GE Healthcare

Xtream Injector Option Installation Manual

OPERATING DOCUMENTATION

5317408-1EN
Rev 3

LEGAL NOTES

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IMPORTANT PRECAUTIONS

LANGUAGE

ПРЕДУПРЕЖДЕНИЕ (BG)	• ТОВА УПЪТВАНЕ ЗА РАБОТА Е НАЛИЧНО САМО НА АНГЛИЙСКИ ЕЗИК. • АКО ДОСТАВЧИКЪТ НА УСЛУГАТА НА КЛИЕНТА ИЗИСКА ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ, 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 ПАЦИЕНТ В РЕЗУЛТАТ НА ТОКОВ УДАР ИЛИ МЕХАНИЧНА ИЛИ ДРУГА ОПАСНОСТ.
警告 (ZH-CN)	• 本维修手册仅提供英文版本。 • 如果维修服务提供商需要非英文版本，客户需自行提供翻译服务。 • 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人员，操作员或患者造成触电、机械伤害或其他形式的伤害。
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 medmindre denne servicemanual har været konsulteret og er forstået. • Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk, 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 voordat 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 or from mechanical or other hazards.
HOIATUS (ET)	• Käesolev 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 de service n'est disponible qu'en anglais. • Si le technicien du client a besoin de ce manuel dans une autre langue que l'anglais, c'est au client qu'il incombe de le faire traduire. • Ne pas tenter d'intervenir sur les équipements tant que le manuel service 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 στα αγγλικά μόνο. • Εάν το άτομο παροχής σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει υπηρεσίες μετάφρασης. • Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό εκτός εαν έχετε συμβουλευτεί και έχετε κατανοήσει το παρόν εγχειρίδιο σέρβις. • Εαν δε λάβετε υπόψη την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στο άτομο παροχής 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 eingöngu 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 inglese. • Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione. • Si proceda alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto • Il non rispetto della presente avvertenza potrebbe far compiere operazioni da cui derivino lesioni all'addetto, alla manutenzione, all'utilizzatore ed al paziente per folgorazione elettrica, per urti meccanici od 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 지침서는 영어로만 이용하실 수 있습니다 . • 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우 , 번역 서비스를 제공하는 것은 고객의 책임입니다 . • 본 서비스 지침서를 참고했고 이해하지 않는 한은 해당 장비를 수리하려고 시도하지 마십시오 . • 이 경고에 유의하지 않으면 전기 쇼크 , 기계상의 혹은 다른 위험으로부터 서비스 제공자 , 운영자 혹은 환자에게 위해를 가할 수 있습니다 .
BRDINJUMS (LV)	• Ðî apkalpes rokasgrâmata ir pieejama tikai angïu valodâ. • Ja klienta apkalpes sniedzçjam nepieciešama informâcija citâ valodâ, nevis angïu, klienta pienâkums ir nodroðinât tulkoðanu. • Neveiciet aprîkojuma apkalpi bez apkalpes rokasgrâmatas izlasîðanas un sapraðanas. • Ðî brîdinâjuma neievçroðana var radît elektriskâs strâvas trieciena, mehânisku vai citu risku izraisîtu traumu apkalpes sniedzçjam, operatoram vai pacientam.

ÁSPĖJIMAS (LT)	• Ðis eksploatavimo vadovas yra prieinamas tik anglø kalba. • Jei kliento paslaugø tiekëjas reikalauja vadovo kita kalba – ne anglø, numatyti vertimo paslaugas yra kliento atsakomybë. • Nemëginkite atlikti árangos techninës prieþiûros, nebent atsiþvelgëte á ðá eksploatavimo vadovà ir já supratote. • Jei neatkreipsite dëmesio á ðá perspëjimà, galimi suþalojimai dël elektros ðoko, mechaniniø ar kitø pavojø paslaugø tiekëjui, operatoriui ar pacientui.
ADVARSEL (NO)	• Denne servicehåndboken finnes bare på engelsk. • Hvis kundens serviceleverandør trenger 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 dostawca usług klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta. • Nie próbować serwisować wyposażenia bez zapoznania się i zrozumienia niniejszego podręcznika serwisowego. • Niezastosowanie się do tego ostrzeżenia może spowodować urazy dostawcy usług, operatora lub pacjenta w wyniku porażenia elektrycznego, zagrożenia mechanicznego bądź innego.
ATENÇÃO (PT)	• Este manual de assistência técnica só se encontra disponível em inglês. • Se qualquer outro serviço de assistência técnica solicitar estes manuais noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução. • Não tente consertar o equipamento sem ter consultado e compreendido este manual de assistência técnica. • O não cumprimento deste aviso pode pôr em perigo a segurança do técnico, do operador ou do paciente devido a choques elétricos, mecânicos ou outros.
ATENȚIE (RO)	• Acest manual de service este disponibil numai în limba engleză. • Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere. • Nu încercați să reparați echipamentul decât ulterior consultării şi înțelegerii 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 обслуживанию предлагается 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 обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения. • Несоблюдение требований данного предупреждения может привести к тому, что специалист по обслуживанию, оператор или пациент получат удар электрическим током, механическую травму или другое повреждение.

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 zodpovednos″ou zákazníka. • Nepokúšajte sa o obsluhu zariadenia skôr, ako si neprečítate návod na obluhu a neporozumiete mu. • Zanedbanie tohto upozornenia môže vyústi″ do zranenia poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, do mechanického alebo iného nebezpečenstva.
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.
DIKKAT (TR)	• Bu servis kilavuzunun sadece ingilizcesi mevcuttur. • Eğer müşteri teknisyeni bu kilavuzu ingilizce dişinda bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer. • Servis kilavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz. • Bu uyariya uyulmamasi, elektrik, mekanik veya diğer tehlikelerden dolayi teknisyen, operatör veya hastanin yaralanmasina 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 General Electric representative or a hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

To file a report:

- Call 1-800-548-3366 and use option 8.
- Fill out a report on http://us44hdd21/sctq/InstallFulfill/InstalFulfillment.htm
- Contact your local service coordinator for more information on this process.

Rev. Jan. 5, 2005

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT

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

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

IMPORTANT...X-RAY PROTECTION

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

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

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

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

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

LITHIUM BATTERY CAUTIONARY STATEMENTS

CAUTION **Risk of Explosion.**

Danger of explosion if battery is incorrectly replaced.

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

ATTENTION **Danger d'Explosion**

Il y a danger d'explosion s'il y a 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 Healthcare PQR Process to report all omissions, errors, and defects in this publication.

Revision History

Revision	Date	Reason for change
3	05/18/10	Added Medrad information
2	03/24/09	Updated Section 1.0, 2.0, 3.0 and 6.0
1	08/28/08	Initial Release

List of Effected Pages

PAGES	REVISION	PAGES	REVISION	PAGES	REVISION
1 through 44	3				

Table of Contents

Preface
Publication Conventions

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

Section 1.0
Safety & Hazard Information

1.1 Text and Character Representation

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

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

EXAMPLES OF HAZARD STATEMENTS USED

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

⚠ **DANGER SEVERE PERSONAL INJURY**

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

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

⚠ **WARNING SERIOUS PERSONAL INJURY**

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

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

⚠ **CAUTION Minor Personal Injury**

Caution is used when a hazard exists which <u>can or could cause minor injury</u> to self or others if instructions are ignored. They include for example:

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

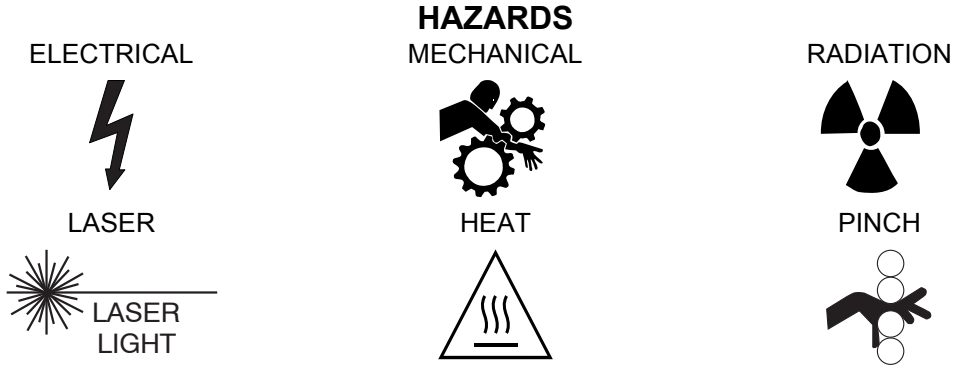
⚠ **NOTICE Property Damage Only**

Notice is used when a hazard is present that can cause property damage but has <u>absolutely no personal injury risk</u>.They can include:

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

1.2 Graphical Representation

Important information will always be preceded by the exclamation point ⚠ contained within a triangle, as seen throughout the Preface chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could possibly cause harm.



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Section 2.0
Publication Conventions

2.1 General Paragraph and Character Styles

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

EXAMPLES OF PREFIXES USED FOR GENERAL INFORMATION

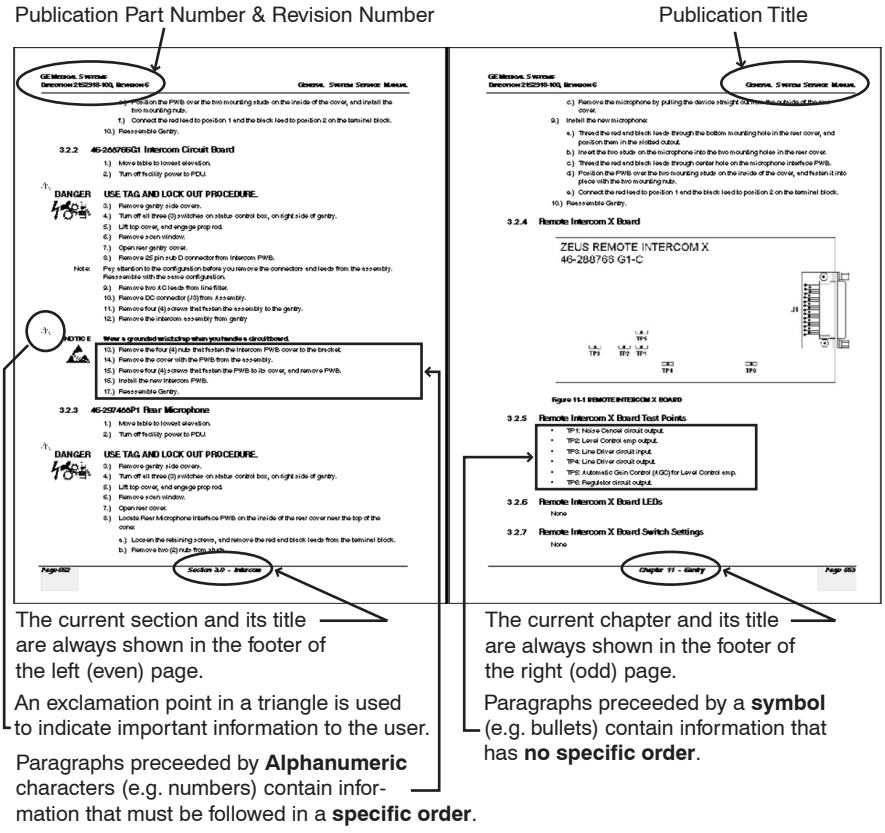
Purpose: Introduces and provides meaning as to the information contained within the chapter, section or subsection, Such as used at the beginning this chapter for example.

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

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

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

2.2 Page Layout



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

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

2.3 Computer Screen Output/Input Text Character Styles

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

Example: Fixed Output

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

Example: Variable Output

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

Example: Fixed Input

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

Example: Variable Input

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

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

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

Example: Hard Keys

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

Example: Soft Keys

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

END OF SECTION

Chapter 1
Xtream Injector Option Installation

Section 1.0
Introduction

1.1 Overview

The Xtream Injector is a start synchronization of CT scanner and Injector. Pressing the Start Scan button makes the scan and injector start simultaneously.This feature is only available with the injector, which supports CANopen Injector Interface Standard (CiA425) and is verified by GEHC.

There are 2 classes in Xtream Injector.

- Xtream Injector, which is the same as Class1 in CiA425, allows only ON/OFF.
- Enhanced Xtream Injector, which is the same as Class4 in CiA425, allows ON/OFF and injector parameters setting from the CT scanner.

CT scanner and injector are operated independently after start of scanning.

1.2 Prerequisites

The following hardware must be installed prior to this option installation.

- Gantry I/F Panels with IPC (Integrated Peripheral Control) board
- Accessory AC Outlet in console (For Nemoto Injector Only)
- CiA425 Compliant Injector certified by GEHC (see Table 1-1)

Type	Manufacturer/Model
Patient contrast injector: For Xtream Injector option	Nemoto Dual Shot Alpha (CIA425 Class I) / GEHC 5328194 Nemot0 Dual Shot Alpha (CIA425 Class IV) / GEHC 5328195 Nemoto Dual Shot GX (CIA425 Class IV)
Patient contrast injector: For Enhanced Xtream Injector option	Nemoto Dual Shot Alpha (CIA425 Class IV) / GEHC 5328195 Nemoto Dual Shot GX (CIA425 Class IV)
Medrad Stellant for patient contrast injector	Medrad ISI900 (for Stellant D) (CiA425 Class I and Class IV) / GE 5335919

Table 1-1 CiA425 Compliant Injector certified by GEHC (as of May, 2010)

Note:
- MEDRAD provides an option to upgrade from previously installed injector to integrated version. Installation of additional hardware and firmware upgrade of injector must be completed by MEDRAD before installation of this option.
- It is also recommended that both GE service and Injector vendor to be present for system checkout to confirm the equipment work properly.

Section 2.0
Material List

Part Number	Quantity	Description
5317258	1.0	Power Cable (IEC Style)
	1.0	Option Key DVD (Xtream Injector or Enhanced Xtream Injector)
5317408-1EN	1.0	Instruction
5169456	1.0	Injector Control Cable

Note: For VCT and HD, Injector control cable is included in system cable collector.

Section 3.0
Interconnect Diagram

3.1 Nemoto Injector

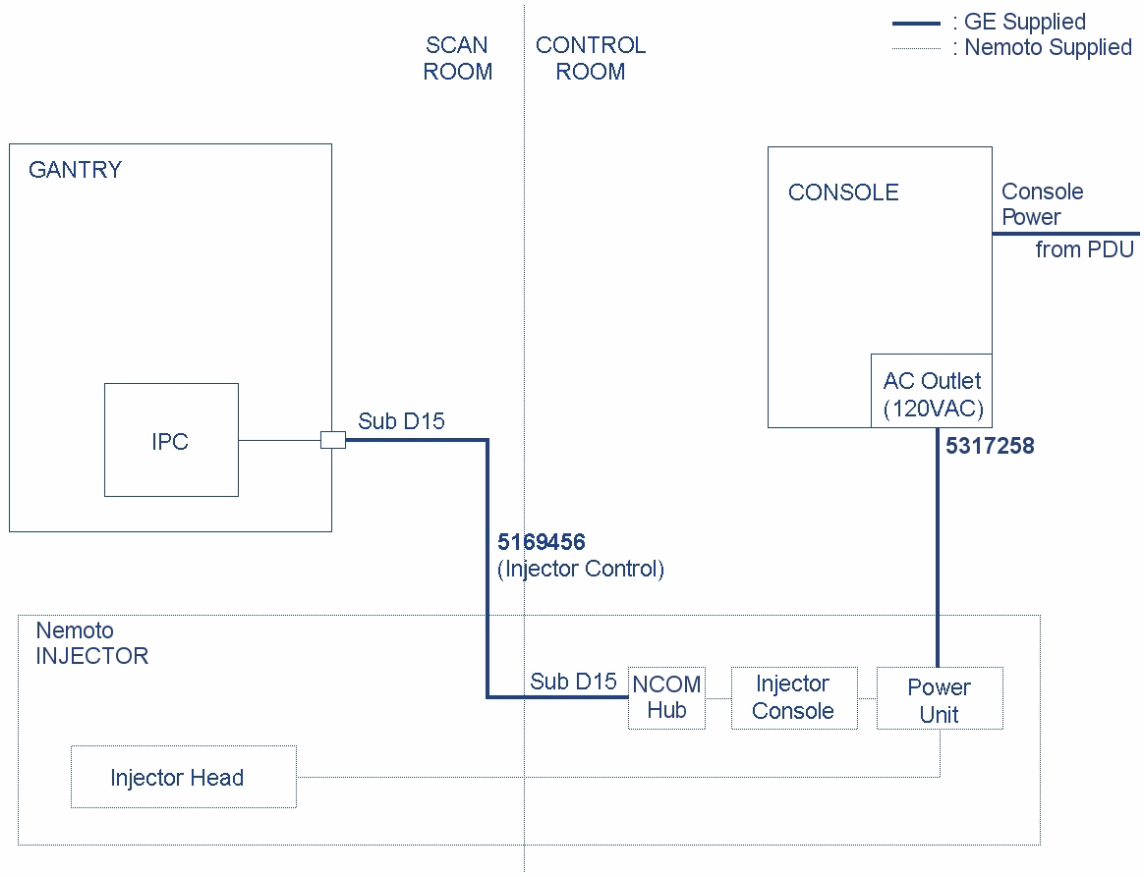


Figure 3-1 Interconnect Diagram

3.2 MEDRAD Diagram

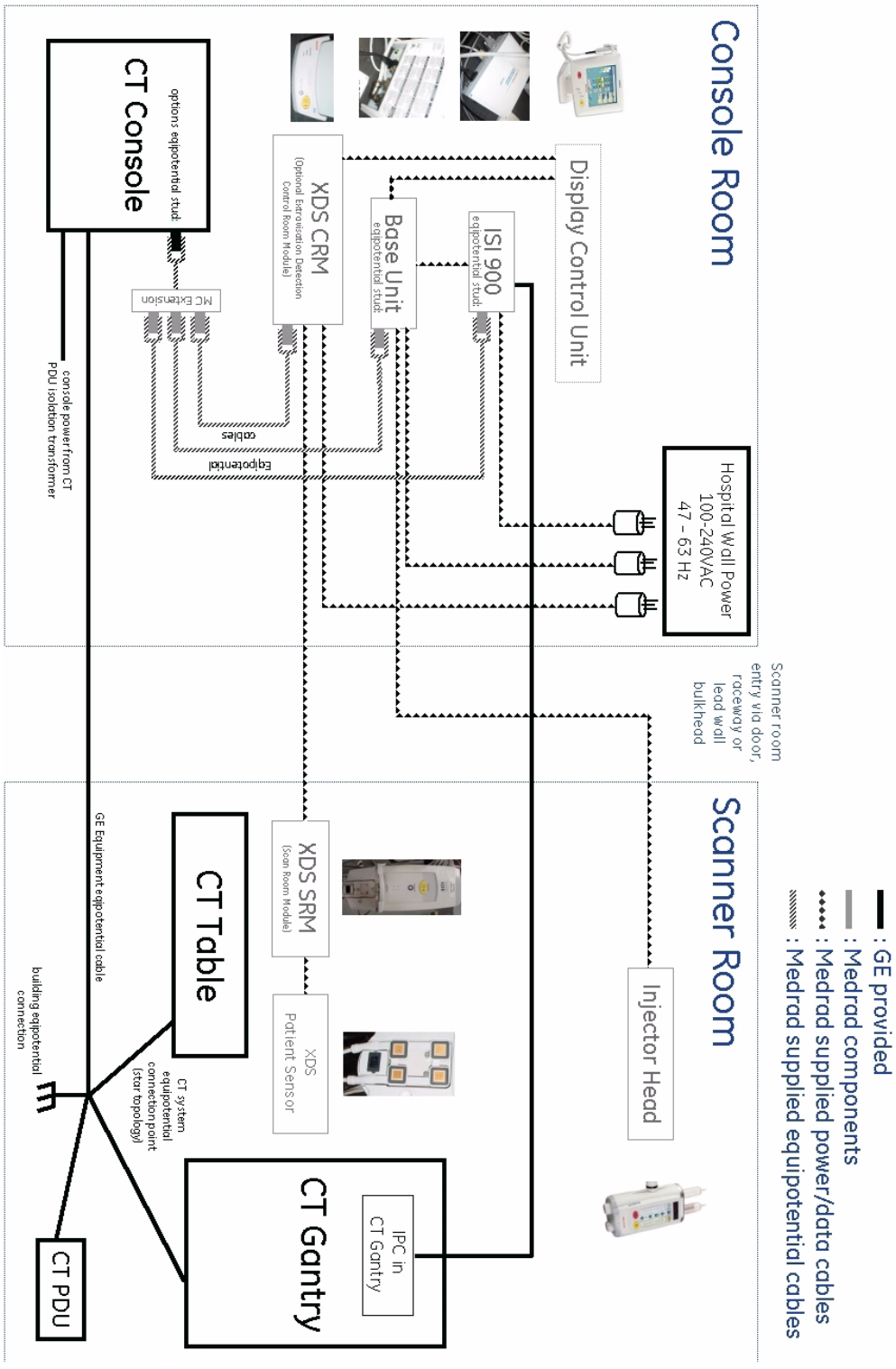


Figure 3-2 MEDRAD Interconnect Diagram

Section 4.0
Installation Procedure

4.1 Install Injector

Installation of the injector is done by Injector vendor or local distributors. If GE service is responsible for the installation of the injector in your country, follow the installation manual shipped with injector.

4.2 Install cables between CT and Injector

DANGER RISK OF ELECTRIC SHOCK. USE PROPER LOCKOUT/TAGOUT PROCEDURES.

4.2.1 Preparation - Cover Removal

1.) Use an 8mm Hex wrench to unlatch the side cover from the front cover.

2.) Remove the right side cover by lifting it upward to release the two (2) latches, located on the top edge of the cover. Once removed, the Service Switch Panel should be exposed.

3.) Turn OFF all 3 switches (Axial Drive, HVDC, 120 VAC) on the Service Switch Panel.

4.) If installed, remove both rear base covers, to gain access to Sub D15 connector on IPC Bracket, as shown in Figure 4-2.

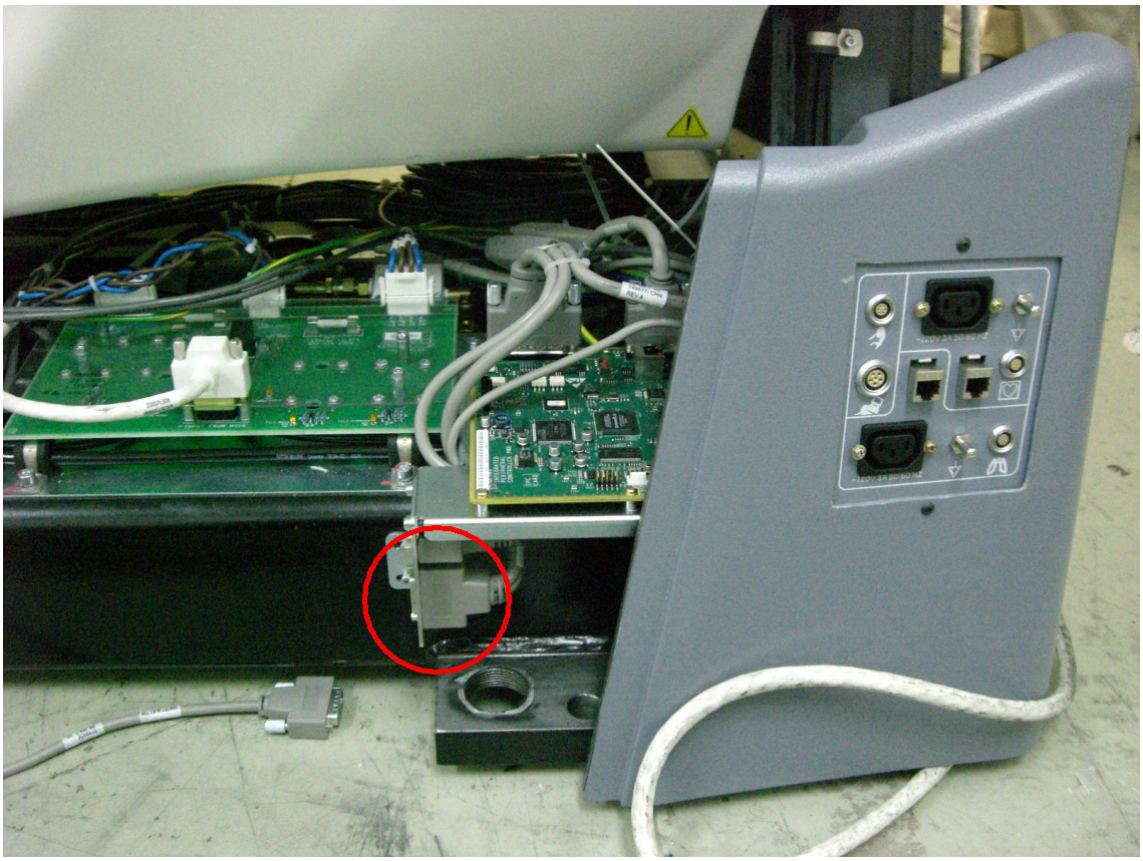


Figure 4-2 Sub D15 Connector (example of BrightSpeed)

4.2.2 Install Cables

1.) Install Injector power cable 5317258 and Sub-D Cable 5169456 according to “Interconnect Diagram“ (Figure 3-1 and Figure 3-2).

WARNING

- To insure operator and patient safety, Medrad requires the use of earth equipotential cables as shown in the diagram (Figure 3-2).

WARNING

- Connect power cables directly to the console (Nemoto) or the wall outlets (Medrad) as shown. Use of multi-tap powerstrips is prohibited.

4.3 Restore Power to the Gantry

1.) At the Service Switch Panel. Ensure the 3 switches, (Axial Drive, HVDC, 120VAC) are set to ON.

2.) Install all covers.

4.4 Install Option Software Key

Install option software key (Xtream Injector or Enhanced Xtream Injector) from Install Options GUI in Common Service Desktop.

For Enhanced Xtream Injector option, the Injector Setup screen appears during the installation. Choose the same pressure limit unit with Injector.

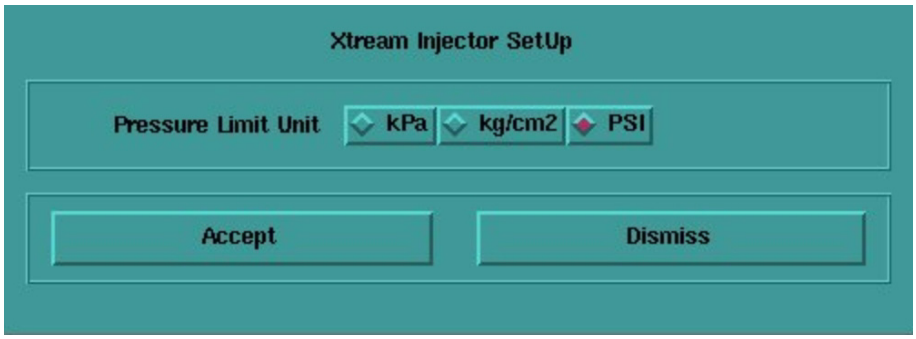


Figure 4-3 Xtream Injector Set Up Screen

Note: Xtream Injector and Enhanced Xtream Injector option key cannot be installed together.

Section 5.0
Functional Test

Note: The following tests need to be done with injector service personnel.

5.1 Verify Connection between CT and Injector

1.) Turn on the injector.

2.) Confirm the following message is logged in gesyslog,

```
IPC : Information : Validated Injector is connected.
```

- If connection to injector is OK but non-GE certified injector is connected, the following message will be logged.

  ```
  IPC : Information : Connected injector is nothing in validated
  list.
  ```

- If none of the above message appears, it means non-compatible injector is connected or there may be hardware problems on Injector or interface (IPC or cable).

5.2 Functional Test for Xtream Injector Option

1.) Turn on the Injector and select an injection protocol on the Injector Monitor. Keep injector “NOT arming state”.

2.) On CT Console, select a scan protocol with Xtream Injector OFF in New Patient. Set scan parameters as Axial or Helical on view edit screen.

3.) After [Confirm] button becomes selectable, click [Xtream Injector (blue)] button.

[Xtream Injector (blue)] button for injector should turn to [Xtream Injector (red)].
Then [Confirm] button is disabled.

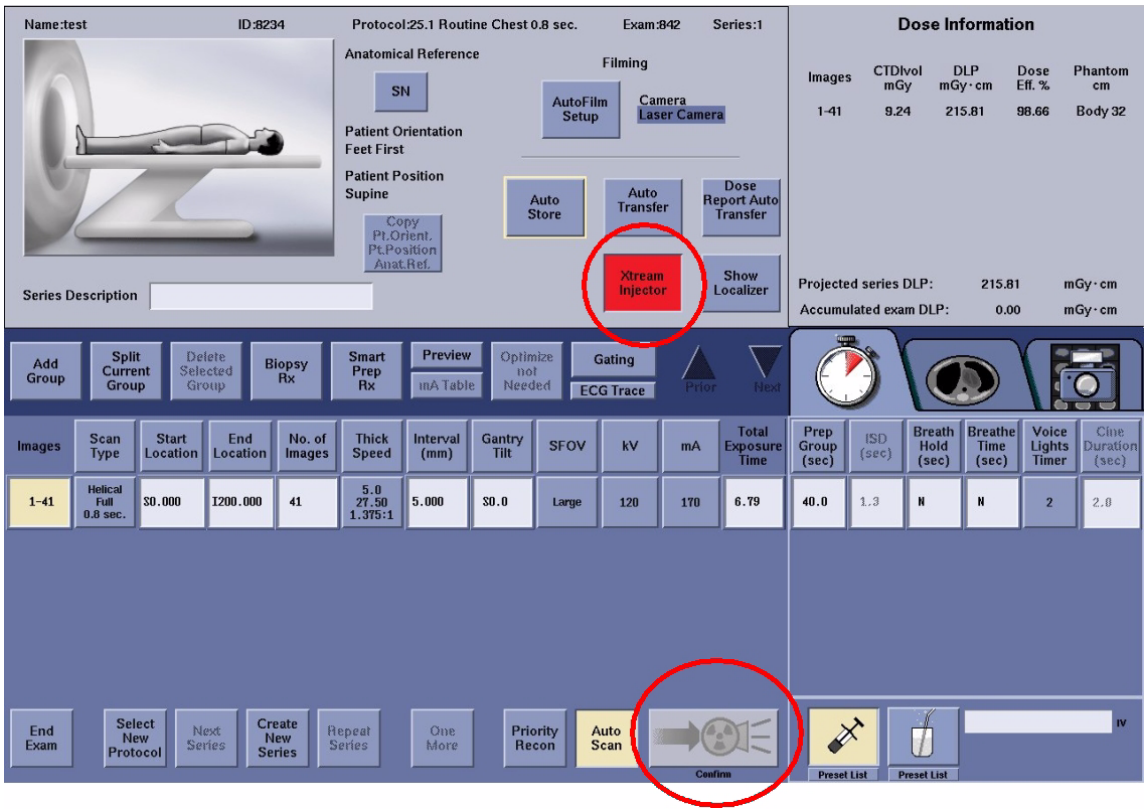


Figure 5-1 View Edit Screen with Xtream Injector Button

4.) Press arming button* on Injector. [Xtream Injector (red)] button on CTUI should turn to [Xtream Injector (white)]. Then [Confirm] button becomes selectable.

*On Nemoto DualShot injector, arming button means “Air Check” button.

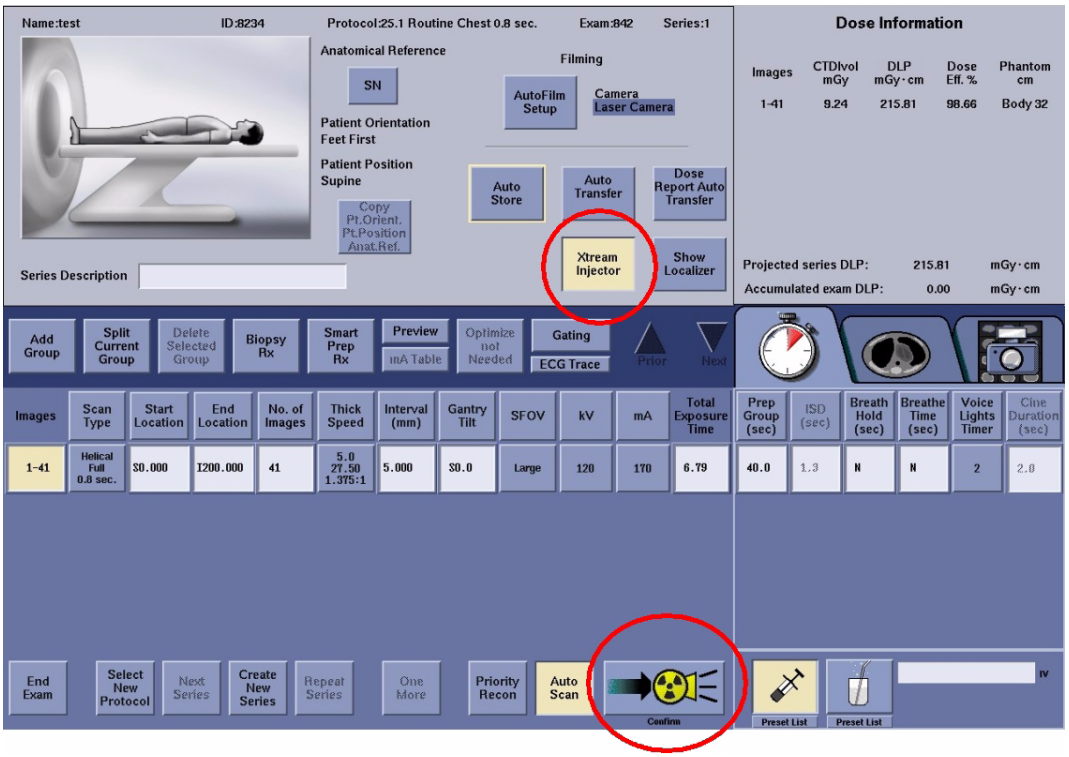


Figure 5-2 View Edit Screen with Xtream Injector Button

5.) Modify injector parameters on Injector Monitor.
[Xtream Injector (white)] button on CTUI should turn to [Xtream Injector (red)].
Then [Confirm] button is disabled.

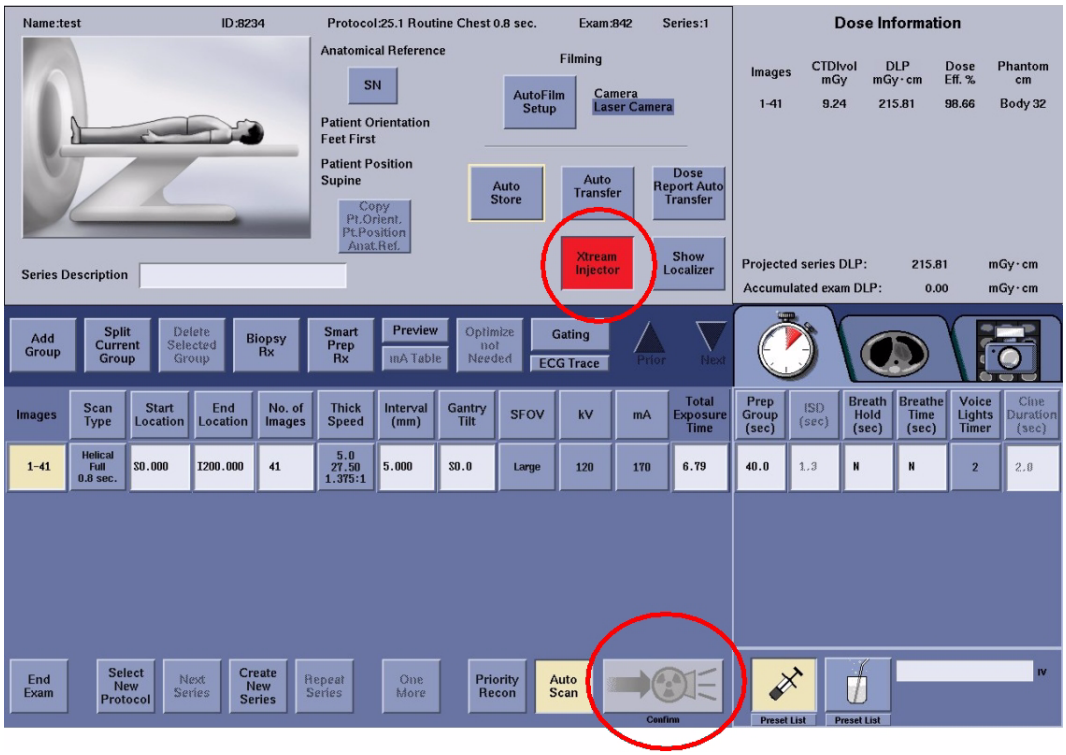


Figure 5-3 View Edit Screen with Xtream Injector Button

6.) Click [Xtream Injector (red)] button on CTUI.
[Xtream Injector (red)] button on CTUI should turn to [Xtream Injector (blue)] and [Confirm] button should become selectable.

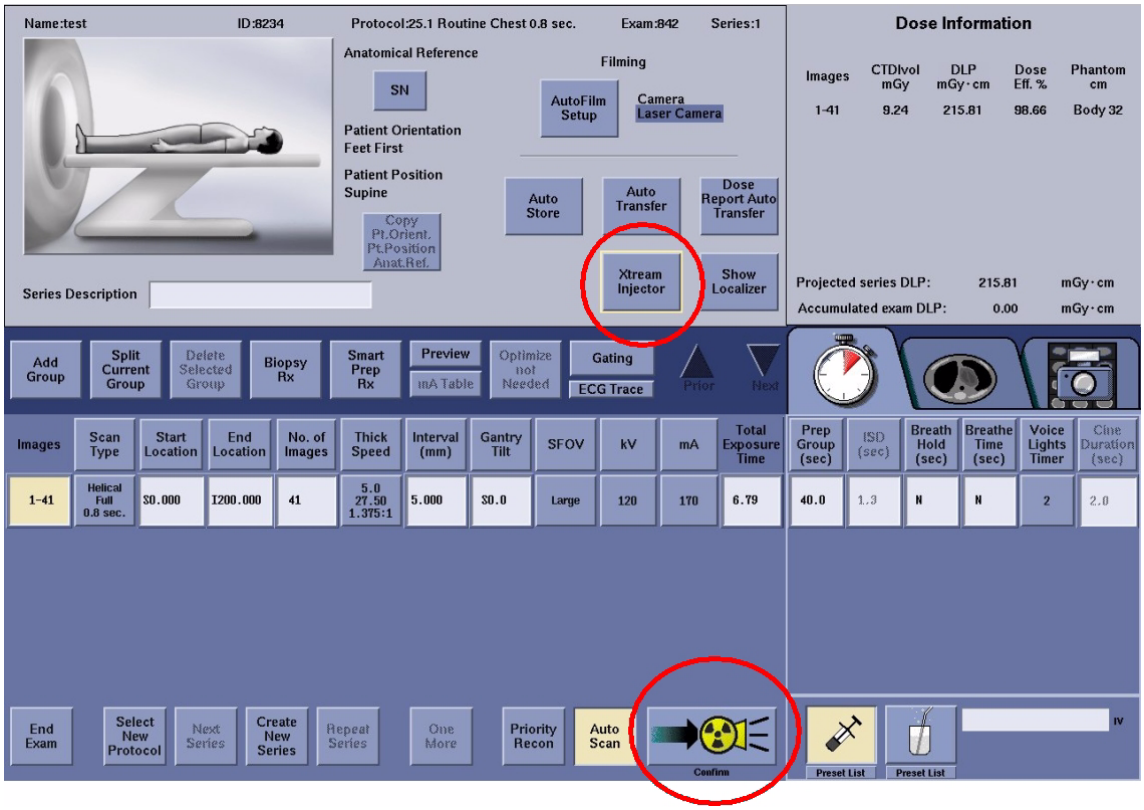


Figure 5-4 View Edit Screen with Xtream Injector Button

7.) Click [Xtream Injector (blue)].
[Xtream Injector (blue)] turns to [Xtream Injector (red)].

8.) Press arming button on Injector.
[Xtream Injector (red)] turns to [Xtream Injector (white)] and [Confirm] button becomes active.

9.) Click [Confirm] button on view edit screen.
[Scan Start] on SCIM starts to blink.

10.) Press [Start] button on Injector.
Injection is not started.

11.) Press [Scan Start] button on SCIM. (If Scan Start gets Time Out, then click [Resume] button.)
Scan and Injection are started simultaneously. (Wait until scan and injection complete.)

12.) This completes the Xtream Injector function test.

5.3 Functional Test for Enhanced Xtream Injector Option

1.) Turn on the Injector.

2.) On CT Console, select a scan protocol with Xtream Injector OFF in New Patient.

3.) Set scan parameters as Axial or Helical on view edit screen and click [Xtream injector (blue)].

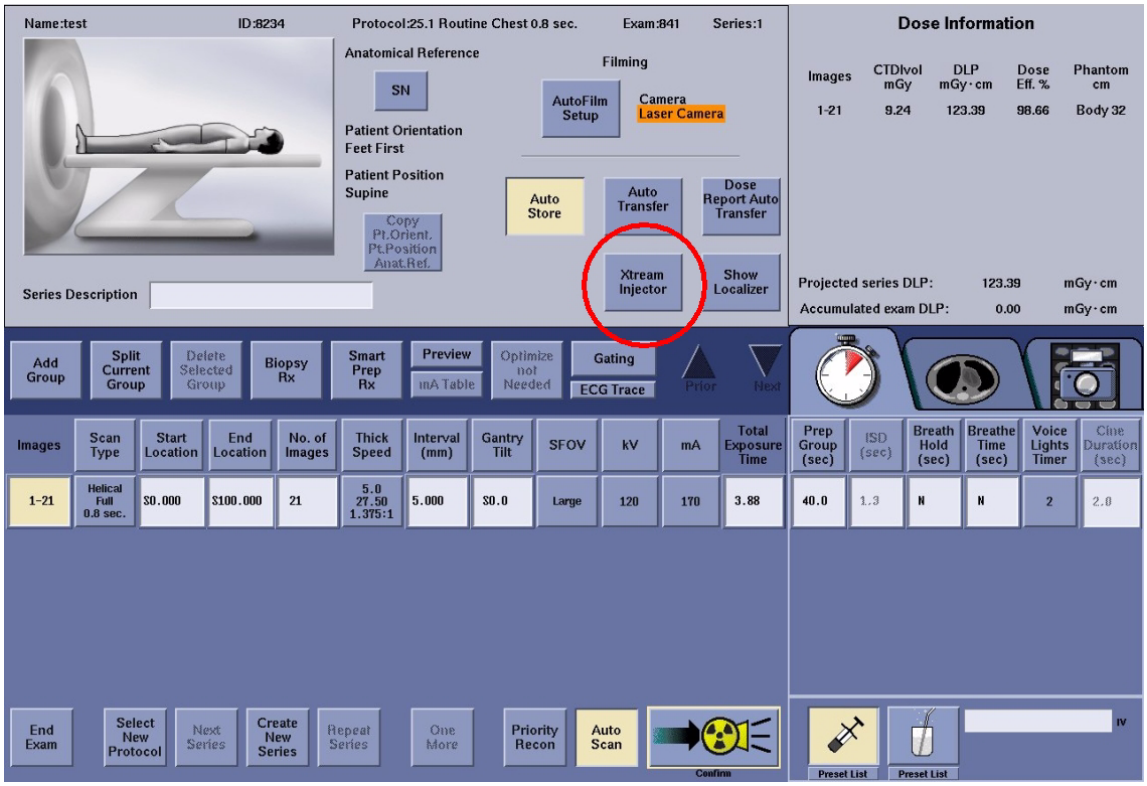


Figure 5-5 View Edit Screen with Xtream Injector Button

4.) The Enhanced Xtream Injector screen appears. Click [Off] button to turn to [On].

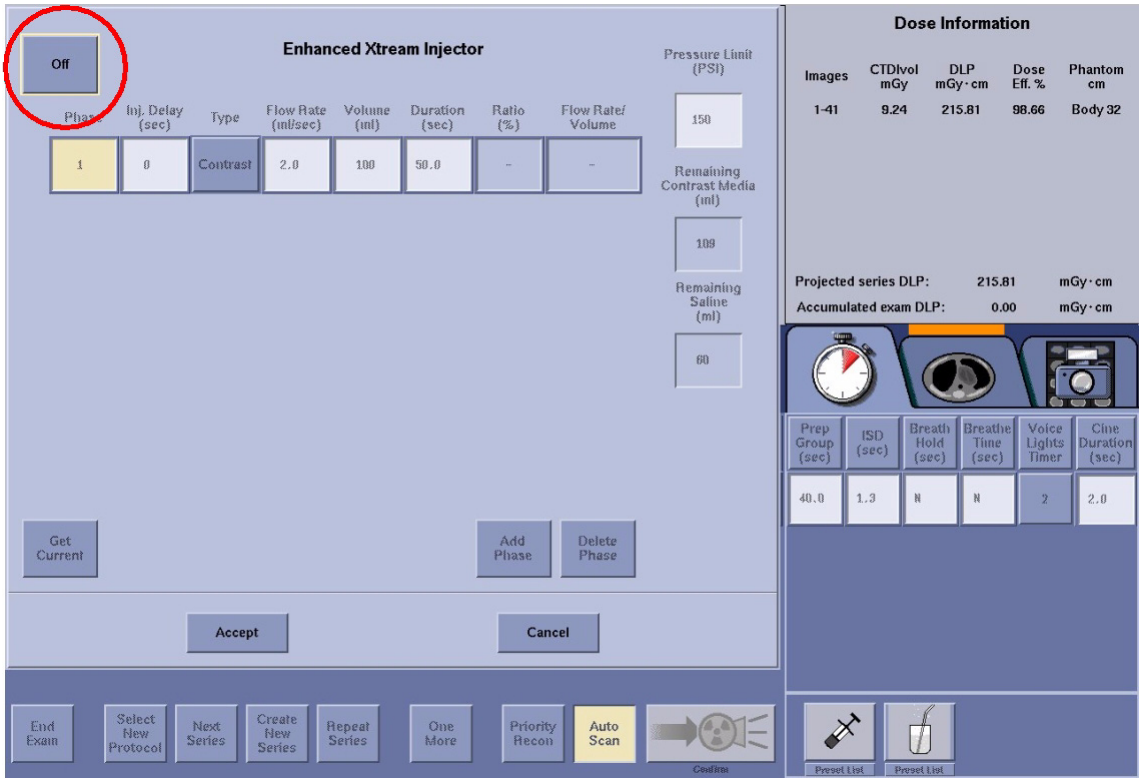


Figure 5-6 Enhanced Xtream Injector Screen

5.) Default injector parameters are shown. Modify injector parameters on the screen.

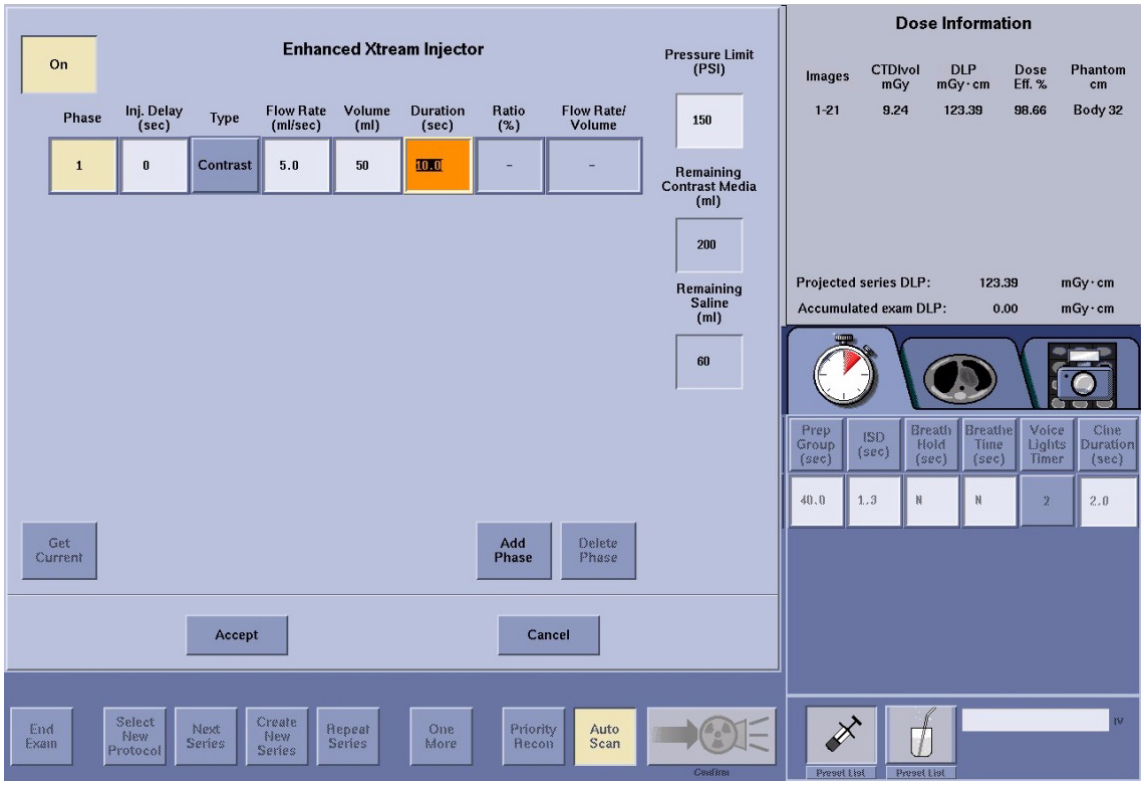


Figure 5-7 Enhanced Xtream Injector Screen

6.) Click [Accept] button. This will download the modified parameters to Injector. [Xtream injector] button becomes [Xtream Injector (Not Ready)](red).

7.) Modify injector parameters on Injector Monitor. Then click [Xtream Injector (red)] button on CT Console.

8.) Attention pop-up appears.

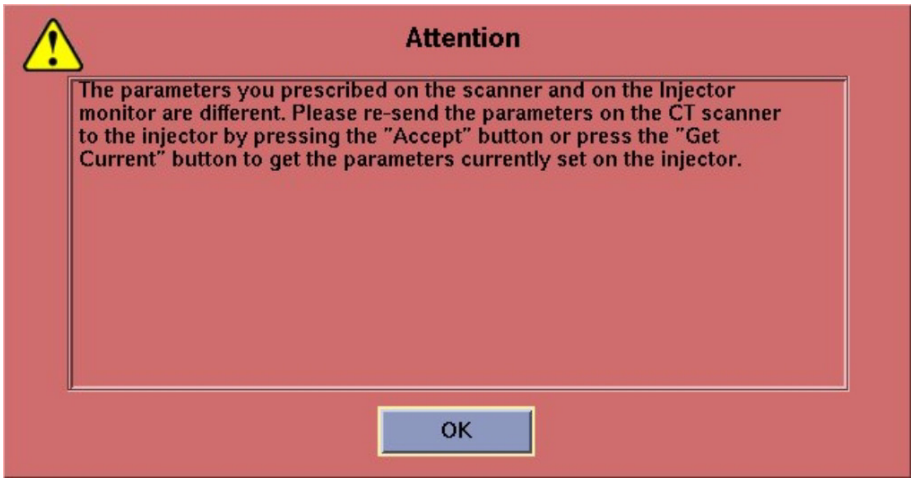


Figure 5-8 Attention Pop-up

9.) Click [OK] on Attention pop-up and then click [Get Current] button on the Enhanced Xtream Injector screen. This will upload the modified parameters on injector to CT.

10.) Modify injector parameters on the Enhanced Xtream Injector screen. Click [Accept] button.
Parameters on CT are downloaded to injector again.
[Xtream injector] button becomes [Xtream Injector (Not Ready)](red).

11.) Press arming button on Injector, and then click [Confirm] and press [Scan Start] on SCIM.

12.) Scan and Injection are started simultaneously. (Wait until scan and injection complete.)
After injection completed, actual data ([Injection Actual Data]) is logged into :
/usr/g/service/log/gesys_<system name>.log

13.) This completes Enhanced Xtream Injector function test.

Section 6.0
System Level Safety Test

6.1 Patient Touch Leakage Test

6.1.1 Tools and Test Equipment

- Standard FE Tool Kit
- Dale 600 Meter (from tool pool; p/n 48-328406G1)
- Date extended length lead (part of p/n 46-328406G1)

6.1.2 Safety

WARNING **POTENTIAL FOR SHOCK**
GROUND WIRES WILL HAVE GROUND CURRENT PRESENT WITH POWER "ON".
FOLLOW APPROPRIATE SAFETY PROCEDURES FOR WORKING WITH AN ENERGIZED SYSTEM.

NOTICE **Follow ALL required safety and PPE procedures customary for your organization, when working on this product.**

6.1.3 Required Conditions

- Only trained service personnel should service the GE CT Scanner.
- Footswitch cover must be removed.

6.1.4 Procedure

1.) Move the table to ISO elevation.

2.) Remove the footswitch covers and the gantry left side cover.

3.) Refer to the Dale 601 Operator's Manual for instructions on the use of the Dale 600 meter for measuring leakage current (or refer to Figure 5-9, for a quick overview)

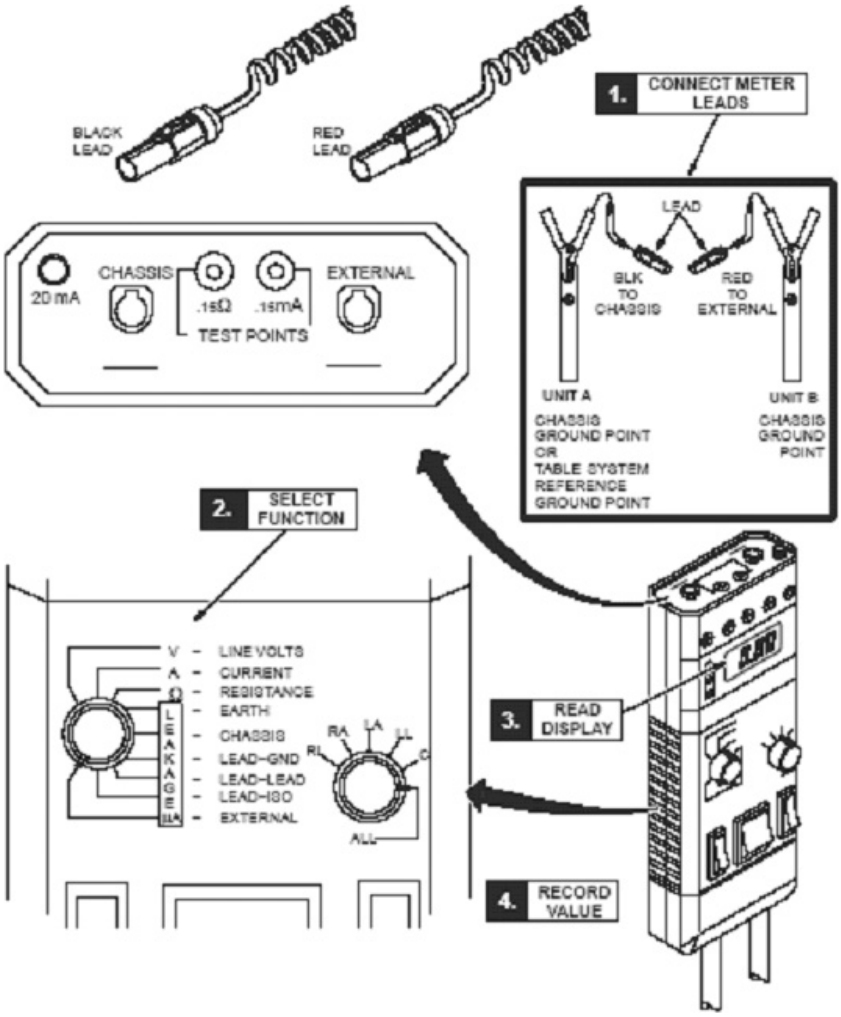


Figure 5-9 Using Dale 600 to Measure Leakage Current

4.) Plug the Dale 600 Meter into the outlet on the gantry left side.
Confirm the outlet is correctly wired per the three LED indicators on the meter.

5.) Connect one end of the shorter black lead to the chassis plug and connect the other end to the table ground bus.

6.) Connect the longer red test lead (or the longer black lead) to the external plug on the top of the Dale 600 meter.

7.) Set the function switch on the Dale to *external*. Use the external lead to touch the meter's test terminal, to test that the meter is operational.

8.) The black lead will be connected to the table base ground bus, and the read is connected to the devices (components) under test.

Note: Your meter may have two black leads that are keyed for chassis and the ground connection.

A valid calibration sticker must be present on the meter you used.

9.) Leakage current is tested with power ON.:

Measurement Area	Current Not to Exceed
Critical care ares (invasive)	**10μa CT Systems**
General care areas	20μa
Not intended for patient area	50μa

Table 5-2 Maximum Leakage Current Measurements

10.) Test the exposed metal surface of the injector components.

Table Base Gnd Bus to	Install <10μA
Injector Assembly Metal Surface (see Figure 5-10)	

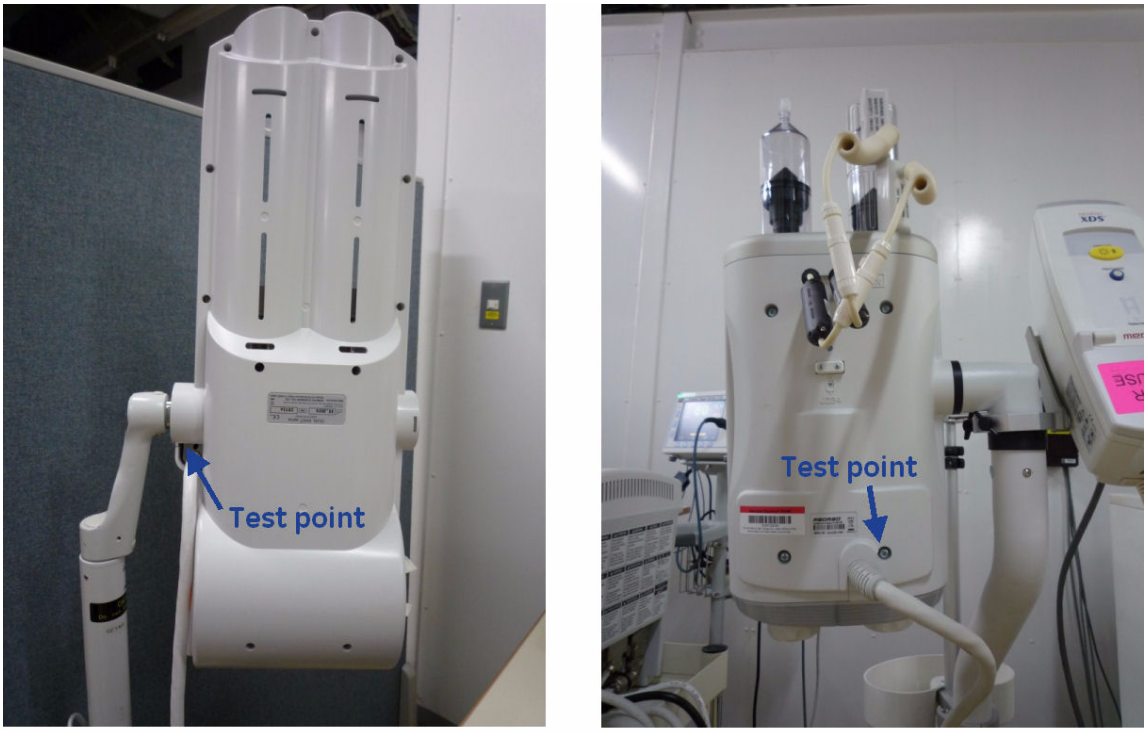


Figure 5-10 Test Points for MEDRAD

NOTICE **Be Aware of Static Discharge from: scan window, keypads, display, and touch pads or other plastic surfaces.**

11.) **Procedure Hints**:

a.) Look for items that have abnormal measurements, high or low.

These could indicate mis-wiring, loose connections, or poor connections due to corrosion, painted surfaces, etc.

b.) High leakage could indicate a wiring error such as a neutral connected to the ground.

c.) Fluctuating ground currents could indicate a short, poor connection, or facilities ground problem causing leakage currents from other areas of the facility to flow though our system grounds.

6.1.5 Finalization

No finalization required.

6.2 Injector Chassis Leakage Test (MEDRAD Stellant Injector Only)

6.2.1 Tools and Test Equipment

- Standard FE Service Tool Kit
- GE Loto Kit
- Dale 600 or 601 Leakage Current Meter (from tool pool; p/n 46328406G1)
- Documentation: LOTO PPE in the Equipment Service section of the Service Methods manual.

Note: This procedure was validated only with the Dale 600/601. GE cannot guarantee the accuracy of this procedure if you use another meter.

6.2.2 Safety

DANGER **POTENTIAL FOR ELECTRIC SHOCK**
GROUND WIRES WILL HAVE GROUND CURRENT PRESENT WITH POWER “ON”.
THIS TEST IS PERFORMED WITH POWER "ON" - SYSTEM IN STAND-BY!

NOTICE **Follow ALL required safety, PPE, and arc-flash procedures customary for your organization, when working on this product.**

DANGER **POTENTIAL FOR ELECTRIC SHOCK**
SERVICING HARDWARE WITH POWER "ON".

6.2.3 Procedure

Follow LOTO and other safety procedures found in this manual before starting this procedure.

1.) Power down the console and follow the GEH LOTO procedure.
2.) Remove the Table foot switch top cover to gain access to the ground cables and ground bar.

Note: Do NOT disconnect ANY grounds at this time.

3.) Confirm that all system grounds are securely attached to the system ground buss and NOT the Table base.
4.) The electrician will remove all external electrical connections made during installation, including:
    a.) Main system ground at PDU
    b.) Power feeder flex connection at PDU
    c.) Room door interlocks and room warning light connections
    d.) Any and all other external ground connections to the system.
5.) Confirm that all external gantry, table, console, and PDU connections have been removed.

Note: Some wires such as the room warning light may have external power and wire nuts, which should be installed to protect from arching.

6.) Follow the LOTO procedure for re-energizing power and boot to application level. If not already done, remove the footswitch assembly top cover while the system boots.
7.) Plug the Dale 600 / 601 Leakage Current Meter into one of the outlets on the gantry.

8.) Connect the meter leads to the meter as follows:

a.) Connect one end of the shorter black lead to the chassis plug and the other to the table ground bus.

b.) Connect the longer red test lead to the external plug on top of the Dale 600 / 601 meter.

9.) Set the function switch on the Dale 600 / 601 meter to EXTERNAL. Using the external lead, touch the meter's test terminal to confirm that the meter is operational.

Note: For more detailed information, refer to the Dale 600 / 601 Operator's Manual or see Figure 5-9, for a quick overview.

With the system at application-level and all components functional, test the system ground wires as follows:

a.) Remove a ISI900 ground wire.

b.) Test that ISI900 ground wire.

c.) Replace that ISI900 ground wire.

d.) Repeat, testing all Injector ground wires ONE-AT-A-TIME. A list of the Injector ground wires appears in Table 5-3.

Note: The measured leakage current must not exceed 5 MA in any ground wire

Components	Results	Date	Tester
ISI900			
Base Unit			
XDS CRM			

Table 5-3 Injector Ground Measurements

10.) After completing all tests, follow the LOTO procedure to power down the system.

11.) The electrician will reinstall all electrical connections, conduits, cables, and wires removed in Step 6 and will secure all connections per NEC code. Check that all connections are securely tightened.

12.) Reinstall all removed system covers, except for the gantry right-side cover, located by the service switch panel.

SYSTEM POWER-UP AND TEST

Note: Complete this section of the installation manual on-site.

1.) Follow the LOTO procedure for re-energizing power.

2.) Turn-on the gantry service switches and power up the console.

3.) Check that no cables remain in the gantry rotating path.

4.) Return cover dollies to storage areas.

5.) Check that the table controls and footswitch function properly.

6.) Re-test the system by completing a system functional scan. If installed, be sure to test the room warning light and the door interlock at this time.

7.) Complete the CT System Chassis Leakage test, if required by your state, and forward the completed form to your Project Manager of Installation. (This form is located on the Service CD.)

6.2.4 Finalization

No finalization required.

Section 7.0
Finish Installation

7.1 Process Product Locator Card

1.) Process the product locator card according to the instruction in your country.

Appendix A
Injector Status Buttons

There are several status of Xtream Injector.

Note: Definition of “Xtream Injector (red)” is different between Xtream Injector option and Enhanced Xtream Injector option.

1.1 Xtream Injector Status Icons

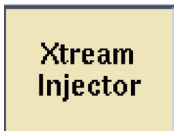
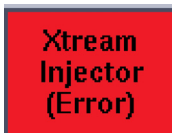
Button Status	Condition
	Xtream Injector is turned off
	Xtream Injector is turned on and injector is ready to start injection
	Xtream Injector is turned on and injector is not connected. Xtream Injector is turned on and injector is not controllable from scanner.
	Xtream Injector is turned on and injector is controllable from scanner, but not ready for injection.

Table A-4 Xtream Injector Status Icons

1.2 Enhanced Xtream Injector Status Icons

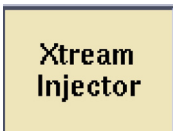
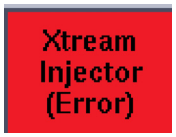
Button Status	Condition
	Xtream Injector is turned off
	Xtream Injector is turned on and injector is ready to start injection in New Patient
	Xtream Injector is turned on and injector is not connected. Xtream Injector is turned on and injector is not controllable from scanner.
	Xtream Injector is turned on and the parameter injector has and scanner has are different. (Both Ready / Not ready to inject) This condition also happens when setting parameter is in progress.
	Xtream Injector is turned on, parameter injector has and scanner has match, Not ready to inject.

Table A-5 Enhanced Xtream Injector Status Icons

GE Medical Systems, a General Electric Company, going to market as GE Healthcare.
3000 N. Grandview Boulevard
Waukesha, Wisconsin 53188
USA

www.gehealthcare.com

Imagination at work