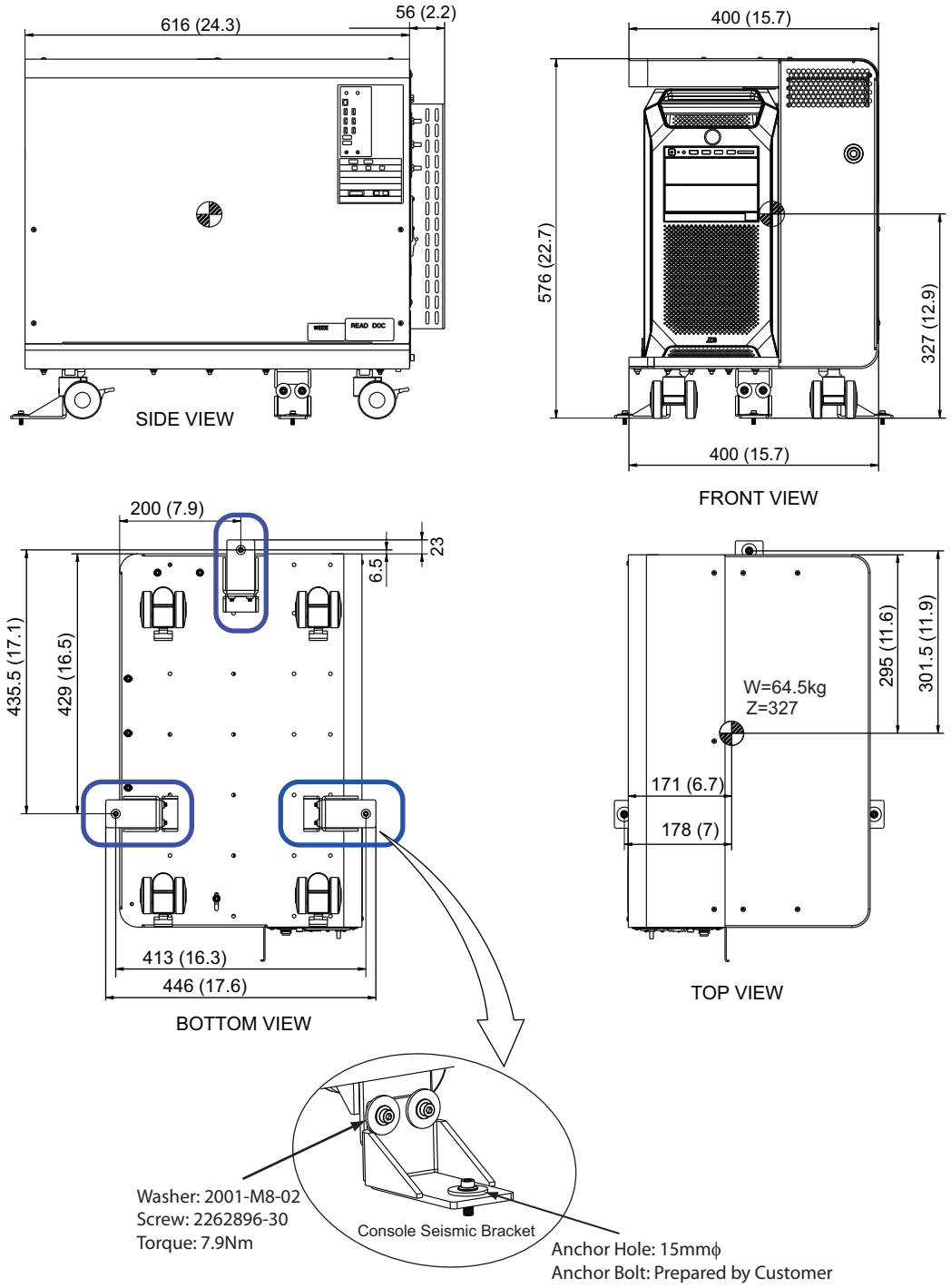
REQUIRED PERSONS	PRELIMINARY REQS	PROCEDURE	FINALIZATION
1 (FE or mechanical supplier)		Labor on-site	

15.2 Procedure

15.2.1 Console

If site specifications require seismic mounting, the customer may require different anchoring methods based on local requirements. Anchor type, size and torque shall be defined by the customer. Refer to Figure 2-86 for holes placement. The console seismic brackets (5357148-3), M6 screws (2262896-30) and M8 washers (2001-M8-02) are included in Console Seismic Kit (5812703-2) that is shipped with Console.

Figure 2-86 Seismic Console Mounting Hole Locations for OpenOC with Z8G4



15.2.2 Power Distribution Unit

If site specifications require seismic mounting, use the PDU seismic brackets (2354563-2) and the PDU shipping kit (5453382-2) that were shipped with PDU. Refer to Figure 2-88 for mounting hole locations, and mount PDU so it can be easily removed for service.

It is the customer's responsibility to provide an appropriate anchor/fastener from the bracket to the floor.

CAUTION **The PDU is very heavy and may present a crush hazard if proper precaution and tools are not used.**

Figure 2-87 PDU Seismic Brackets and Shipping Kit

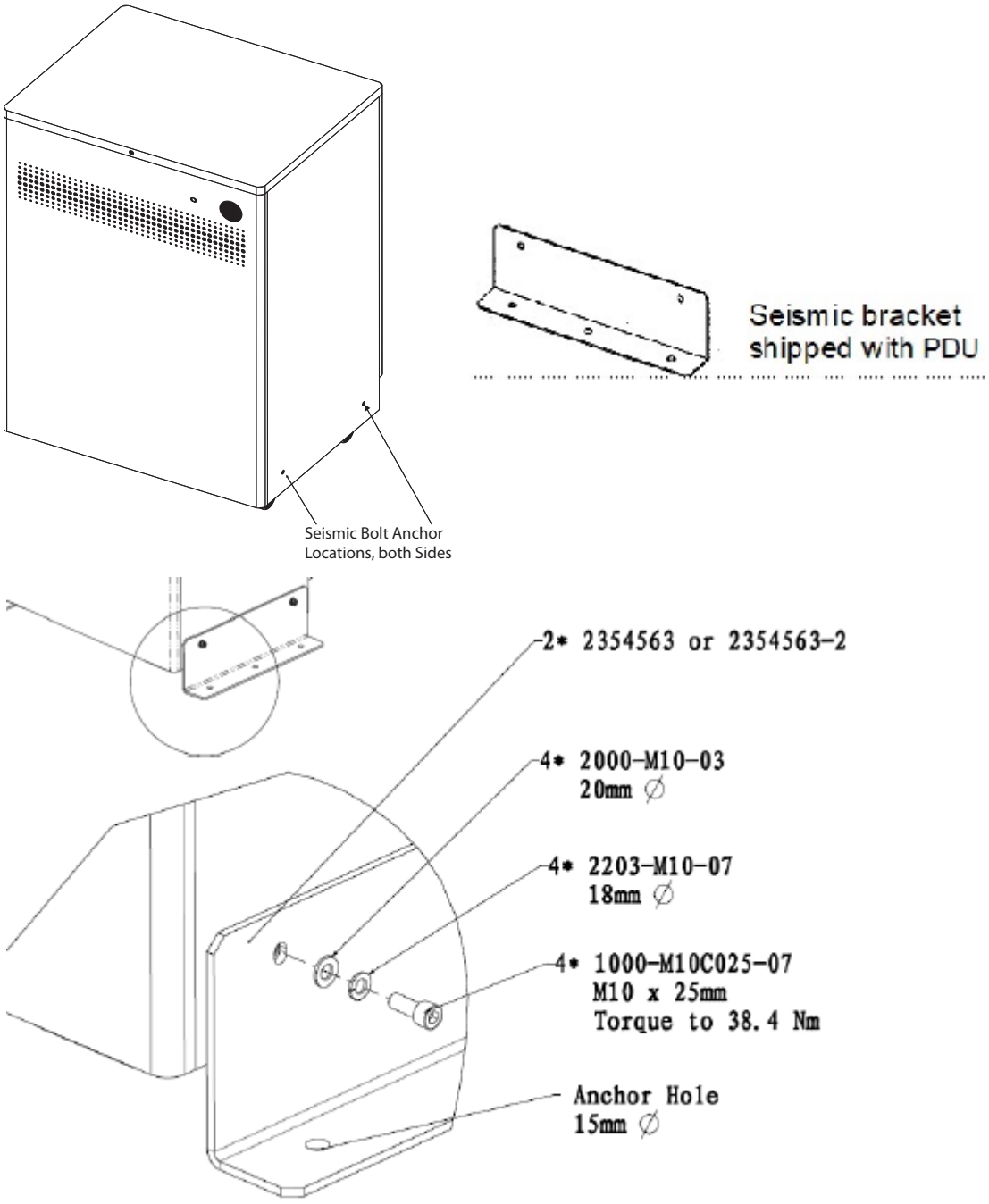
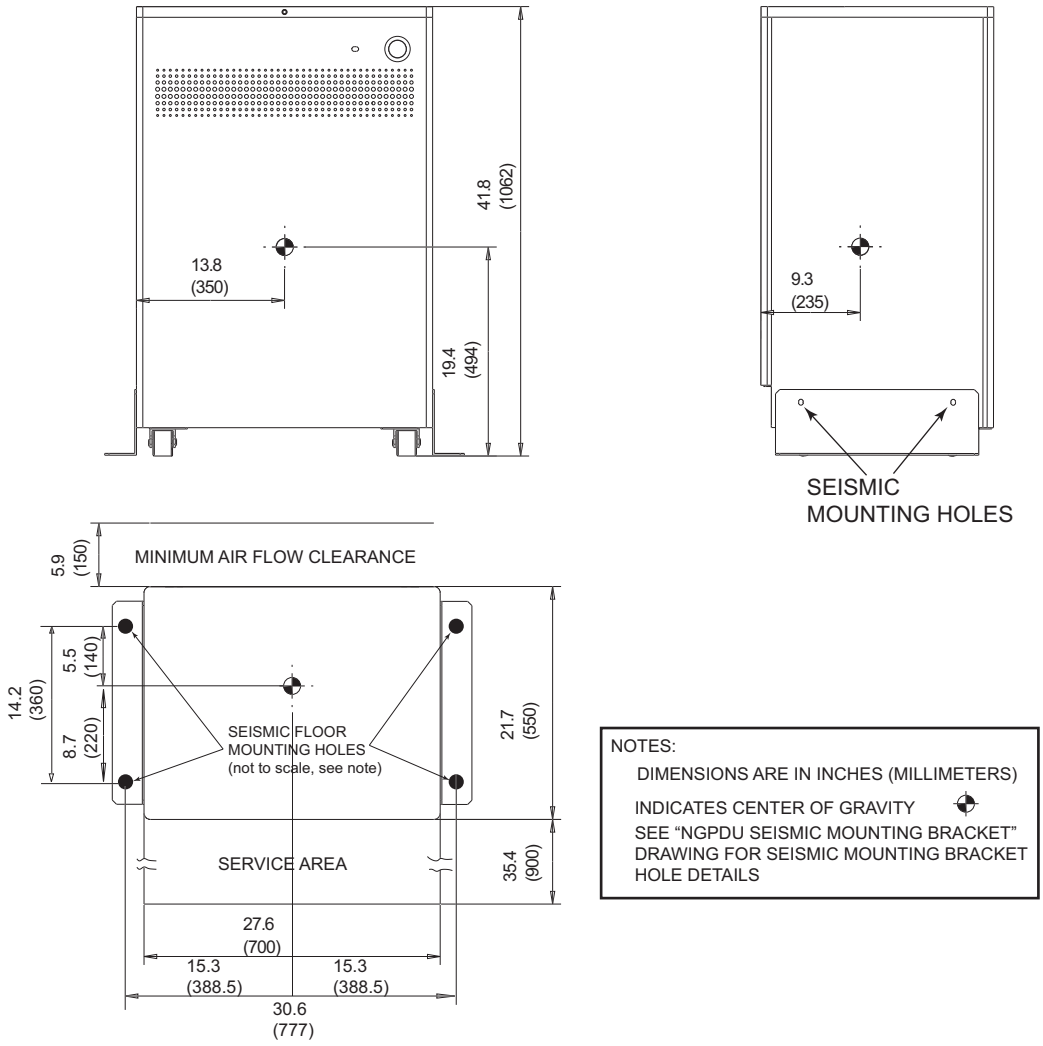


Figure 2-88 Seismic PDU Mounting Hole Locations



Page Left Intentionally Blank

Chapter 3
Power, Ground & Interconnect Cables

NOTICE **Potential for Data Loss and/or Equipment Damage**

To prevent potential data loss and equipment damage, please do the following:

- **When instructed, record data collected from the procedures in this chapter on GE Form e4879. For more information about this form, see Section 8.0 of Chapter 5.**
- **Only use the Installation manual that arrives with your system for installation. Any other revisions of this manual may not exactly match your system.**

Note: Use dry cleaning for electro components

Section 1.0 Introduction

Site use of conduit, floor duct, wall duct, or a raised computer floor, as well as the individual component layout determines the system cable sequence. If your site has floor or wall ducts that will interfere with placement of the table/gantry, it may be important to have the movers unload the cable boxes (8 & 9) first and run those cables while others unload the subsystems.

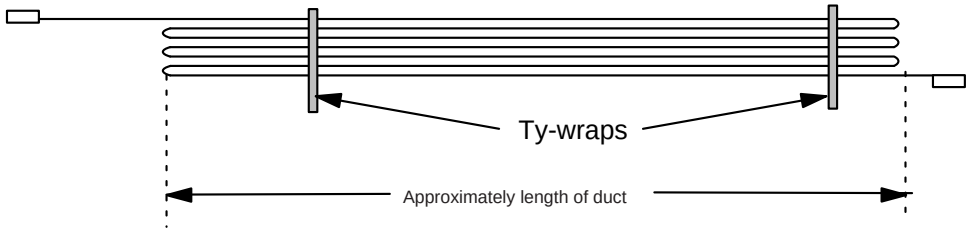
- Try to run the system cables after the contractor completes the contractor supplied wiring.
- All ground wires and other contractor wiring should be complete to the point of equipment placement.

NOTICE **Potential for Equipment Damage**

Do not store excess cable in the bottom of the PDU or Gantry.

When possible, store excess cable length in a serpentine configuration, approximately one meter long. **(Do NOT coil excess cable.)**

Figure 3-1 Excess Cable Storage Configuration



- Keep signal and control cables away from power cables and power wiring. When you lay cables in a raceway, locate the signal cables in a separate section of the raceway, or a separate conduit.
- Check all connections for tightness.
  - Use suitable tools and judgment.
  - Check all visible connections, especially ground connections.
- Check for reasonable cable routing.
  - Take into consideration necessary take-up distances for equipment maintenance, etc.
  - Try to complete as neat a job as possible.

1.1 System Component Identification

Identify all system cables by the system component designators listed in Table 3-1 on page 174. Each end of a system cable has a label.

DESIGNATOR	SYSTEM COMPONENT
CT2	Gantry
CT1	Patient Table
PDU	Power Distribution Unit
OC1	Operator Console (Console Computer)
WL	X-Ray ON Warning Light
A1	Primary Power Disconnect
SEO	System Emergency OFF
DS	Door Interlock Switch
BBNC	Broad-Band Network Connection

Table 3-1 System Component Identifiers

1.2 Cable Identifiers

The ends of the cables may be marked with a piece of blue, yellow, red, or orange colored tape to help with the cable installation. Table 3-2 lists the subcomponent, and corresponding color.

SUBCOMPONENT	COLOR
Gantry	Blue
Table	Yellow
PDU	Red
Console Computer	Orange

Table 3-2 Cable Color Identifiers

RUN NO.	DESCRIPTION	PART NUMBER	
		SHORT CABLES (KIT 5443710)	LONG CABLES (KIT 5438124)
1	Facility MDP to Room Disconnect (A1)	cust. supplied	cust. supplied
2	Room Disconnect (A1) to PDU	cust. supplied	cust. supplied
3	Room Disconnect (A1) to System E-Off	cust. supplied	cust. supplied
4	PDU to Room Warning Light(s)	cust. supplied	cust. supplied
5	PDU to Scan Room Door Switch	cust. supplied	cust. supplied
50	HVDC Power Cable - PDU to Gantry	2343529-2	2343529
51	HVAC Axial Drive Power - PDU to Gantry	2343530-2	2343530
52	HVAC 120V Power - PDU to Gantry	2343528-4	2343528-3
53	LVAC Power Cable - PDU to Console	2343531-2	2343531
54	LVAC Power Cable - Gantry to Table	n/a	n/a

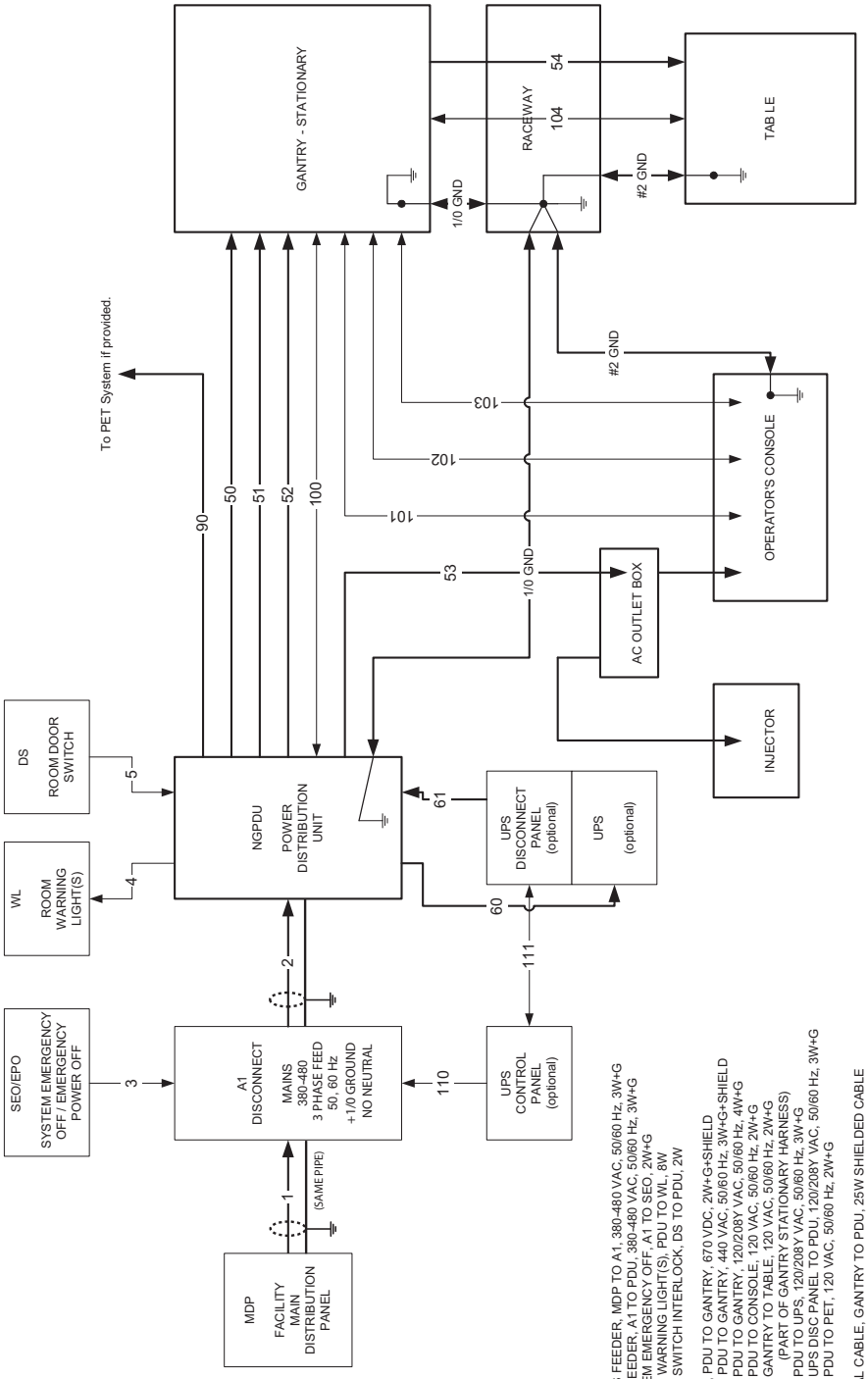
Table 3-3 System Interconnect Cables

RUN NO.	DESCRIPTION	PART NUMBER	
		SHORT CABLES (KIT 5443710)	LONG CABLES (KIT 5438124)
55	Ground, PDU to Raceway	2371450-2	2371450
56	Ground, Console to Raceway	2371450-4	2371450-3
60	LVAC Power Cable - PDU to Optional UPS	-	-
61	E-Stop Cable - PDU to Gantry	-	-
100	Signal Cable - Gantry to PDU	5120646-2	5120646
101	Signal Cable - Gantry to Console	5419981-2	5419981
102	Signal Cable (Ethernet) - Gantry to Console	2373436-3	2373436-2
103	Data Cable (Fiber Optic) - Gantry to Console	5432019	5432019
104	Signal Cable - Gantry to Table	n/a	n/a
110	Signal Cable - UPS Control to Room Disconnect (A1)	-	-
111	Signal Cable - UPS Control to UPS Disconnect Panel	-	-

Table 3-3 System Interconnect Cables (Continued)

Section 2.0
System Interconnect Diagram

Figure 3-2 System Interconnect Diagram



1* MAINS FEEDER, MDP TO A1; 380-480 VAC, 50/60 Hz, 3W+G
2* SUB-FEEDER, A1 TO PDU, 380-480 VAC, 50/60 Hz, 3W+G
3* SYSTEM EMERGENCY OFF, A1 TO SEO, 2W+G
4* X-RAY WARNING LIGHT(S), PDU TO WL, 8W
5* DOOR SWITCH INTERLOCK, DS TO PDU, 2W

50 HVDC, PDU TO GANTRY, 670 VDC, 2W+G+SHIELD
51 HVAC, PDU TO GANTRY, 440 VAC, 50/60 Hz, 3W+G+SHIELD
52 LVAC, PDU TO GANTRY, 120/208Y VAC, 50/60 Hz, 4W+G
53 LVAC, PDU TO CONSOLE, 120 VAC, 50/60 Hz, 2W+G
54 LVAC, GANTRY TO TABLE, 120 VAC, 50/60 Hz, 2W+G
(PART OF GANTRY STATIONARY HARNESS)
60 LVAC, PDU TO UPS, 120/208Y VAC, 50/60 Hz, 3W+G
61 LVAC, UPS DISC PANEL TO PDU, 120/208Y VAC, 50/60 Hz, 3W+G
90 LVAC, PDU TO PET, 120 VAC, 50/60 Hz, 2W+G

100 SIGNAL CABLE, GANTRY TO PDU, 25W SHIELDED CABLE
101 SIGNAL CABLE, GANTRY TO CONSOLE, 25W SHIELDED CABLE
102 SIGNAL CABLE, GANTRY TO CONSOLE, ETHERNET RJ45
103 DATA CABLE, GANTRY TO CONSOLE, FIBER OPTIC
104 SIGNAL CABLE, GANTRY TO TABLE, 25W SHIELDED CABLE
(PART OF GANTRY STATIONARY HARNESS)
110 SIGNAL CABLE, UPS CONTROL TO A1, 5W
111 SIGNAL CABLE, UPS CONTROL TO UPS DISC PANEL, 4W

* NOTE: Runs 1, 2, 3, 4 & 5 are customer supplied. All others are supplied by GEMS.

Section 3.0
Contractor Connections

CONNECTION OR WALL BOX	AWG #	CONNECTION FROM	CONNECTION TO PDU	INSTALLED AND CHECKED
A1	#1	Load - T1	TS-1 L1	
	#1	Load - T2	TS-1 L2	
	#1	Load - T3	TS-1 L3	
	#1/0	GND	TS-1 GND **(Do NOT connect anything to neutral point.)**	
WL (Warning light) *See Figure 3-60.*	#14	LV Source -1	TS6 1	
	#14	LV Source -2	TS6 2	
	#14	X-Ray ON Light -1	TS6 3	
	#14	X-Ray ON Light -2	TS6 4	
	#14	Sys-ON Light -1	TS6 5	
	#14	Sys-ON Light -2	TS6 6	
	#14	Ready Light -1	TS6 7	
	#14	Ready Light -2	TS6 8	
DS (Scan Room Door Switch)	#14	Door SW-1	TS6 9	
	#14	Door SW-2	TS6 10	

Table 3-4 Contractor PDU Connections

Note: **IMPORTANT:** Add AWG #2 ground wire from table frame to table/gantry raceway ground bar (as shown in Figure 3-2).

WARNING **WORK WITH THE ELECTRICAL CONTRACTOR TO BE SURE EXTERNAL POWER SOURCE IS TURNED OFF.**

Section 4.0
Console Connections

4.1 NIO Console Connections

PART #	DESCRIPTION	CONNECT TO	QTY	LENGTH MM
5366514-2	USB EXTENSION CABLE	Keyboard	1	3560 ± 30
5450275	PS2 EXTENSION CABLE	Mouse	1	3500 ± 50
5332107-2	CABLE, DVI to D-SUB VIDEO CABLE	Monitor	1	3000 ± 20
5408703	DP to DVI cable, 3 meter	Monitor	1	3000 ± 50
5315370	CABLE, USB TYPE A-B	PMT media Tower, DVD-RW/USB external HDD	2	2000
5432953-2	Power Cable, Peripheral Tower to NIO AC Box	PMT Media Tower	1	3050 ± 50
5432953-3	Power Cable, Display Monitor to NIO AC Box	Display Monitor	1	3050 ± 50
5432953-4	Power Cable, Scan Monitor to NIO AC Box	Scan Monitor	1	3050 ± 50

Table 3-5 GEMS Supplied Cables List for NIO Console with Z800

PART #	DESCRIPTION	CONNECT TO	QTY	LENGTH MM
5366514-2	USB EXTENSION CABLE	Keyboard	1	3560 ± 30
5366514	USB EXTENSION CABLE	Mouse	1	3000 ± 30
5315370	CABLE, USB TYPE A-B	PMT media Tower, DVD-RW/USB external HDD	2	2000
5408703	DP to DVI cable, 3 meter	Monitor	2	3000 ± 50
5432953-2	Power Cable, Peripheral Tower to NIO AC Box	PMT Media Tower	1	3050 ± 50
5432953-3	Power Cable, Display Monitor to NIO AC Box	Display Monitor	1	3050 ± 50
5432953-4	Power Cable, Scan Monitor to NIO AC Box	Scan Monitor	1	3050 ± 50

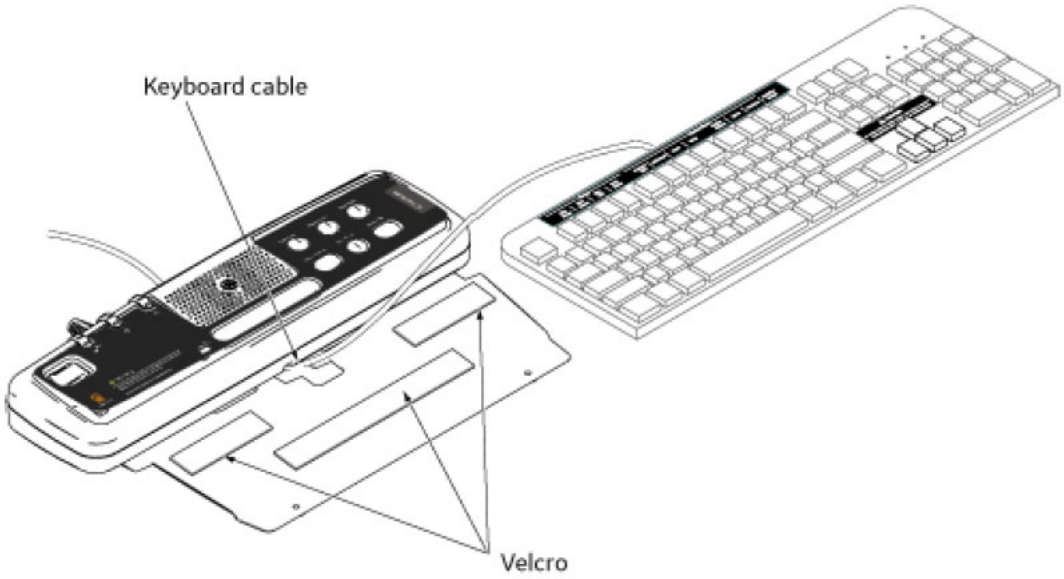
Table 3-6 GEMS Supplied Cables List for NIO Console with Z820

4.1.1 GSCB, Keyboard, Trackball & Mouse Installation

1.) Install the GSCB to the metal plate by using four screws.

2.) Route the keyboard cable under the GSCB and attach the keyboard to the GSCB metal plate with velcro strip and fit snugly against the GSCB.

Figure 3-3 GSCB and Keyboard



3.) Route the keyboard and the mouse cables to Console.
If the length of keyboard and mouse cables is not enough, add the following cable extensions (shipped with OC)

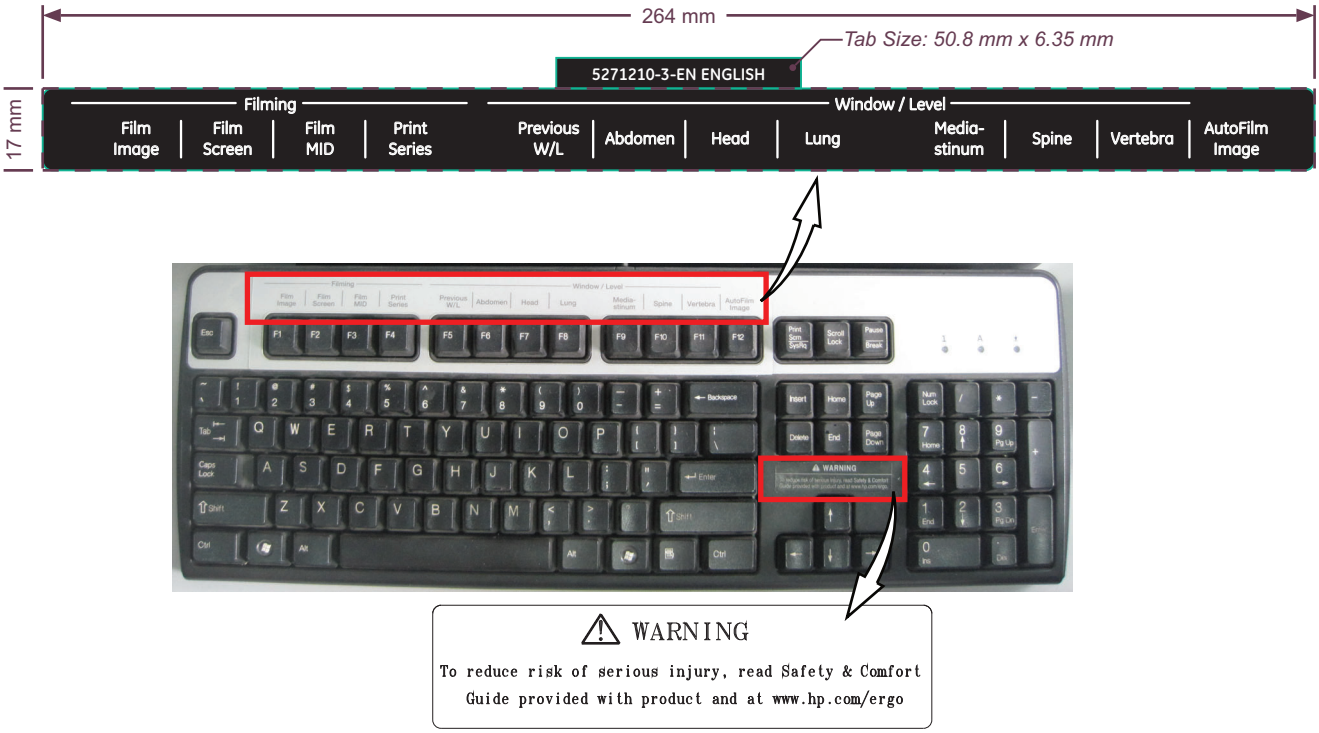
DESCRIPTION	HOST PC	PART NUMBER	CABLE LENGTH	QTY
PS2 Ext Cable (Mouse)	Z800	5450275	3500 mm	
USB Ext Cable (Mouse)	Z820	5366514	3000 mm	1
USB Ext Cable (Keyboard)	Z800/Z820	5366514-2	3560 mm	1

Table 3-7 Cable Extension

4.) Select the local language keyboard overlay and GSCB film from the keyboard collector (5431062-1-XX) to attach.

- Select the keyboard overlay and warning label from the keyboard collector (5324605-XX) to attach. (See Figure 3-4)

Figure 3-4 Keyboard Overlay and Warning Label Attached (English)



- Select the proper GSCB film (with **Tilt/E-Reset**, P/N is 5401237-XXX) to install.

Note: Verify that none of the buttons get caught and stuck under the overlay. Pay close attention to the prescribed tilt button on systems with the tilt feature.

Figure 3-5 GSCB Connected to Keyboard with Tilt/E-Reset Overlay Attached

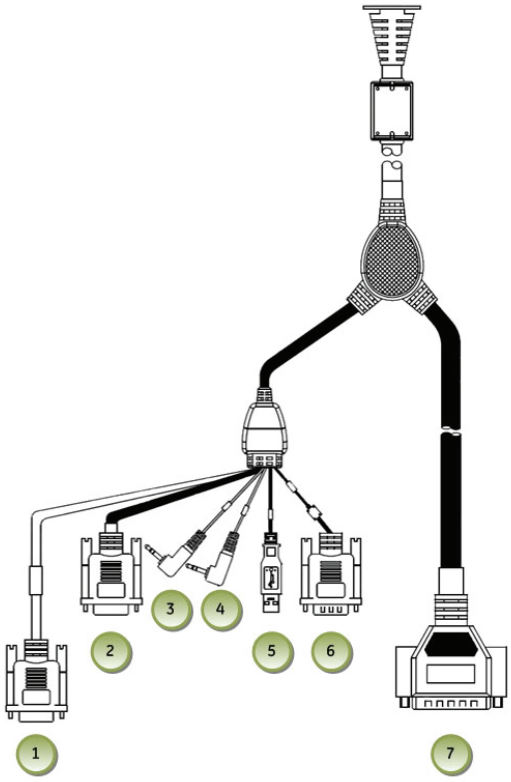
Note: X-ray ON sound can be turned off / on using the switch on GSCB bottom if customer does not like it and if local regulation does not require X-ray ON sound. Detail information refer to ***Service Methods->Troubleshooting->Console-> GSCB Troubleshooting***.

5.) The keyboard should attach to the GSCB using the supplied Velcro strip and fit snugly against the GSCB when finished.

6.) Route the GSCB cable and connect connectors according to Figure 3-6 and Table 3-8.

Note: The USB cable of GSCB is reserved, please tie it with tie-wrap.

Figure 3-6 GSCB Cable



#	ITEM	DESCRIPTION
1	GSCB - DB9/F Black	Host Computer DIP Serial Port
2	GSCB - DB9/F Gray	Host Computer RS232
3	GSCB - Green Audio	Host Computer Audio Out (Green)
4	GSCB - Blue Audio	Host Computer Audio In (Blue)
5	GSCB - USB	Not Used
6	GSCB - DB9/M Black	AC Box J56
7	GSCB - DB25/M Black	TGP Gantry Cable

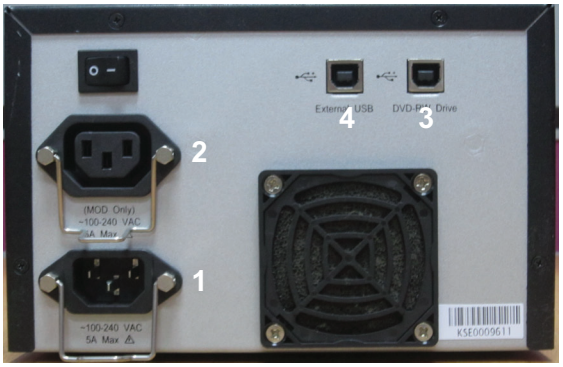
Table 3-8 GSCB Cable

4.1.2 Connecting the Media Tower (5270510-20/21/22)

Figure 3-7 Media Tower

Front View

Rear View



1) Power for Media Tower
2) Power for MOD Drive
3) DVD-RW Drive
4) External USB
5) HDD External
SSA Key

Connect the power cable to the rear of the media tower. Use the following cables for connection.

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
USB Cable (PMT)	5315370	2000 mm	2
Power Cable, Peripheral Tower to **NIO Console** AC Box	5432953-2	3050 mm	1

Table 3-9 Media Tower Cables

4.1.3 Connecting the LCD Monitor

NOTICE **Equipment Damage Possible**

Do not touch the video signal cable connector pins as this might bend them. When connecting the video signal cable, check the alignment of the HD15 and DVI connector. Do not force the connector in the wrong way, otherwise the pins might bend.

4.1.3.1 Connect Scan Monitor and Image Monitor for NIO Console with Z800

Scan Monitor

- Video cable from Console Host DP0 to Monitor DVI
- Power cable from Console J10
- Route through the cable keeper

Figure 3-8 Video Cable and Power Cable for Scan Monitor

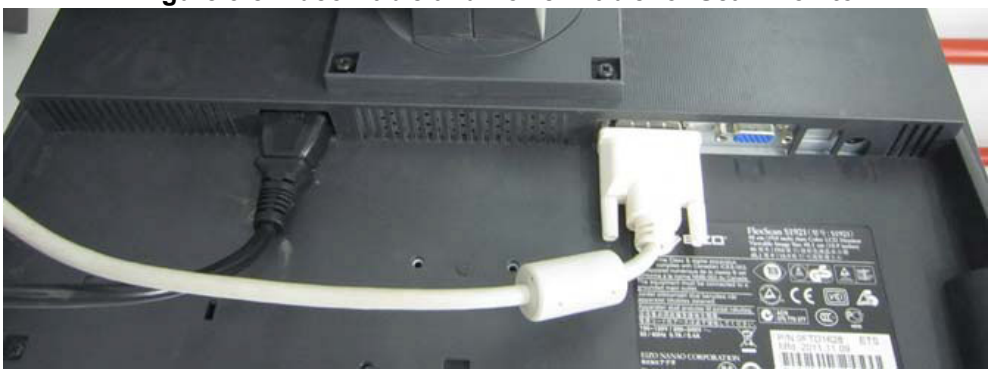


Image Monitor

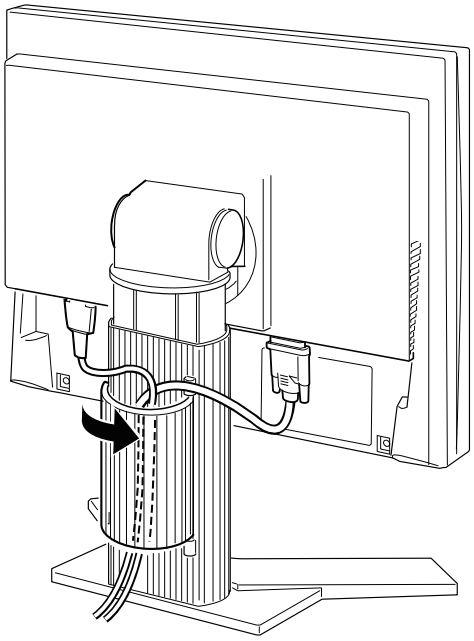
- Video cable from Console Host DVI-I 0 to Monitor VGA
- Power cable from Console J9
- Route through the cable keeper

Figure 3-9 Video Cable and Power cable for Image Monitor

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
Scan Monitor Power Cable	5432953-4	3050 mm	1
Scan Monitor Video Cable	5408703	3000 mm	1
Display Monitor Power Cable	5432953-3	3050 mm	1
Display Monitor Video Cable	5332107-2	3000 mm	1

Table 3-10 Monitor Cables

Figure 3-10 Cable Routing and Keeper



4.1.3.2 Connect Scan Monitor and Image Monitor for NIO Console with Z820

Scan Monitor

- Video cable from Console Host DP1 to Monitor DVI
- Power cable from Console J10
- Route through the cable keeper

Image Monitor

- Video cable from Console Host DP0 to Monitor DVI
- Power cable from Console J9
- Route through the cable keeper

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
Scan Monitor Power Cable	5432953-4	3050 mm	1
Display Monitor Power Cable	5432953-3	3050 mm	1
Monitor Video Cable	5408703	3000 mm	2

Table 3-11 Monitor Cables for Z820

Figure 3-11 Video Cable and Power Cable Connections

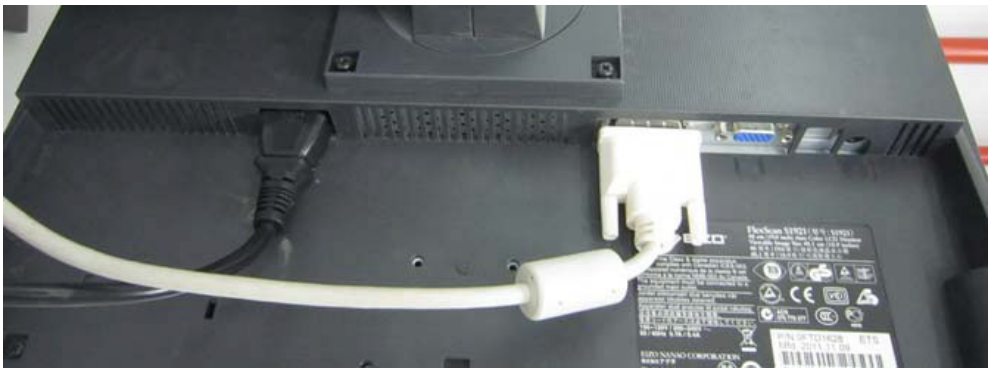
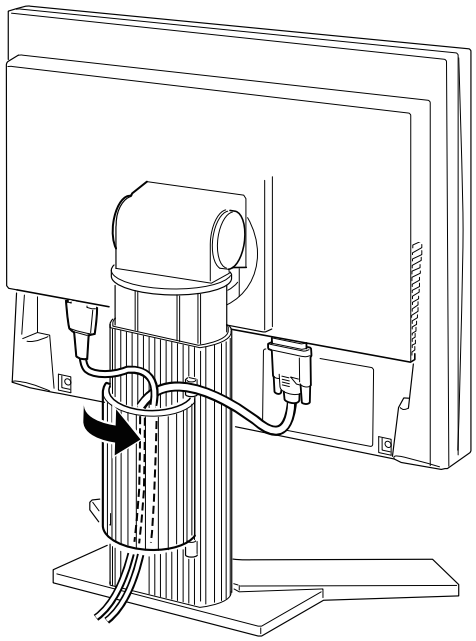


Figure 3-12 Cable Routing and Keeper



4.1.3.3 LCD Video Monitor Setup

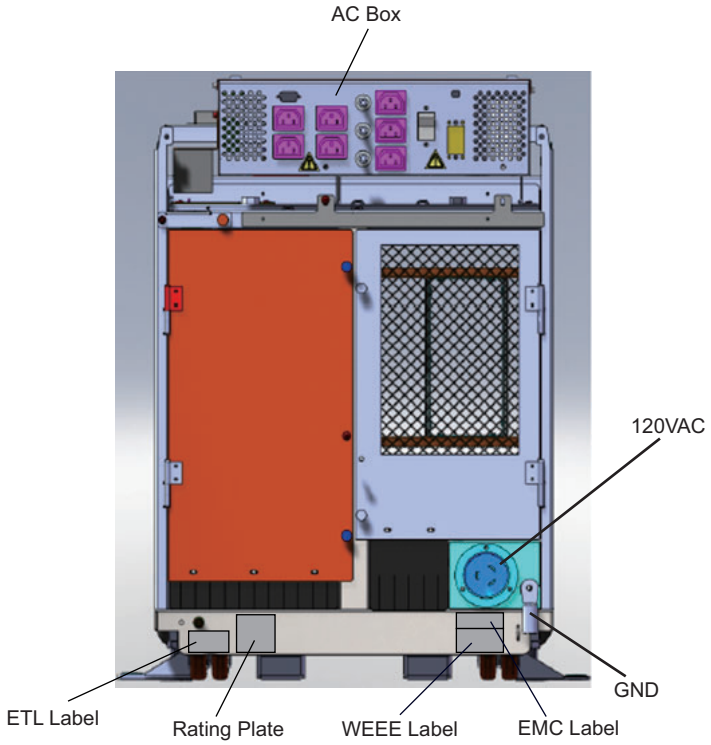
Detail LCD video monitor setup please refer to ***Service Methods→ Align,Setup,Cals →Console →LCD Video Monitor Setup.***

4.1.4 Console Connections

NOTICE **Potential for equipment damage never connect a mouse or keyboard with the host computer powered "ON". Doing so can destroy components within the host computer.**

1.) Open the right side of the console rear panel.

Figure 3-13 NIO16 Console Rear View



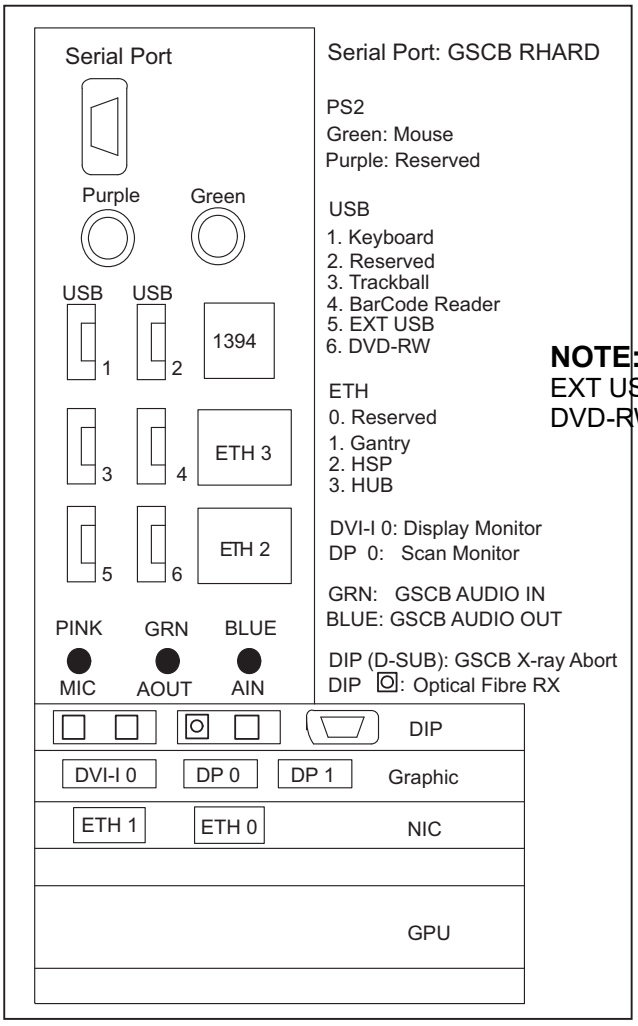
2.) Connect the power cable and ground cable to the console rear panel. (See Figure 3-13)

PART NUMBER		DESCRIPTION
SHORT	LONG	
2343531-2	2343531	120VAC Power Cable from PDU to OC
2371450-4	2371450-3	Ground, Raceway to OC

Table 3-12 Console Cable Connections

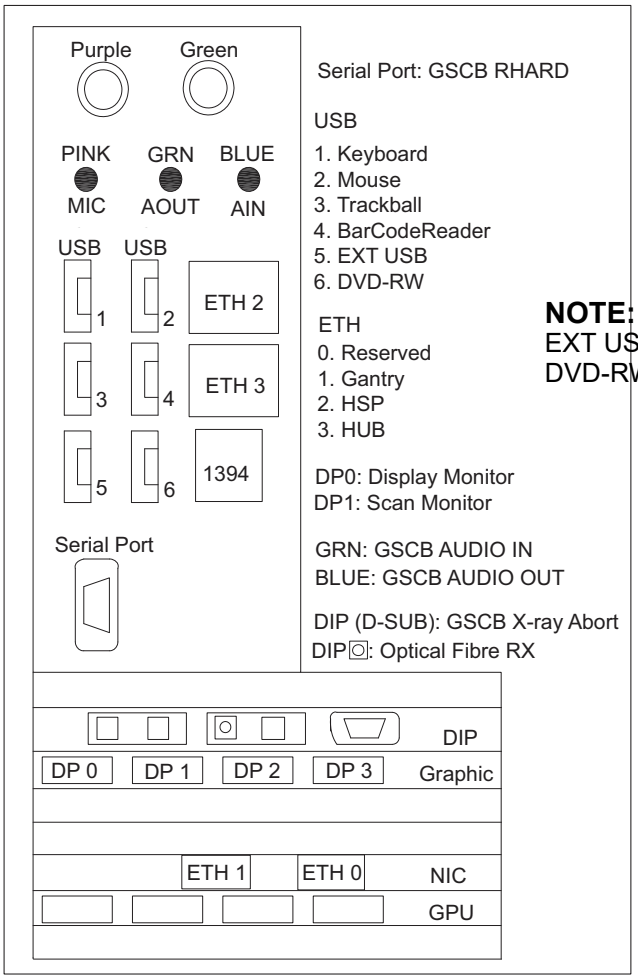
3.) Connect the all cables (see Table 3-5 and Table 3-6) to the rear of Host Computer referring to the drawing below (Figure 3-14 and Figure 3-15). The drawing is also printed on the right rear door of the console.

Figure 3-14 Z800 Host Computer Connections



NOTE:
EXT USB is for Media Tower External HDD Drive
DVD-RW is for Media Tower DVD Drive

Figure 3-15 Z820 Host Computer Connections



NOTE:
EXT USB is for Media Tower External HDD Drive
DVD-RW is for Media Tower DVD Drive

4.1.5 Optional Long Cable Connections

In most cases the Console peripherals such as Monitors, Keyboard, Mouse and GSCB will be mounted to, or placed on top of the Console Unit. In some cases these items may be placed to a short distance away from the actual Console Unit on a counter top or other surface requiring additional extension cables.

Refer to ***Service Methods -> Installation -> Option -> Console Long Cable Kit Installation Manual (5456816-1EN)*** for the detailed information.

4.1.6 Switch Hub Connections

Switch Hub located on the left bottom of the console. Plug cables into Switch Hub on console.

Figure 3-16 Switch Hub Location

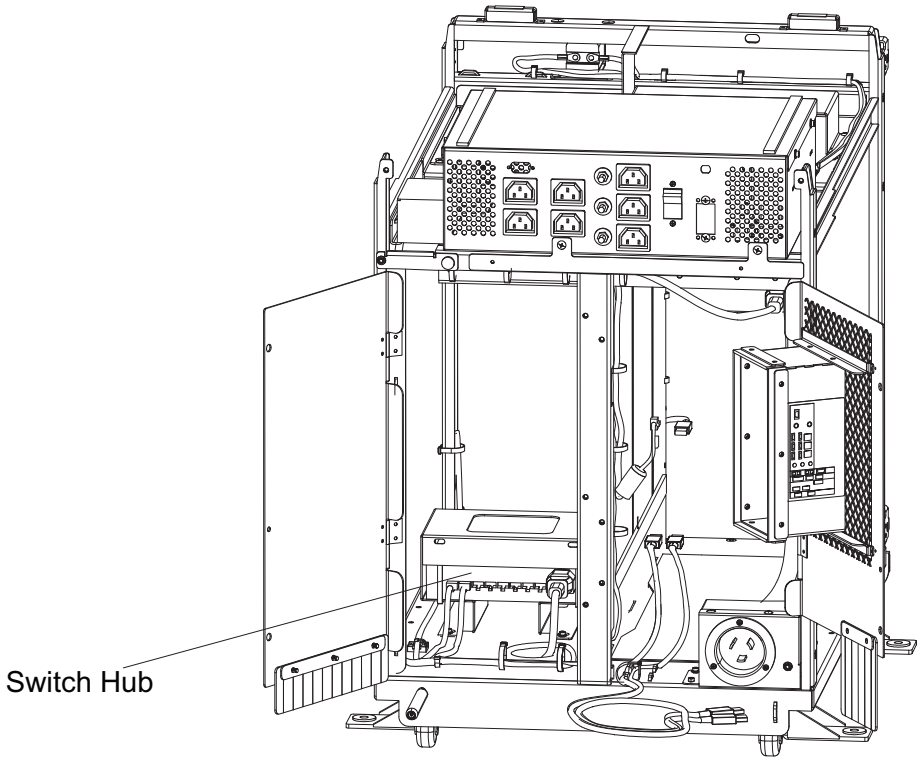
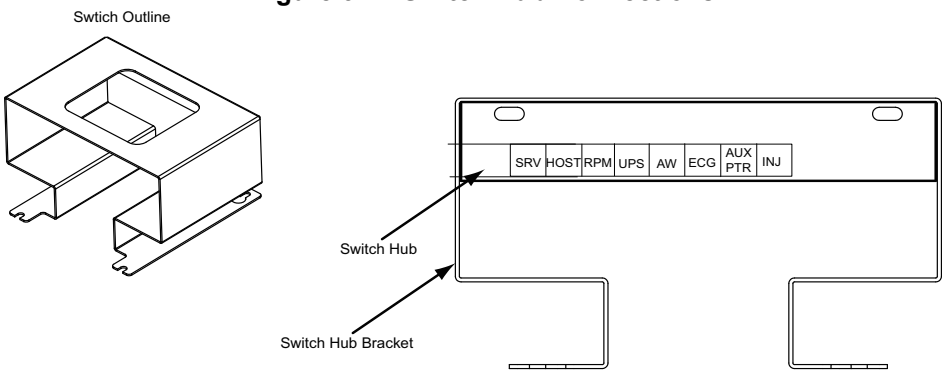


Figure 3-17 Switch Hub Connections



4.1.7 AC Box Connections

CAUTION **The outlets are not for General Use. Operator Console outlet has a rating for 2.5A at 120VAC. Accessories should not exceed above rating.**

Note: Console power is single phase power. Outlet assigned is not critical.

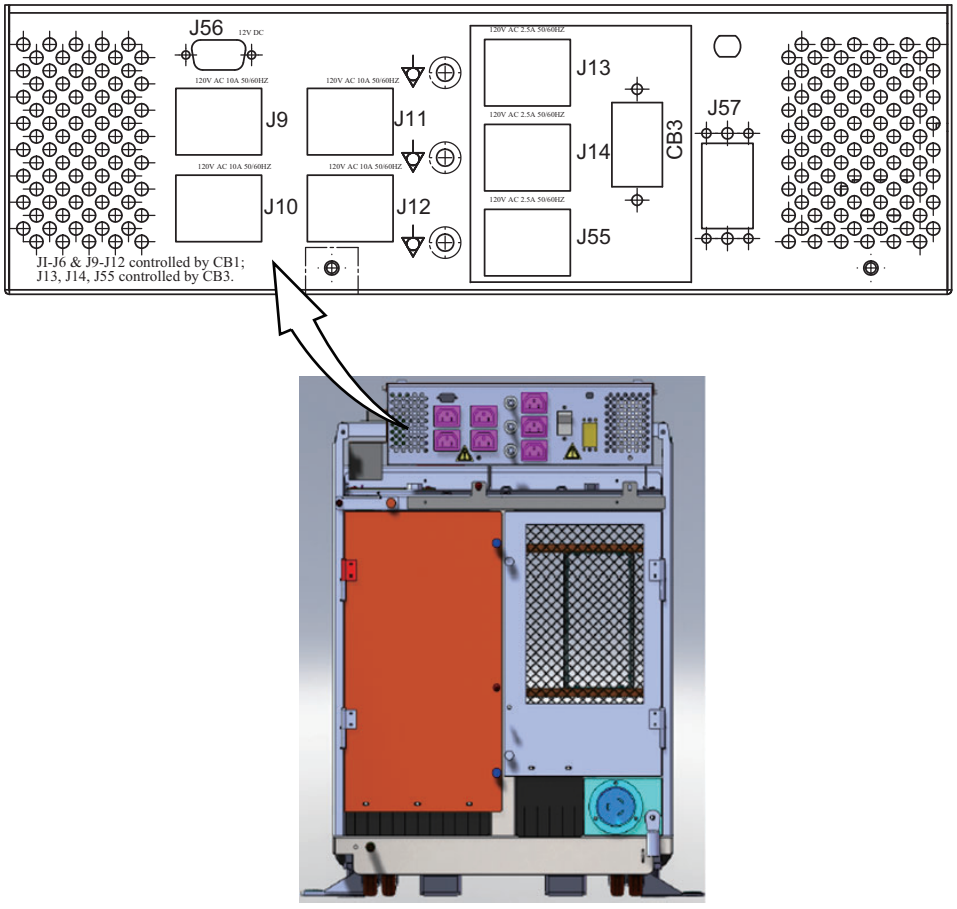
1.) Connect the console power cable and ground cable to the console power panel.

2.) Connect console component power cords as listed in Table 3-13. (“J numbers” increment from top to bottom, left to right)

Number	Description
J9	Display Monitor Power Connection
J10	Scan Monitor Power Connection
J11	Peripheral Media Tower Power Connection
J12	In-Room Monitor Connection
J13	Injector Power Connection
J14	RPM Power Connection
J56	GSCB Power Connection

Table 3-13 AC Box Outlet Assignments

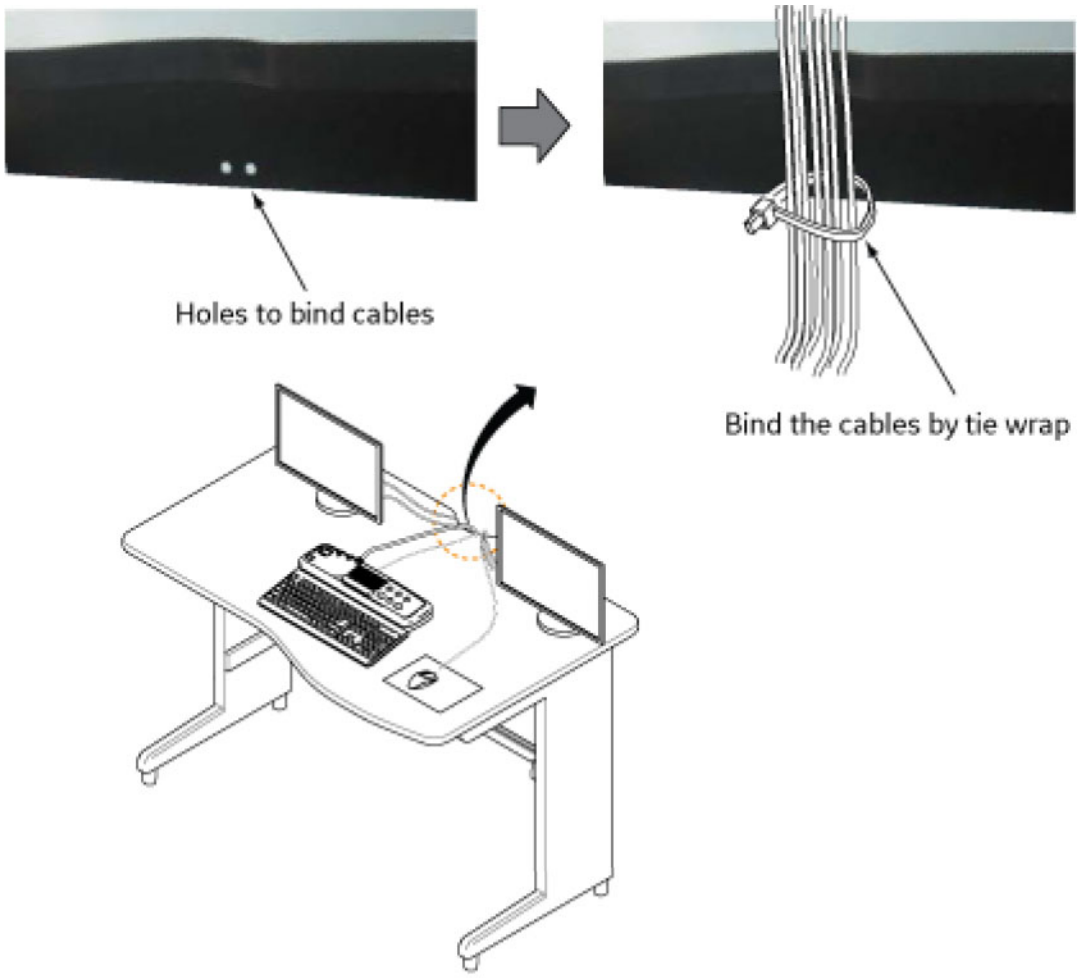
Figure 3-18 AC Box Connections



4.1.8 Cable Arrangement

Arrange the cables appropriately by using the cable clamps equipped on the console tables.

Figure 3-19 Example: Cable Arrangement



4.2 OpenOC Console Connections

Part #	Description	Connect to	QTY	LENGTH MM
5431909	USB EXTENSION CABLE	Keyboard	1	3500 ± 50
5458346	USB EXTENSION CABLE	Mouse	1	3500 ± 50
5315370	CABLE, USB TYPE A-B	PMT media Tower, DVD-RW/USB external HDD	2	2000
5408703-2	DP to DVI cable, 3 meter	Monitor	1	3000 ± 50
5641358	DVI-D to DVI-D Cable, 3 meter	Monitor	1	3000 ± 150
5432953-6	Power Cable, Peripheral Tower to Open Chassis J5	PMT media Tower	1	3050 ± 50
5478299-6	Power Cable, Display monitor to Open Chassis Console	Display Monitor	1	3050 ± 50
5478299-5	Power Cable, Scan monitor to Open Chassis Console	Scan Monitor	1	3050 ± 50

Table 3-14 GEMS Supplied Cables List for OpenOC with Z840

Part #	Description	Connect to	QTY	LENGTH MM
5431909	USB EXTENSION CABLE	Keyboard	1	3500 ± 50
5458346	USB EXTENSION CABLE	Mouse	1	3500 ± 50
5408703-2	DP to DVI cable, 3 meter	Monitor	2	3000 ± 50
5795077	Mini DP to DP Dongle	Monitor (Adapter)	2	250
5478299-6	Power Cable, Display monitor to Open Chassis Console	Display Monitor	1	3050 ± 50
5478299-5	Power Cable, Scan monitor to Open Chassis Console	Scan Monitor	1	3050 ± 50

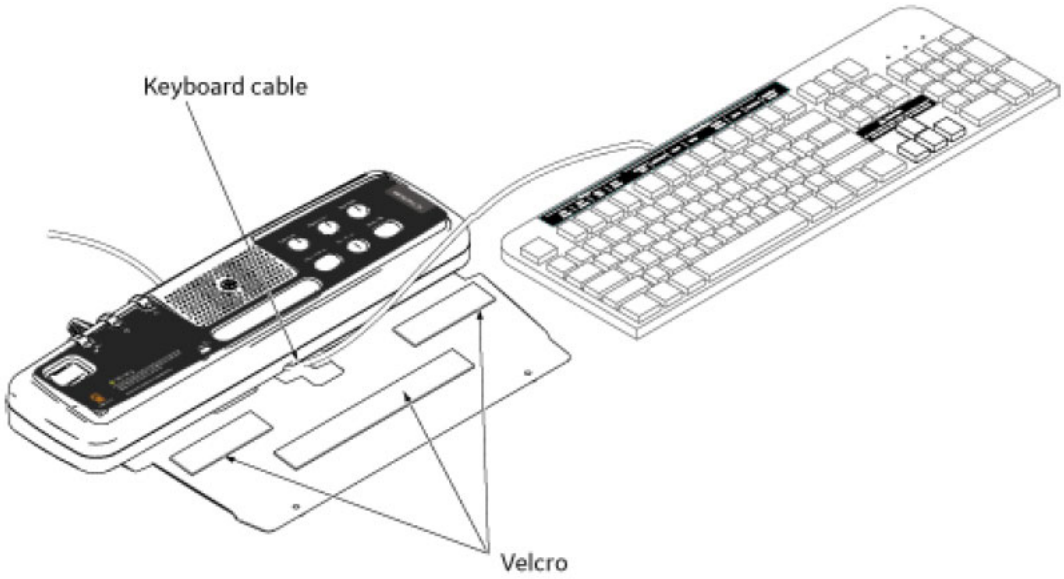
Table 3-15 GEMS Supplied Cables List for OpenOC with Z8G4

4.2.1 GSCB, Keyboard, Trackball & Mouse Installation

1.) Install the GSCB to the metal plate by using four screws.

2.) Route the keyboard cable under the GSCB and attach the keyboard to the GSCB metal plate with velcro strip and fit snugly against the GSCB.

Figure 3-20 GSCB and Keyboard



3.) Route the keyboard and the mouse cables to Console.
If the length of keyboard and mouse cables is not enough, add the following cable extensions (shipped with OC)

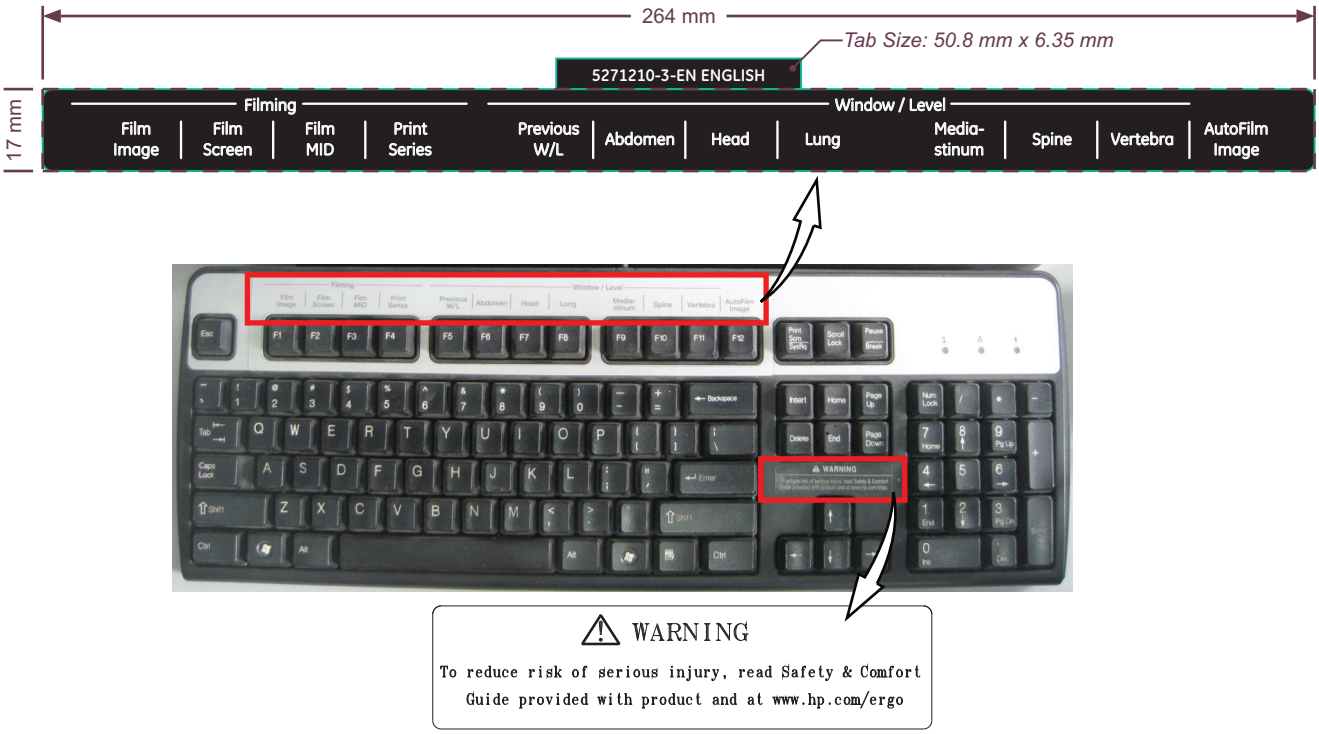
DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
USB Extension Cable (Mouse)	5458346	3500 mm	1
USB Extension Cable (Keyboard)	5431909	3500 mm	1

Table 3-16 Cable Extension

4.) Select the local language keyboard overlay and GSCB film from the keyboard collector (5431062-1-XX) to attach.

- Select the keyboard overlay and warning label from the keyboard collector (5324605-XX) to attach. (See Figure 3-21)

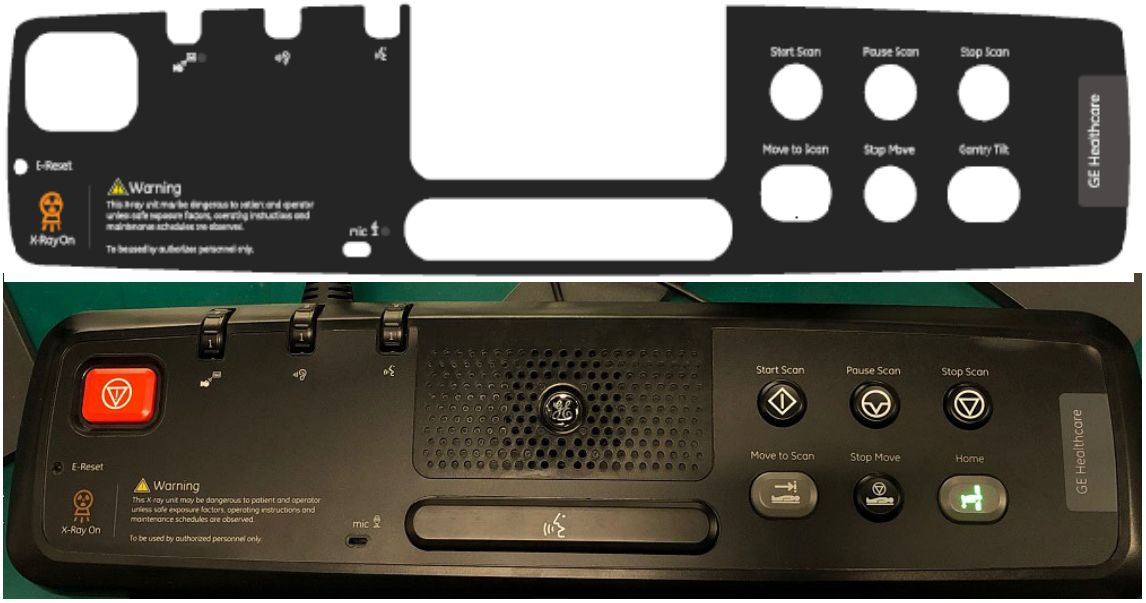
Figure 3-21 Keyboard Overlay and Warning Label Attached (English)



- Select the proper GSCB film (with **Tilt/E-Reset**, P/N is 5401237-XXX) to install.

Note: Verify that none of the buttons get caught and stuck under the overlay. Pay close attention to the prescribed tilt button on systems with the tilt feature.

Figure 3-22 GSCB Film with Home Button



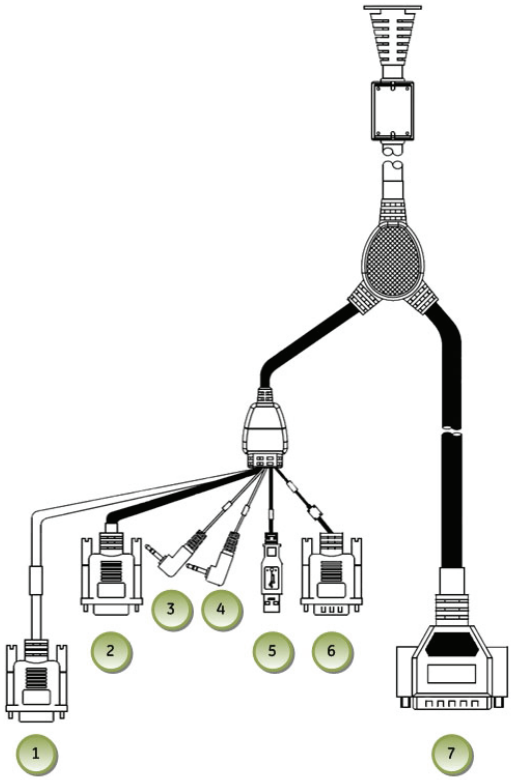
Note: X-ray ON sound can be turned off / on using the switch on GSCB bottom if customer does not like it and if local regulation does not require X-ray ON sound. Detail information refer to ***Service Methods->Troubleshooting->Console-> GSCB Troubleshooting***.

5.) The keyboard should attach to the GSCB using the supplied Velcro strip and fit snugly against the GSCB when finished.

6.) Route the GSCB cable and connect connectors according to Figure 3-23 and Table 3-17.

Note: The USB cable of GSCB is reserved, please tie it with tie-wrap.

Figure 3-23 GSCB Cable



#	ITEM	DESCRIPTION
1	GSCB - DB9/F Black	Host Computer DIP Serial Port
2	GSCB - DB9/F Gray	Host Computer RS232
3	GSCB - Green Audio	Host Computer Audio Out (Green)
4	GSCB - Blue Audio	Host Computer Audio In (Blue)
5	GSCB - USB	Not Used
6	GSCB - DB9/M Black	AC Box J56
7	GSCB - DB25/M Black	TGP Gantry Cable

Table 3-17 GSCB Cable

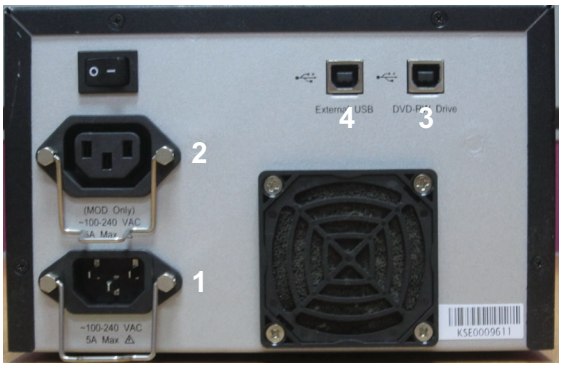
4.2.2 Peripheral Media Tower

4.2.2.1 Media Tower (5270510-22)

Figure 3-24 Media Tower

Front View

Rear View



1) Power for Media Tower
2) Power for MOD Drive
3) DVD-RW Drive
4) External USB
5) HDD External
   SSA Key

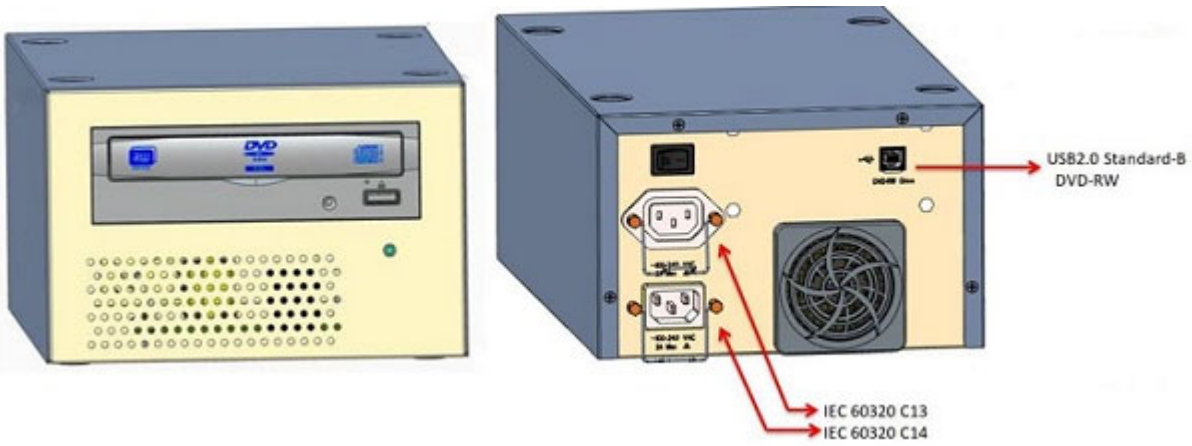
Connect the following cables to the rear of the media tower.

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
USB Cable (PMT)	5315370	2000 mm	2
Power Cable, Peripheral Tower to **OpenOC16 Console (with Z840)** AC Box	5432953-6	3050 mm	1

Table 3-18 Media Tower Cables

4.2.2.2 Media Tower (Option, 5270510-23)

Figure 3-25 DVD Media Tower



Connect the following cables to the rear of the media tower.

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
USB Cable (PMT)	5315370	2000 mm	1
Interconnect Power Cord to **OpenOC16 Console (with Z8G4)** AC Box	5466460-4	3050 mm	1

Table 3-19 Media Tower Cables

4.2.3 Connecting the LCD Monitor

NOTICE **Equipment Damage Possible**

Do not touch the video signal cable connector pins as this might bend them. When connecting the video signal cable, check the alignment of the HD15 and DVI connector. Do not force the connector in the wrong way, otherwise the pins might bend.

4.2.3.1 Connect Scan Monitor and Image Monitor for OpenOC with Z840

Figure 3-26 EIZO (DIN) LCD Monitor Cable Connectors

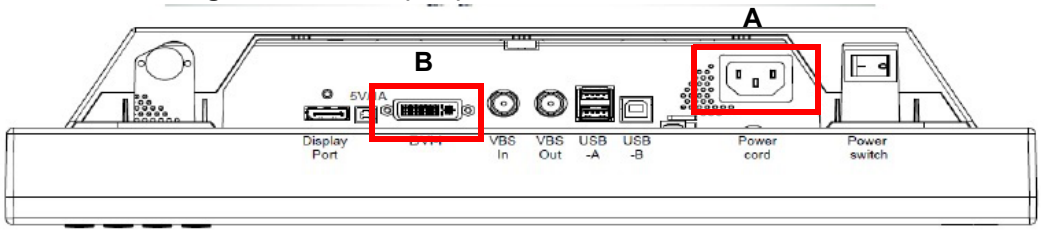
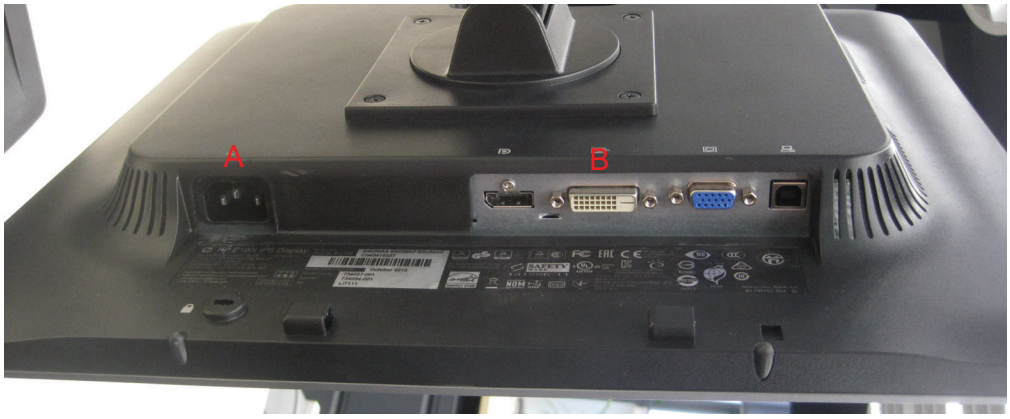


Figure 3-27 HP LCD Monitor Cable Connectors



ITEM	DESCRIPTION
A	Power Cable Connection
B	DVI Video Connection - Scan (Left) - Display / Image (Right)

Scan Monitor

- Video cable from Console Host DP0 to Monitor DVI
- Power cable from Console AC Box J1
- Route through the cable keeper

Image Monitor

- Video cable from Console Host DVI to Monitor DVI
- Power cable from Console AC Box J2
- Route through the cable keeper

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
Scan Monitor Power Cable	5478299-5	3050 mm	1
Scan Monitor Video Cable	5408703-2	3000 mm	1
Display Monitor Power Cable	5478299-6	3050 mm	1
Display Monitor Video Cable	5641358	3000 mm	1

Table 3-20 Monitor Cables for Z840

4.2.3.2 Connect Scan Monitor and Image Monitor for OpenOC with Z8G4

Figure 3-28 EIZO S1934 LCD Monitor Cable Connectors

Figure 3-29 EIZO (DIN) LCD Monitor Cable Connectors

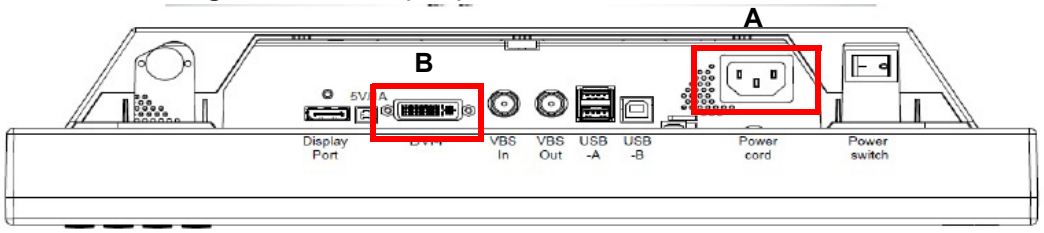


Figure 3-30 HP LCD Monitor Cable Connectors

ITEM	DESCRIPTION
A	Power Cable Connection
B	DVI Video Connection - Scan (Left) - Display / Image (Right)

Scan Monitor

- Video cable from Console Host DP to Monitor DVI
- Power cable from Console AC Box J1
- Route through the cable keeper

Image Monitor

- Video cable from Console Host DP to Monitor DVI
- Power cable from Console AC Box J2
- Route through the cable keeper

Note: Connect the Mini DP - DP Dongle (5795077) to the monitor video cable (5408703-2).

DESCRIPTION	PART NUMBER	CABLE LENGTH	QTY
Scan Monitor Power Cable	5478299-5	3050 mm	1
Display Monitor Power Cable	5478299-6	3050 mm	1
Monitor Video Cable	5408703-2	3000 mm	2
Mini DP to DP Dongle Cable	5795077	250 mm	2

Table 3-21 Monitor Cables for Z8G4

4.2.3.3 LCD Video Monitor Setup

Detail LCD video monitor setup please refer to ***Service Methods→ Align,Setup,Cals →Console →LCD Video Monitor Setup.***

4.2.4 Console Connections

NOTICE **Potential for equipment damage never connect a mouse or keyboard with the host computer powered "ON". Doing so can destroy components within the host computer.**

Figure 3-31 OpenOC (w/ Z840) Console Rear View

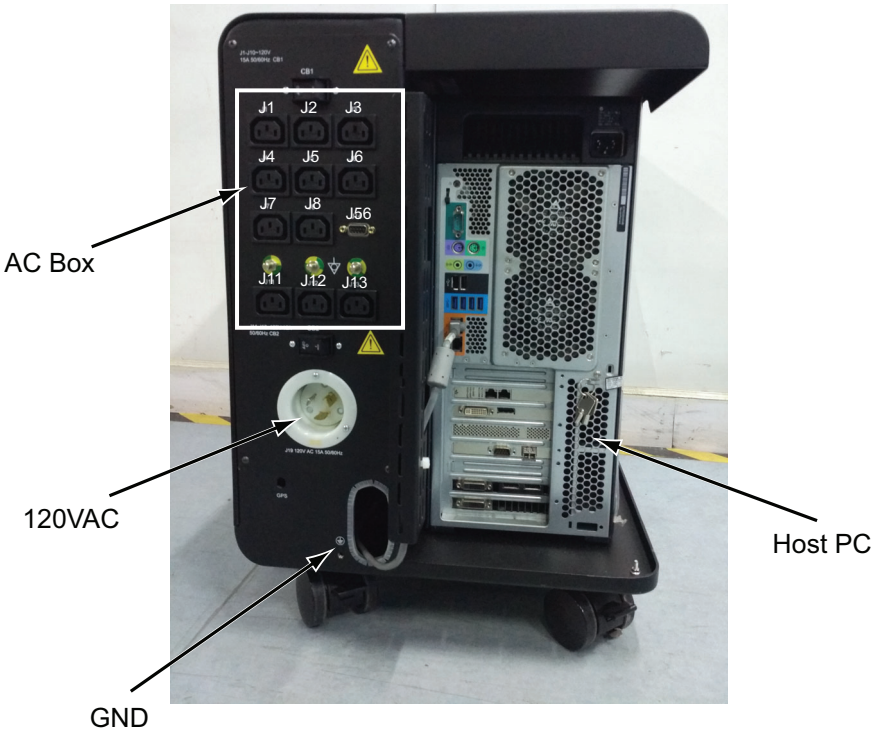
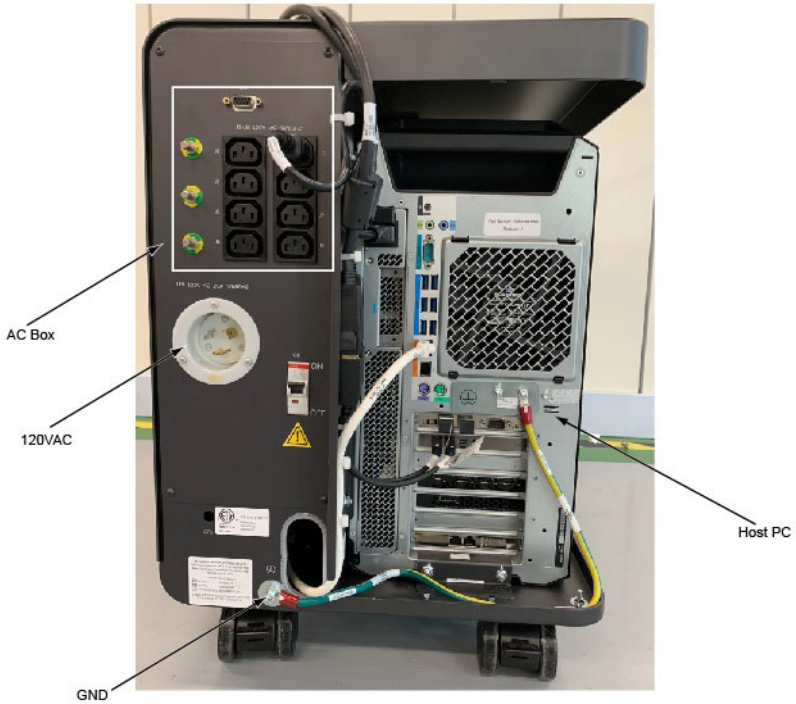


Figure 3-32 OpenOC (w/ Z8G4) Console Rear View



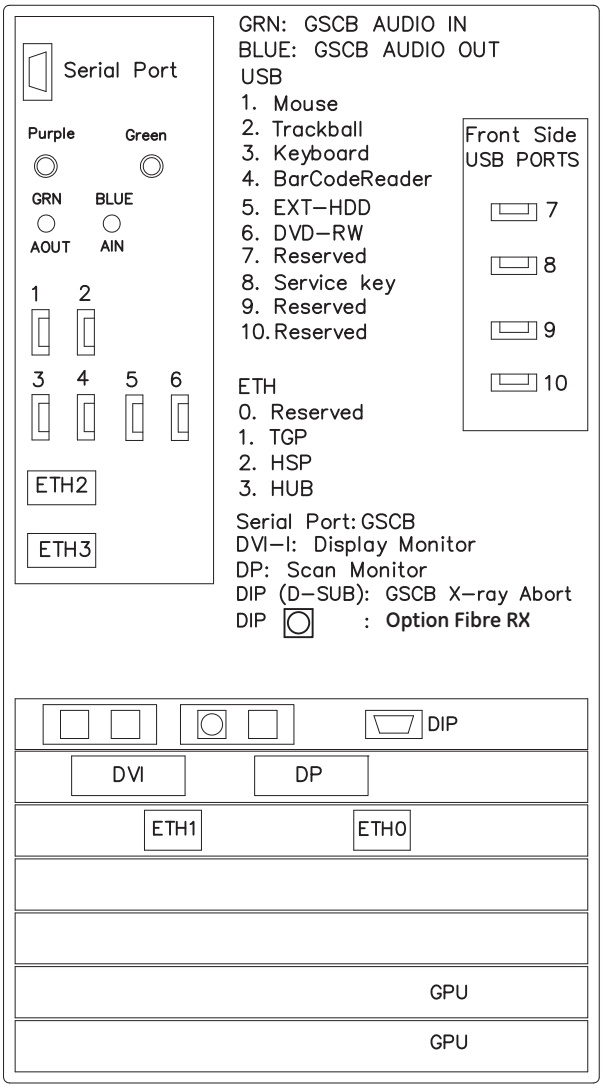
7.) Connect the power cable and ground cable to the console rear panel. (See Figure 3-31)

PART NUMBER		DESCRIPTION
SHORT	LONG	
2343531-2	2343531	120VAC Power Cable from PDU to OC
2371450-4	2371450-3	Ground, Raceway to OC

Table 3-22 Console Cable Connections

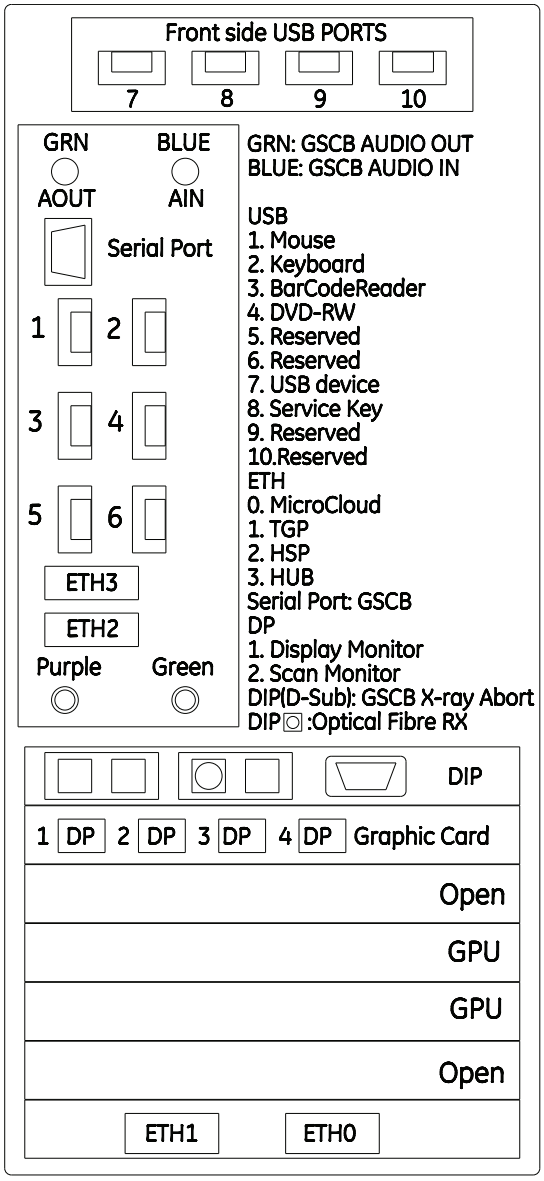
8.) Connect the all cables (see Table 3-14 and Table 3-15) to the rear of Host Computer referring to the drawing below (Figure 3-33 and Figure 3-34). The drawing is also printed on the right rear door of the console.

Figure 3-33 Z840 Host Computer Connections



NOTE:
EXT-HDD is for Media Tower External HDD Drive
DVD-RW is for Media Tower DVD Drive

Figure 3-34 Z8G4 Host Computer Connections



4.2.5 Optional Long Cable Connections

In most cases the Console peripherals such as Monitors, Keyboard, Mouse and GSCB will be mounted to, or placed on top of the Console Unit. In some cases these items may be placed to a short distance away from the actual Console Unit on a counter top or other surface requiring additional extension cables.

Refer to ***Service Methods -> Installation -> Option -> Console Long Cable Kit Installation Manual (5456816-1EN)*** for the detailed information.

4.2.6 Switch Hub Connections

Switch Hub located inside the OpenOC chassis. Plug cables into the Switch Hub on the console.

Figure 3-35 Switch Hub Location

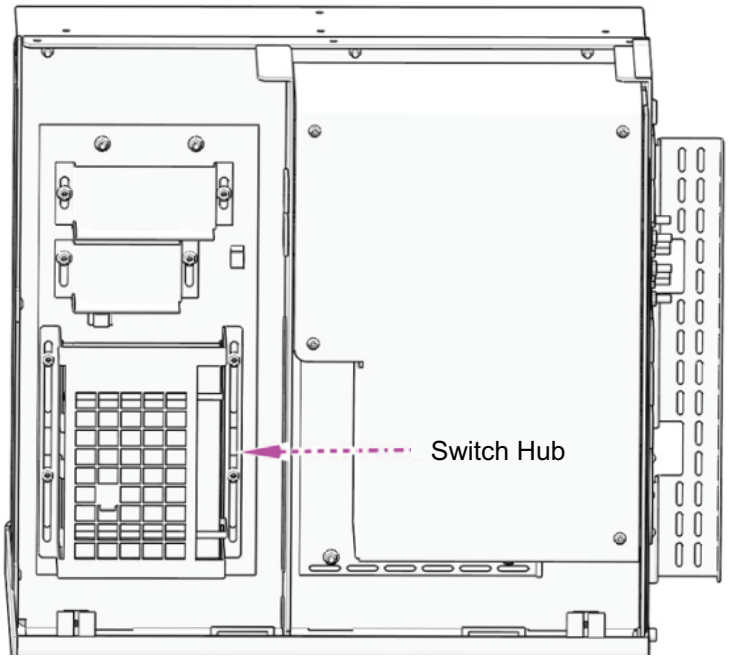
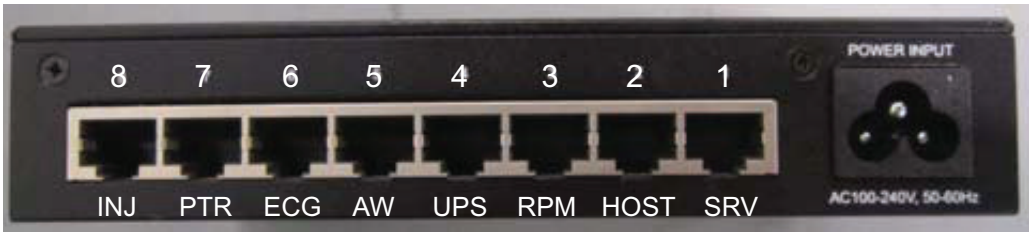


Figure 3-36 Switch Hub Connection



4.2.7 AC Box Connections

CAUTION **The outlets are not for General Use. Operator Console outlet has a rating for 2.5A at 120VAC. Accessories should not exceed above rating.**

Note: Console power is single phase power. Outlet assigned is not critical.

4.2.7.1 AC Box Assembly (5412524-6) for Z840

1.) Connect the console power cable and ground cable to the console power panel.

2.) Connect console component power cords as listed in Table 3-23. (“J numbers” increment from top to bottom, left to right)

Number	Description
J1	Scan Monitor Power Connection
J2	Display Monitor Power Connection
J4	In-Room Monitor Connection
J5	Peripheral Media Tower Power Connection
J10	Video Splitter
J12	RPM Power Connection
J13	Injector Power Connection
J56	GSCB Power Connection

Table 3-23 AC Box Outlet Assignments

Figure 3-37 OpenOC AC Box Connections

4.2.7.2 AC Box Assembly (5412524-10) for Z8G4

1.) Connect the console power cable and ground cable to the console power panel.

2.) Connect console component power cords as listed in Table 3-24. (“J numbers” increment from top to bottom, left to right)

Number	Description
J1	Scan Monitor Power Connection
J2	Display Monitor Power Connection
J5	DT Tower Power Connection
J7	In-Room Monitor
J11	Video Splitter
J12	Switch Hub
J56	GSCB Power Connection

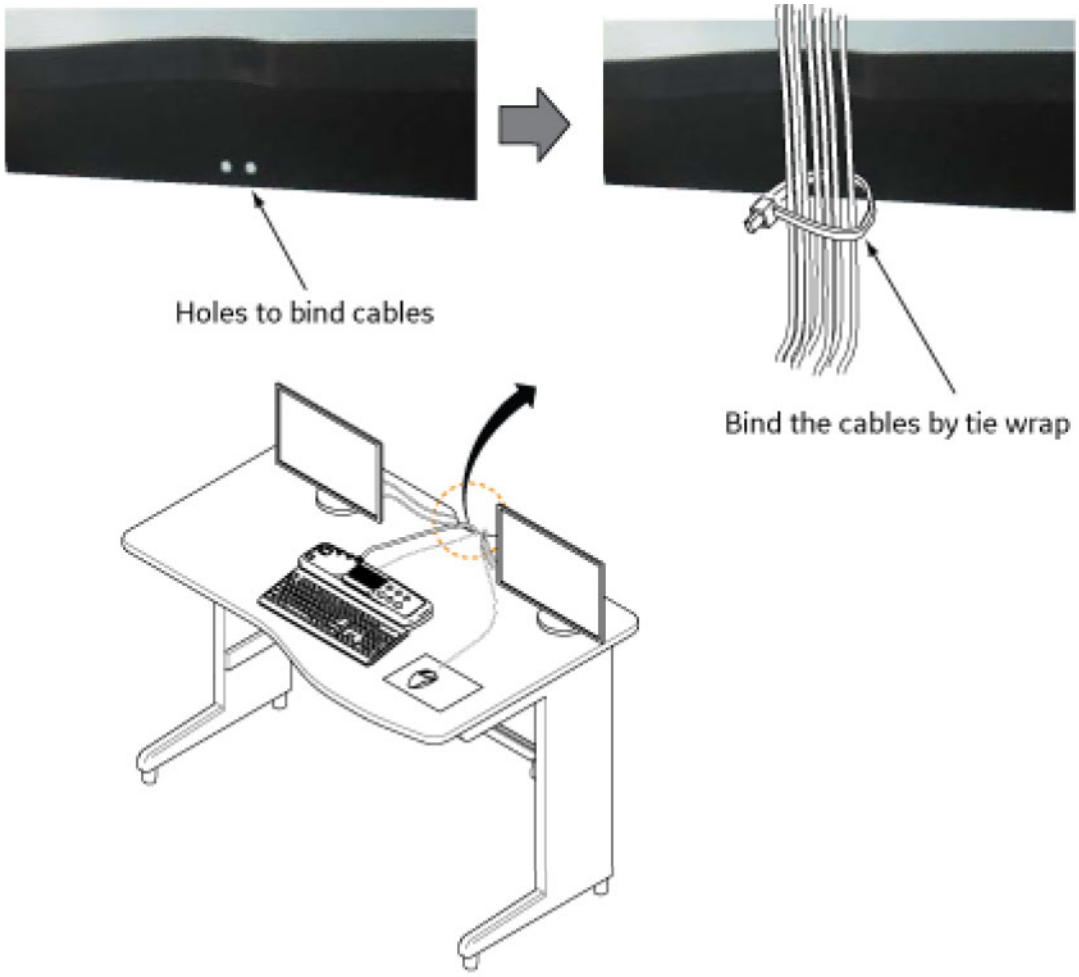
Table 3-24 AC Box Outlet Assignments

Figure 3-38 OpenOC AC Box Connections

4.2.8 Cable Arrangement

Arrange the cables appropriately by using the cable clamps equipped on the console tables.

Figure 3-39 Example: Cable Arrangement



Section 5.0
Install Options

5.1 Install Optional Bar Code Reader

Follow the installation procedures in the Bar Code Reader box. When finished neatly dress all cables.

5.2 Install Optional Remote Monitor

Follow the installation procedures in the Remote Monitor box.

5.3 AVIMOS Camera Optional

Follow the instructions (5863844-1EN) to install. This is a ceiling/wall-mounted option, check that the junction plate is installed correctly with the holes in the correct location.

GE will provide two junction plates (Standard - 5863746 and Pipe - 5863748). If the junction plates supplied by GE can not meet the requests of the building structure, the customer's architect can design and install the equivalent junction plate with sufficient strength to hold the camera.

WARNING The customer's architect is responsible for installing of junction plate. The system manufacturer will NOT inspect and test that the fixing methods between the Junction Plate and the building structure meet the loading capacity specified (recommend a 4x safety factor).

5.4 Install Injector Option

Follow the instructions shipped with the option. If this is a ceiling-mounted option, check that the plate is installed correctly with the holes in the correct location.

Note: For Gantry with IPC board, Injector power will plug into the Gantry. Follow IPC option instruction shipped with kit.

5.5 Install The IVY Monitor and Stand Option

Follow the instructions shipped with the Monitor and stand kit. Review the instructions carefully before assembling the stand and accessory basket to avoid repeated steps.

5.6 Customer Accessories (Head Holders and Extender)

Open the boxes and installed the appropriate language warning labels.
The head holders ship with shims installed to assure proper fit. Check that shims are included and a pair is installed. The holder should fit snugly. Follow the procedure in Section 4.0 of Chapter 3 to install Head Holders.

5.7 Install Service Cabinet (Option)

The service cabinet you receive may ship disassembled. Assembly takes about 1.5 hours.

1.) Assemble the cabinet following the instructions located in the cabinets shipping box.
2.) When you complete assembly, place the cabinet in the location shown on the site print.
3.) Place all service materials shipped with the system in the service cabinet.

5.8 UPS Installation

If the site has an Uninterruptible Power Supply (UPS), please refer to UPS Installation manual. The manual is shipped with UPS kit.

Section 6.0
Gantry Cable Connections

6.1 Gantry Cable Connections

Please refer to Figure 3-2 for complete system interconnect details.

TO	FROM	CABLE DESCRIPTION
Gantry Power Pan	PDU	HVDC
Gantry Power Pan	PDU	440VAC
Gantry Power Pan	PDU	120VAC
Gantry Power Pan	Console	Fiber - *Take extreme care when you install the fiber optic DAS data cable. Do not step on, kink, or sharply bend this fragile DAS cable*.
Gantry Power Pan	Console	LAN
TGPG (J9)	Console	Control
TGPG (J11)	PDU	Control

Table 3-25 Gantry Cable Connections

1.) If using a rear cable entry box (B7850RC), install it now, before routing cables to gantry.

NOTICE

Potential for equipment damage.

Observe correct polarity when connecting the high voltage DC power. Reversing these leads will result in serious equipment damage. The HVDC positive conductors have red insulation and are labeled “ONE.” The HVDC negative conductors have black insulation and are labeled “TWO.” Lead “ONE” must be connected to lead “ONE,” and lead “TWO” must be connected to lead “TWO.”

Observe correct phase rotation when connecting the axial motor power. Phases one, two and three should be connected top to bottom.

2.) Install the cables to the gantry power pan. The power pan is located on the rear of the gantry at its base. See Figure 3-40 and Figure 3-41 for connections.

Note: The gantry 120VAC cable may not fit under the gantry frame. Install this cable before gantry placement—or remove the power plug—to route it under the gantry.

Figure 3-40 Gantry Power Pan Connections

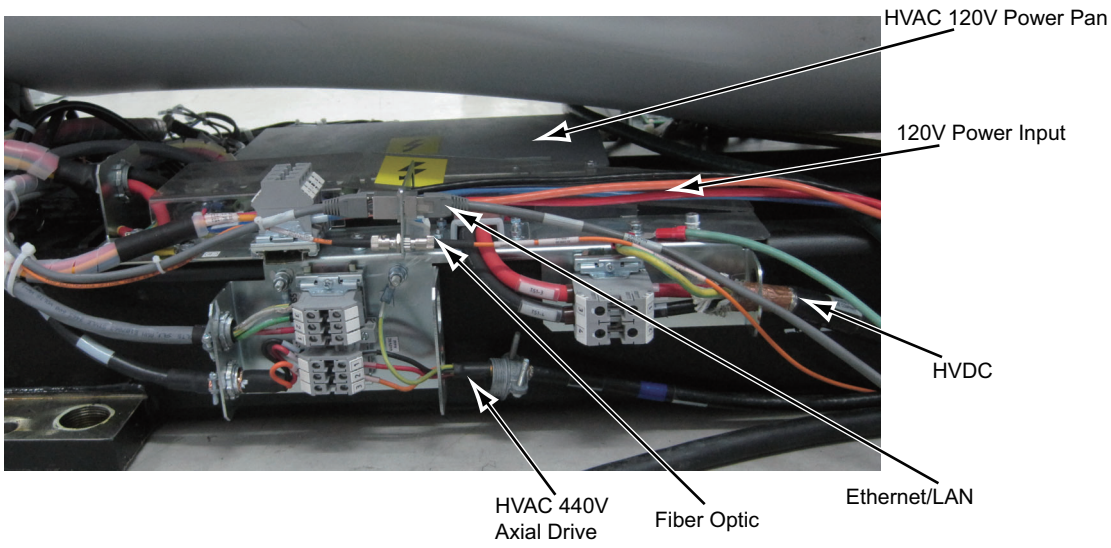
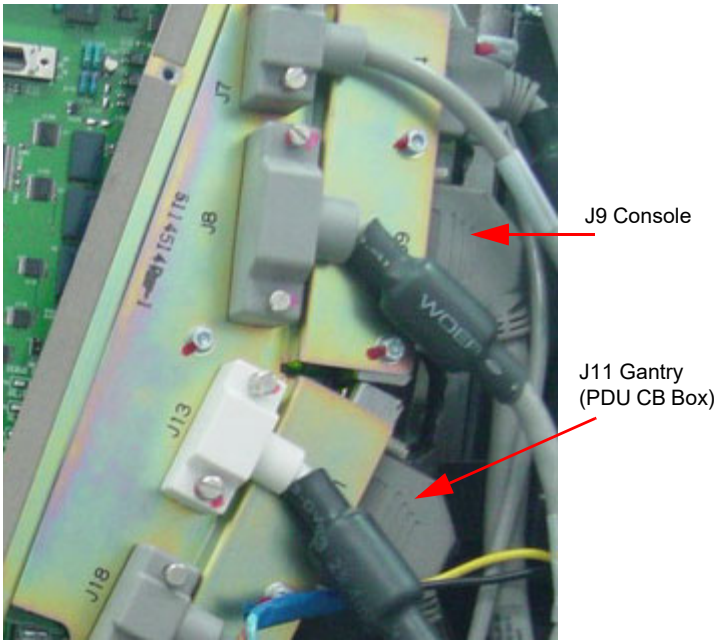


Figure 3-41 TGPG Connections

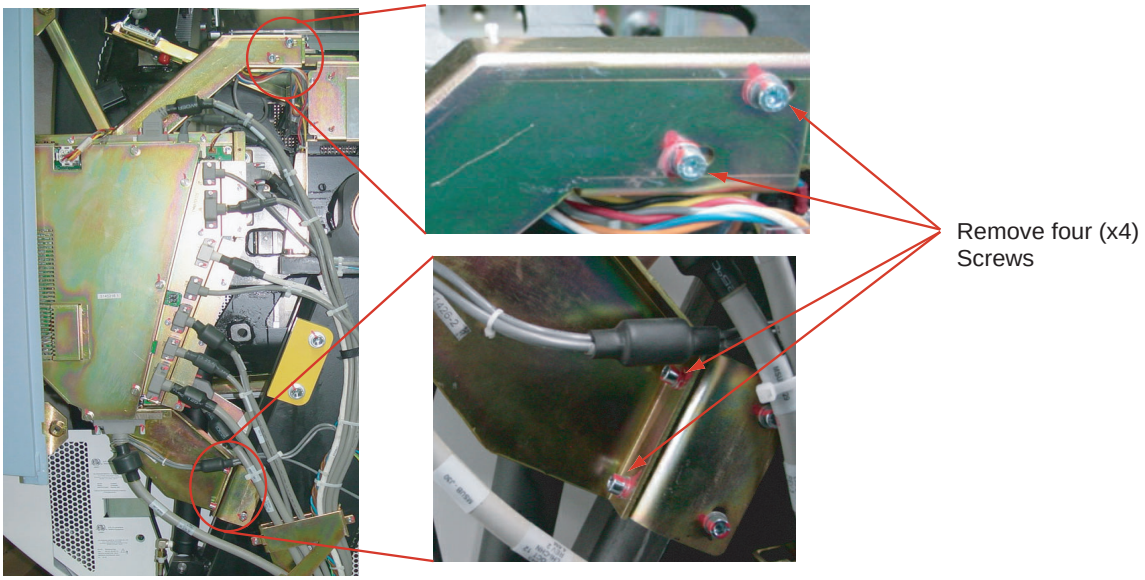


3.) Install cables to the gantry TGPG.

Note: If it's difficult to connect the cables to TGPG, follow below steps to take the TGPG outside the gantry frame (not remove the TGPG), so that it is easier to attach the cables to TGPG.

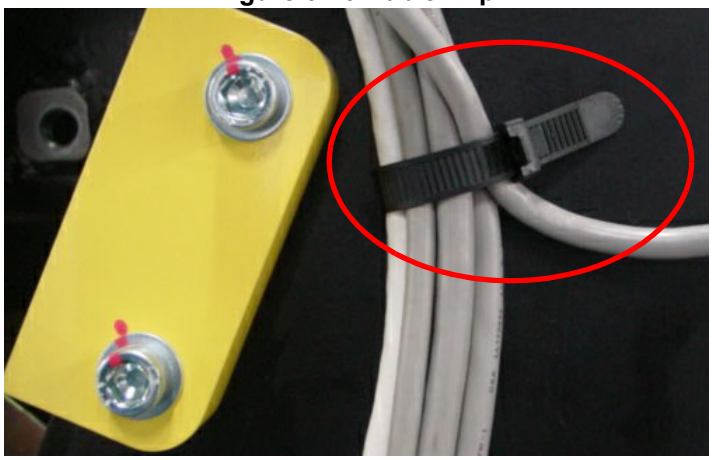
a.) Remove the four (4) screws which secure the TGPG assembly on the gantry frame. See figure shown.

Figure 3-42 TGPG Assembly On The Gantry Frame



b.) Loose the cable clip. See Figure shown.

Figure 3-43 Cable Clip

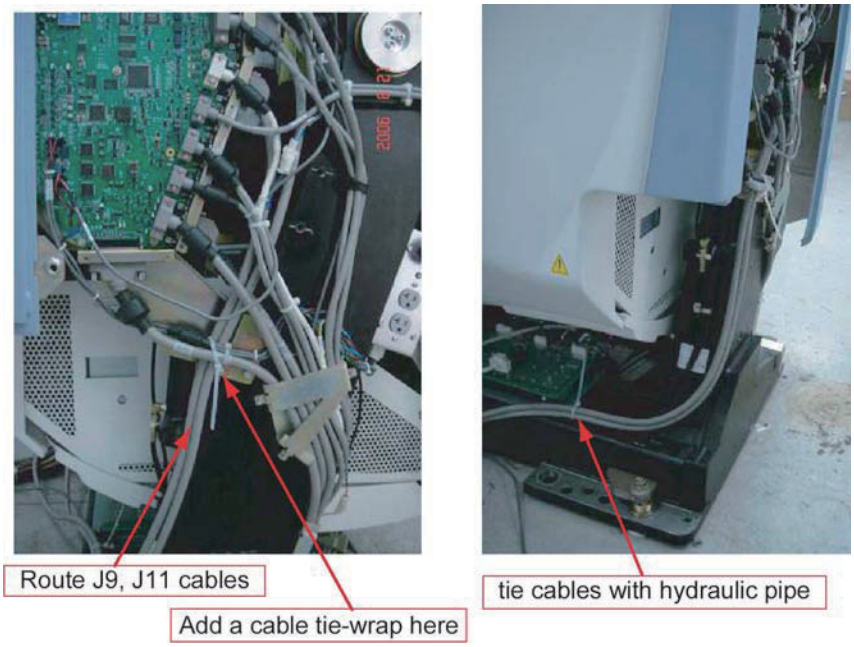


c.) Slightly rotate the TGPG outside, so that the cable receptacles on the TGPG is easier to access.

d.) Connect the cables on TGPG, then install the TGPG assembly with reversed order through step c) to a).

e.) Route J9 and J11 cables behind all cables at this area.

Figure 3-44 Route Cables



6.2 Accessory Monitor Setup

6.2.1 Cardiac Monitor

Note: The following procedure is applied only if the Accessory I/F Hardware (IPC) Option is installed.

1.) Follow install instructions shipped with monitor to set up the monitor stand with basket.

2.) After the stand is assembled, mount the monitor to the stand by sliding the monitor onto the plate.

3.) Pull down the front pin on plate and slide monitor until it snaps into place.

4.) Secure the monitor using the two nylon set screws under the plate.

5.) Connect the long CAT5 LAN cable between back side of Gantry option interface and Console EKG port.
The long CAT5 cable is included in IVY Monitor kit.

6.) Attach the cables. *Do not use the cables shipped with the monitor*, find the 5317480 cable included with the Cardiac Cable Kit (E8007TB).

⚠ **CAUTION** **The outlets are not for General Use. Gantry outlets have a rating for 3.0A at 120VAC. Accessories should not exceed above rating.**

7.) Connect the IEC power cord, ground wire, LEMO and CAT5 to the gantry option interface panel. (See Figure 3-45).

Figure 3-45 Gantry Option Interface Panel

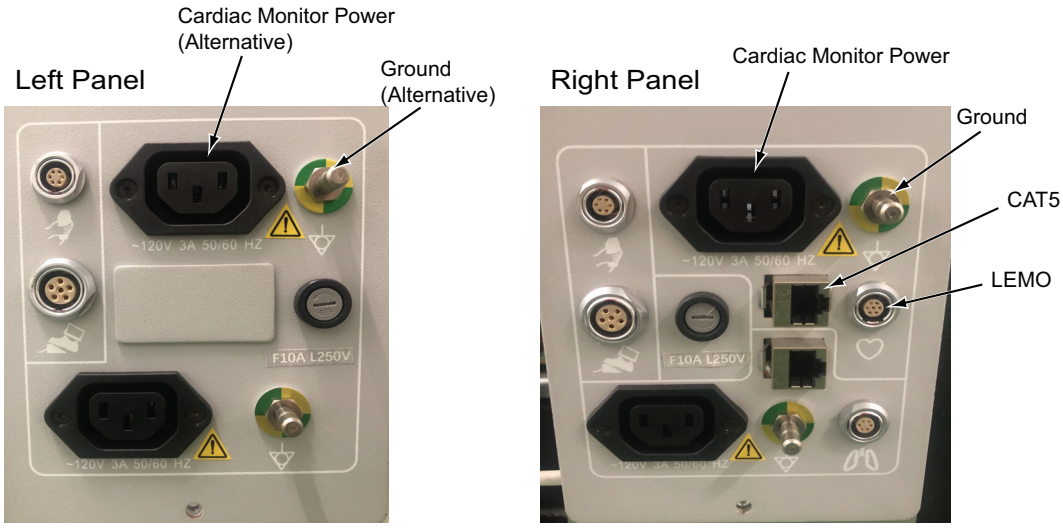


Figure 3-46 Connections on Rear of Cardiac Monitor (IVY7800)

8.) Connect the power cord, ground wire, HD15 and CAT5 to the monitor panel.(See Figure 3-46).

9.) The cardiac monitor receives power from the gantry.

10.) Strain relief the cables to the monitor stand, and to the gantry base covers using tie-wraps. (See Figure 3-47).

Figure 3-47 Cables Strain Relieved to Stand (example)

6.2.2 Respiratory Monitor

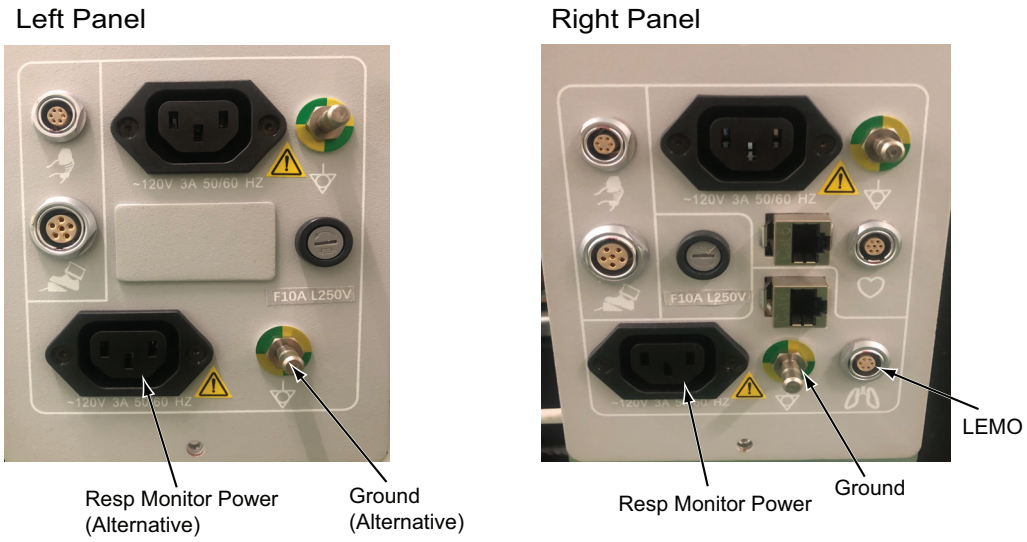
Note: The following procedure is applied only if the Accessory I/F Hardware (IPC) Option is installed.

Note: Installation of the Respiratory Monitor is done by Varian Service.

CAUTION **The outlets are not for General Use. Gantry outlets have a rating for 3.0A at 120VAC. Accessories should not exceed above rating.**

Power outlet, ground and LEMO connector for the Respiratory Monitor are provided as shown in Figure 3-48.

Figure 3-48 Respiratory Option Interface Panel



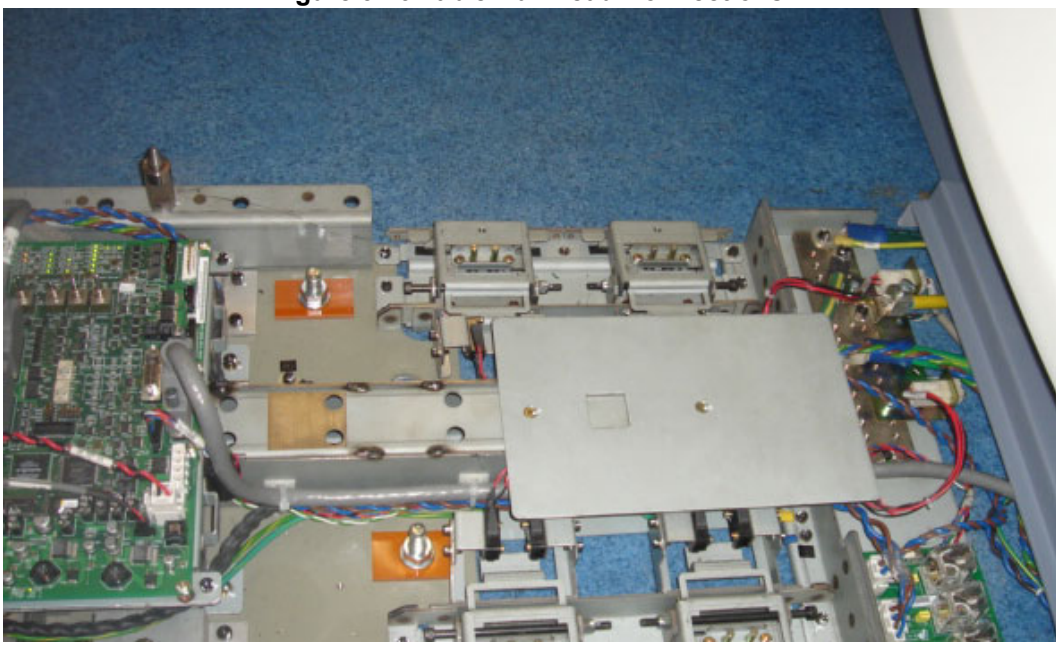
Section 7.0
Table Connections

Pull and connect the following cables:

J#	CABLE DESCRIPTION
J1	120 VAC
J9	Signal Cable

Table 3-26 Cables Connected to Table

Figure 3-49 Table Bulkhead Connections



Section 8.0
PDU Cable Connections & Configuration

CAUTION

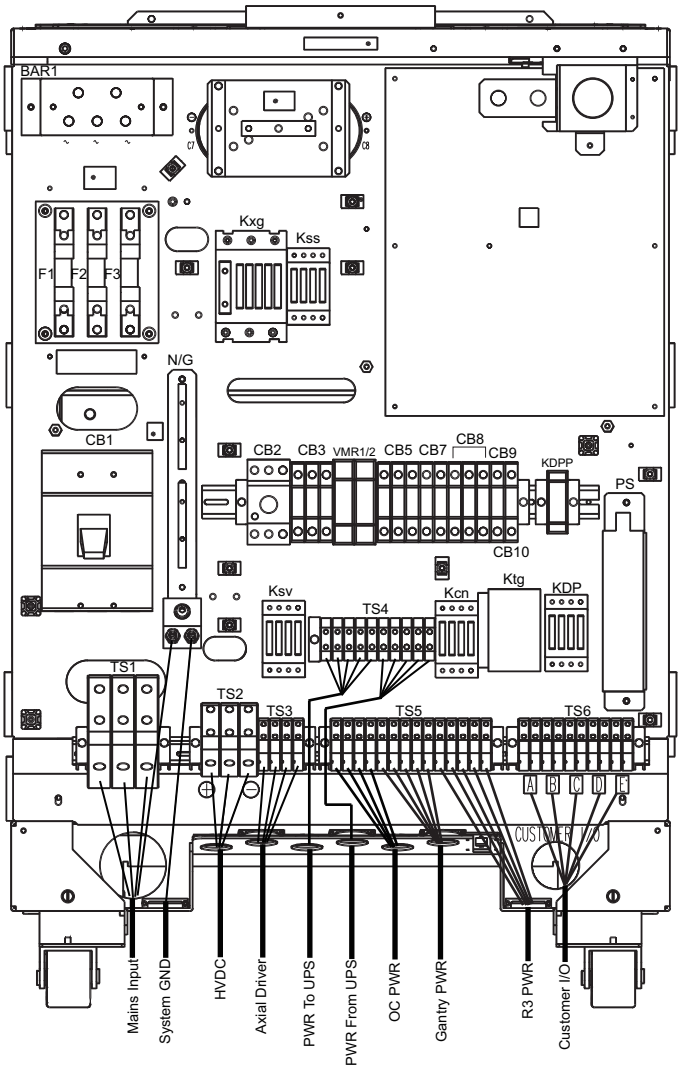
Do not work in an energized PDU. When working on the PDU, follow this simple rule: Always tag and lock out power to the PDU at the "main" disconnect. Failure to due so can result in electrocution or death.

Do NOT apply power to the PDU until all work has been completed and all PDU covers are in their proper place.

8.1 Introduction to NGPDU

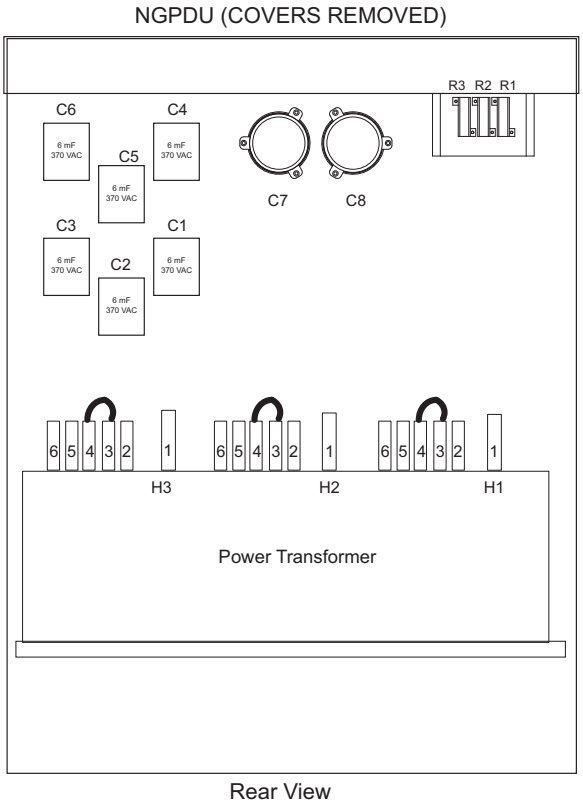
As seen in Figure 3-50, a number of cables must be installed throughout the PDU. Specific details on each connection can be found in the sub-sections that follow. Use Figure 3-50 for reference. The PDU has been designed to have cables routed into the PDU from behind and/or beneath it.

Figure 3-50 Cable Connections for PDU-71 - Front



HVDC	TS2-1	Red
	TS2-2	Gm/Yellow
	TS2-3	Black
Axial	TS3-1	Black
	TS3-2	Red
	TS3-3	Orange
	TS3-4	Gm/Yellow
OC Power	TS5-1	Brown
	TS5-2	Blue
	TS5-3	Gm/Yellow
CT Gantry	TS5-4	Black
	TS5-5	Red
	TS5-6	Orange
	TS5-7	Blue
	TS5-8	Gm/Yellow

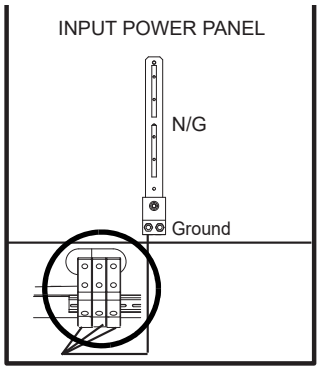
Figure 3-51 Cable Connections for PDU-71 - Rear



8.1.1 Panel - 380 - 480VAC Mains "TS1" Input Power Connection

1.) Remove the TS1 panel front cover.
2.) Strip the wires to fit securely on the power block.
3.) Observe incoming phases (L1, L2 and L3) and insert bare leads into power block.
4.) Insert "vault" ground into PDU "vault" ground lug.
5.) Tighten all fasteners securely and replace the TS1 front panel.

Figure 3-52 Input Power Panel Connections



When Mains power is available to the PDU, the "TS1" power light will be illuminated.

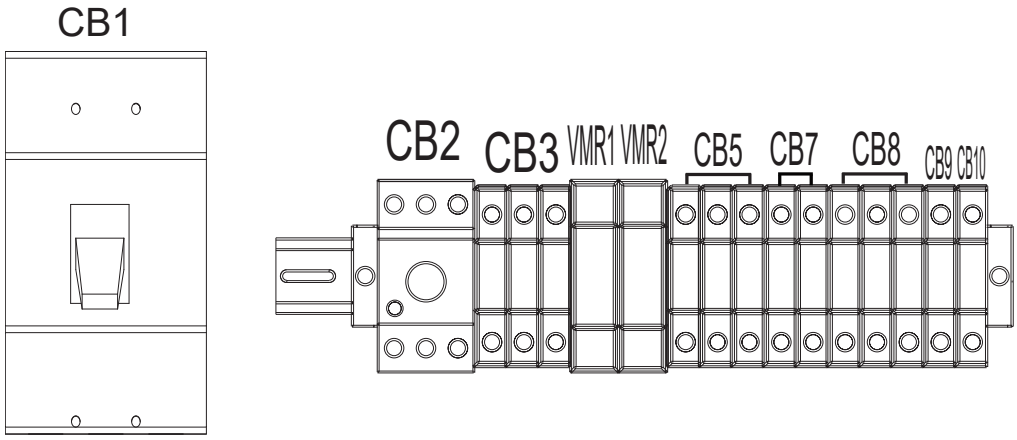
Figure 3-53 Power Torque Values

TS1 (Model-Phoenix)	Bolt/Hex
	12.91 ft-lb (17.5 N-m)
TS1 (Model-ABB)	**Bolt/Hex**
	6.82 ft-lb (9.25 N-m)

8.1.2 Panel - Circuit Breakers

Place the circuit breakers in the “off/down” position during installation, even with Mains incoming power tagged and locked out. After you have completed work on the PDU, you may return the circuit breakers to the “ON” positions.

Figure 3-54 Circuit Breaker Panel for PDU-71



By design, when CB3 is in the “OFF” position, circuit breakers 5, 7, 8, 9 and 10 are switched “OFF”. CB3 is essentially in series with these breakers.

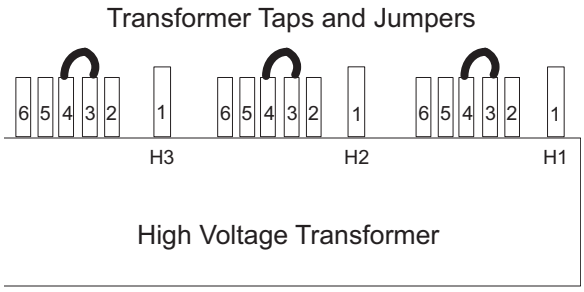
CIRCUIT BREAKER	DESCRIPTION
CB2	Circuit Protection (Axial Drive)
CB3	Fully Winding Protection (Master power of CB5, 7, 8, 9 and 10), 120 and 208 VAC
CB5	CT Gantry / CT Gantry option / PET Gantry
CB7	Operator Console
CB8	R3 Power
CB9	NGPDU Control Power Supply / Power monitor relay
CB10	Power monitor relay

Table 3-27 Panel Circuit Breaker Descriptions for PDU-71

8.1.3 Transformer (480VAC) Taps

Verify that the transformer taps are set properly. The transformer taps are set to 480 VAC operation at the factory. The taps should be set as shown in Figure 3-55.

Figure 3-55 PDU Tap Positions for 480 volt operation



Note: Taps should be shipped as shown for 480 VAC only. For all others, you must move the taps to correct position according to Table 3-28.

LINE INPUT CONDITIONS

1.) Monitor the No Load Line to line voltage at L1, L2, L3, during the workday. Do not record this data during "brown out" conditions.

2.) After you determine the nearest nominal line, verify the tap connections match (refer to Table 3-28 PDU Line Tap Connections for tap locations)

3.) Verify that the No Load Line to Line Voltage never falls outside the corresponding minimum and maximum values listed in Table 3-28)

4.) Use a 0-750 AC voltmeter of 3/4% accuracy to measure the line-to-line voltages at L1, L2 and L3.

WARNING **THIS PROCEDURE MEASURES POTENTIALLY HAZARDOUS VOLTAGES. USE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES**.

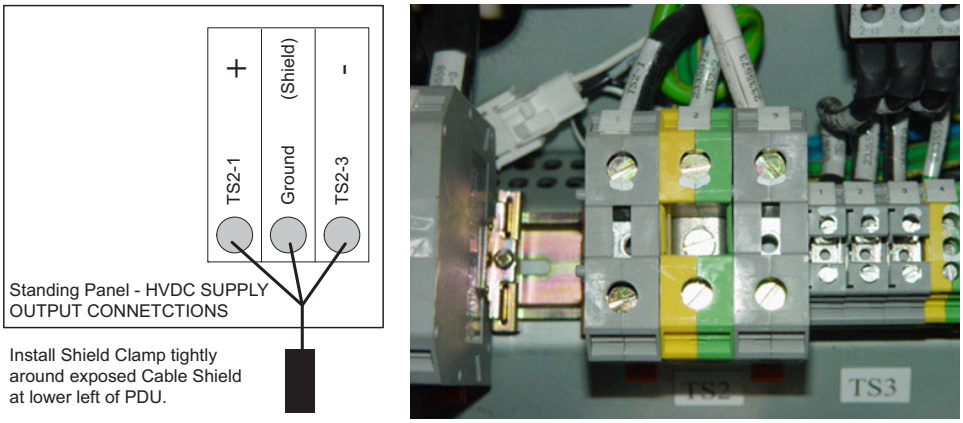
NO LOAD Line to Line Voltages		**TAP CONNECTIONS** (All 3 phases must have same the configuration)		
Nominal	Maximum Range (10%)	Phase A Connection	Phase B Connection	Phase C Connection
480V*	432 to 528*	3-4*	3-4*	3-4*
460V	414 to 506	3-5	3-5	3-5
440V	396 to 484	3-6	3-6	3-6
420V	378 to 462	2-4	2-4	2-4
400V	360 to 440	2-5	2-5	2-5
380V	342 to 418	2-6	2-6	2-6
240V	216 to 264	1-4	1-4	1-4
220V	198 to 242	1-5	1-5	1-5
200V	180 to 220	1-6	1-6	1-6
* Factory Default				

Table 3-28 PDU Line Tap Connections

8.1.4 HVDC Connection (TS2)

Connect the internally shielded HVDC cable to TS2 on the standing panel. See Figure 3-50 for the location of the connector and Figure 3-56 for details. Observe polarities and grounds.

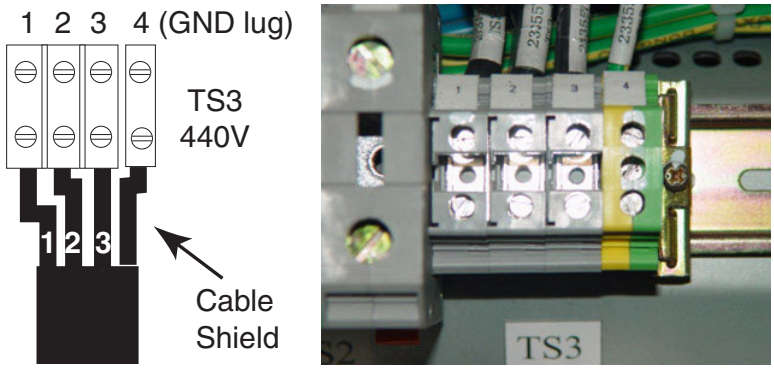
Figure 3-56 HVDC Connection



8.1.5 440V Connection (TS3)

Connect the internally shielded 440V cable from the gantry to TS3 on the panel. See Figure 3-50 for the location of the connector and Figure 3-57 for details. Observe the labels on the cable leads for proper identification and orientation.

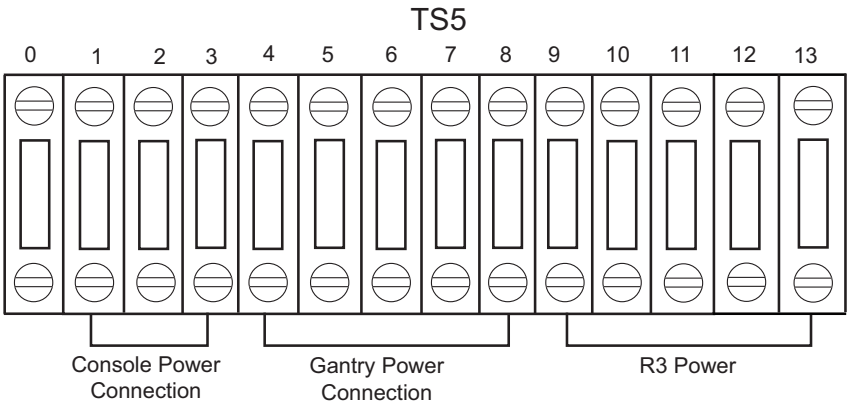
Figure 3-57 440VAC Connection



8.1.6 Gantry & Console Power Connections (TS5, 120V)

Both Gantry and Console power cables come pre-terminated. Plug the console power cable wires to TS5, 1-3 and the gantry power cable wires TS5, 4-8 as shown in Figure 3-58 (pdu-71).

Figure 3-58 Gantry & Console Power Connections for PDU-71



8.1.7 Console Power Cable Re-termination

Power cable re-termination should be used as a last resort. Short and long cables are available.

1.) Carefully remove the power plug and **record the color of the wires** in Table 3-29. The terminals are labelled X, W and G on the plug.

TERMINAL	X	W	G
Description	Hot	Neutral	Ground
Color			

Table 3-29 Console Power Cable Termination

2.) Cut the cable to desired length and dress ends.

3.) Re-install the power plug, according to the orientations recorded in Table 3-30.

4.) Verify that less than 1 ohm of resistance exists between the following connections:

FROM PDU PLUG	TO CONSOLE PLUG END	
CB1 -11 (J5 Phase X)	Phase X	☐ Check box when complete
A3 Neutral Buss Bar (J5 -13 Phase W)	Phase W Neutral	☐ Check box when complete
A3 Ground Buss Bar (J5 -22 Ground)	Ground Ground Green screw	☐ Check box when complete

Table 3-30 Resistance Verification Points

8.1.8 PDU Control Cable

The PDU control cable comes pre-terminated and should not be re-terminated in the field. Excess cable length must be stored. Simply plug the cable into “J2” on the “A4” panel. Secure it by using the fasteners intergrated into cable’s connector shell.

8.1.9 System Ground Connection

Connect the ground wire (green with a yellow strip) from the Table/Gantry raceway ground bus to the system ground lug in the PDU. See Figure 3-50, and Figure 3-59 below.

Figure 3-59 PDU System Ground Connection

Main Ground	Bolt/Hex
	22.87 ft-lb (31.0 N-m)

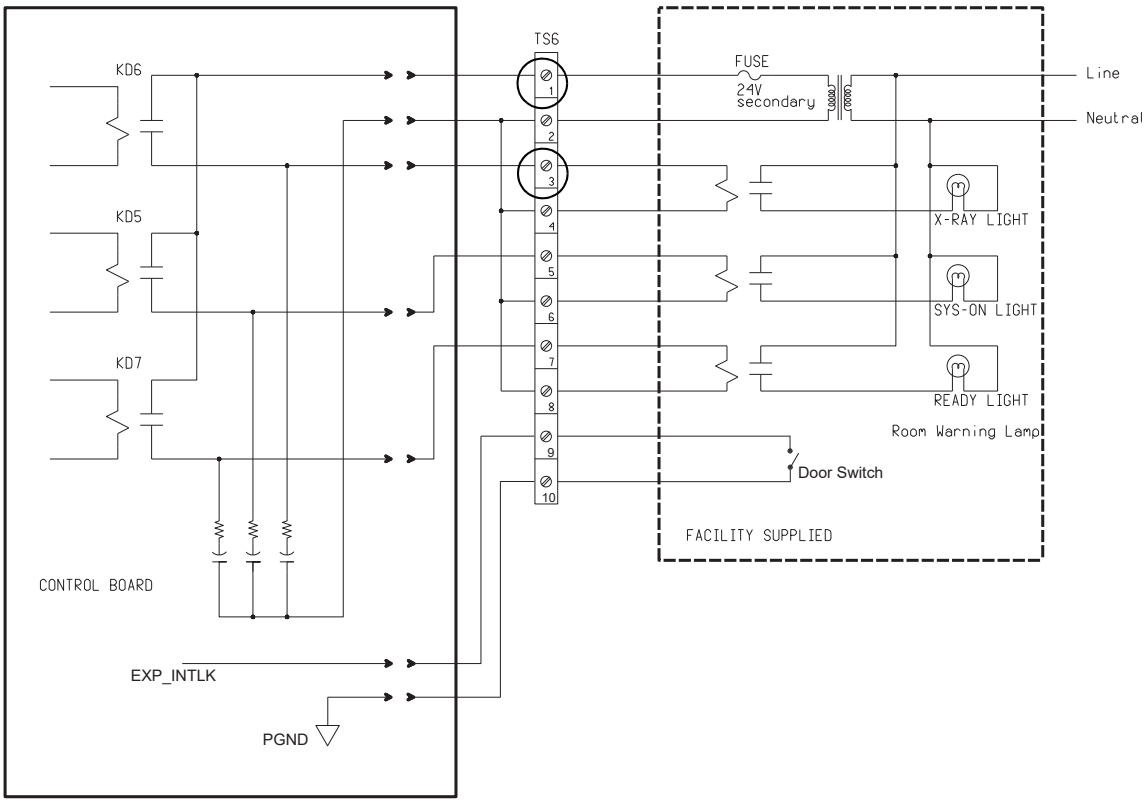
8.1.10 Warning Light & Door Interlock Connections

8.1.10.1 Warning Light Configuration & Connection

1.) Warning Light is controlled by signals from the system.

2.) This step is site specific. The PDU by default is configured for “no” external warning light connection. If you have external warning lights, see Figure 3-60 for proper connection.

Figure 3-60 Typical TS6 Warning Light & Door Interlock Connections



It is recommended that you use the four (4) wire method of adding an X-ray warning light to a room, as shown in Figure 3-60. When using this method, you:

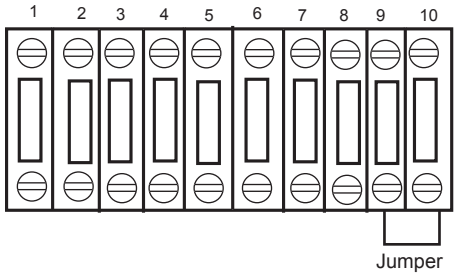
- Minimize EMC interference.
- Increase contact life of the relay used in the PDU.

8.1.10.2 Door Interlock Connections

Door interlocks are used to prevent X-Rays from being generated when the scan room door is open.

The Door Interlock circuitry in the PDU is shipped from the factory engaged. This means the system cannot generate X-ray until disengaged. A short must exist between pins 9 & 10 for X-ray to be generated. Using a small piece of wire, short pins 9 and 10 together, see Figure 3-61.

Figure 3-61 Without a Door Interlock

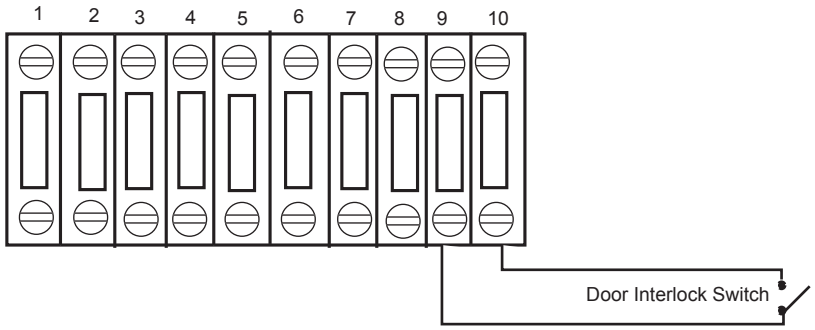


If not using a door interlock switch, add a jumper.

Note: If jumper is not in place, exposures will not be made. Check this jumper if you get scan interlock errors.

To use the system with a a door interlock switch, wire a normally open switch between pins 9 & 10 that is attached to the interlock.

Figure 3-62 With a Door Interlock



8.1.11 Torque Value

Tighten all fasteners securely.

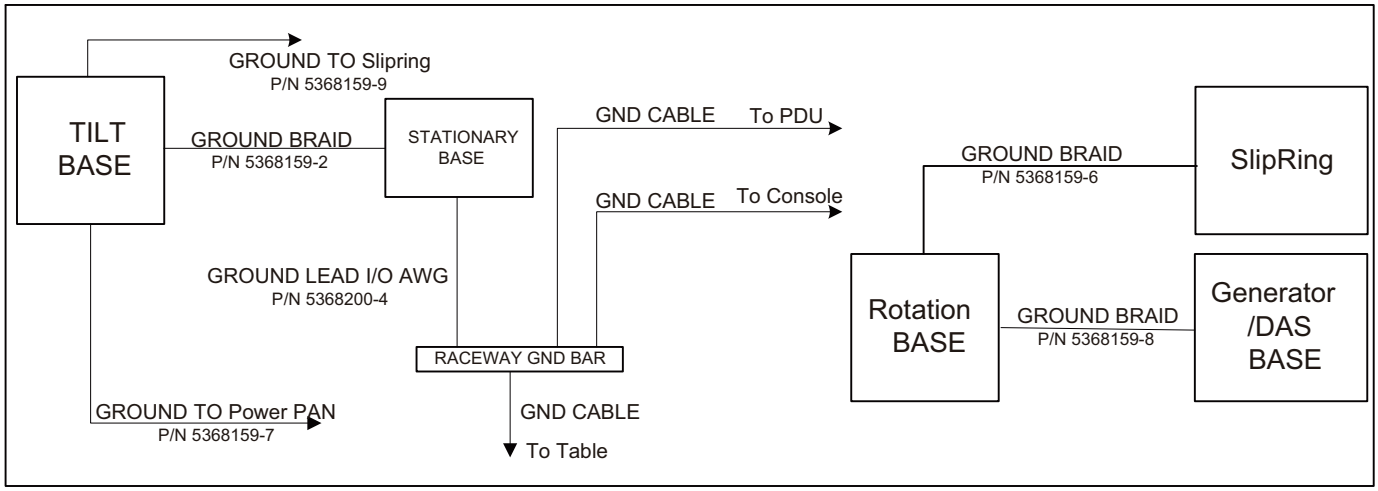
TERMINAL NO.	MODEL-PHOENIX			MODEL-ABB		
	P/N	MODEL	TORQUE	P/N	MODEL	TORQUE
TS1	5324772	UKH95	12.9ft-lb (17.5N-m)	5795116	ZS95	6.8ft-lb (9.25N-m)
TS2	5324755; 5324758	UKH50; USLKG50	5.2ft-lb (7N-m)	5807667; 5807668	ZS70; ZS70-P	4.8ft-lb (6.5N-m)
				5795117; 5795118	M35/16; M35/16.P	2.2ft-lb (3N-m)
TS3/4/5	5324773; 5324757	UK16N; USLKG16N	1.2ft-lb (1.6N-m)	5795119; 5795120	M16/12; M16/12.P	1.0ft-lb (1.4N-m)
TS6	5324774	UK10N	1.2ft-lb (1.6N-m)	5795121	M10/10	1.0ft-lb (1.4N-m)

Table 3-31 PDU Terminal Torque Values

Section 9.0
System Ground Connections

As seen in Figure 3-63, the Table/Gantry raceway ground bus is used to centralize all system grounding. The system ground is tied to vault ground at the Power Adapter, through its chassis.

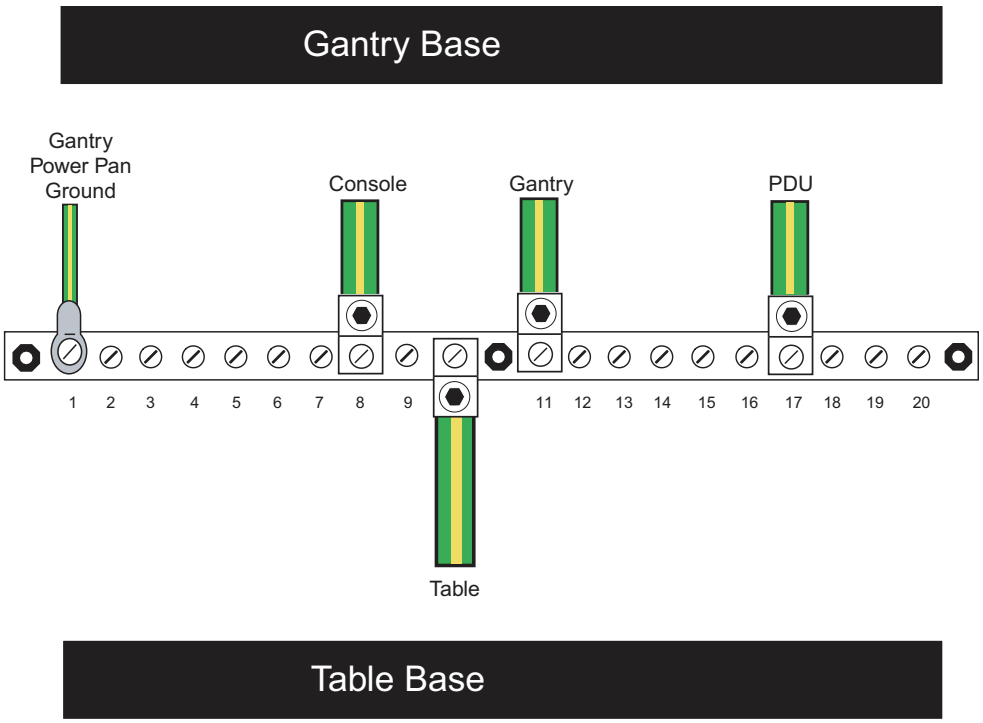
Figure 3-63 CT System Ground Connections



The gantry is tied to system ground at a number of points. It is important that all of these ground connections are securely made. See Figure 3-64.

Check that the terminals will not be loosened, by moving or swinging the cables rather strongly by hand.

Figure 3-64 Table/Gantry Raceway Bus - Grounds



Various types and sizes of wire are used to ground the system. Please use the type and sizes specified in Table 3-32, below.

AWG #	CONNECTION TO	CONNECTION TO
#1/0	Power Adapter	Power Main
#2	Console	Raceway
#1/0	Gantry	Raceway
#2	Table (frame)	Raceway
#1/0	Power Adapter	Gantry Frame

Table 3-32 System Ground Connections

Page Left Intentionally Blank

Chapter 4
System Continuity & Ground Checks

NOTICE **Potential for Data Loss and/or Equipment Damage**

To prevent potential data loss and equipment damage, please do the following:

- **When instructed, record data collected from the procedures in this chapter on GE Form e4879. For more information about this form, see Section 8.0 of Chapter 5.**
- **Only use the Installation manual that arrives with your system for installation. Any other revisions of this manual may not exactly match your system.**

Section 1.0
System Continuity & Ground Checks (Mechanical Contractor Task)

Use this section to check cable and ground connections.

1.1 Tools Required

- Digital VOM
- 10m (30 ft) of #18 wire
- 600 VAC meter leads

1.2 Procedure

Reference Figure 4-1: Front View of NGPDU, with Covers Removed on page 233 and Figure 4-2: Gantry Power Pan on page 233.

WARNING **USE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES; LOCK OUT WALL POWER.**

1.) Remove all System Power at the A1 Mains Disconnect Panel. Follow Lockout/Tagout procedures.
2.) Put the UPS in the Service Position.
3.) Remove the Power Adapter input power panel cover.
4.) Verify, with a voltmeter, that mains power is disconnected.
5.) Verify that less than 1 ohm of resistance exists between the following ground connections:

Table 4-1 Mains Connections to Power Adapter

FROM	TO	
Wall ground connection	Power Adapter Cabinet	☐ Check box when complete

6.) Verify that less than 1 ohm of resistance exists between the following connections:

Table 4-2 Resistance Verification Points

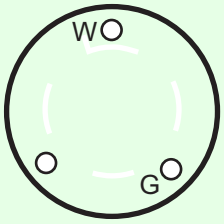
FROM	SIGNAL NAME (COLOR)	TO	
PDU TS2-1	+HVDC	Gantry HV Power Pan TS1-1	☐ Check box when complete
PDU TS2-2	HVDC Ground	Gantry Power Pan Chassis	☐ Check box when complete
PDU TS2-3	-HVDC	Gantry HV Power Pan TS1-2	☐ Check box when complete
PDU Ground Bus	HVDC shield	Gantry HVDC cable shield	☐ Check box when complete
PDU TS3-1	Axial drive 440vac	Gantry HV Power Pan TS2-1	☐ Check box when complete
PDU TS3-2	Axial drive 440vac	Gantry HV Power Pan TS2-2	☐ Check box when complete
PDU TS3-3	Axial drive 440vac	Gantry HV Power Pan TS2-3	☐ Check box when complete
PDU TS3-4	Axial drive ground	Gantry Power Pan Chassis	☐ Check box when complete
PDU Ground Bus	Axial drive shield	Gantry 440 VAC cable shield	☐ Check box when complete
PDU TS5-1	120vac Phase A	Console Power Plug: 	☐ Check box when complete
PDU TS5-2	120vac Neutral		☐ Check box when complete
PDU TS5-3	Ground		☐ Check box when complete
PDU TS5-4	120vac Phase A	Gantry HV Power Pan TS4 - L1	☐ Check box when complete
PDU TS5-5	120vac Phase B	Gantry HV Power Pan TS4 - L2	☐ Check box when complete
PDU TS5-6	120vac Phase C	Gantry HV Power Pan TS4 - L3	☐ Check box when complete
PDU TS5-7	120vac Neutral	Gantry HV Power Pan TS4 - N	☐ Check box when complete
PDU TS5-8	Ground	Gantry Power Pan Chassis Ground Stud	☐ Check box when complete

Figure 4-1 Front View of NGPDU, with Covers Removed

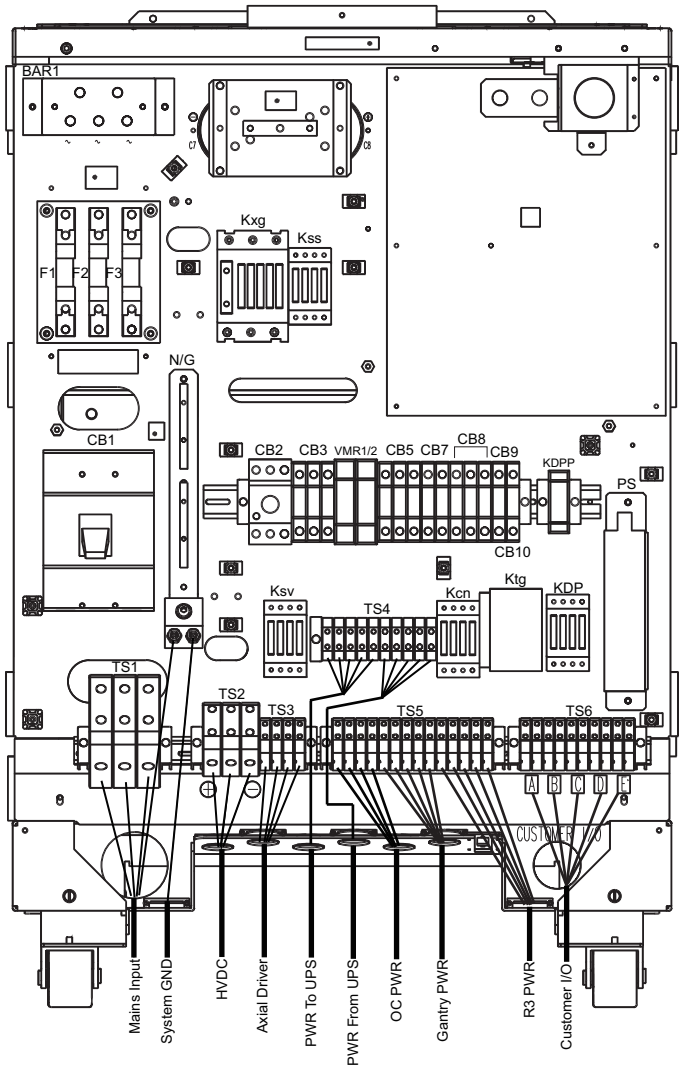
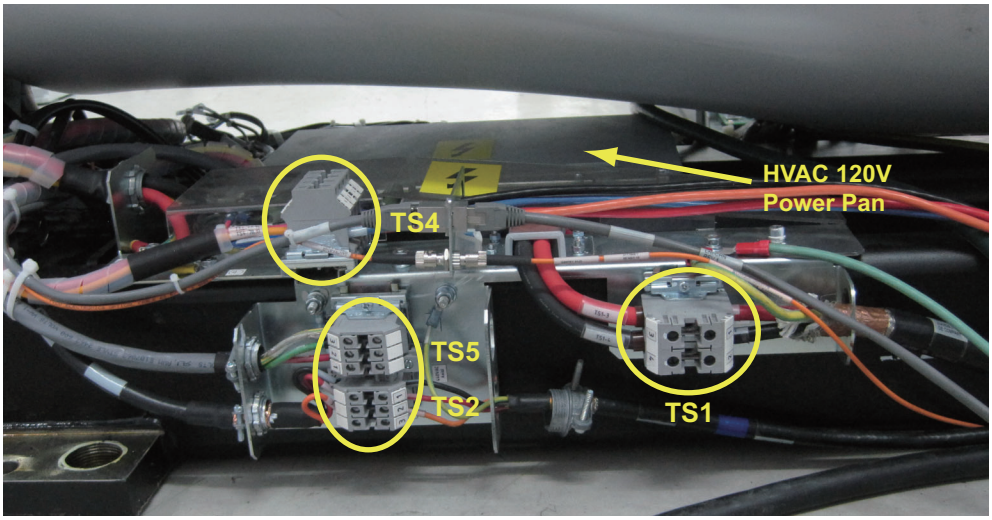


Figure 4-2 Gantry Power Pan



WARNING **TURN OFF ALL PDU CIRCUIT BREAKERS.**

7.) Set an ohmmeter to the lowest scale. Check between the following points for shorts to ground. Verify no continuity exists between the following points:

Table 4-3 No Continuity Verification Points

FROM PDU	TO A1 BREAKER BOX	
TS2-1 (+HVDC)	vault ground	☐ Check box when complete
TS2-3 (-HVDC)	vault ground	☐ Check box when complete
TS3-1 (440vac output)	vault ground	☐ Check box when complete
TS3-2 (440vac output)	vault ground	☐ Check box when complete
TS3-3 (440vac output)	vault ground	☐ Check box when complete

8.) Leave the metal cover off the PDU A3 input power panel until you complete the checks in the next section.

Section 2.0
Site Ground Continuity Check

1.) Use an ohmmeter to verify the presence of **less than 1.0 ohm of resistance** between each of the following points:

Table 4-4 Resistance Verification - Site Ground

FROM	TO	
PDU Ground Bus	Vault Ground	☐ Check box when complete
PDU Ground Bus	Table/Gantry raceway ground point	☐ Check box when complete
Table/Gantry raceway ground point	Gantry Chassis	☐ Check box when complete
Table/Gantry raceway ground point	Table Chassis	☐ Check box when complete
Table/Gantry raceway ground point	Operator Console Chassis	☐ Check box when complete
All Display or Computing Options (if any)	Operator Console Chassis	☐ Check box when complete

2.) Install remaining covers on the:

- Gantry
- Table
- Console
- PDU

Section 3.0
Mechanical Installation Completion Section

Complete the *Mechanical Installation* section of the GE e4879 and turn it over to your site FE. The electronic file for the checklist is found on the Optima CT520 Series and Optima Advance Service Information 5457941-8EN from SIMS Content Viewer. The electronic checklist is also located in the downloadable forms directory of the SIMS Content Viewer.

This Page Intentionally Blank.

AppendixA
Removal & Installation of Covers

NOTICE **Follow all required safety and PPE procedures customary for your organization, when working on this product.**

Tools and Test Equipment:

- Front and rear cover dollies
- Hex wrench set

Section 1.0
Gantry Scan Window

CAUTION **Potential for Equipment Damage. The cones of the front and rear gantry covers must be aligned within specification to ensure proper scan window fit. If the scan window is not fit properly, fluids can get into the collimator and detector, causing image artifacts or permanent damage.**

This procedure assumes the front and rear covers are installed.

1.) Grab the window at the top and pull firmly downward.

2.) Pull the scan window down from the top center and then grasp both sides of the scan window, move them together and lightly pull upward, until you can free the window from between the front and rear coves. See Figure A-1.

Note: You may need to use the tip of a flat blade screwdriver to pull down the top edge of the scan window away from the cover in order to grab it with your fingers. Be careful not to push the screwdriver in too far as the gasket can be damaged.

Figure A-1 Scan Window

Section 2.0
Gantry Side Covers

2.1 Side Cover Removal

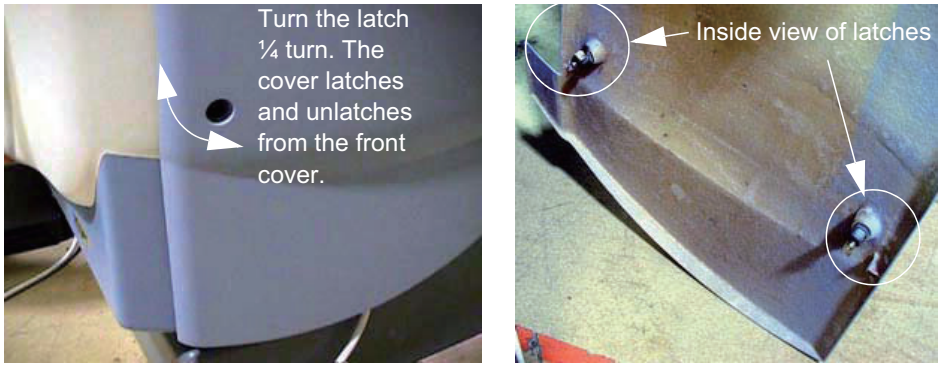
1.) If removing side cover in preparation for front cover removal, move the table to its lowest position before powering off gantry.

CAUTION **Potential for injury if covers removed and power is left "ON".**

Always remove the right side cover first, and turn OFF power at the Service Switch Panel.

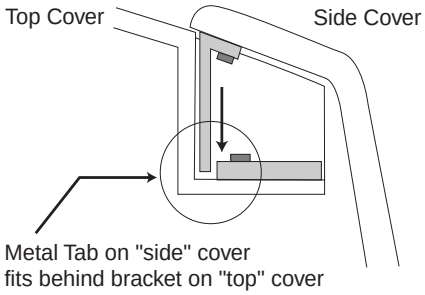
2.) Use an 8mm Hex wrench, turn the latch ¼ turn to latch and unlatch the side cover from the front cover and the rear cover. See Figure A-2.

Figure A-2 Side Cover Latches



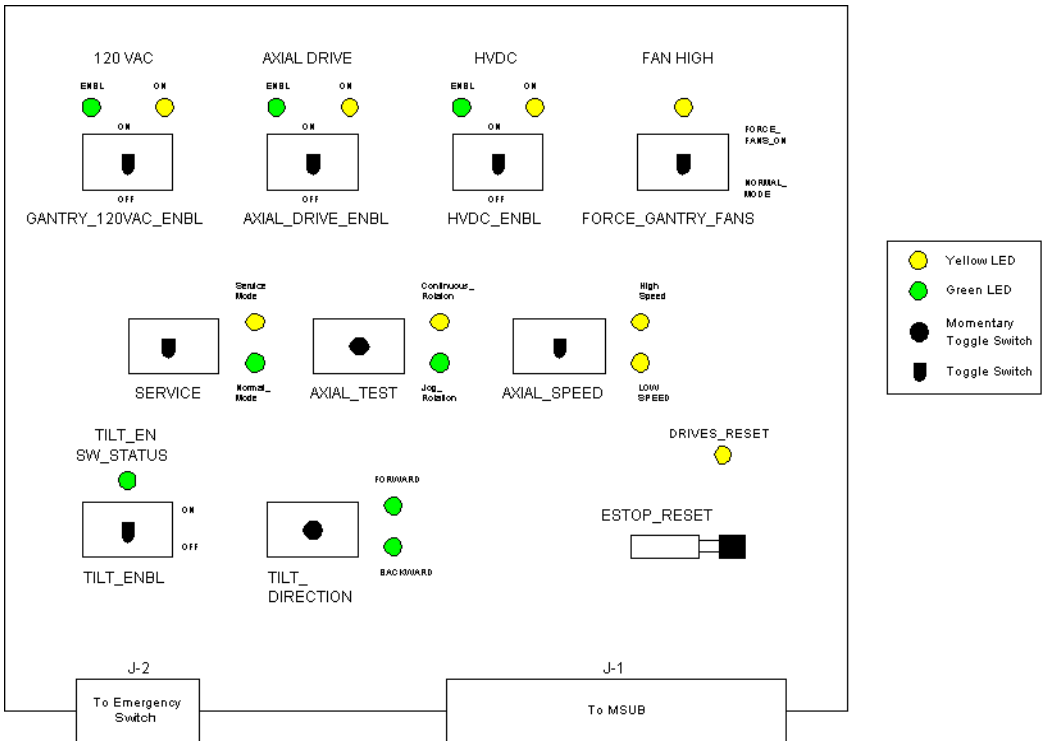
3.) Remove the right side cover by lifting it upward to release the two (2) latches, located on the top edge of the cover.

Figure A-3 Side and Top Cover Clasp



4.) Turn OFF the **HVDC**, **120 VAC**, and **AXIAL DRIVE** power switches on the gantry service switch panel (see Figure A-4).

Figure A-4 Gantry Service Switches



5.) Repeat steps 1-3 for the left side cover.

2.2 Side Cover Installation

1.) To install a side cover, place it over the top cover and let the two (2) side cover latches slide behind the metal tabs, located on the top cover. See Figure A-3.

2.) Use Hex wrench to secure the side cover to front cover by turning the bolts a quarter turn. See Figure A-2.

Section 3.0
Gantry Top Covers

3.1 Top Cover Removal

CAUTION **Potential for Shock.**
Voltage may be present. Potential for injury if covers removed and power is left ON. Always remove the right side cover first, and turn OFF power at the service switches.

1.) Remove the gantry right side cover (see Gantry Side Covers Removal and Re-install).

NOTICE **Always turn OFF the HVDC before the 120 VAC. Turning OFF 120 VAC power before HVDC power can result in equipment damage.**

2.) Turn OFF the **HVDC**, **120 VAC**, and **AXIAL DRIVE** power switches on the gantry service switch panel (see Figure A-4).

3.) Disconnect the power cable that connects the fan on the top cover to the gantry.

Note: The cooling fans are now mounted on the top covers, one on each.

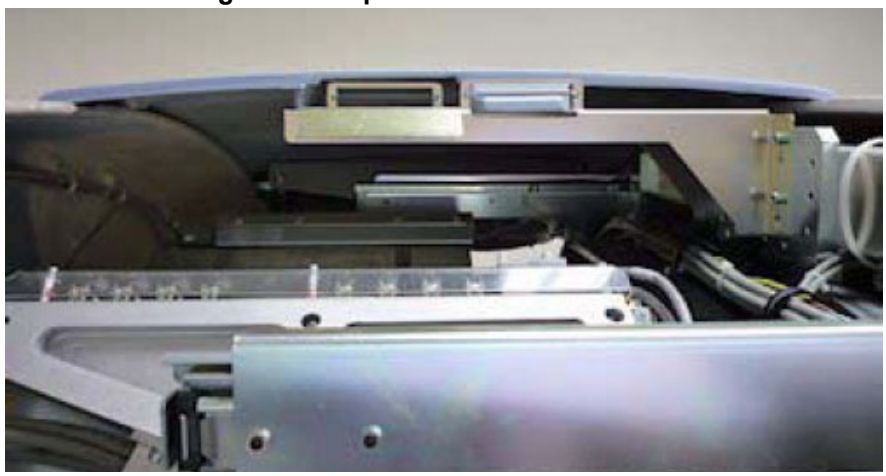
4.) Loosen the 2 Phillips screws which secure the top cover with the front and rear covers.

Figure A-5 Top Cover Mounting Screws

5.) Take the end of the top cover nearest to the side cover and tilt upwards.

6.) Slide the cover down to disengage the tab from the mounting bracket. See Figure A-6.

Figure A-6 Top Cover Tabs and Bracket



7.) Lift the cover clear and repeat the above steps for the other cover.

3.2 Top Cover Installation

The top cover consists of two (2) pieces. Install the front and rear gantry covers, if not already installed. See Section 4.0 on page 243, and Section 5.0 on page 256.

1.) Take one of the top covers and align the tabs on the cover with its associated bracket. Lift and slide the cover into place. Position the cover to fully engage the fan interlock switch. Secure the cover using 2 Phillips screws.

2.) Take the other top cover and align the tabs on the cover with its associated bracket. Lift and slide the cover into place, while being sure to engage the fan interlock switch. Secure the cover using 2 Phillips screws.

3.) Connect the cable from the fans to the gantry.

NOTICE **Always turn OFF the HVDC before the 120 VAC. Turning OFF 120 VAC power before HVDC power can result in equipment damage.**

4.) Turn on the three (3) power switches.

5.) Ensure fans work properly.

6.) Re-install the gantry side covers.

Section 4.0
Gantry Front Cover

NOTICE **Potential for cover damage.**

Front and rear cover removal and installation can be safely accomplished by one (1) person using the dollies provided with the system. Failure to use these dollies will significantly increase the likelihood of damage to the covers. Do not lean covers against walls.

4.1 Front Cover Dolly Setup

DANGER **DO NOT USE DOLLIES ON UNEVEN SURFACES SUCH AS STEPS OR ELEVATOR THRESHOLDS. THE DOLLIES ARE DESIGNED TO BE USED ON FLAT LEVEL FLOORS WITHIN THE SCANNING SUITE ONLY. MISUSE CAN RESULT IN PERSONAL INJURY OR DAMAGE TO COVERS OR OTHER FACILITY ITEMS.**

CAUTION **Rotating arms on the stand are supposed to be stiff. If they fall freely, tighten the tensioning nuts. Loose rotating arms will reduce the stability of the dollies when supporting the front cover. Do not lubricate.**

1.) Arrange Dolly sections for assembly. The base and post can be assembled only one way. Refer to Figure A-7 and Figure A-8.

- The base uses two (2) palm screws to clamp the four (4) legs in the open or usage mode.
- The base also uses the same palm screws to prevent the legs from falling in storage mode.
- The top post can be inserted in either base and is keyed for proper engagement.
- The top post locking pin prevents the sections from separating during usage.

Figure A-7 Front Cover Dolly in Storage Mode

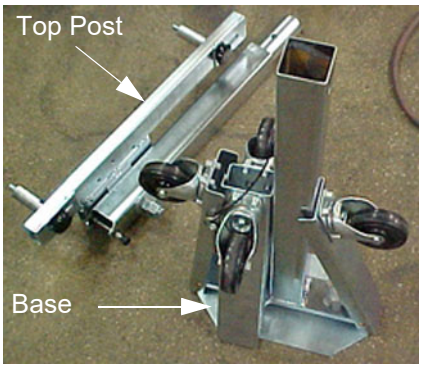
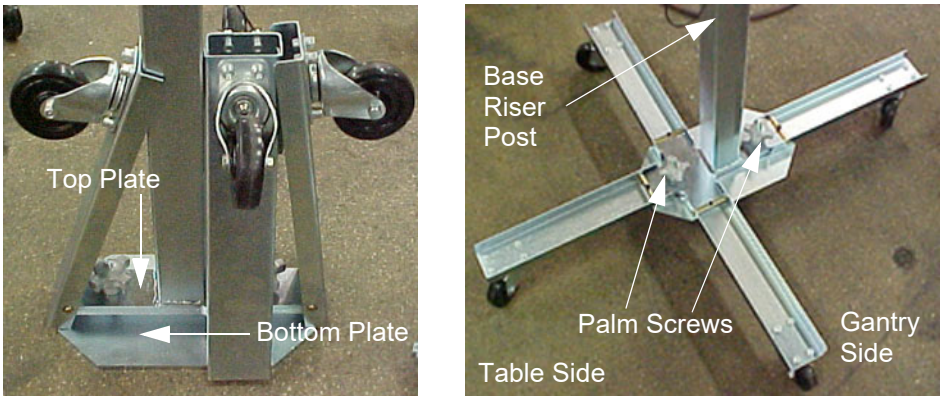


Figure A-8 Front Cover Dolly Base Assembly



2.) Unfold the base legs by loosening both palm screws to the top of their travel.

3.) Carefully unfold the legs so that the castors touch the floor.

4.) Tighten the palm screws to clamp the legs between the base top and bottom plates.

Note: Lifting the base by the riser post while leaving the castors on the floor will ease palm screw tightening. Reference Figure A-8.

WARNING **ENSURE BOTH PALM SCREWS ARE TIGHTENED SECURELY AND THE LEGS ARE CLAMPED TIGHTLY BETWEEN THE BASE TOP AND BOTTOM PLATES. FAILURE TO DO SO WILL RESULT IN INSTABILITY DURING FRONT COVER HANDLING.**

5.) Insert top post into the base riser post. Align the key for complete engagement.

6.) Insert top post locking pin to secure both top and bottom sections.

7.) Reverse above steps to disassemble.

Note: For base storage only one (1) palm screw needs to be tightened. This will engage the bottom base plate and the leg ends preventing the legs from unfolding during transport and storage.

4.2 Removal

1.) Position the table at its lowest position.

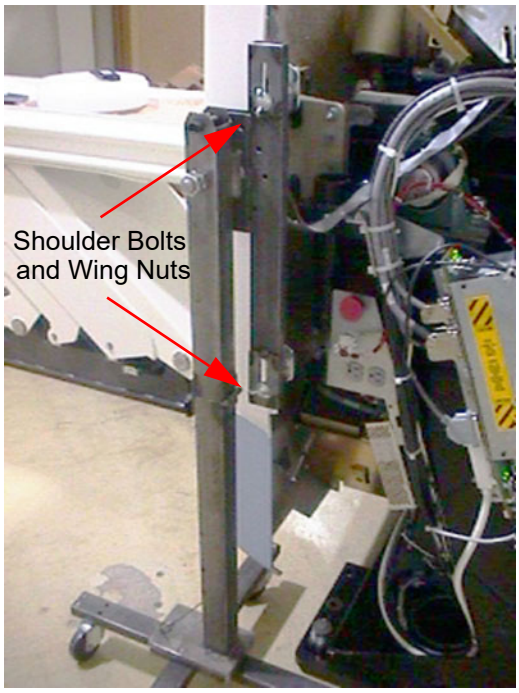
NOTICE **Always turn OFF the HVDC before the 120VAC. Turning OFF 120VAC power before HVDC power can result in equipment damage.**

2.) Remove gantry side and top covers, if you have not already done so. See Section 1.0 on page 237. Make sure that the three (3) power switches have been turned off. See Figure A-4.

3.) Assemble the front cover dolly.

a.) Tighten the two (2) shoulder bolts to the gantry securely. This will make cover installation easier. See Figure A-9.

Figure A-9 Front Side Dolly



b.) Attach side dolly to the shoulder bolts and secure assembly with two (2) wing nuts.

c.) Repeat steps a and b to assemble the other side dolly.

4.) Detach front cover J1 and J3 and front cover LAN cables.

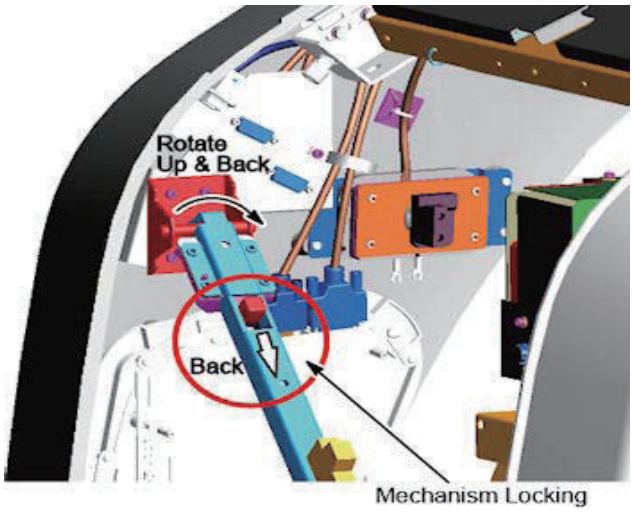
Figure A-10 Front Cover Cables

5.) Remove the Mylar (scan) window.

6.) Remove front cover

a.) Disengage upper cantrell brackets on right sides of the cover.

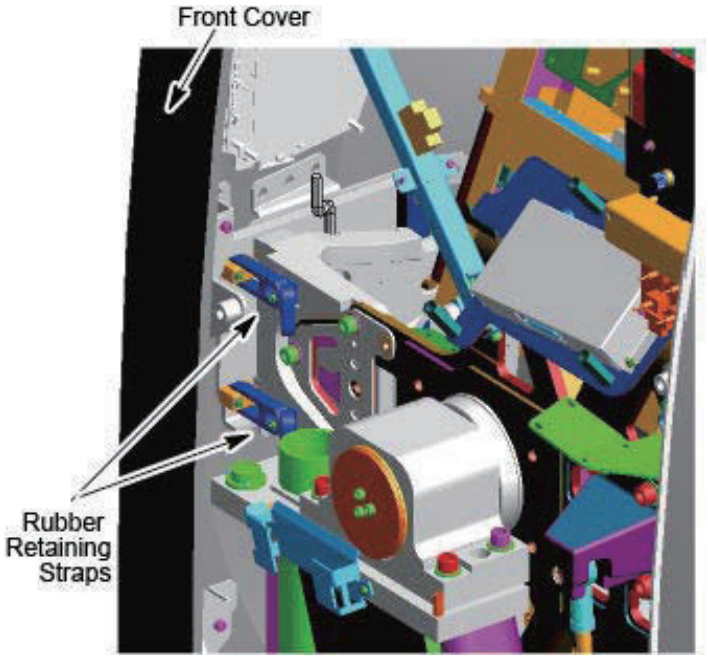
Figure A-11 Releasing cover brackets



A.) Disengage the locking mechanism on the upper cantrell brackets by using your thumb to slide the trigger (red lever) back. This will release the locking mechanism and allow the cantrell to be rotated upwards with steady and firm pressure.

B.) Disengage the rubber retaining straps on right sides. See Figure A-12. You may find it helpful to lift “up” on the cover to align the stud while attaching the rubber retaining straps.

Figure A-12 Rubber Retaining Straps and Cover Locking Mechanism

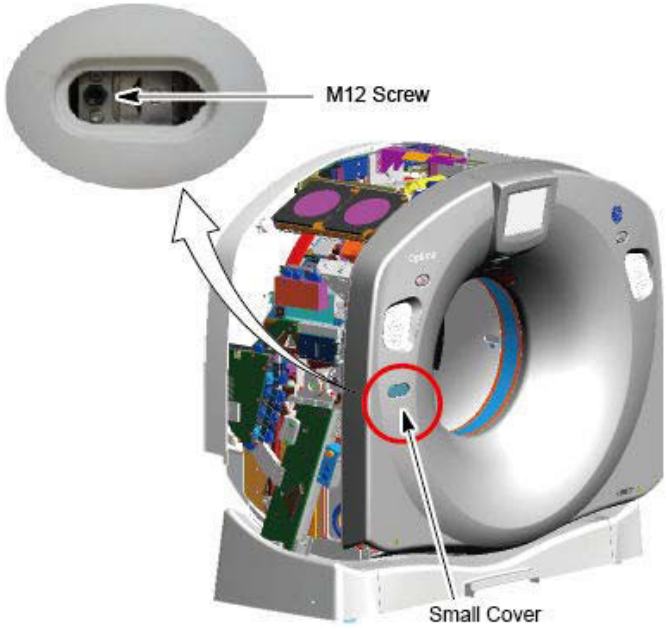


b.) Disengage the left side of the front cover.

A.) Remove the small cover from the front cover.

B.) Loosen M12 screw.

Figure A-13 Disengage the Left Side of the Front Cover



7.) Rotate front cover away from gantry.

a.) Move front cover away from gantry giving enough space (about 5 feet) between front cover and gantry.

b.) Pull the locking pin and rotate front cover away from gantry. Place locking pin in one of the side dolly perforations. See Figure A-14.

Figure A-14 releasing Front Cover Dolly Hinge

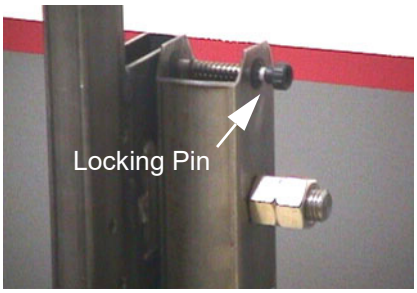
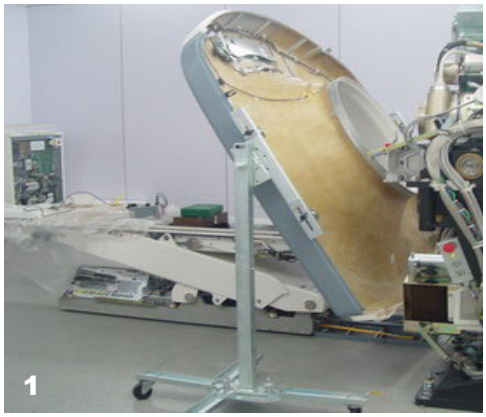


Figure A-15 Front Cover Removal Sequence



1. Upper Left>Rotate cover to make room for step 2.
2. Upper Right>Rotate cover to clear the table. Roll the cover to foot end of table.
3. Lower Left> Rotate the cover upside down to provide clear work area.
   Note: Remove Gantry Display and Control Panel in position 2.

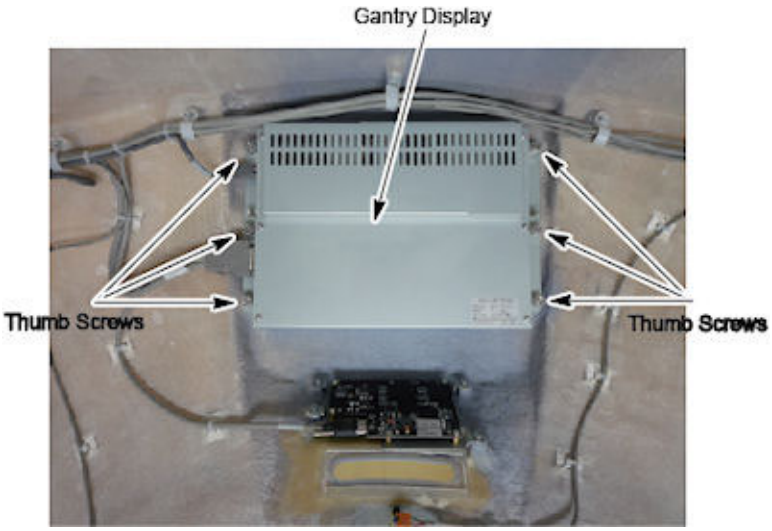
8.) Rotate the cover horizontally and move it back and over the table to a safe location. Once in a safe location, you may over-rotate the cover full vertically but upside down.

9.) Remove the gantry xtream display and control panel from the front cover and place it into its service position if scan is required during maintenance.

a.) Remove the gantry xtream display and place it into its service position.

* Disconnect cables from the gantry xtream display.
* The gantry xtream display is held in place with (6) thumb screws. Use a flat-blade screwdriver to remove the Display. Reference Figure A-16.

Figure A-16 Gantry Display Removal

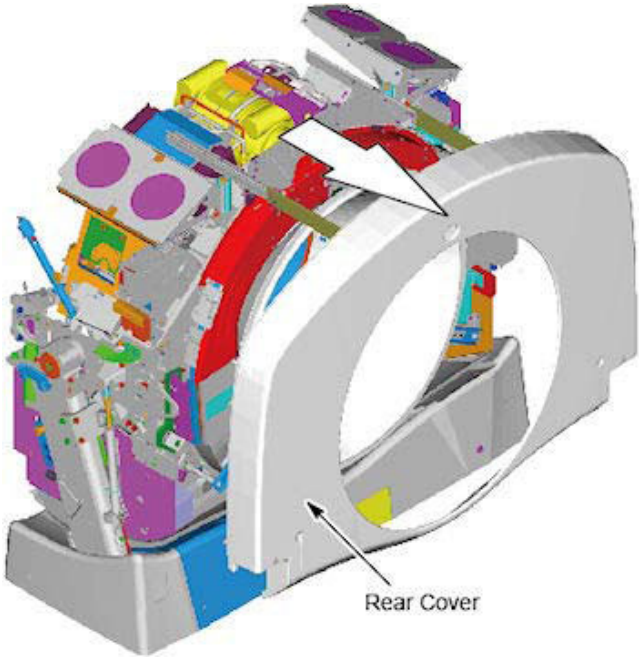


* Loosen two lock screws of the rear cover.

Figure A-17 Lock Screws of the Rear Cover

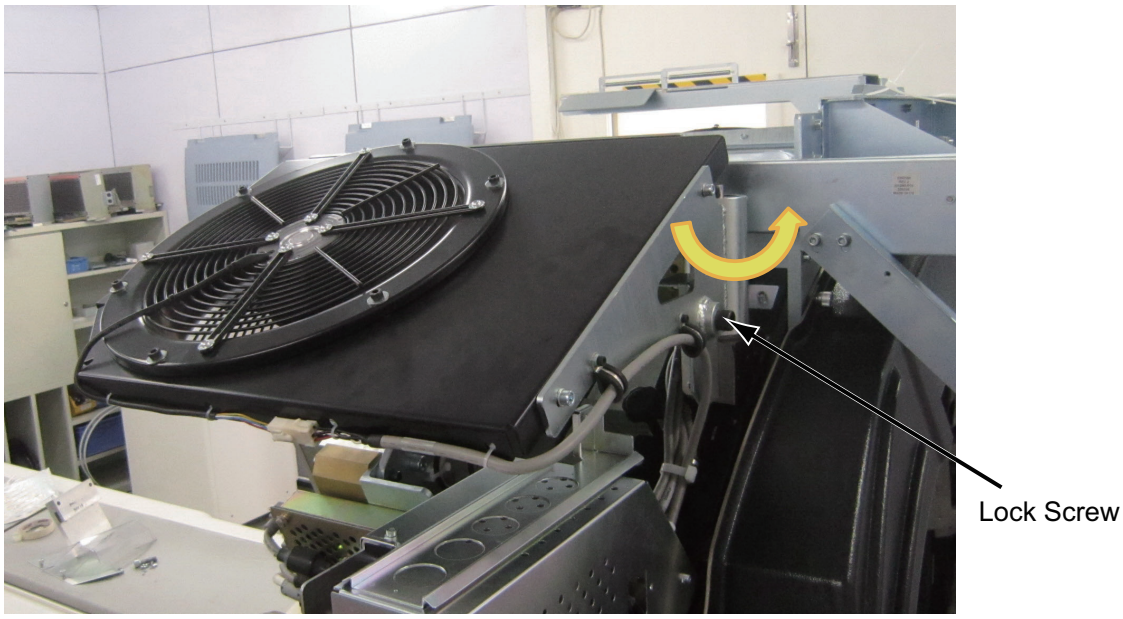
* Side the rear cover backward.

Figure A-18 Rear Cover Slide



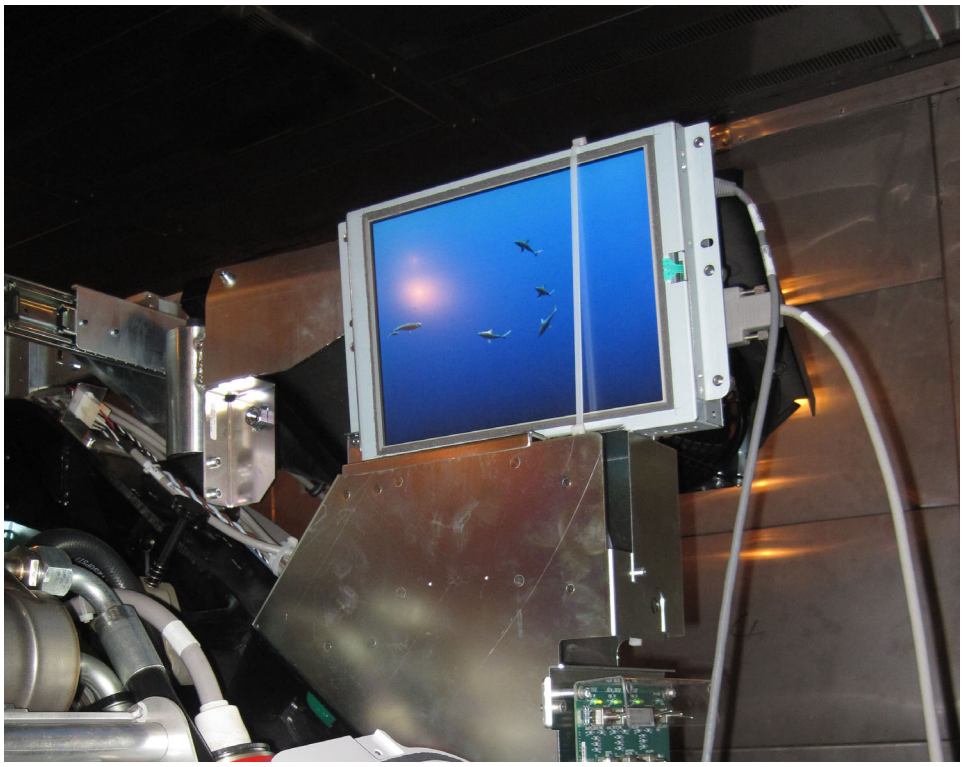
* Loosen the lock screw of the right top fan of the gantry, and rotate the right top fan.

Figure A-19 Top Fan Rotation



* Place the gantry xtream display in the bracket on the right side of the gantry. See Figure A-20.

Figure A-20 Gantry Xtream Display Service Mounting Location



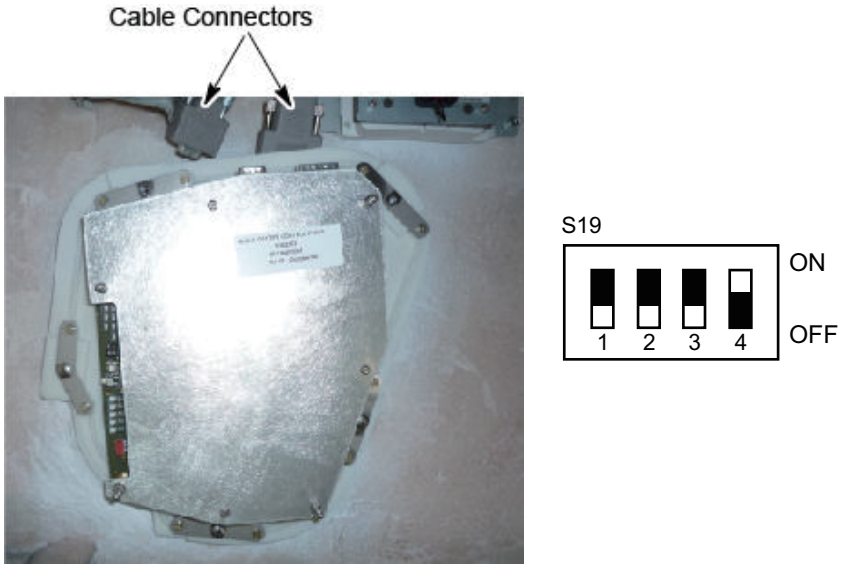
* Connect the cables to the gantry xtream display.

NOTICE **Keep gantry at 0 degree position, DO NOT tilt gantry at this time to avoid damage the xtream display.**

b.) Remove the right gantry control panel and place it into its service position.

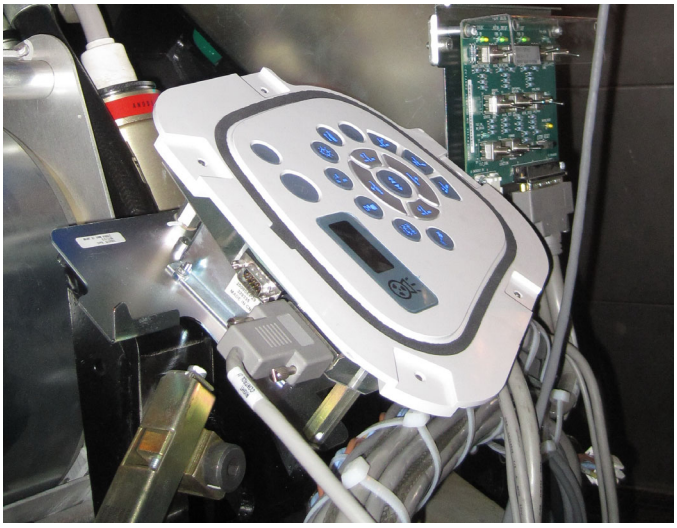
* Disconnect cables from the gantry control panel.
* Loosen (5) screws that mounts the gantry control panel to the cover. Keep one hand on the control panel at all times to prevent it from dropping to the floor. See Figure A-21.
* Set dip switch s19-4 to **ON** position.

Figure A-21 Gantry control panel and Dip Switch Setting



* Align the ball studs with their associated receivers and snap into place.

Figure A-22 Control panel service position



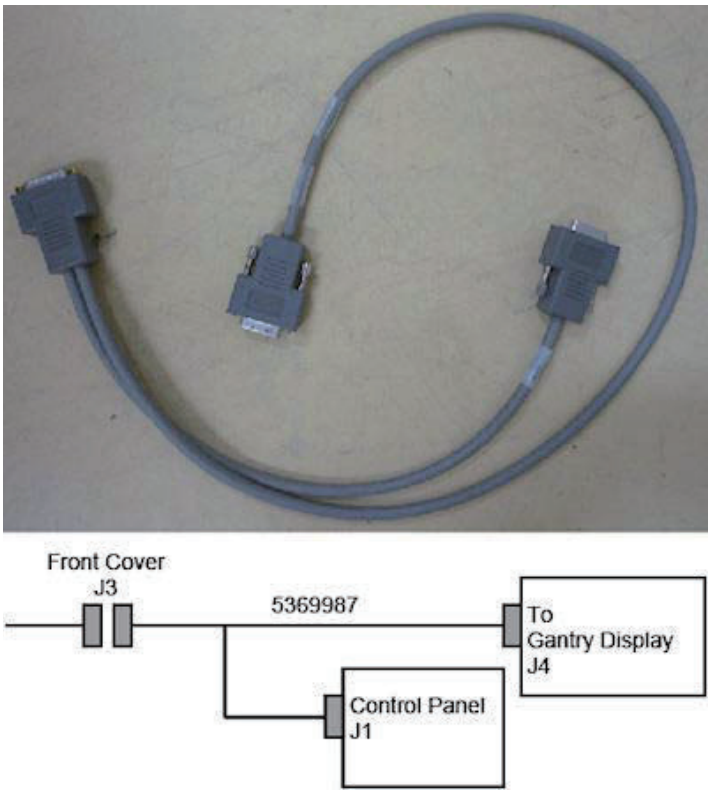
* Connect FCVR BKHD J1 cable to terminator located on the cantrell arm. Reference Figure A-23.

Note: There are 3 cables, each of which is unique. The ribbon cable is not used in the Service configuration. The other 2 cables will only fit in the terminator or the control panel, not both.

Figure A-23 Gantry Service Mode Cable Terminator

* Connect the FRT CVR J3 cable to the extension cable 5369987 and connect the other end of the connectors to display and control panel.

Figure A-24 FRT CVR J3 Cable



4.3 Installation

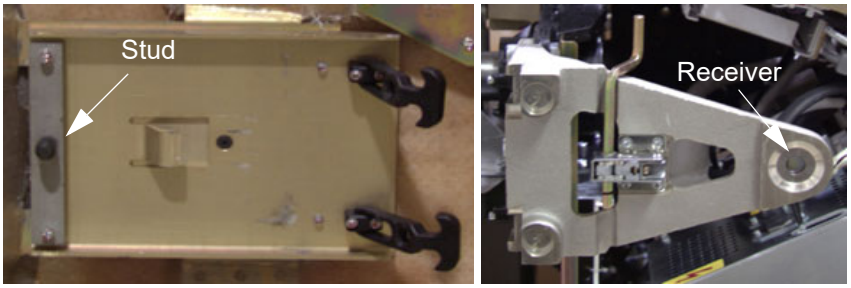
1.) Remove the gantry xtream display and control panel assembly from their service positions and re-attach them to the gantry cover.
   a.) Disconnect cables from the gantry display and the control panel.
   b.) Install the gantry display in front cover. Secure the 6 thumb screws. With a flat-blade screw driver gently tighten past finger tight.
   c.) Set the dip switch S19 on the control panel to all **OFF** position.
   d.) Install the gantry control panel making sure the screws are secure within the receivers.
   e.) Re-attach cables.

NOTICE **Potential for front cover damage.**
When you rotate the gantry front cover back to its vertical position, make sure not to scratch the front cover with the edge of the table cradle.

2.) Rotate gantry front cover back to its vertical position.

3.) Attach the front cover.
   a.) Align the studs on both sides of the front cover with each associated receiver. Receiver is located on the gantry frame.

Figure A-25 Cover stud and Mounting bracket receiver



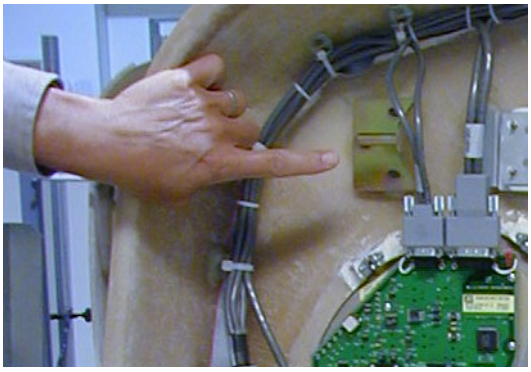
b.) For Right Side:

Insert the stud on one side into its associated receiver and attach the rubber retaining straps. Then insert the stud on the other side into its associated receiver and attach its rubber retaining straps.

You may find it helpful to lift “up” on the cover to align the stud while attaching the rubber retaining straps.

c.) Re-attach upper cantrell brackets on right sides.

Figure A-26 Gantry Front Cover Mounting Pin (top)



d.) For Left Side:

Insert the stud onto it’s associated receiver and fasten the M12 screw and install the small cover (See Figure A-13).

4.) Remove dolly, disassemble and store safely away for later use.

5.) Re-attach cables to cover.

6.) Re-install the Mylar (scan) window.

Section 5.0
Gantry Rear Cover

5.1 Removal

5.1.1 Slide Out Rear Cover.

DANGER **ELECTROCUTION HAZARD.**

HIGH VOLTAGE PRESENT. POTENTIAL FOR INJURY IF COVERS REMOVED AND POWE IS LEFT "ON".

DISTABLE ALL SERVICE SWITCHES PRIOR TO EMOVING REAR COVERS.

NOTICE **Always turn OFF the HVDC before the 120VAC. Turning OFF 120VAC power before HVDC power can result in equipment damage.**

1.) Remove Gantry side covers, top covers and Mylar (scan) window.

2.) Use a 10mm Hex wrench to unlatch the rear cover.

Figure A-27 Rear Cover Unlatch

3.) Slide out the rear cover by pulling the cover backward.

Figure A-28 Rear Cover

5.1.2 Rear Cover Removal

CAUTION **Pinch Hazard.**

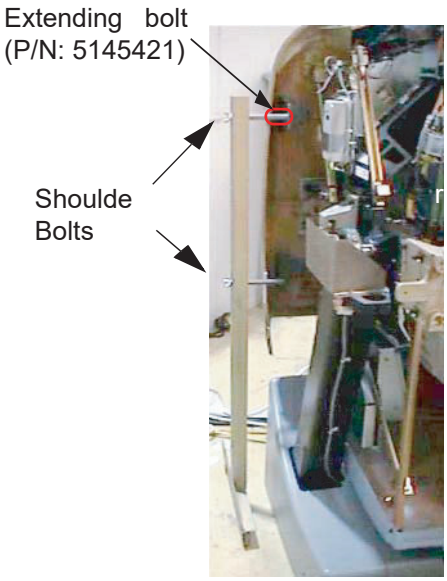
Uncontrolled cover movement.

Make sure the wing nuts are tightened on the cove dollies prior to releasing cover from gantry mounts.

1.) Install the rear cover dolly (5150476).

a.) Tighten the two (2) shoulder bolts to the rear cover. Use the extending bolt for the upper side.

Figure A-29 One Side of the Rear Cover Dolly



b.) Fit side dolly through the shoulder bolts and secure assembly with two (2) wing nuts.

c.) Repeat steps a and b for the other side dolly.

2.) Remove rear cover by removing 8 screws, which attach the rear cover to the brackets.

Figure A-30 Screws of Rear Cover

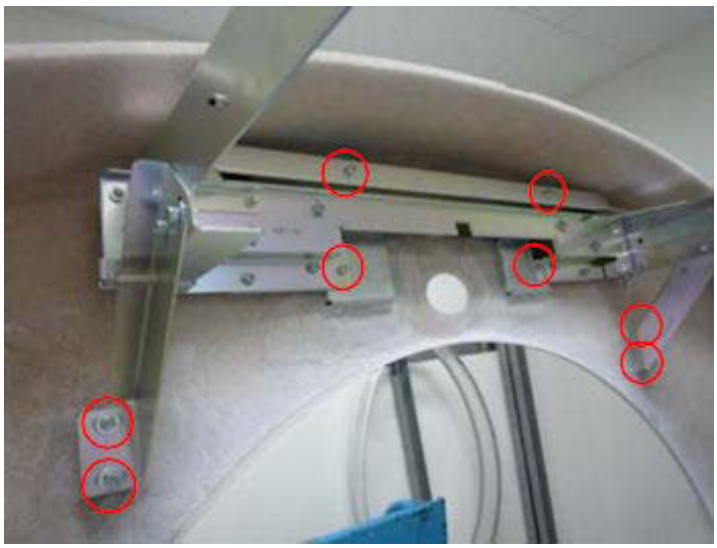


Figure A-31 Remove Rear Cover

3.) Move cover away from gantry as needed.

5.2 Installation

1.) Position cover in back of gantry.
2.) Attach the rear cover to the brackets by 8 screws. (See Figure A-30)
3.) Remove dolly, disassemble and store safely away.
4.) Push the rear cover to gantry frame and secure the cover by turning two (2) latches.
5.) Re-install the Mylar (scan) window.

Section 6.0
Gantry Bore Cover

6.1 Removal

1.) Remove gantry side covers, top covers and mylar window. Refer to each cover's removal procedure.

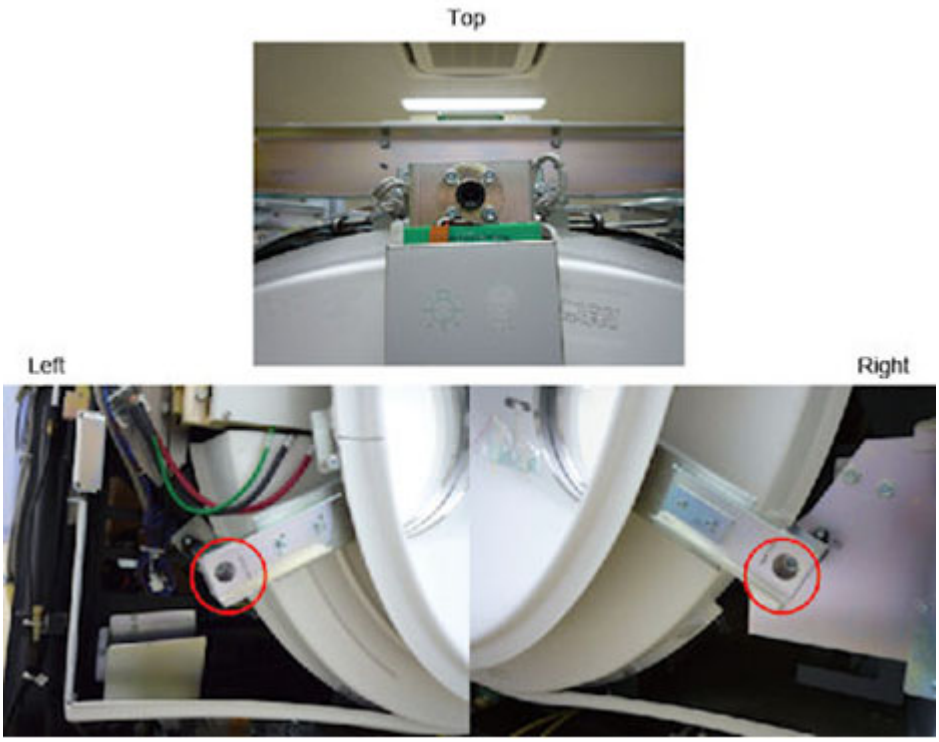
2.) Remove gantry rear cover and move away from the gantry. Refer to gantry rear cover removal procedure.

3.) Disconnect the Breath navigator I/F cable and Mic/T-SW I/F cable from the top of the bore cover.

Figure A-32 Breath Navigator I/F Cable

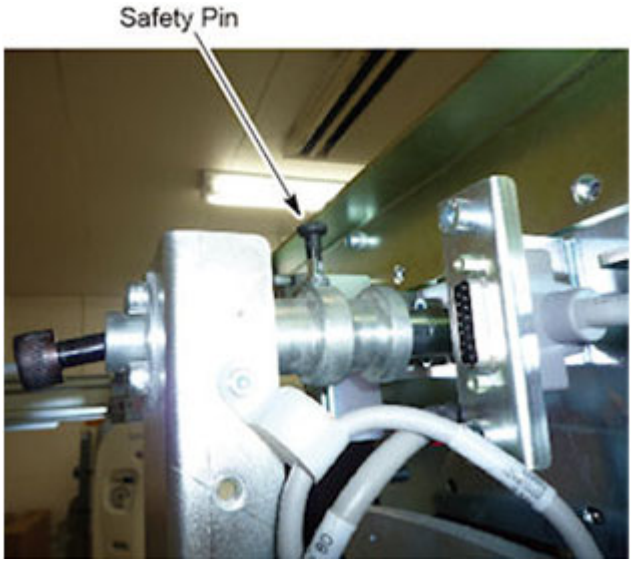
4.) Remove the 2 screws located at two bottom brackets of the bore cover. Then loosen the screw on top. (Refer to Figure A-33)

Figure A-33 Screws of Bore Cover



5.) Pull up safety pin small knob on the bore cover top bracket and rotate 1/4 turn to keep the safety pin disengaged.

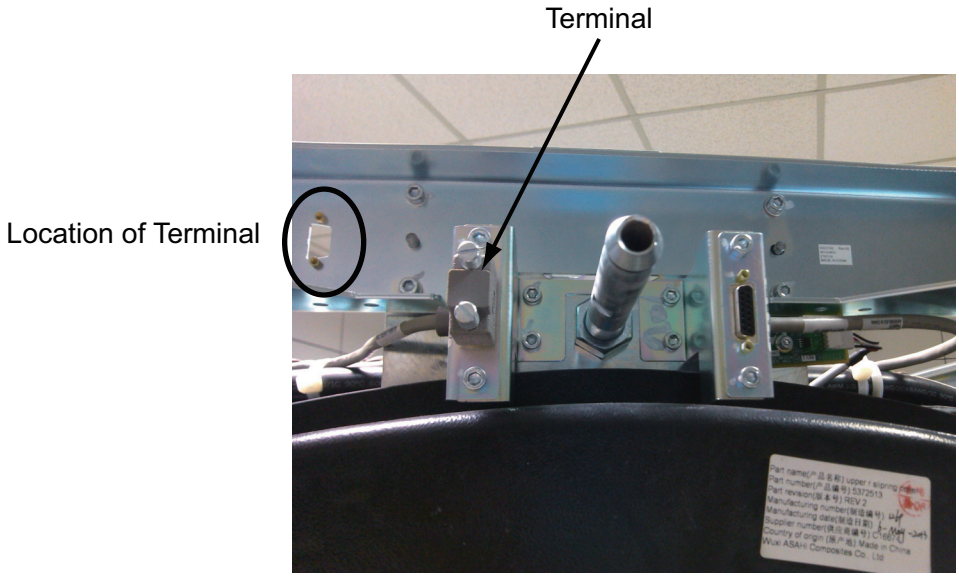
Figure A-34 Safety Pin



6.) With two persons, pull out the bore cover from the gantry stationary brackets and place it on the floor.

NOTICE **Disable UIF communication after gantry bore cover removal, So if need UIF continuation, please insert the terminal to the Mic/T-SW I/F connector.**

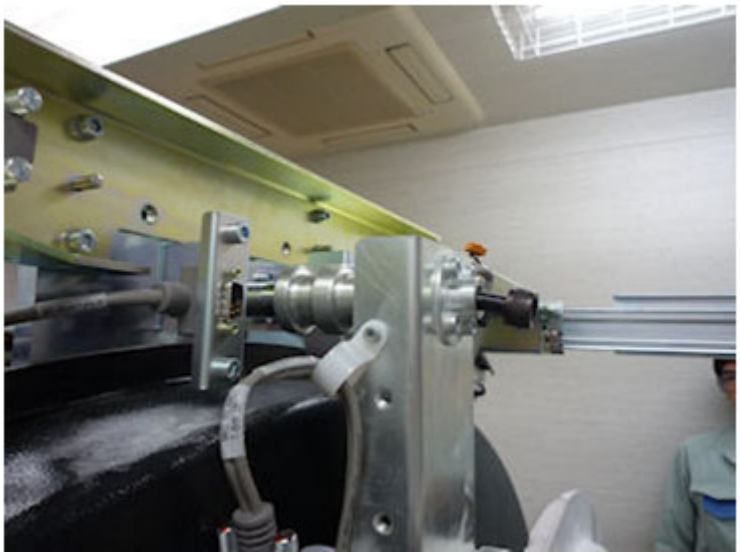
Figure A-35 Location of Terminal



6.2 Installation

1.) With two persons, lift the bore cover and attach it to the gantry stationary brackets. Insert the top of the cover bracket to the gantry stationary bracket first.

Figure A-36 Bore Cover Attachment



2.) Tighten 3 screws located at top and two bottom brackets of the cover.
3.) Connect the Breath navigator I/F cable and Mic/T-SW I/F cable to the connectors.

Section 7.0
Gantry Base Covers

Refer to Figure A-37 for the following assembly sequence.

Note: Tighten means torque to 2.3 Nm

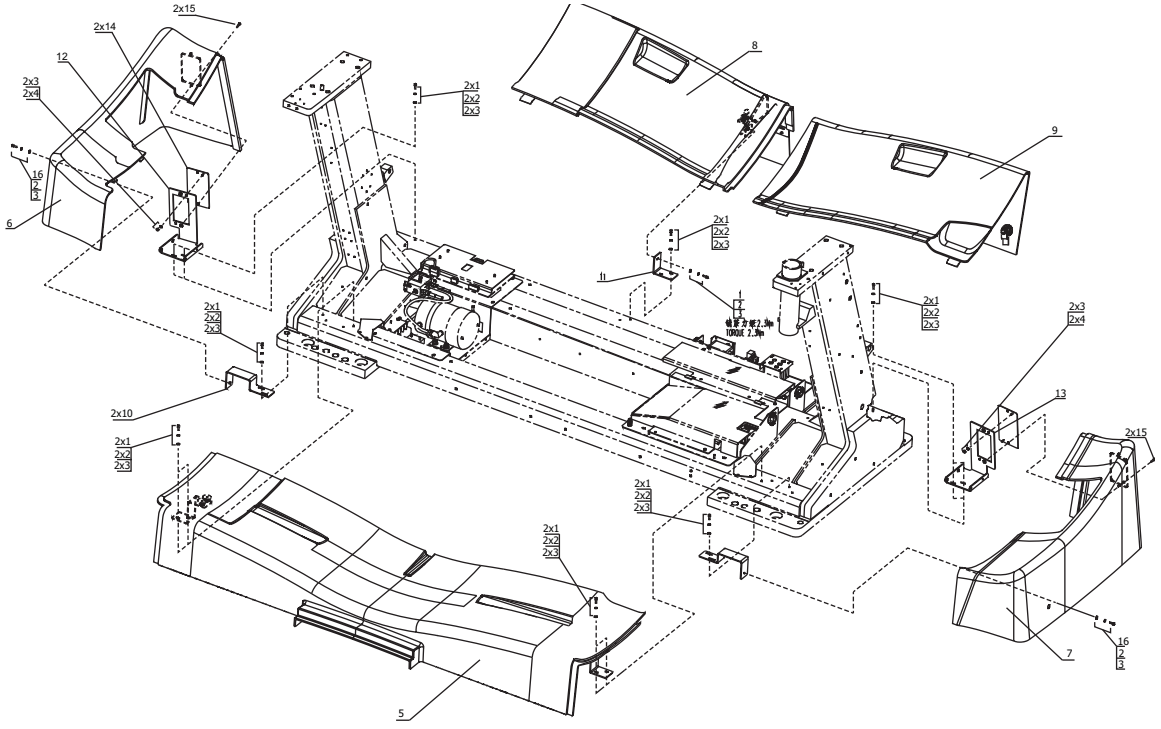
1.) Position cover (item 5) on gantry base with bracket slots aligned to gantry holes. Center cover left to right and attach with (4) hardware (items 1, 2, 3) as shown and tighten.

2.) Assemble two (2) bulkheads (item 14) to two (2) brackets (item 12, 13) using (4) hardware (items 3 and 4). Assembly two (2) brackets (item 10) and two (2) brackets (item 12, 13) to gantry base using eight (8) hardware (items 1, 2, 3). Finger tighten hardware with bracket moved outward to end slots. Install side covers (item 6 and 7) on base pushing brackets (item 10, 12 and 10, 13) inward until properly aligned with front cover. Remove side covers, tighten fasteners and replace side covers using one (1) hardware (item 16, 2 and 3) and two (2) item 15 on each cover and tighten.

3.) Assembly last bracket (item 11) loosely to gantry base with two (2) hardware (item 1, 2 and 3). Install rear cover (item 8) to base properly aligned to side cover (item 6). Attach rear cover to bracket with hardware (items 1, 2 and 3) tightening all fasteners. Lock latch.

4.) Place cover (item 9) on gantry base, aligned to covers (item 7 and 8). Lock both latches.

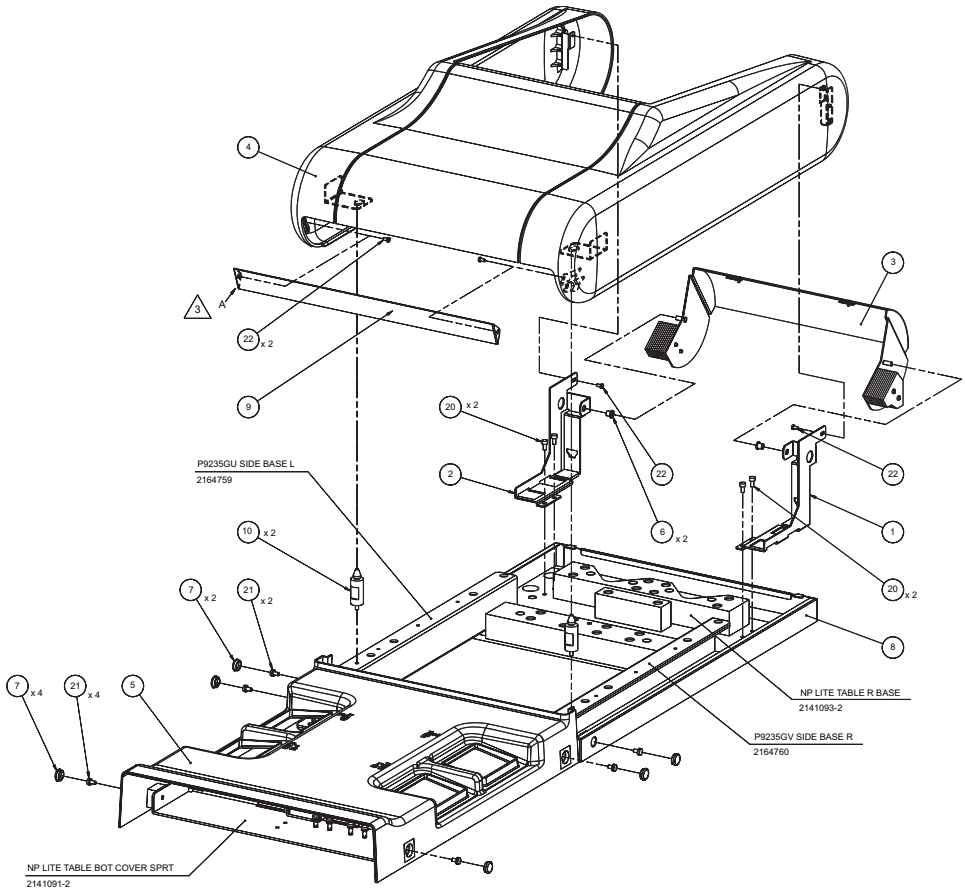
Figure A-37 Gantry Base Covers



Section 8.0
Table Covers Installation

8.1 Table Base Cover

Figure A-38 Table Base Cover



8.2 Table Skirt Cover

1.) Attach the skirt cover to flapper bracket.
2.) Mount the skirt cover to table bracket with two screws in left and right both sides.

Figure A-39 Skirt Cover

8.3 Flapper Installation

1.) Insert two (2) plastic rings into the left and right sides of the flapper.
2.) Attach two flapper brackets to the flapper.
3.) Tighten it to the Table rear bottom by four (4) support bracket screws. There is a gap between the flapper and the table arm as shown in the Illustration below. When the flapper is installed on the table base, the left gap and the right gap must be equal using four (4) support bracket screws.

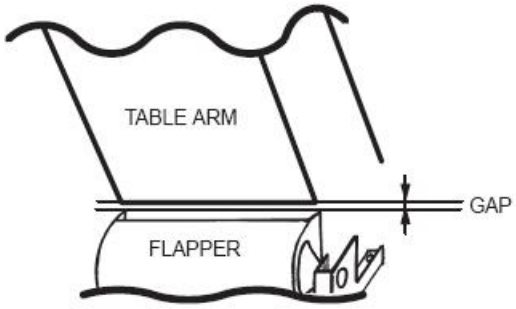
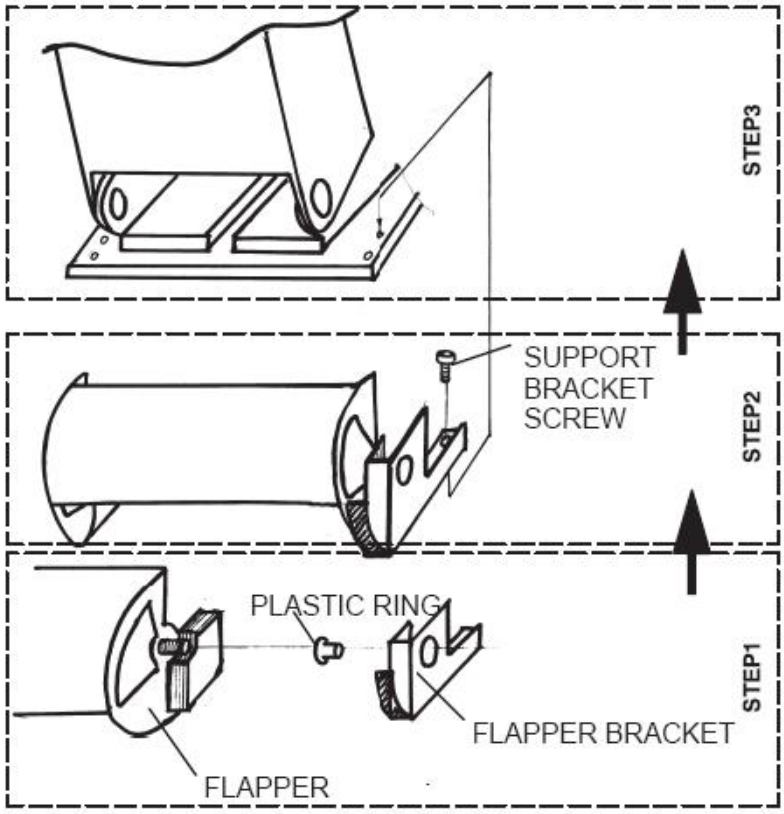


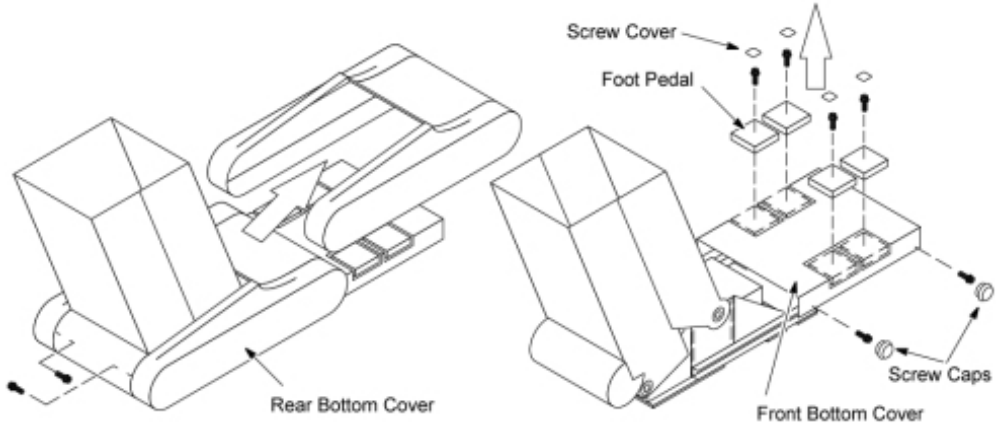
Figure A-40 Flapper Installation



8.4 Bottom Cover installation

1.) Install the front bottom cover using four screws. After installation, install the screw caps onto the screws.
2.) Install the foot switch pedals using four socket screws. After installation, install the screw caps onto the screws.
3.) Install the rear bottom cover so that its tabs are aligned with the frame pins.
4.) Pull the cover rearwards, then mount it using two screws.
5.) After installation, install the screw caps onto the screws.

Figure A-41 Installing the Bottom Covers



Section 9.0
Console Covers Installation/Removal

9.1 NIO Console

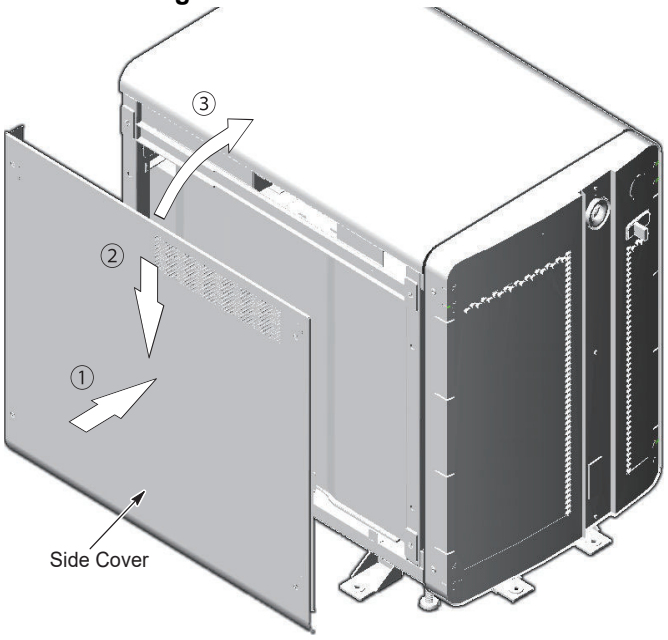
9.1.1 Side Covers Installation

1.) Swing the side cover into position

2.) Insert top edge of side cover into inside of top cover. The distance between side cover rear edge and chassis should be about 20mm.

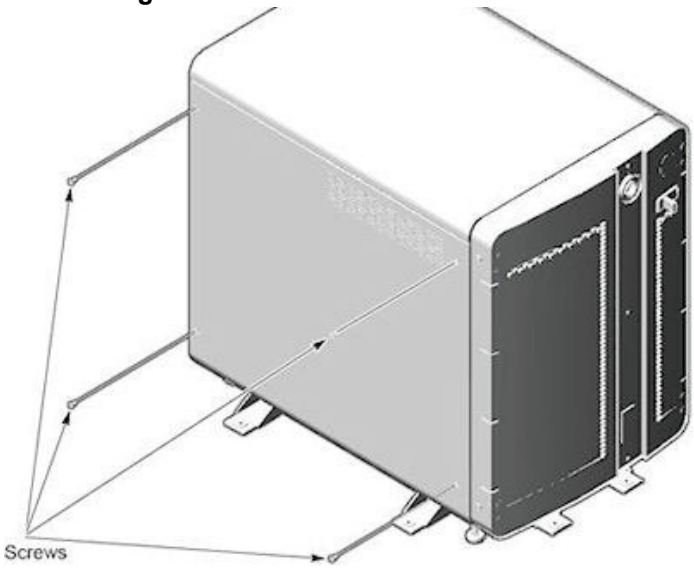
3.) Move side cover forward and fix it on chassis.

Figure A-42 Place Side Cover



4.) Tighten the four screws at the side cover.

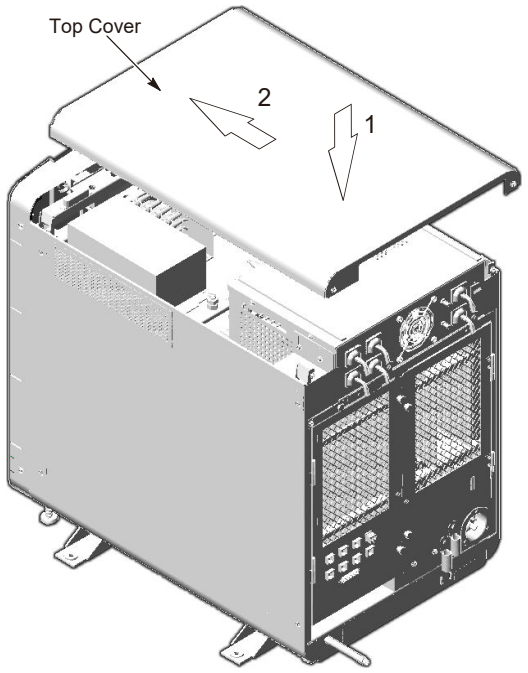
Figure A-43 Install Side Cover Screws



9.1.2 Top Cover Installation

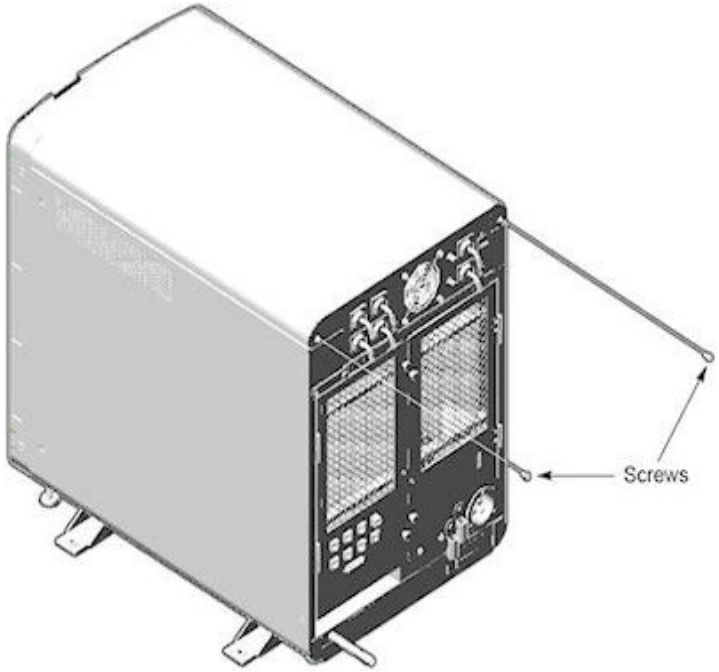
1.) Insert two pins of top cover into the hole in the chassis.
2.) Slide cover backward and fix cover on chassis.

Figure A-44 Place Top Cover



3.) Tighten two screws at behind of top cover.

Figure A-45 Install Top Cover Screws

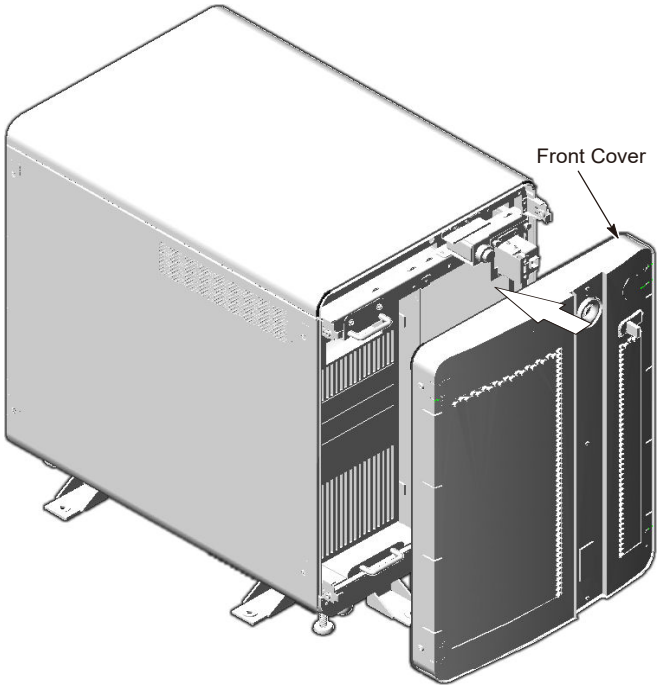


9.1.3 Front Cover Installation

1.) Place the front cover onto console.

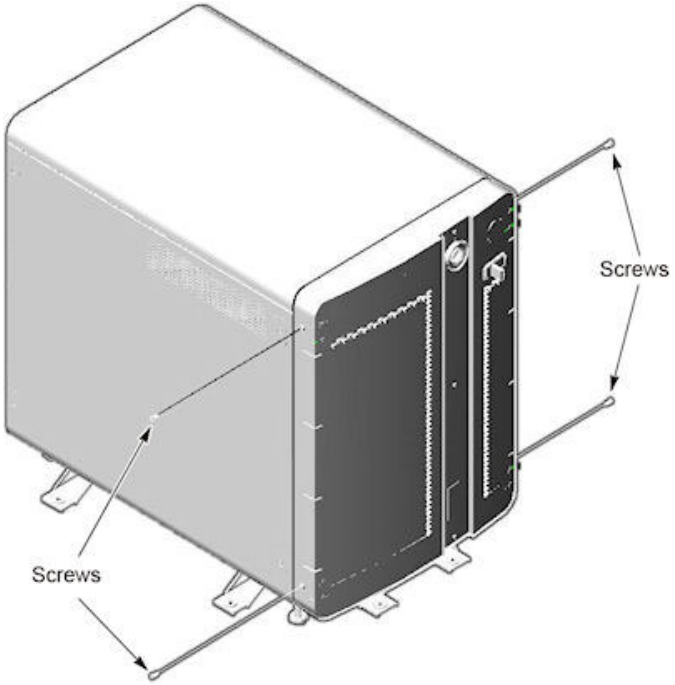
2.) Rotate bottom of cover outward and upward until the cover is placed on the console.

Figure A-46 Place Front Cover



3.) Install four screws (two screws on each side).

Figure A-47 Install Front Cover Screws

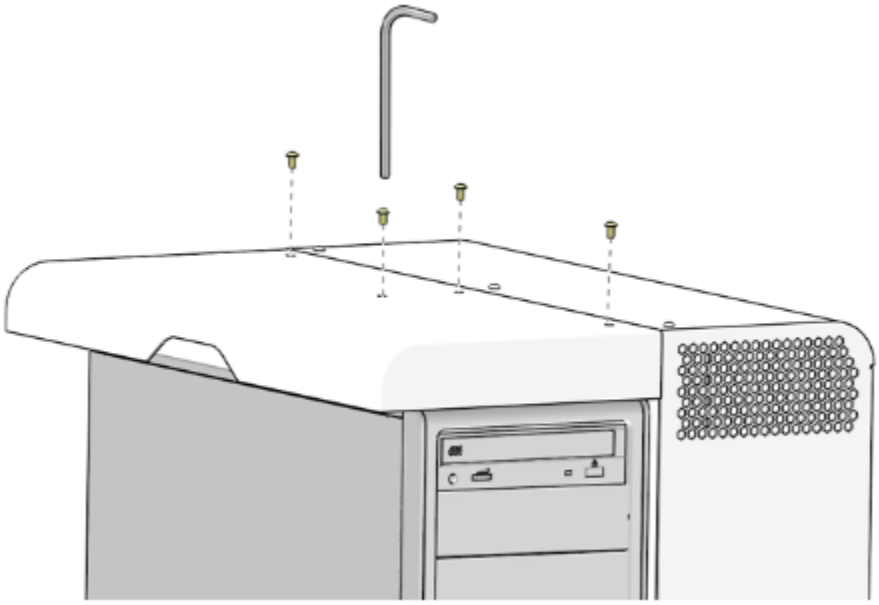


9.2 OpenOC Console

9.2.1 Top Cover Removal/Installation

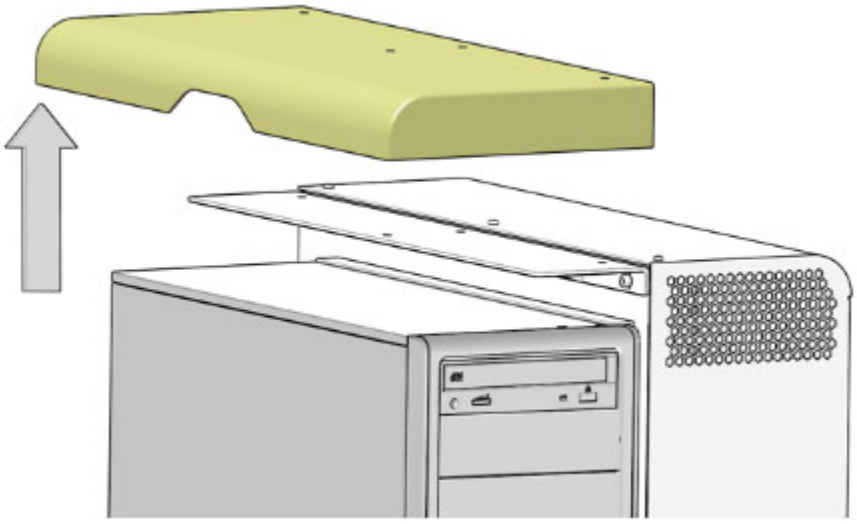
1.) Remove the four (4) Hexagon Button Head Screws (M4 X 8mm) from the top cover at the top of the chassis.

Figure A-48 Top Cover Mounting Screws Removal



2.) Pull the top cover away from the chassis. Then lift upward until it the top cover is free of the chassis and set aside.

Figure A-49 Top Cover Removal



3.) Reset the top cover on top of the chassis.

4.) Install and tighten the four (4) Hexagon Button Head Screws (M4 X 8mm) on the top cover at the rear of the chassis.

9.2.2 Side Cover Removal/Installation

1.) Remove the seven (7) Hexagon Button Head Screws (M4 X 8mm) from the Open Console side cover.

2.) Tilt the side cover away from the chassis. Then lift outward until it the side cover is free of the chassis and set aside.

3.) Insert the bottom edge of side cover into the chassis base and hinge the side cover onto the chassis.

4.) Install and tighten the seven (7) Hexagon Button Head Screws (M4 X 8mm) on the side cover.

AppendixB
Operating Table Installation and Adjustment

Section 1.0
FWS Assembly and Adjustment

1.1 Introduction

Freedom WorkSpace (FWS) is an optional console table with better ergonomic performance. The monitor arm is designed to adjust quickly and easily.

Before assembly go through this section and checklist with the FWS to have an overview.

- Assemble worksurface
  - Assemble table base and worksurface
  - Assemble drawer
- Install Seismic Kit (if need)
- Install monitors
  - Mount pole onto table surface
  - Install monitor with monitor arms
  - Install monitor arms on the pole
  - Route cables
- Adjust the monitors for customer use

1.2 Procedure

1.2.1 Assemble Worksurface (For FWS 5168666-3)

1.) Carefully remove the base assembly from the packaging material.

2.) Attach the crossbrace with the two inner-leg cover and secure the crossbrace to the down leg with six M6 x 10 screws (Figure B-2).

Figure B-1 Worksurface Assembly

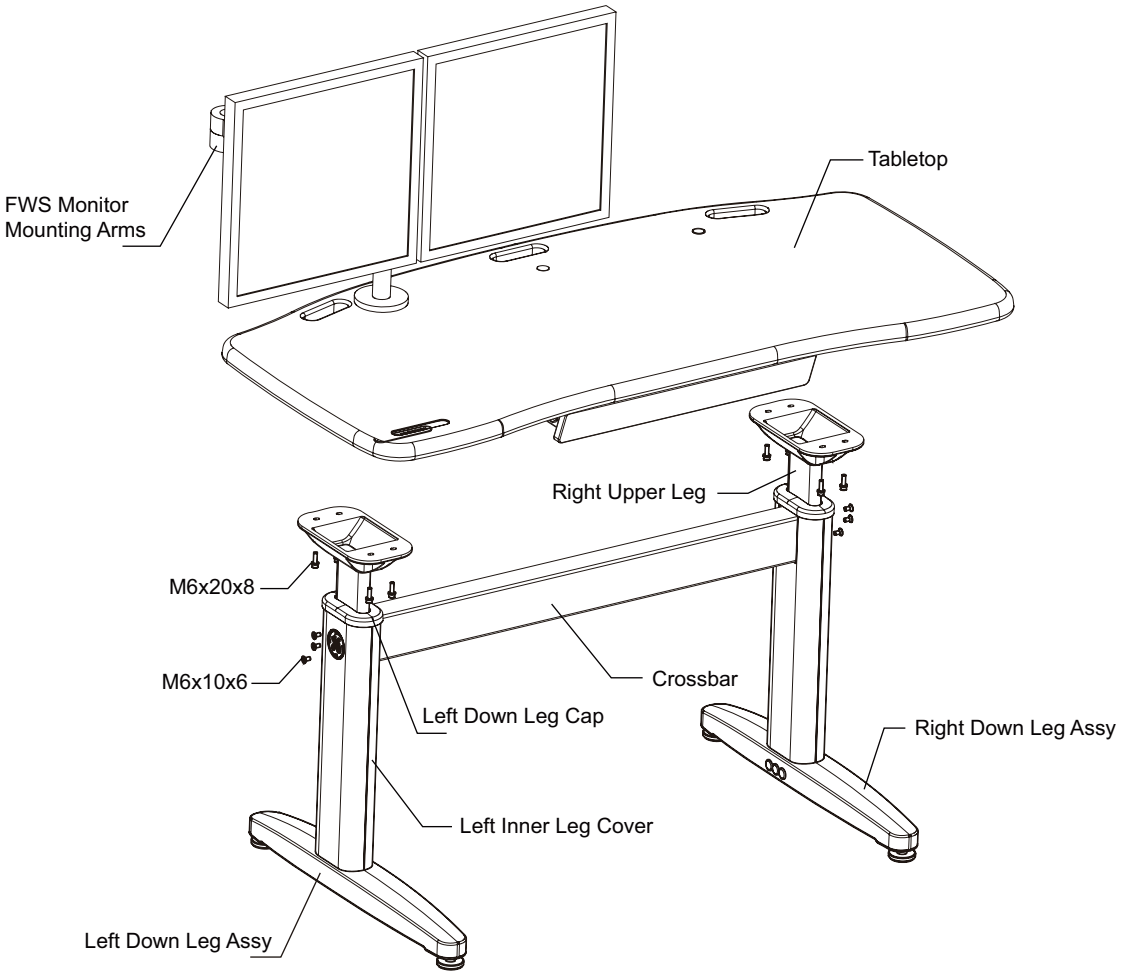
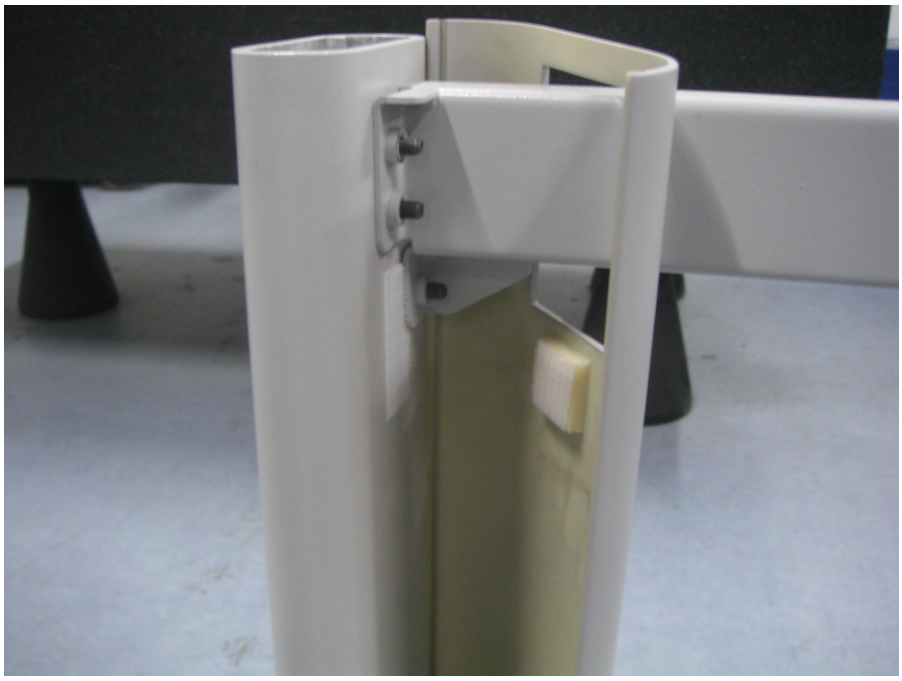


Figure B-2 Inner-Leg Cover

3.) Press the inner-leg cover to secure with the adhesive pad (Figure B-3).

Figure B-3 Inner-Leg Cover and Adhesive Pad



4.) Install upper legs to down legs.

a.) Install down leg cap to the down legs (Figure B-4).

b.) Insert upper legs into down legs, adjust to desired height by attaching the upper legs' screws to appropriate down legs' holes. Figure B-5 shows an example of attaching upper legs at the fifth and seventh holes from the bottom upward. In this case, the height of worksurface would be 785mm.

c.) Secure the upper legs with four M6 x 20 screws each leg.

Figure B-4 Down Leg Cap

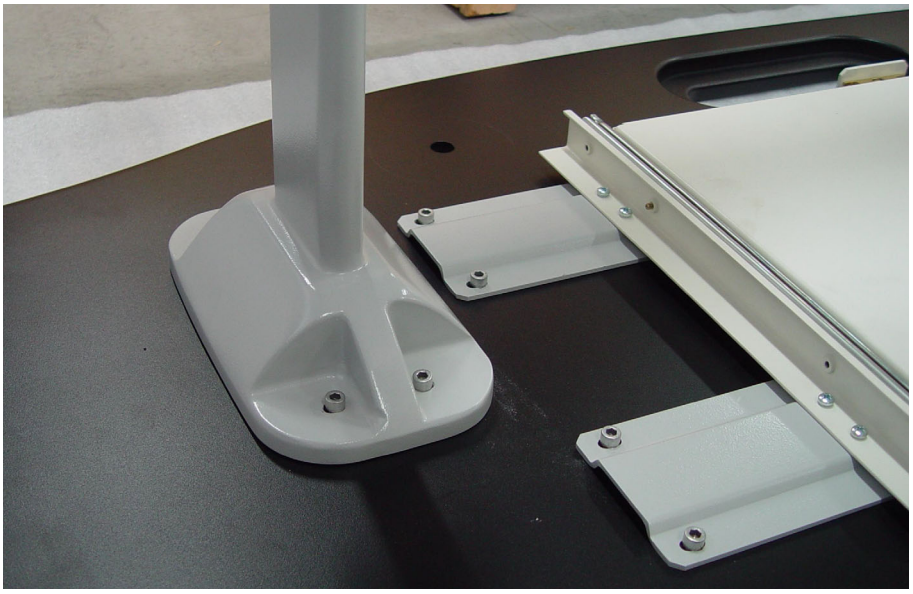
Figure B-5 Down Leg and Screws

5.) Insert outer-leg cover and inner-leg cover into down leg slot. Then push down the upper cover to fix them.(Figure B-6).

Figure B-6 Outer and Inner Leg Covers

6.) Place the worksurface upside down on a clean, soft surface to prevent scratching. Invert the table base onto the worksurface, taking care to align the holes with the pre-drilled holes in the worksurface. Secure the table base to the worksurface with eight M6 x 20 screws (Figure B-7).

Figure B-7 Table base and Worksurface

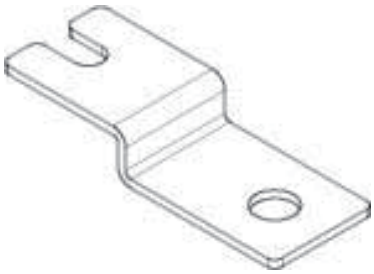


7.) Carefully turn the table assembly to the upright position. Insert hole cover into one of the two holes in the worksurface, the other hole would be used for monitor installation.

8.) The four adjustable glides may be raised or lowered to accommodate varying floor surfaces. Lift the leg off the floor and turn the glide clockwise or counterclockwise to adjust.

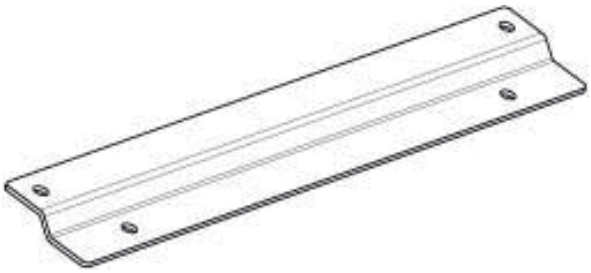
1.2.2 Install Seismic Kit (For FWS 5168666-3)

There are two kinds of anti seismic brackets as shown in below figure.



FWS anti seismic bracket

(Part No.: 5380721)



FWS anti seismic bracket

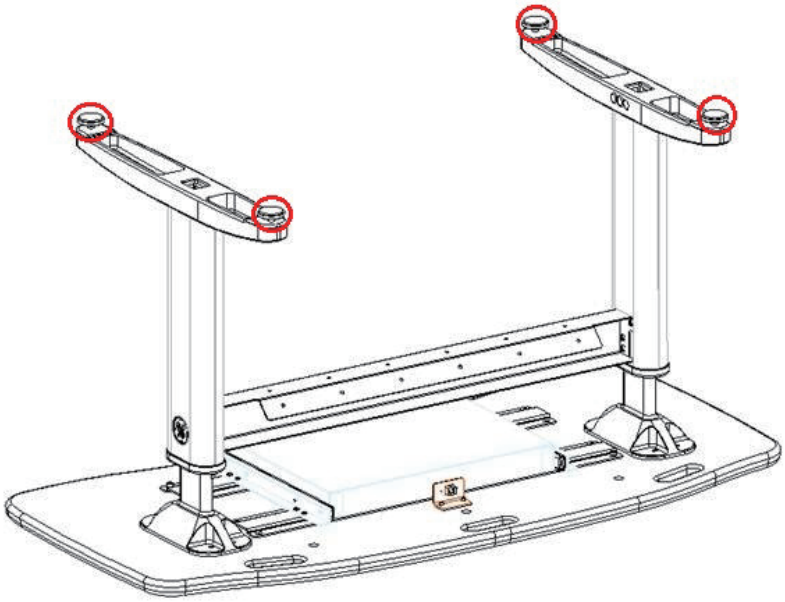
(Part No.: 5451608)

If site specifications require seismic mounting, follow below steps:

- **For anti-seismic bracket 5380721**

1.) Turn over the FWS, loosen the four foot adjusters as Figure B-8 shown.

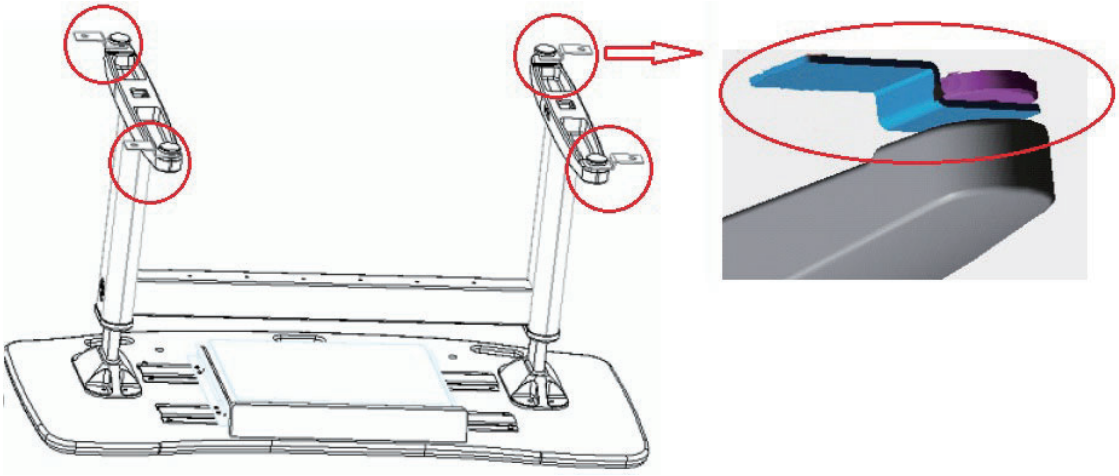
Figure B-8 Foot Adjusters Removal



2.) Insert the anti seismic brackets (5380721) between the adjusters and foots, then tighten the adjusters again, as Figure B-9 shown.

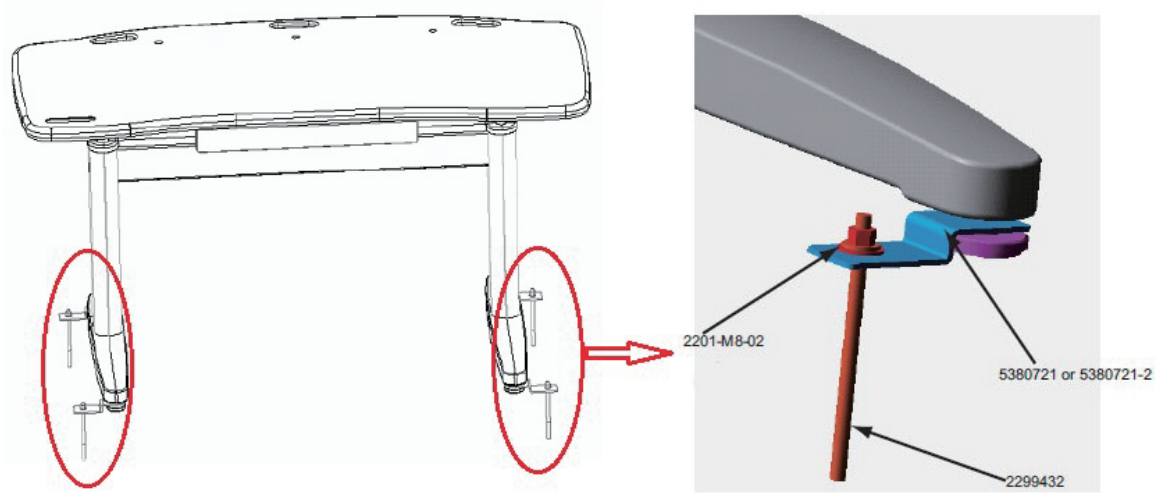
Note: Pay attention to the up down direction of the anti seismic brackets during installation, the side of bracket that used to mount to the floor shall be flush with the foot adjuster.

Figure B-9 Insert Brackets Between Adjuster and Foot



3.) Turn the FWS to the upright position, use anchors to mount the brackets to the floor, as shwon in Figure B-10.

Figure B-10 Mount Brackets to Floor

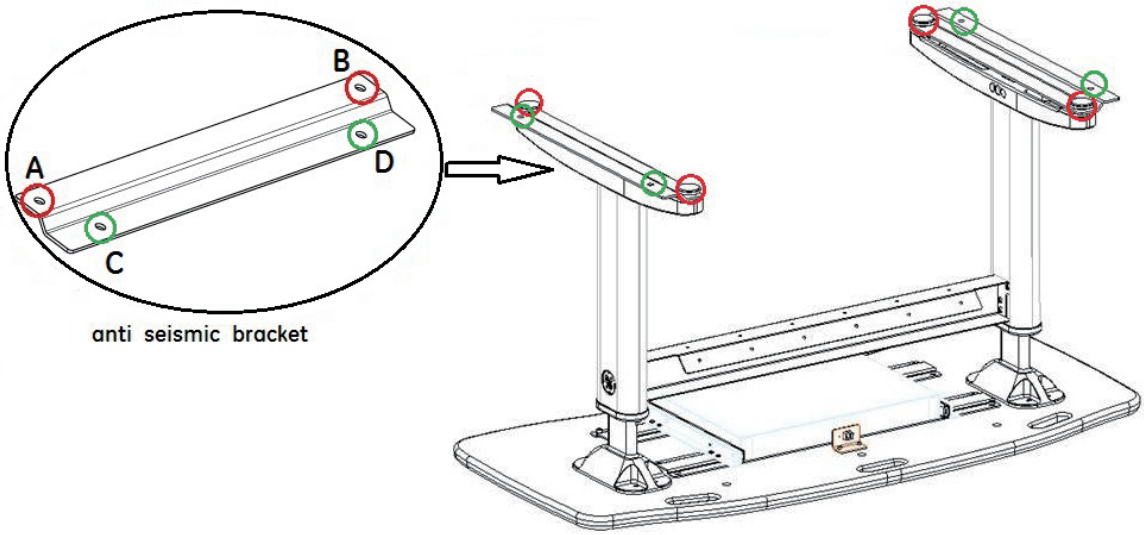


- **For anti-seismic bracket 5451608**

1.) Turn over the Freedom WorkSpace (FWS), loosen and remove the four foot adjusters as Figure B-8 shown.

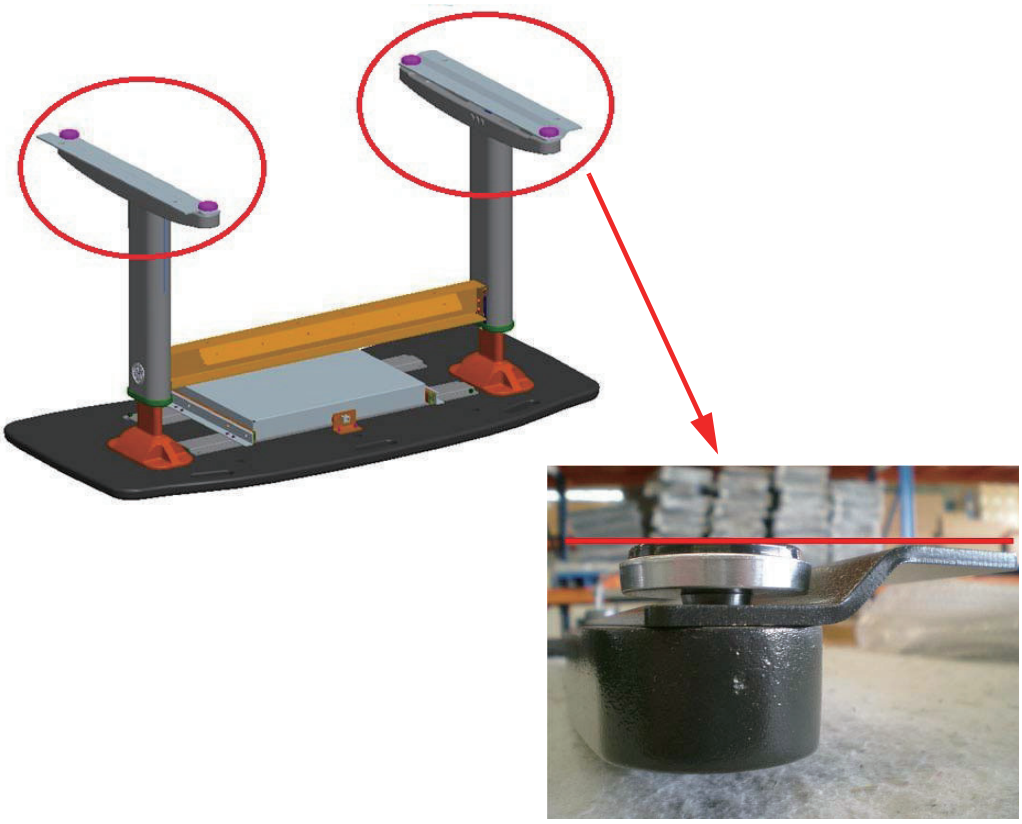
2.) Install two anti seismic brackets (5451608) to each down leg with the foot adjusters, hole A and B shall be used to mount the bracket to the foot adjuster, and hole C and D are used for mounting the bracket to the floor, as shown in Figure B-11.

Figure B-11 Install Anti Seismic Brackets



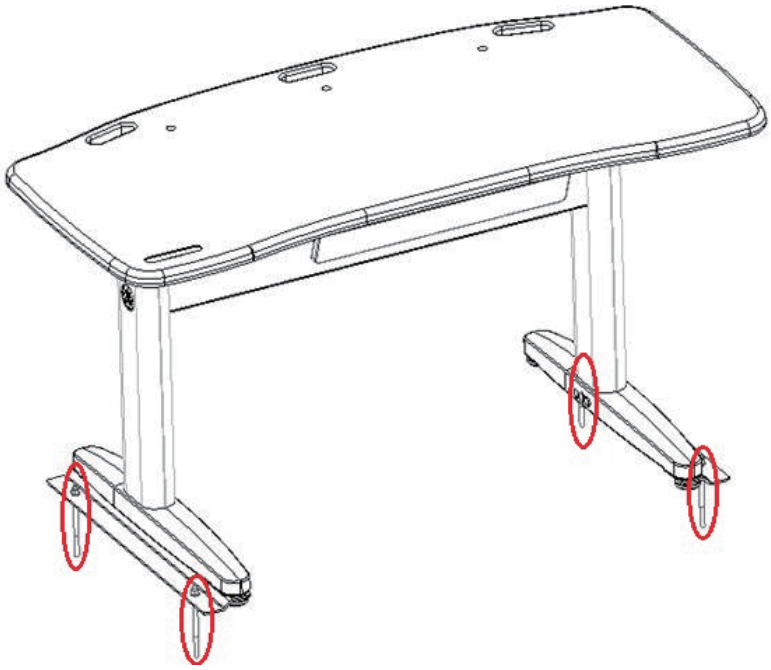
Note: Pay attention to the up down direction of the anti seismic brackets during installation, the side of bracket that used to mount to the floor shall be flush with the foot adjuster, and the holes reserved for mounting the brackets to floor shall be on the outside of each down leg, as shown in Figure B-12.

Figure B-12 Installation Direction of Anti Seismic Brackets



3.) Turn the Freedom WorkSpace (FWS) to the upright position, use anchors provided by customer to mount the brackets to the floor, as shown in Figure B-13.

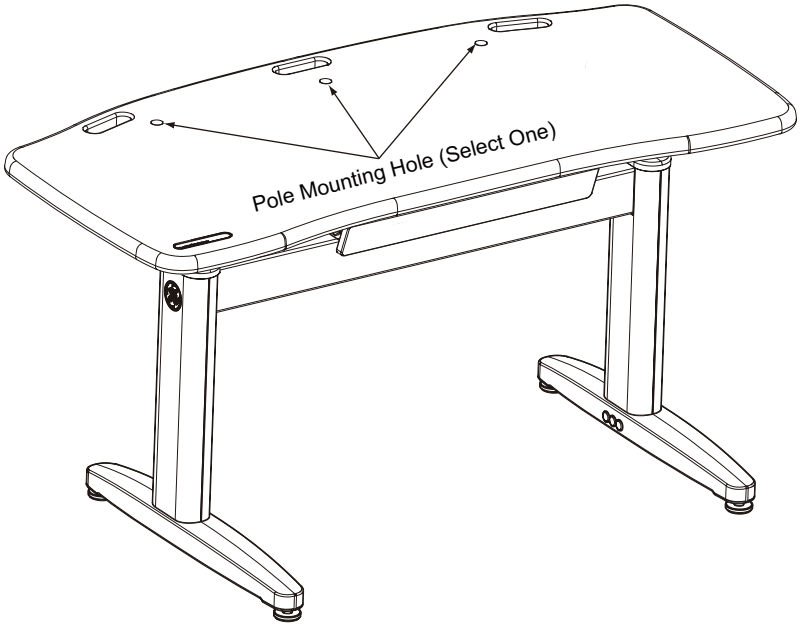
Figure B-13 Mount FWS



1.2.3 Install Monitors

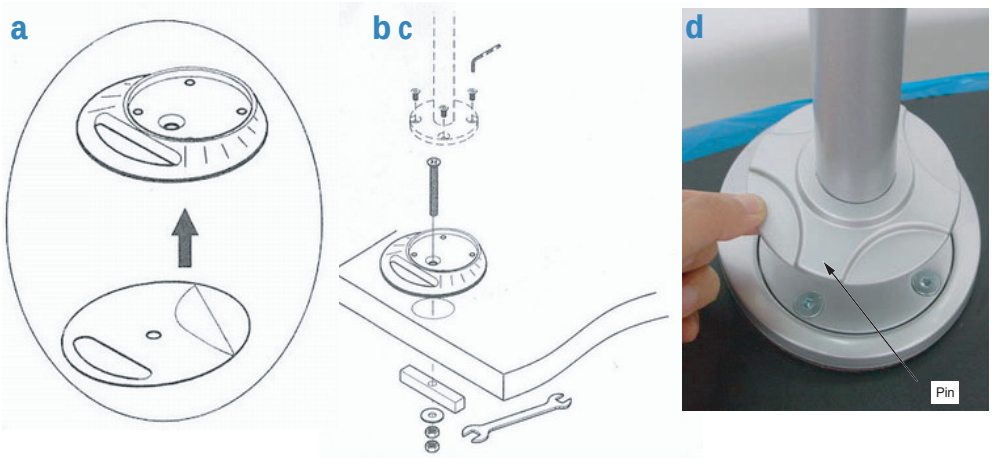
Note: For more information, refer to the materials shipped with the FWS.

Figure B-14 (FWS 5168666-3)



1.) Mount the pole on the worksurface. (See Figure B-14, Figure B-15)
   a.) Adhesive the pad under the grommet mount.
   b.) Use large bolt to go through parts.
   c.) Fix the clamp on the desk with 4 screws.
   d.) Put the screw plate cover through the pole. Check the pin position with the screw.

Figure B-15 Pole Mounting



2.) Change configuration of the monitor arms for site.

a.) Three configurations for customer to select, see pictures below:

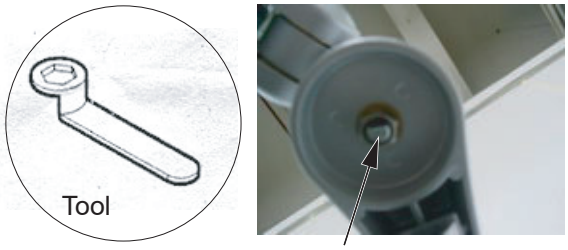
Figure B-16 Three configuration

A. default configuration B. 25 cm arm only C. 18 cm arm only

18 cm arm 25 cm arm

b.) If B or C is selected, disengage the not-to-used arm by unscrewing the junction bolts and reconfigure the arms.

Figure B-17 Junction Bolt



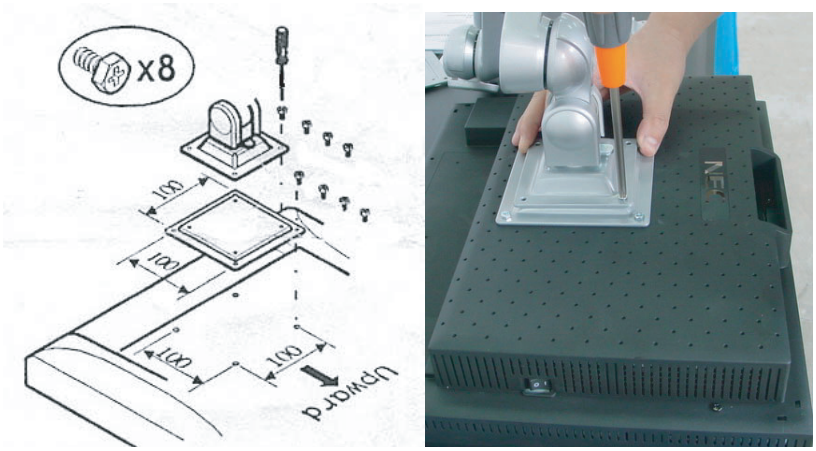
junction bolt (notice the direction during reconfiguratio)

3.) Secure cable covers onto monitor arms. Cable covers should open backward the customer.

Figure B-18 Monitor Arms

4.) Mount the monitors to the arm.

Figure B-19 Monitor Installation



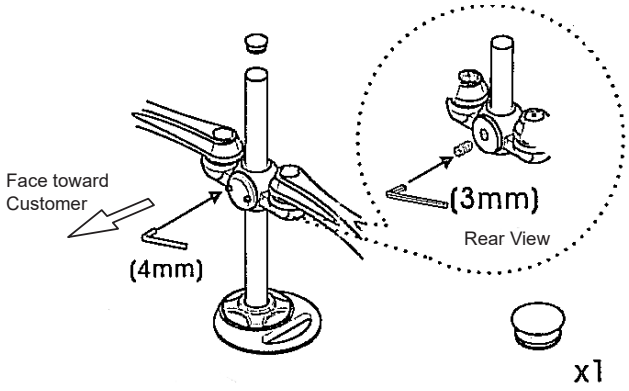
5.) Mount arms with pole. (Figure B-20)

a.) Loosen two screws slightly. Put the arm into the pole and adjust it to the suitable position. Middle joint mount (two large allen screws) of the monitor arms should face toward the customer.

b.) Tighten up the pole with 4mm and 3mm allen keys.

c.) Put in the plug on top of the pole.

Figure B-20 Arm Installation



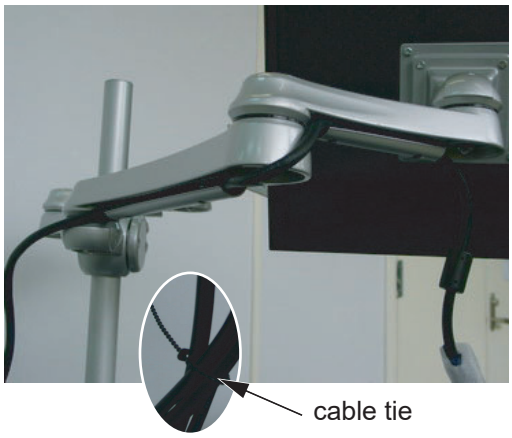
6.) Put extra hole covers onto the holes not used. (Figure B-20)

7.) Route cables.

a.) Thread monitor cables through cable covers.

b.) Use cable tie to wrap the cables together or wrap the cables with pole.

Figure B-21 Cable Fixing



8.) Route cables (for FWS 5168666-3), thread cables through worksurface and use cable tie to wrap them together to the back slot of crossbrace (Figure B-22).

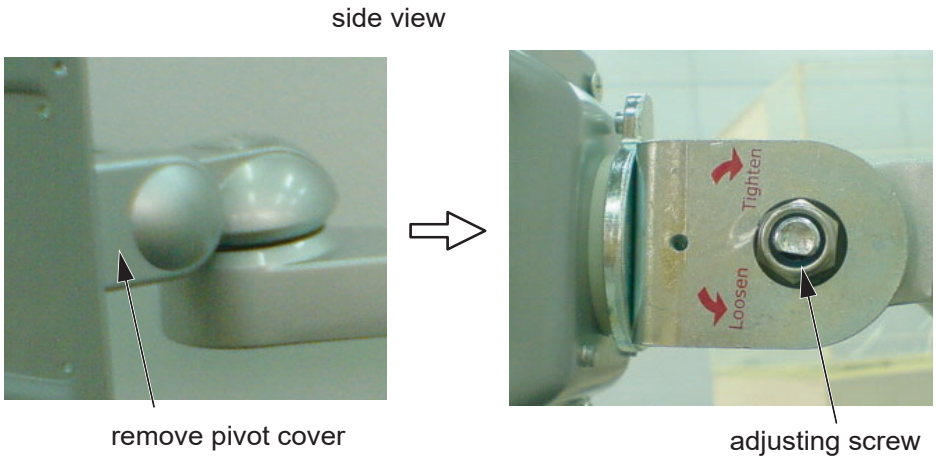
Figure B-22 Cable Routing

1.3 Monitor Adjustment

1.) Position the arms for ergonomic viewing. For optimum ergonomic viewing set top of monitor screen 1" below eye height. With monitor and arm properly supported, loosen screw and adjust up or down to desired height. Retighten to secure arm to pole.

2.) Adjust monitor tilt: Tilt monitor back and forth through entire pivot range of motion. If it does not stay in place or movement in one direction is stiff, pivot needs adjustment - see below (pivot cover is removed). Adjust until monitor stays in place and tilting forces, up or down, are equal.
Increase tilt lifting force: Turn screw clockwise.
Decrease tilt lifting force: Turn screw counterclockwise.

Figure B-23 Adjusting Screw



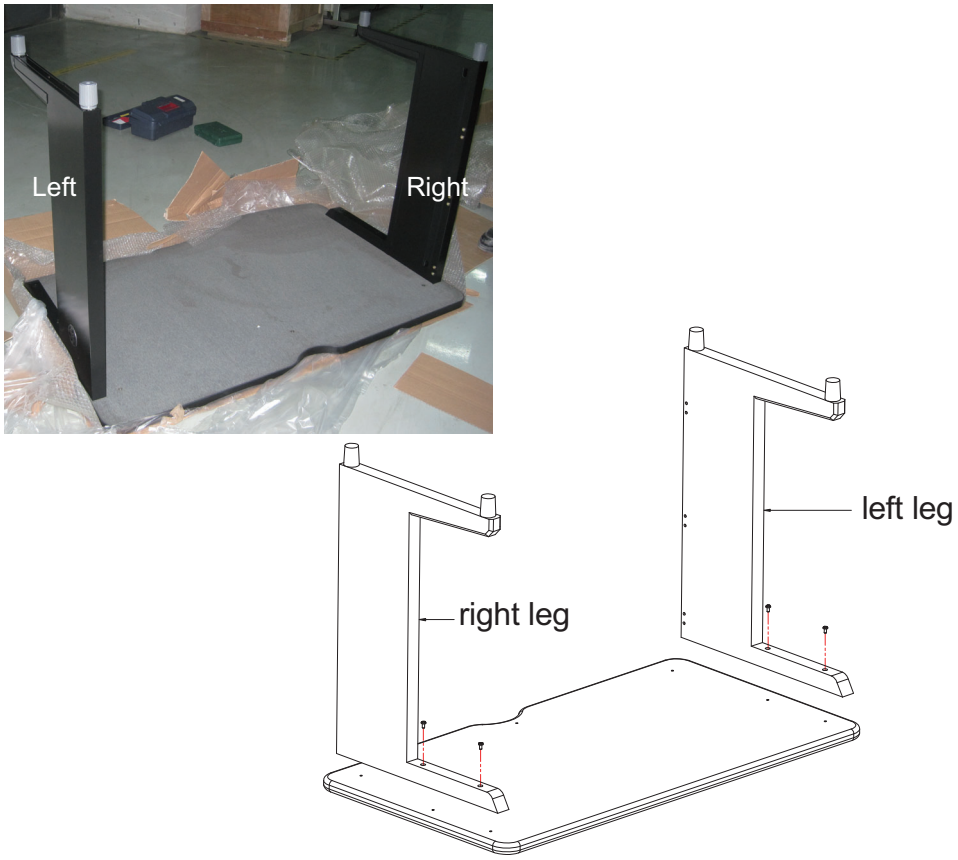
Section 2.0
Aurora SWS Table Assembly and Adjustment (5449758-2)

Aurora SWS table is an optional console table.

1.) Remove all the transportation packaging from the Aurora Table, use the packing material as cushion and carefully put tabletop on it to avoid scratches.

2.) Assembly the left and right legs to the tabletop by screwing 4 screws.

Figure B-24 Table Legs Installation



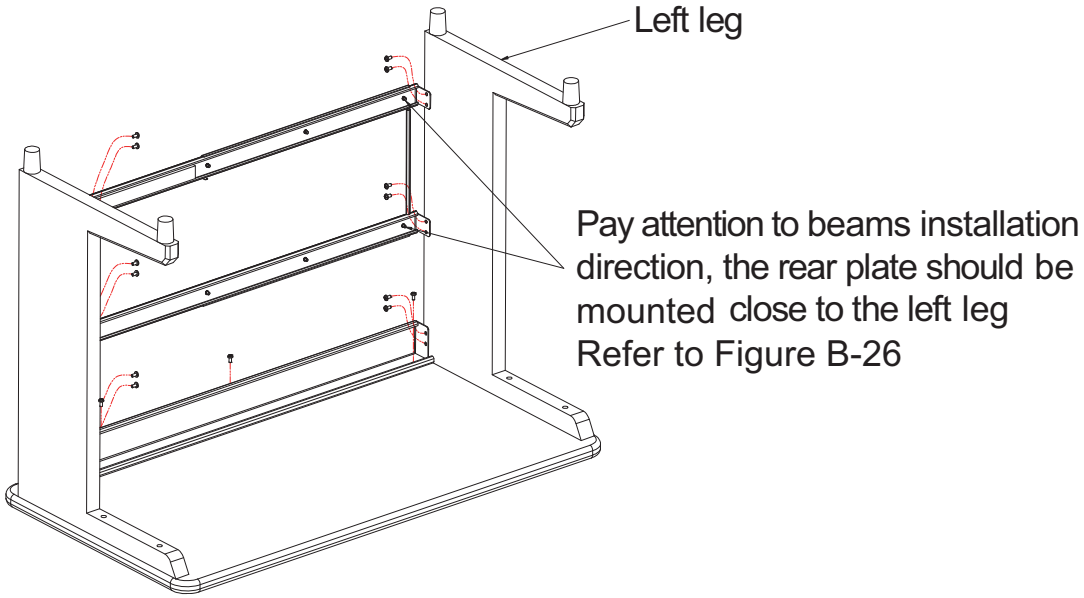
3.) Prepare crossbar and two beams.

4.) Install the upper crossbar by screwing seven screws, three screws for tabletop, four screws for left and right legs.

Figure B-25 Crossbar Installation

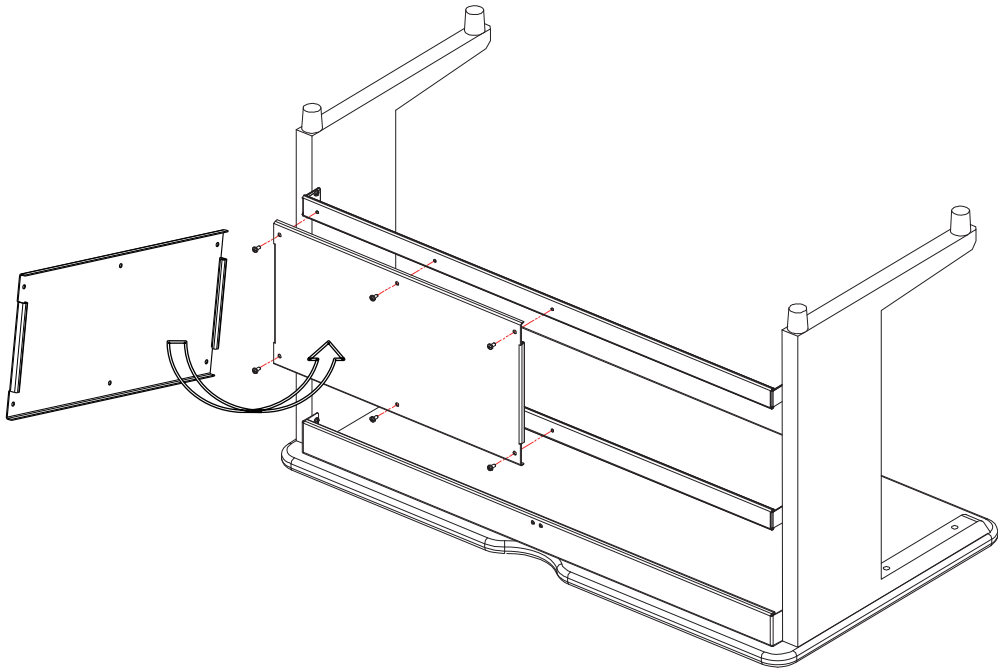
5.) Install two beams to the left and right legs as shown in Figure B-26. Note to keep all screws loose.

Figure B-26 Beams Installation



6.) Mount the rear plate on two beams by screwing 6 screws.

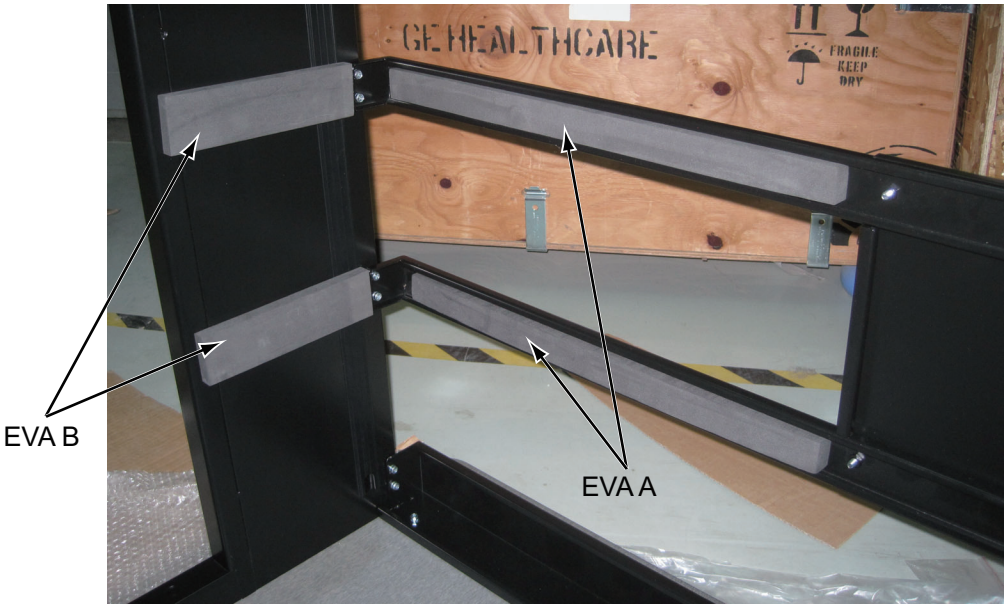
Figure B-27 Rear Plate Installation



7.) Tighten all screws.

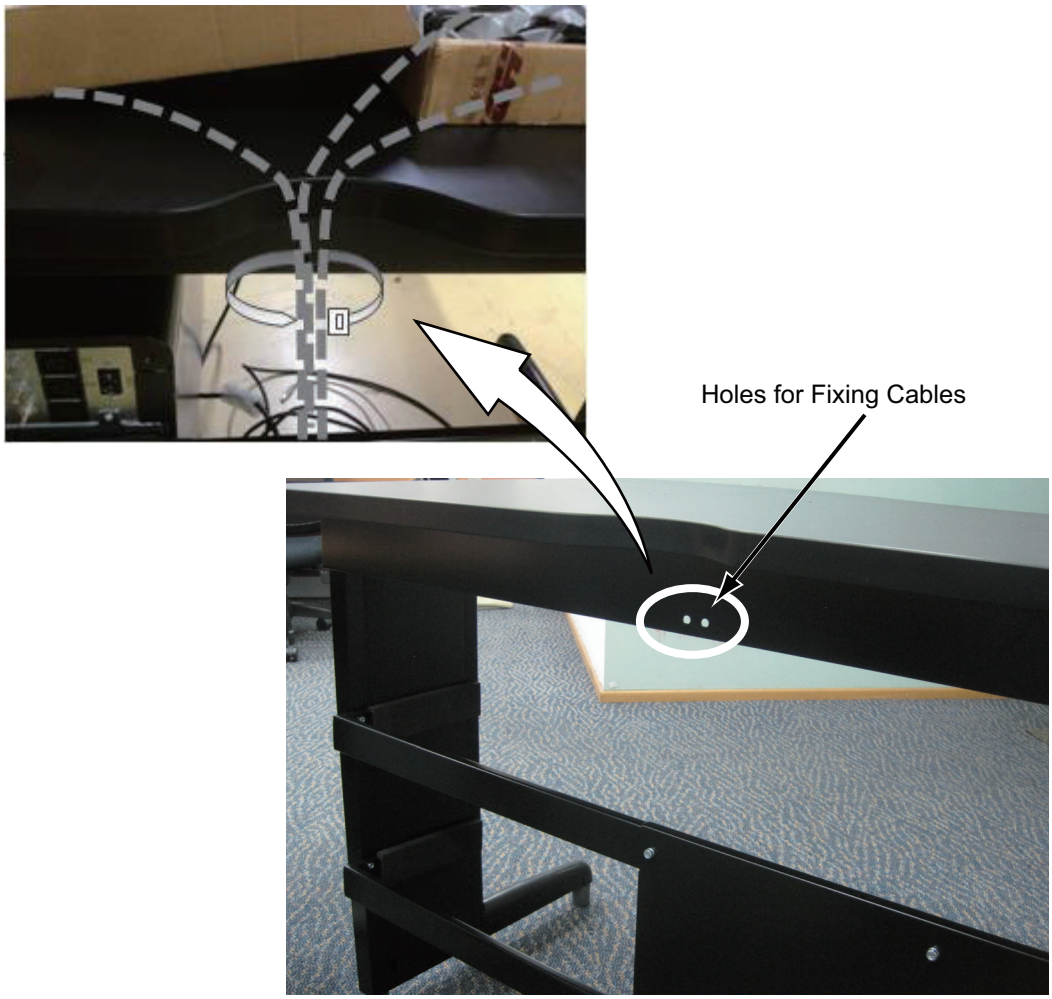
8.) Stick EVA A on the teams and EVA B on the right leg as shown in Figure B-28.

Figure B-28 EVA Attaching



9.) Overturn the table, then place monitors and route cables to the table.

Figure B-29 Fixing Cable



Page Left Intentionally Blank

AppendixC
Pictorial Representation of Required Tools

Use the following guide as a reference, if you are unsure of a tool listed in Section 2.3, on page 31.

Table C-1 Required Tools

TOOL NAME	PICTURE	EXAMPLE PART NUMBER*
Adapter		Sears Industrial: $^{3}/_{8}$" to $^{1}/_{2}$" (9-4258)
Ball-Peen Hammer		Sears Industrial: 1lb/2lb (9-38465)
Canned Air		Miller Stephenson: Aero Duster (MS-222N)
Clamp on Amp Meter		Sears Industrial: 9-WTAD105
Combination Wrench Set		Sears Industrial: U.S. Standard & Metric (9-44048)
Cordless Screwdriver		Sears Industrial: 9-MU65401
Deep Well Socket		Sears Industrial: $^{3}/_{4}$" X $^{3}/_{8}$" (included with 9-34496)
Dental Pick		
Diagonal Cutting Pliers		Sears Industrial: Small (9-45077)

* Part Numbers given for reference only. GEMs does not endorse any tool brand name.

Table C-1 Required Tools (Continued)

TOOL NAME	PICTURE	EXAMPLE PART NUMBER*
Drill		Sears Industrial: $^{3}/_{8}$" or $^{1}/_{2}$" (9-27859)
Drill Adapter		Sears Industrial: 3" X $^{3}/_{8}$" (9-APSZ24)
Drill Bit Set		Sears Industrial: U.S. Standard (9-66084)
DVM		Sears Industrial: 9-82028 Sears Industrial: 9-FL873
Extension for Ratchet Wrench		Sears Industrial: 3" X ½" (9-44133)
Gloves		Sears Industrial: Large (9-40502)
Hammer Drill		Sears Industrial: ½" (9-27205)
Hex Bit Set		Sears Industrial: ¼" (9-SK45508)
Hex Key (Allen Wrench) Set		Sears Industrial: U.S. Standard (9-46284)

* Part Numbers given for reference only. GEMs does not endorse any tool brand name.

Table C-1 Required Tools (Continued)

TOOL NAME	PICTURE	EXAMPLE PART NUMBER*
Level		Sears Industrial: 4’ (9-39856)
Masonry Bit		
Open-End Wrench (Thin or Standard Tappet)		Snap-on: 10mm (SRSM10) & 21mm (LTAM2124)
Ratchet Wrench		Sears Industrial: $^{3}/_{8}$" (9-43175)
Reciprocating Saw with Blades		Sears Industrial: 9-MU650921
Safety Glasses		Sears Industrial: 9-18650
Safety Shoes		
Screwdriver Set		Sears Industrial: Phillips & Straight (9-41505)
Socket Set		Sears Industrial: Standard $^{3}/_{8}$" (9-34496)
Sockets		Sears Industrial: 1 $^{1}/_{8}$" X $^{1}/_{2}$" (9-47516)

* Part Numbers given for reference only. GEMs does not endorse any tool brand name.

Table C-1 Required Tools (Continued)

TOOL NAME	PICTURE	EXAMPLE PART NUMBER*
Step Ladder		Sears Industrial: 6’ (9-WN6006)
Tongue & Groove Pliers		Sears Industrial: Large (9-CL440)
Torpedo Level		Sears Industrial: 9" (9-39829)
Torque Wrench		Sears Industrial: $^{3}/_{8}$" (9-WR3470)
Universal Joint		Sears Industrial: $^{3}/_{8}$" (9-4435)
Vacuum Cleaner		Sears Industrial: 8 Gal (9-17780)
Spring Balance		U0012BF Spring Balance

* Part Numbers given for reference only. GEMs does not endorse any tool brand name.

www.gehealthcare.com