GE Medical Systems

Technical Publications

2138853

Revision 5

LOGIQ™ α200

CE 0459

Service Manual

Operating Documentation

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WARNING

- **THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.**
- **IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.**
- **DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.**
- **FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.**

AVERTISSEMENT

- **CE MANUEL DE MAINTENANCE 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'INTERVENTION 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

- **DIESES KUNDENDIENST–HANDBUCH 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, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST–HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.**
- **WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.**

AVISO

- **ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.**
- **SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.**
- **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.**

ATENÇÃO

- **ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.**
- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS 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 POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A' CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.**

AVVERTENZA

- **IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.**
- **SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS 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.**
- **NON TENERE CONTO 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

・このサービスマニュアルには英語版しかありません。
・ＧＥＭＳ以外で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下さい。
・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。

注意:

- 本维修手册仅存有英文本。
- 非 GEMS 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。
- 未详细阅读和完全了解本手册之前，不得进行维修。
- 忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

LIST OF EFFECTIVE PAGES

REV	DATE	PRIMARY REASON FOR CHANGE
0	March 1. 1997	Inital release
1	April 1. 1997	System software version 1.0 console release
2	July 15. 1997	Error correction
3	May 7. 1998	System software version 2.0 console release
4	June 17. 1998	System software version 2.01 console release
5	April 15. 1999	FRU added & Update

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CHAPTER 5 – DIAGRAMS

CHAPTER 6 – RENEWAL PARTS

SECTION TITLE PAGE

CHAPTER 6 – RENEWAL PARTS (continued)

SECTION TITLE PAGE

CHAPTER 7 – PERIODIC MAINTENANCE

CHAPTER 8 – INSTALLATION FOR OPTIONS

1–1 SERVICE MANUAL CONTENTS

This manual provides service information on the LOGIQ α200 Ultrasound Scanning System. It contains the following chapters:

1. **Chapter 1, Introduction:** Contains a content summary and warnings.
2. **Chapter 2, Installation:** Contains physical and electrical requirements that must be considered prior to installation and a complete LOGIQ α200 installation procedure with installation checklist.
3. **Chapter 3, System Configuration:** Contains system configuration and specifications.
4. **Chapter 4, Functional Checks:** Contains functional checks that must be performed as part of the installation, or as required during servicing and periodic maintenance.
5. **Chapter 5, Diagrams:** Contains block diagrams and functional explanations of the LOGIQ α200 electronics.
6. **Chapter 6, Renewal Parts:** Contains a complete list of replacement parts for the LOGIQ α200 and disassembly procedures for all changeable FRU.
7. **Chapter 7, Periodic Maintenance:** Provides periodic maintenance procedures for the LOGIQ α200.
8. **Chapter 8, Installation for Options:** is provided to keep the option installation instructions supplied with each option.

1–2 SAFETY

1–2–1 Warnings

WARNING!

CAREFULLY READ ALL THE WARNINGS LISTED BELOW!

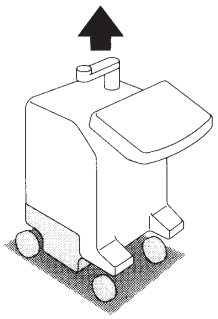
1. The operator manual should be fully read and understood before operating the LOGIQ α200 and kept nearby for quick reference.
2. Although the ultrasound energy transmitted from the LOGIQ α200 transducer is within AIUM/NEMA standards, unnecessary exposure should be avoided. Only trained personnel should operate the LOGIQ α200.
3. To prevent electrical shock, the LOGIQ α200 should be connected to a properly grounded power receptacle. Do not use a three to two prong adapter. This defeats safety grounding.
4. Do not use with Defibrillator when LOGIQ α200 is being operated .
5. Probes are fragile, please handle with care.
6. Concerning Outside Markings, refer to Illustration 1–1, 1–2, 1–3, 1–4, 1–5, 1–6, 1–7, 1–8, and 1–9.
7. For the cleaning, disinfection, and sterilization, refer to Probe section in LOGIQ α200 User Manual and Caution Sheet supplied with each probe.

NOTICE

This medical equipment is approved, in terms of the prevention of radio wave interference, to be used in hospitals, clinics and other institutions which are environmentally qualified. The use of this equipment in an inappropriate environment may cause some electronic interference to radios and televisions around the equipment. Proper handling of this equipment is required in order to avoid such trouble according to the operator and service manuals.
This equipment can be used in residential areas only under the supervision of physicians or qualified technicians.

1–2–1 Warnings (Continued)

WARNING 警告 WARNUNG AVERTISSEMENT AVVERTENZA ADVERTÊNCIA ADVERTENCIA 경고



Hazardous movement can cause serious injury. Keep your head and body away from above video monitor support arm. Video monitor support arm is spring loaded. Releasing arm when monitor is not attached will cause sudden upward movement.

怪我をするので飛び出しに注意。顔や手をモニターアームの上にもっていかないこと。ビデオモニターが搭載されていない状態でモニターアームのロックを解除すると、モニターアームが飛び出します。

Gefährliche Bewegungen können zu schweren Verletzungen führen.Bringen Sie nicht Gesicht oder Hände in die Nähe des Videomonitortragearms. Der Videomonitortragearm ist federgelagert. Entriegelung des Arms ohne aufgesetzten Monitor läßt den Arm nach oben federn.

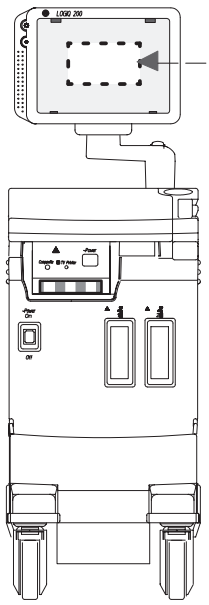
Tout mouvement dangereux peut provoquer des blessures sérieuses. Se tenir à bonne distance du bras de support à ressorts du moniteur vidéo. Quand le moniteur n'est pas monté, la libération du bras provoquera son soulèvement brutal.

Bruschi movimenti possono provocare ferite. Tenete la testa ed il corpo lontano dal supporto del monitor quando il monitor non è montato. Lo sganciament accidentale del supporto puo causare un improvviso movimento di quest'ultimo verso l'alto.

Movimentos perigosos podem causar danos sérios. Mentenha sua cabeça e corpo afastados da parte superior da alavanca de suporte do monitor de vídeo. Alavanca de suporte do monitor de vídeo é equipada de mola. Liberando a alavanca,quando o monitor não estiver fixado, causará movimento repentino dirigido para cima.

El movimiento peligroso puede ocasionar daños serios. Mantenga la cabeza y el cuerpo apartados de la parte superior del brazo de soporte del monitor de vídeo. El brazo de soporte del monitor de vídeo tiene carga de resorte. Si se suelta el brazo cuando no está montado el monitor, se ocasionará el movimiento súbito hacia arriba.

모니터 지지대의 윗쪽에 머리나 몸을 가까이 하지 마십시요. 모니터 지지대에는 스프링이 압축되어 있습니다. 모니터를 장착치 않고 상하조정 버튼을 누르면 갑자기 위로 튀어오르니 주의하십시오.



OUTSIDE MARKINGS OF LOGIQ α200 (FOR ALL UNITS)
ILLUSTRATION 1–1

1–2–1 Warnings (Continued)

⚠ CAUTION 注意 ACHTUNG ATTENTION ATTENZIONE ATENÇÃO ATENCION 주의

Possible injury. Placing objects on top of the monitor may cause the monitor to tilt with the falling objects resulting in injury to the operator. Do not place any objects on the monitor.

怪我の可能性あり。モニタ上に物を載せるとモニタが傾き、物が落下して怪我をすることがあります。モニタの上に物を載せないこと。

Keine Gegenstände auf den Monitor legen, da diese herabfallen und Beschädigungen und/oder Verletzungen verursachen können.

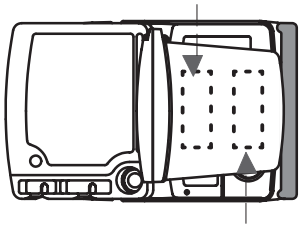
Le moniteur risquant de s'incliner, ne rien poser dessus, qui pourrait vous blesser.

Pericolo di farsi male. Se si mettono oggetti sul monitor, questo si inclina e c'è il pericolo che gli oggetti cadano e ci si faccia male. Non mettere oggetti sul monitor.

Existe a possibilidade de ocorrer acidentes. Caso algum objeto seja colocado sobre o monitor, este poderá inclinar-se e o objeto poderá cair, provocando algum acidente. Não coloque nenhum objeto sobre o monitor.

Existen posibilidades de lesiones. Al colocar objetos sobre el monitor, puede inclinarse el monitor. caerse los objetos y causar lesiones. No colocar objetos sobre el monitor.

모니터 위에는 어떠한 물건도 올려놓지 마십시오. 모니터가 기울때 물건이 떨어져 사용자가 다칠수 있습니다.



⚠ CAUTION 注意 ACHTUNG ATTENTION ATTENZIONE ATENÇÃO ATENCION 주의

To avoid injury by tipping over,
SET THE MONITOR TO THE LOWEST POSITION BEFORE MOVING.

怪我をするので転倒に注意。機器の移動時にはモニターアームを最下位置まで下げてから移動のこと。

Da ein Umkippen zu Verletzungen führen kann, DEN MONITOR DES GERÄTES AUF VOR STELLUNGSWECHSEL AUF DIE NIEDRIGSTE POSITION EINSTELLEN.

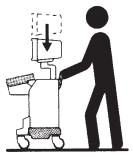
Pour éviter le basculement accidentel de la machine,
BAISSER LE MONITEUR AVANT LE DÉPLACEMENT.

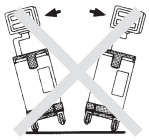
PREDISPORRE IL MONITOR NELLA POSIZIONE PIÙ BASSA PRIMA DI MUOVERE la macchina, per evitare rischi di ferite causate dal ribaltament.

Para evitar danos por deslizamentos,
POSICIONE O MONITOR NO SEU NÍVEL MAIS BAIXO.

Para evitar daños por deslizamientos,
POSICIONE EL MONITOR A SU NIVEL MÁS BAJO ANTES DE MOVERLO.

기기의 안전을 위하여 이동중에는 반드시 모니터를 최저위치로 조정하십시오.





To avoid injury by tipping over,
DO NOT PUSH THIS UNIT FROM THE SIDES.

怪我をするので転倒に注意。機器の側面から押さないこと。

Da ein Umkippen zu Verletzungen führen kann,
DIE EINHEIT NICHT VON DER SEITE SCHIEBEN.

Pour éviter le basculement accidentel de la machine,
NE PAS LA POUSSER PAR LE CÔTÉ.

NON SPINGERE LA MACCHINA DI LATO
per evitare rischi di ferite causate dal ribaltamento.

Para evitar danos por deslizamentos,
NÃO MOVA A UNIDADE PELAS LATERAIS.

Para evitar daños por deslizamientos,
NO EMPUJE LA UNIDAD POR LOS LADOS.

기기의 안전을 위하여 제품의 측면에서 절대로 밀지마십시오.

OUTSIDE MARKINGS OFLOGIQ α200 (FOR ALL UNITS)
ILLUSTRATION 1–2

Note

For further details regarding the cautions above, refer to 2–2–8 MOVING INTO POSITION in Chapter 2.

1–2–1 Warnings (Continued)

⚠ CAUTION 注意 ACHTUNG ATTENTION ATTENZIÓNE ATENÇÃO ATENCIÓN 주의

Do not use the following devices near this equipment. Cellular phone, radio transceiver, mobile radio transmitter, radio controlled toy, etc. Use of these devices near this equipment could cause this equipment to perform outside the published specifications.Keep power to these devices turned off when near this equipment.

本機の近くでは以下の機器を使用しないでください。本機が仕様から外れた動作をすることがあります。携帯電話、トランシーバー、携帯無線機、ラジコンのおもちゃなど。本機の近くではこれらの機器の電源スイッチを切ってください。

In der Nähe dieser Ausrüstung folgende Geräte nicht benutzen: Funktelefone, Radioempfänger, mobile Radiosender, ferngesteuertes Spielzeug, usw. Der Gebrauch dieser Geräte könnte während des Betriebes Fehlfunktionen verursachen. Schalten Sie die Stromversorgung dieser Geräte in der Nähe der Ausrüstung ab.

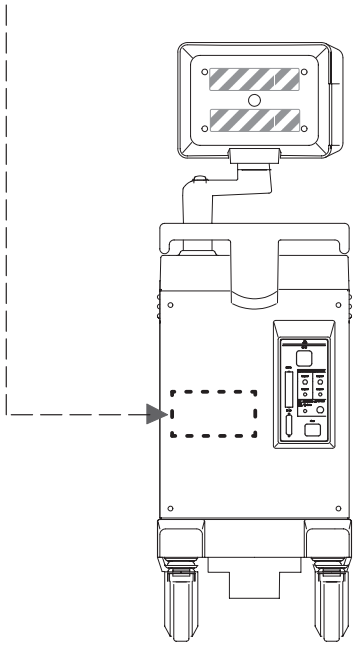
Prière de ne pas utiliser les appareils suivant à côté de cet équipement. Les téléphones portables, les transmetteurs radios, les radios mobiles, les commandes à distance, etc. L'utilisation de ces appareils à proximité de cet equipement peut amener l'equipement a fonctionner en dehors des spécifications publiées. Prière d'éteindre ces appareils lorsqu'ils sont a proximité de cet équipement.

Non utilizzare mai i dispositivi menzionati di seguito vicino a questo apparécchio. Telèfono cellulare, ricetrasmettitore di ràdio, trasmettitore di ràdio mòbile, gicattoli con contròllo di ràdio, ecc. La utilizazzióne dei dispositivi potrebbe causare il funzionamento anormale di questo apparécchio. Tenere spenti tali dispositivi quando vicini a questo apparécchio.

Favor não utilizar os seguintes aparelhos perto deste equipamento. Telefone móvel, rádio trans-receptor, rádio transmissor móvel, brinquedos à controle remoto, etc. A utilização desses aparelhos perto deste equipamento pode fazê-lo com que não funcione segundo as especificações publicadas. Favor manter esses aparelhos desligados quando estiverem perto deste equipamento.

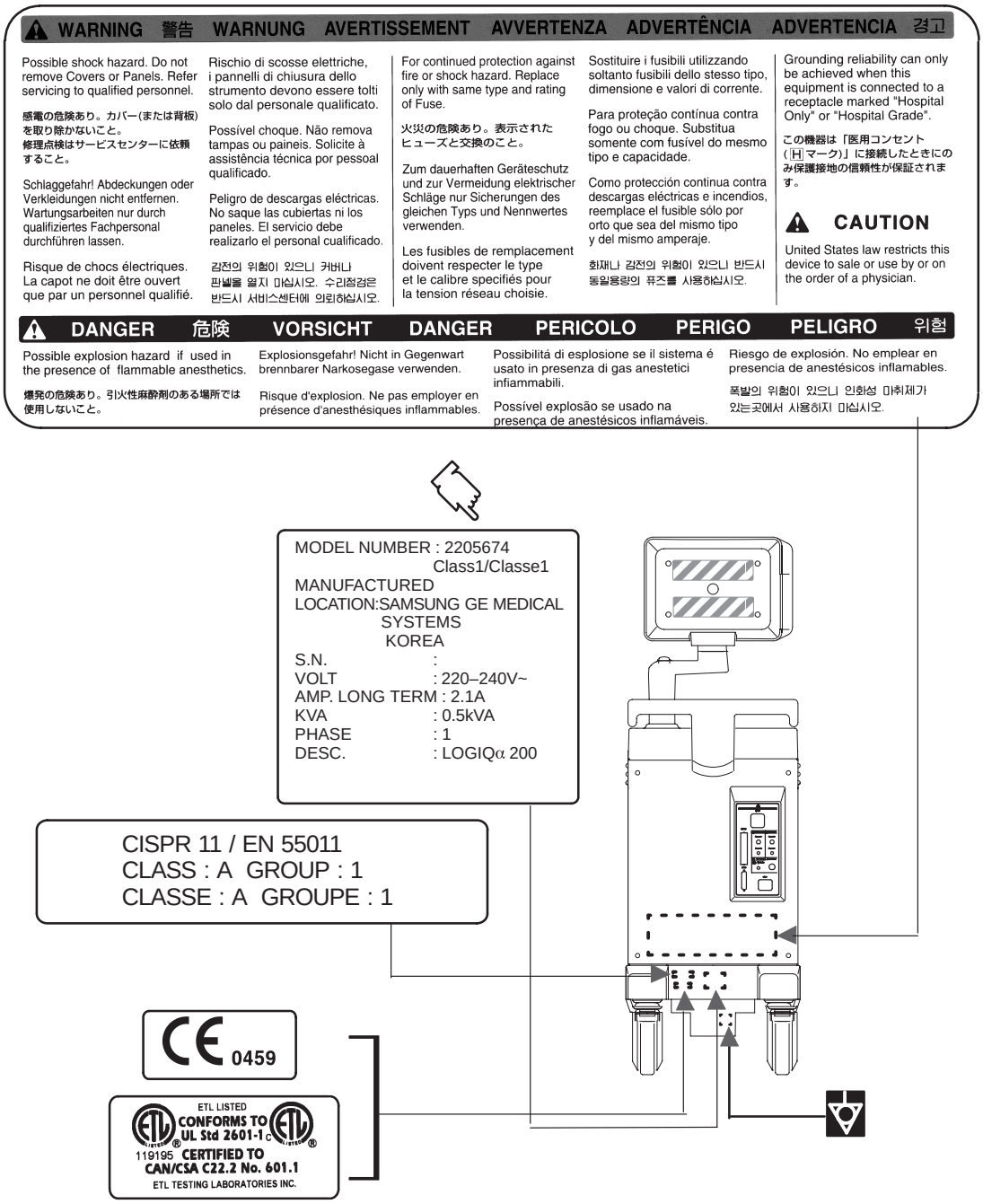
No utilice los siguientes aparatos cerca de este equipo. Teléfono movil, transmisor-receptor, transmisor de radio movil, juguete radio controlado, etc. La utilization de estos aparatos cerca de este equipo puede hacer con que el equipo no funcione según las especificaciones publicadas. Mantenga estos aparatos apagados cuando cerca de este equipo.

본 장비의 근처에서 휴대폰, 무전기, 이동용 무선송신기, 무선장난감 등을 사용하지 마십시오. 장비가 오동작을 일으킬 수도 있으므로 이러한 기기들의 전원을 반드시 꺼 주십시오.



OUTSIDE MARKINGS OFLOGIQ α200 (FOR ALL UNITS)
ILLUSTRATION 1–3

1–2–1 Warnings (Continued)

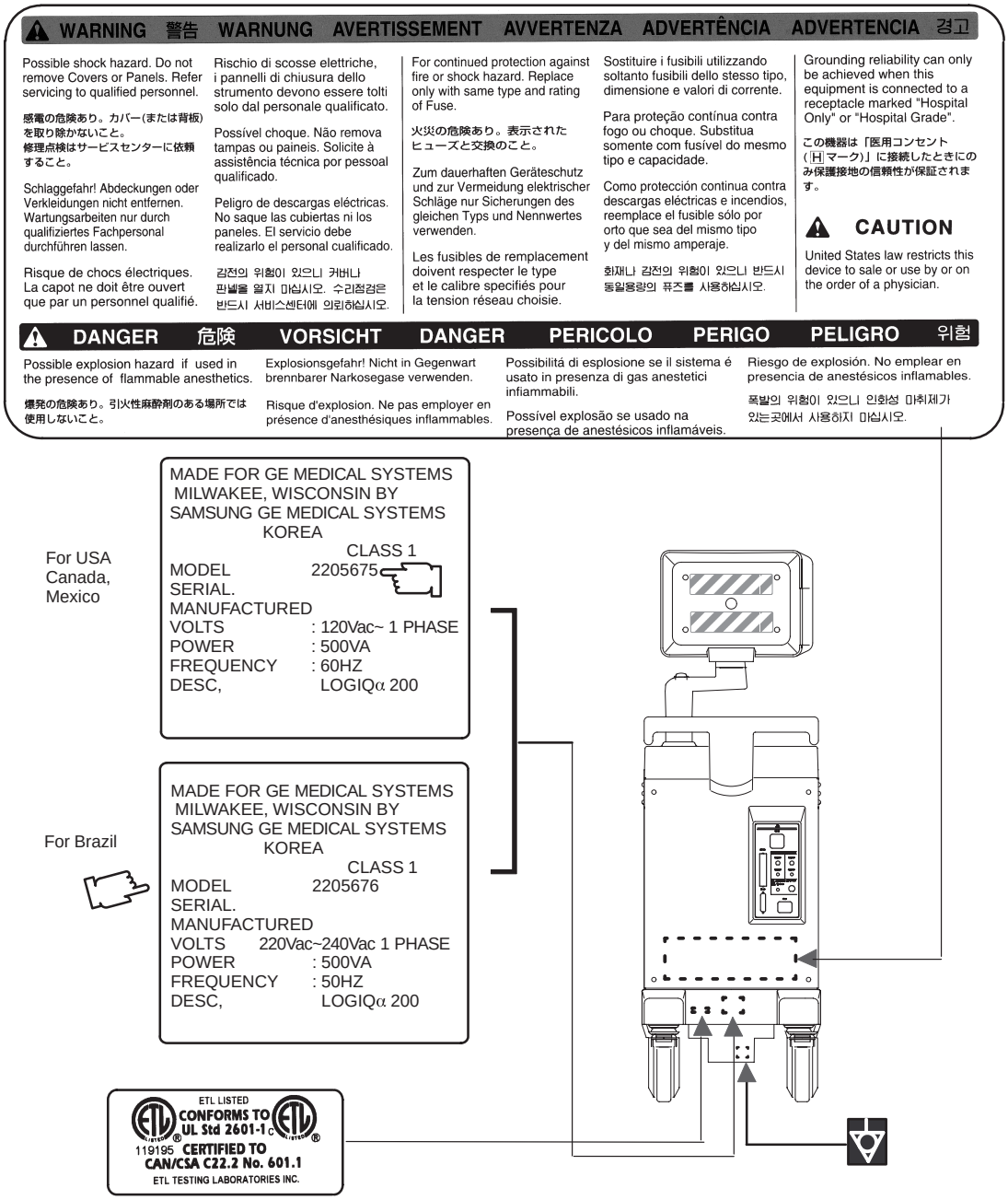


OUTSIDE MARKINGS OFLOGIQ α200 (FOR EUROPE)
ILLUSTRATION 1–4

Note

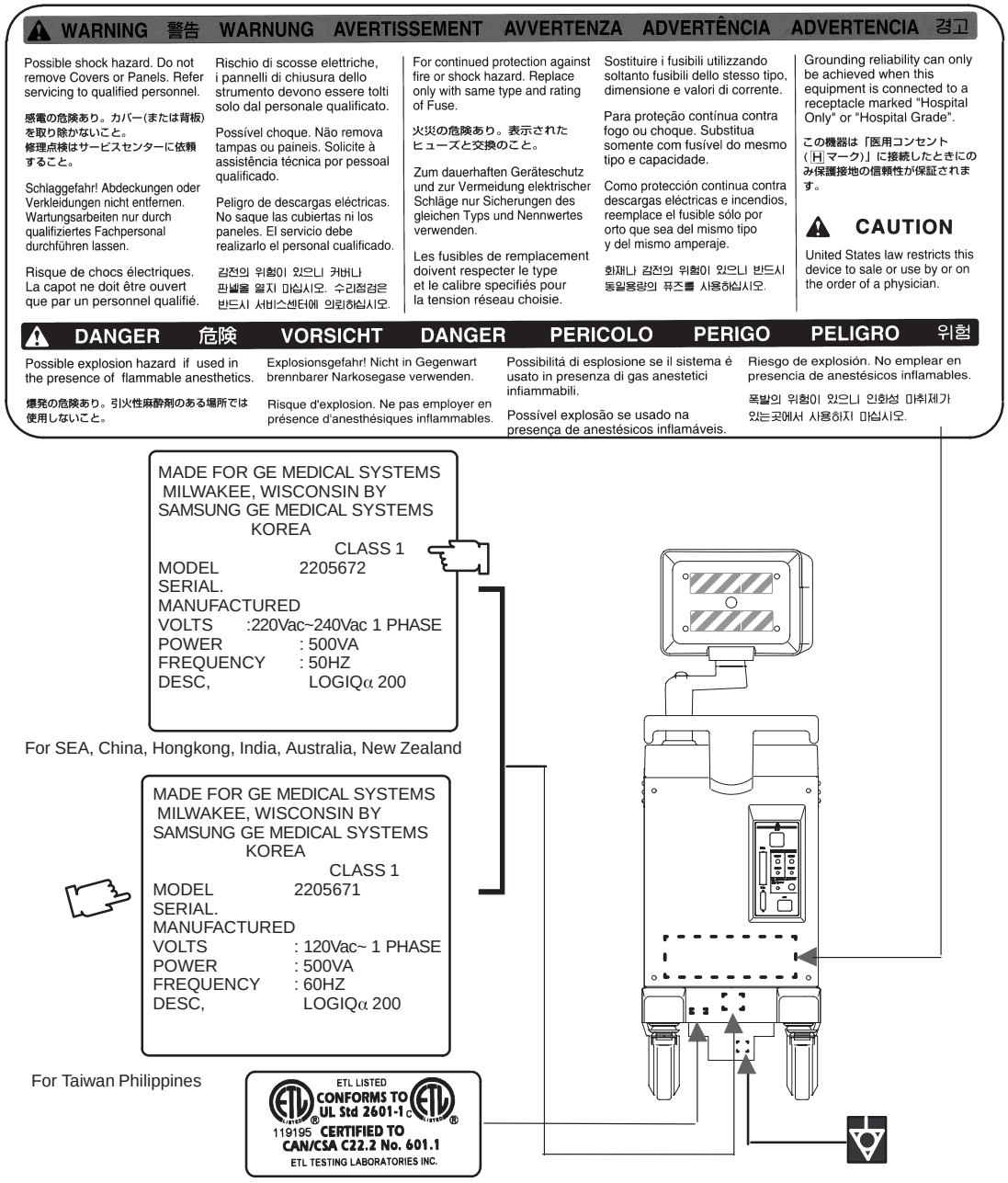
For the symbols shown in the illustration above, refer to latter pages in this chapter.

1–2–1 Warnings (Continued)



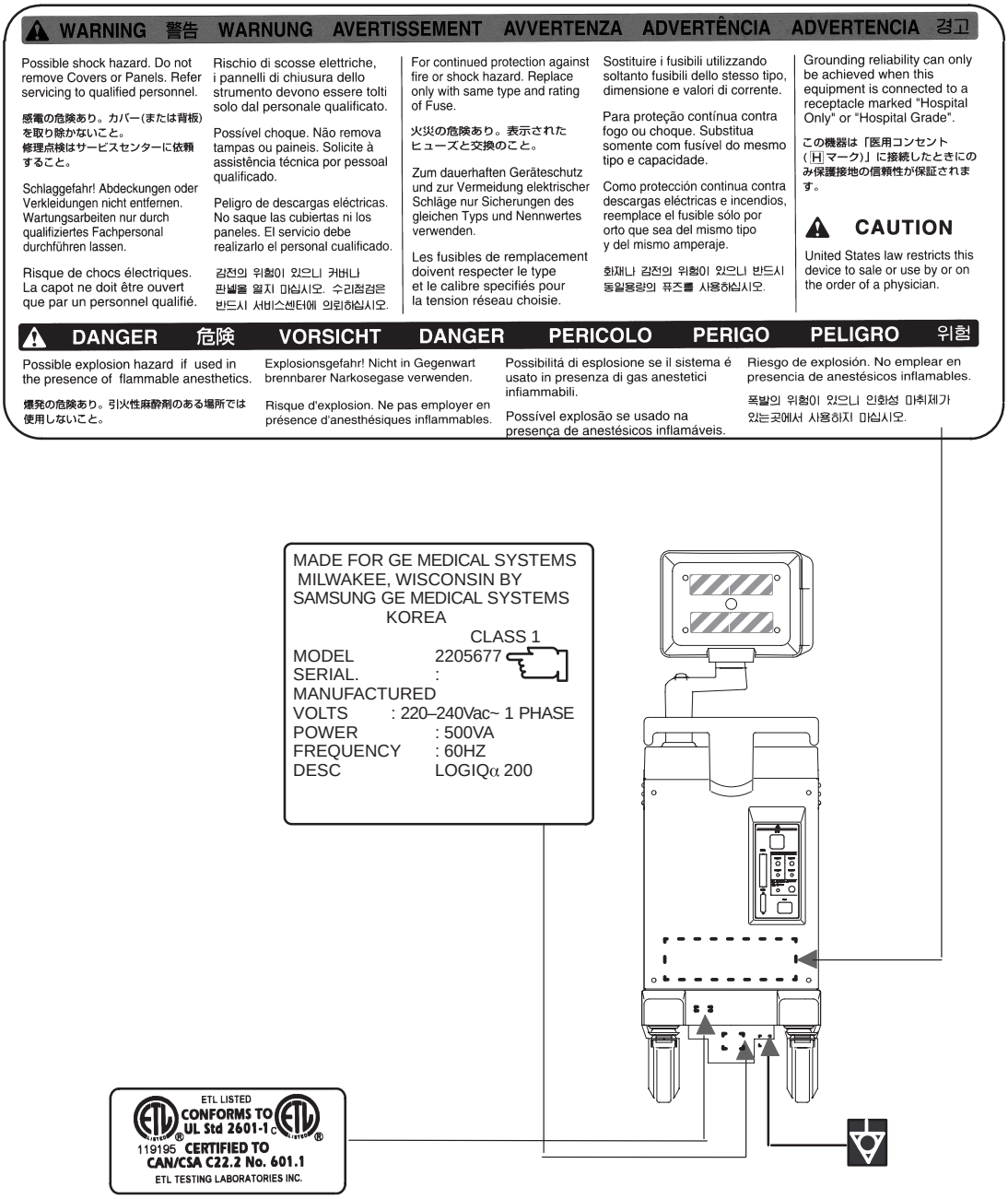
OUTSIDE MARKINGS OFLOGIQ α200 (FOR USA CANADA MAXICO BRAZIL)
ILLUSTRATION 1–5

1–2–1 Warnings (Continued)



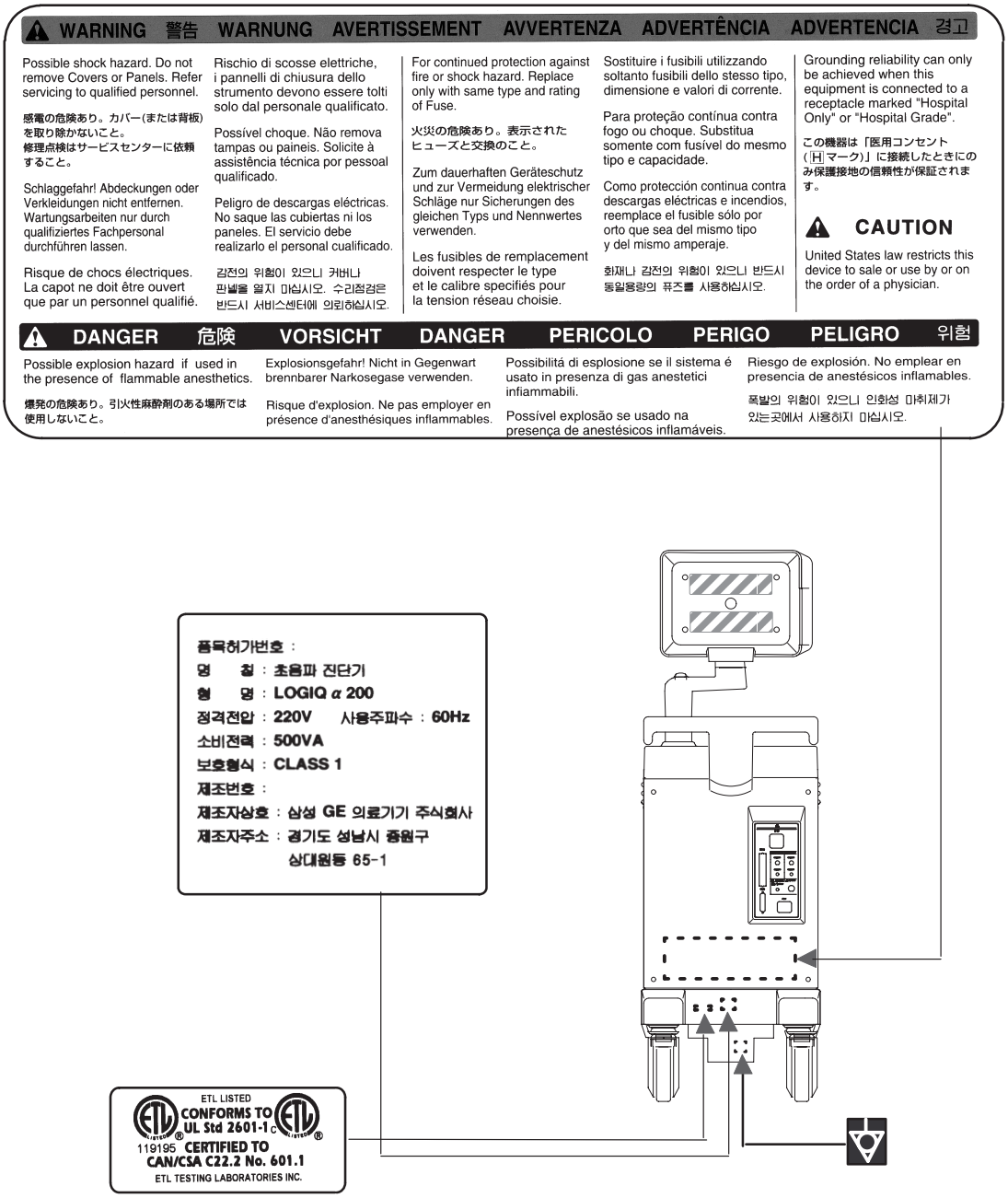
OUTSIDE MARKINGS OFLOGIQ α200 (FOR SEA CHINA HONGKONG INDIA AUSTRALLIA NEWZEALAND TAIWAN PHILLIPPINES)
ILLUSTRATION 1–6

1–2–1 Warnings (Continued)



OUTSIDE MARKINGS OFLOGIQ α200 (FOR CHILE)
ILLUSTRATION 1–7

1–2–1 Warnings (Continued)

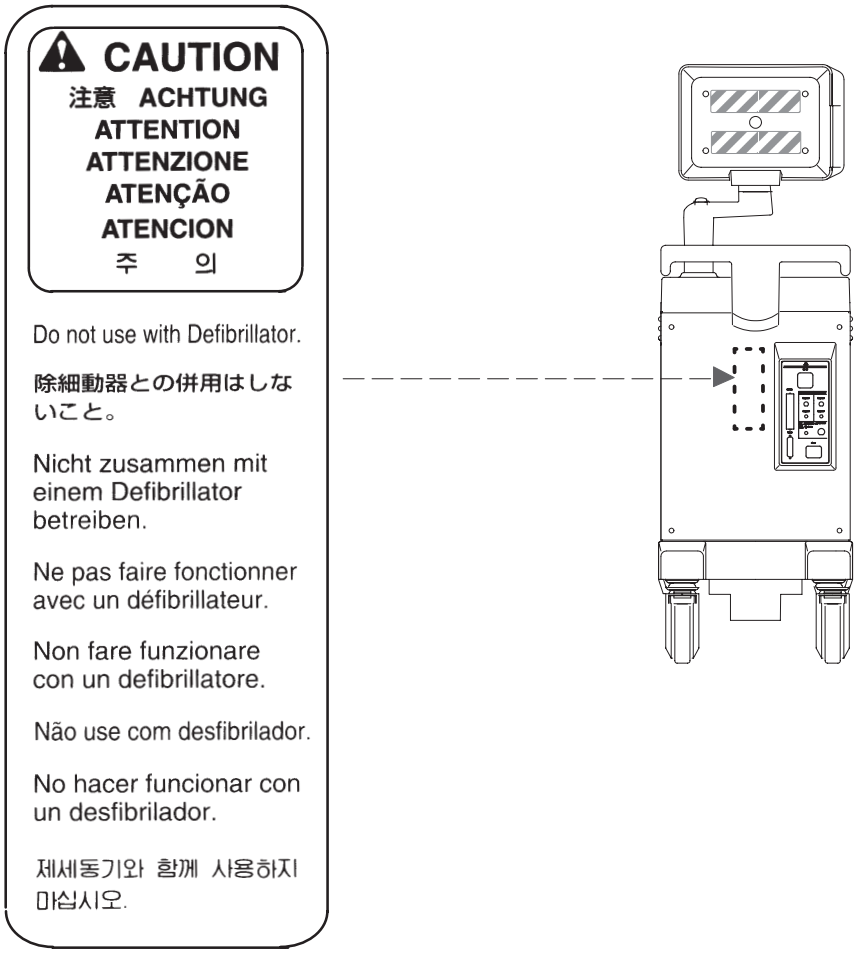


OUTSIDE MARKINGS OFLOGIQ α200 (FOR KOREA)
ILLUSTRATION 1–8

1–2–1 Warnings (Continued)

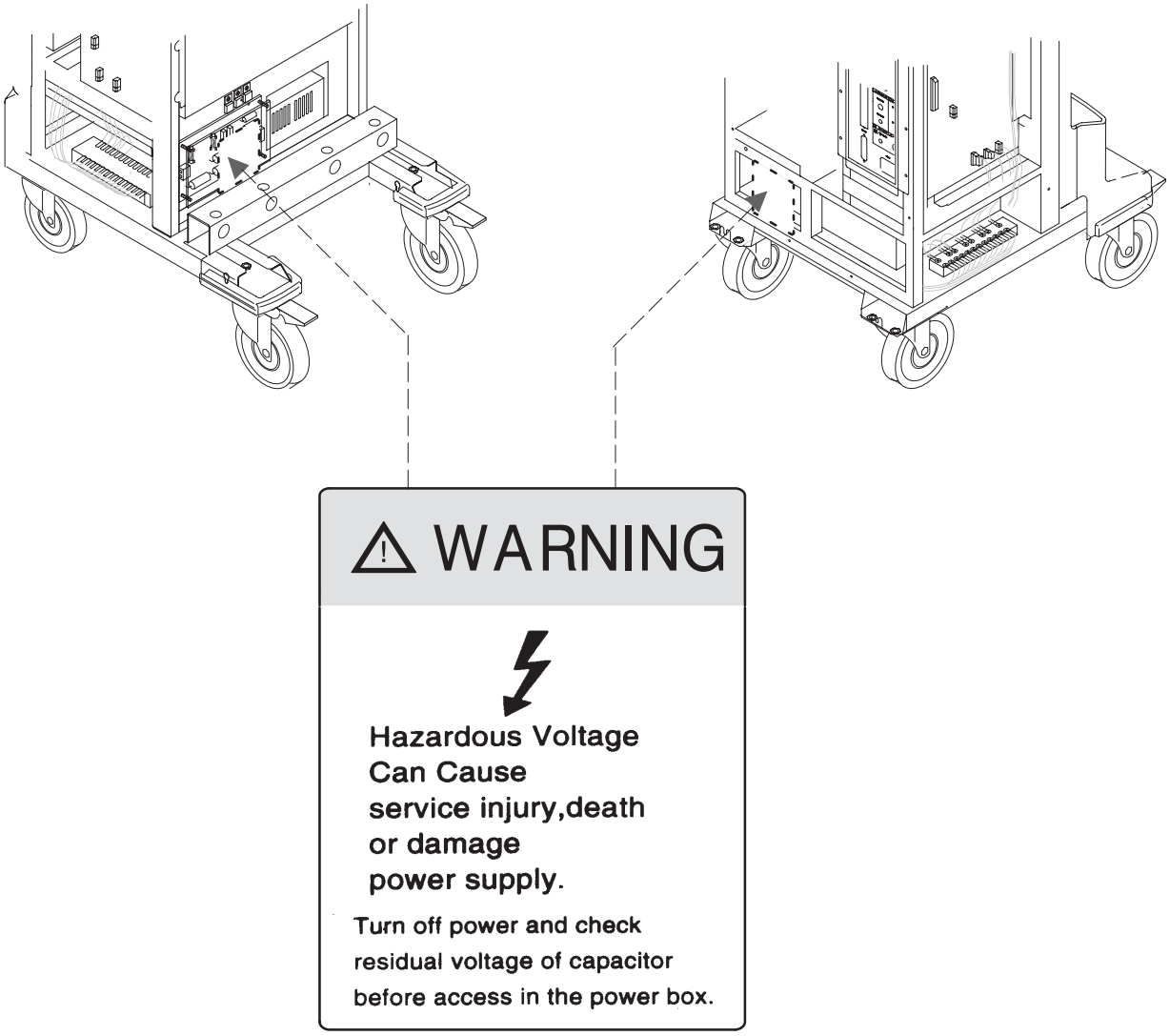
CAUTION

Do not use a Defibrillator simultaneously with the ECG, as its excessive voltage will damage the signal input block of the ECG unit.



OUTSIDE MARKINGS OF LOGIQ α200 (FOR UNITS WITH ECG)
ILLUSTRATION 1–9

1–2–1 Warnings (Continued)



NOTE: Two labels are attached on rear of the SMPS assy box inside the rear cover and front of HV Board Assy inside the front base cover.

MARKINGS OF LOGIQ 500 (INSIDE COVERS)
ILLUSTRATION 1–10

1–2–1 Warnings (Continued)

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

Label/Icon	Purpose/Meaning	Location
Identification and Rating Plate	Manufacturer's name and address Date of manufacture Model and serial numbers Electrical ratings (Volts, Amps, phase, and frequency)	Rear of console near power inlet
Type/Class Label	Used to indicate the degree of safety or protection.	
IP Code (IPX1)	Indicates the degree of protection provided by the enclosure per IEC 529. IPX1 indicates drip proof.	Foot Switch
	Equipment Type BF (man in the box symbol) IEC 878-02-03 indicates B Type equipment having a floating applied part.	Probe connectors
	Equipment Type CF (heart in the box symbol) IEC 878-02-05 indicate equipment having a floating applied part having a degree of protection suitable for direct cardiac contact.	ECG connector and surgical probes
Device Listing/ Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear of console
"DANGER – Risk of explosion used in..."	The system is not designed for use with flammable anesthetic gases.	Rear of console
	"CAUTION" The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	Various
	"ATTENTION – Consult accompanying documents" is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Various

1–2–1 Warnings (Continued)

Label/Icon	Purpose/Meaning	Location
	"CAUTION – Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	Various
	"Mains OFF" Indicates the power off position of the mains power switch.	Front of system, Main power switch
	"Mains ON" Indicates the power on position of the mains power switch.	Front of system, Main power switch
	"Equipotentiality" Indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment. **CAUTION** This is only for "**FUNCTIONAL GROUNDING**", NOT "PROTECTIVE EARTH".	Rear of console
	Indicates Main protective earth terminal	Various

1–2–2 Specifications

Type of protection against electric shock: Class I EQUIPMENT (*1)

Degree of protection against electric shock: Type BF EQUIPMENT (*2) (Except ECG)

Type CF EQUIPMENT (*3) (ECG Only)

Ordinary Equipment
Continuous Operation

*1. Class I EQUIPMENT
EQUIPMENT in which protection against electric shock does not rely on BASIC INSULATION only, but which includes an additional safety precaution in that means are provided for the connection of the EQUIPMENT to the protective earth conductor in the fixed wiring of the installation in such a way that ACCESSIBLE METAL PARTS cannot become LIVE in the event of a failure of the BASIC INSULATION.

*2. Type BF EQUIPMENT
TYPE B EQUIPMENT with an F–TYPE APPLIED PART
TYPE B EQUIPMENT: EQUIPMENT providing a particular degree of protection against electric shock, particularly regarding:

– allowable LEAKAGE CURRENT;

	Normal mode	**Single failure mode**
Patient leakage current	Less than 100μA	Less than 500μA

*3. Type CF EQUIPMENT
EQUIPMENT providing a particular degree of protection higher than that for TYPE OF BF EQUIPMENT against electronic shock particularly regarding allowable LEAKAGE CURRENT, and having an F–TYPE APPLIED PART.

– allowable LEAKAGE CURRENT;

	Normal mode	**Single failure mode**
Patient leakage current	Less than 10μA	Less than 50μA

1–3 EMC (Electromagnetic Compatibility)

1–3–1 EMC Performance

All types of electronic equipment may characteristically cause electromagnetic interference with other equipment, either through air or connecting cables. The term EMC (Electromagnetic Compatibility) indicates capability of the equipment, which curbs electromagnetic influence from other equipment and at the same time does not affect other equipment with similar electromagnetic radiation from itself.

This product is designated to fully comply with EN60601–1–2 (IEC 601–1–2), In Medical electronic equipment EMC regulations.

Proper installation following this service manual is required in order to achieve the full EMC performance of the product.

The product must be installed as stipulated in 1–3–2, Notice upon Installation of Product.

In case of issues related to EMC, please follow procedures stated in 1–3–4, Countermeasures against EMC-related Issues.

1–3–2 Notice upon Installation of Product

1) Use either power supply cords provided or designated by GEMS or SGMS. Products equipped with power source plug should be plugged into the fixed power socket which has the protective grounding conductor.

   Connect a three-pole plug to a three-pole socket without using a three-pole-to-two-pole converter.

2) Locate the equipment as far as possible from other electronic equipment.

3) Be sure to use cables provided by GEMS and SGMS. Wire these cables following these installation procedures.

   (Example) Wire power cables separately from signal cables.

4) Lay out the main equipment and other peripherals following the installation procedures described in Chapter2, INSTALLATION.

1–3–3 General Notice

1) Designation of Peripheral Equipment Connectable to This Product

   Equipment which conforms to EN60601–1–2 (IEC601–1–2), can be hooked up to the product without compromising its EMC performance.

   Avoid using other equipment. Failure to comply with this instruction may result in poor EMC performance of the product.

2) Notice against User Modification

   Never modify this product. Unilateral user modification may cause degradation in EMC performance. Modification of the product includes:

   a) Changes in cables (length, material, wiring etc.)

   b) Changes in system installation/layout

   c) Changes in system configuration/components

   d) Changes in means of fixing system/parts (cover open/close, screwing cover)

3) Operate the system with all covers closed. If you open any cover for some reason, be sure to close it before starting/resuming operation.

   Operating the system with any cover open may affect EMC performance.

1–3–4 Countermeasures against EMC-related Issues

Generally it is very difficult to handle issues related to EMC. It may be time consuming and costly.

General countermeasures

Electromagnetic interference with other equipment

1) Electromagnetic interference may be alleviated by positioning other equipment far from the system.

2) Electromagnetic interference may be mitigated by changing the relative location (installation angle) between the system and other equipment.

3) Electromagnetic interference may be eased by changing wiring locations of power/signal cables of other equipment.

4) Electromagnetic influence may be reduced by altering the path of power supply for other equipment.

1–3–5 Notice on Service

1) Ensure all screws are tight after servicing. Loose screws may cause degradation in EMC performance.

2) In case the high frequency gasket of this system is broken, replace it with a new one immediately.

1–4 ADDRESS

This system is not repairable by the customer. If this equipment does not work as indicated in the Operator Manual, please contact your service support center. If the service engineer needs additional information to repair this equipment, please contact the following address (The necessary information will be provided to the Service Engineer as needed):

GE Medical Systems
Ultrasound Business Group
4855 W. Electric Ave., Milwaukee, WI 53219
USA
TEL: (1) 800–437–1171
FAX: (1) 414–647–4090

CANADA
TEL: (1) 800–668–0732

LATIN & SOUTH AMERICA
TEL: (1) 305–735–2304

GE Ultrasound Europe
GE Ultraschall GmbH & Co.KG
Beethovenstraβe 239 Postfach 11 05 60
D–42655 Solingen GERMANY
TEL: 0130–81–6370 (OLC–Europe Toll Free Number)
(49) 212–2802–207 (English/German Hotline)
(49) 212–2802–208 (English/German/French Hotline)
FAX: (49) 212–2802–28

GE Yokogawa Medical Systems
On–Line Center (OLC), Asia
Ultrasound Group
67–4, Takakura–cho, Hachioji–shi, Tokyo, 192–0033
JAPAN
TEL: (81) 426–48–2940
FAX: (81) 426–48–2950

SAMSUNG GE MEDICAL SYSTEMS
64–3, Sangdaewon–dong, Chungwon–Ku,
Sungnam–Si, Kyunggi–do,
KOREA
TEL: (82) 342–40–6000
FAX: (82) 342–42–0420

2–1 PREINSTALLATION

2–1–1 Introduction

This section describes various general electrical, operational, and environmental considerations that must be considered before installing the LOGIQ α200 Ultrasound unit.

2–1–2 Power Line Requirements

The following power line parameters should be monitored for one week before installation. We recommend that you use an analyzer Dranetz Model 606–3 or Dranetz Model 626:

PARAMETER		LIMITS	
Voltage Range	Korea		220 VAC ± 10% (198 – 242 VAC)
	USA		115 VAC ± 10% (103 – 127 VAC)
	Europe, LA		220 – 240 VAC ± 10%(198 –264 VAC)
	Japan.		100 VAC ± 10% (90 – 110 VAC)
	Asia		115 VAC ± 10% (103 – 127 VAC)
			220 – 240 VAC ± 10%(198 –264 VAC)
Voltage Range	All applications		MAX. 500 VA
Line Frequency	All applications		50/60Hz (±2Hz)
Power Transients	Less than 25 % of nominal peak voltage for less than 1 millisecond for any type of transient, including line frequency, synchronous, asynchronous, or aperiodic transients.		
Decaying Oscillation	Less than 15 % of peak voltage for less than 1 millisecond.		

2–1–3 Physical Specifications

The LOGIQ α200 (excluding accessories) weighs 76 Kg (168 lbs). See Chapter 3, ILLUSTRATION 3–1 for dimensions.

Operating Conditions

The LOGIQ α200 is designed to operate within a temperature range of 10 °C to 40 °C (50 °F to 104 °F), and a relative humidity range of 5 % to 90 % (Non–condensing).

Patient Comfort

Concerning permissible operating temperature and humidity tolerances, we recommend that ambient room temperature should be maintained between 20 °C to 26 °C (68 °F to 79 °F), Humidity should be maintained between 50 % and 70 % for patient comfort during ultrasound scanning.

Electromagnetic Interference (EMI)

Ultrasound machines are susceptible to interference from the radio frequencies, magnetic fields, and transients in the air or power leads. Possible EMI sources should be identified. Electrical and electronic equipment may produce EMI unintentionally or as a result of a malfunction. These sources include medical lasers, cauterizing guns, computers, monitors, fans, gel warmers, microwave ovens, and cellular phones. The presence of broadcast station or van may also cause interference.

Carefully read the following precautions before installing the unit.

1. Connect the power plug for any other equipment into the fixed outlet with ground wire.
2. Securely connect any equipment with permanent ground connection to the earth ground furnished in the building.
3. Install the unit as far from any electrical or electronic equipment as possible.

If any EMI troubles are known or suspected to be present, try to deal with the equipment suspected to have influence on the Ultrasound machine as follows:

1. Move the ultrasound machine as far from the equipment as possible.
2. Change the arrangement of the equipment in the room.
3. Plug the equipment into other outlet.
4. Move the power cable or signal cable connected with the equipment.

Securely re-tighten drive any screws for the Ultrasound machine after re-assembling for service operation.

2–1–4 Recommended Ultrasound Room Layout

TABLE 2– 1 provides the requirements for an ultrasound room:

TABLE 2– 1
ULTRASOUND ROOM REQUIREMENTS

POWER SOURCE	230VAC, 50Hz, SINGLE PHASE For Europe Version 115V, 60Hz, SINGLE PHASE For USA Version
CURRENT RATING	2A (115V, 100V) ; 1A (220–240V) CIRCUIT BREAKER
RADIATION SHIELDING	NONE REQUIRED for ULTRASOUND ENERGY
TEMPERATURE	20–26 °C (68–79 °F) for PATIENT COMFORT
HUMIDITY	50% to 70% for PATIENT COMFORT
HEAT DISSIPATION	2000 BTU/Hr for LOGIQ α200
FLOOR LOADING	Approximately 240 – 300 kg/m^2 without Accessories
FLOOR CONDITION	Gradient : WITHIN 5 degrees
LOGIQ α200 Weight	76 kg (168lbs) without Accessories

2–1–4 Recommended Ultrasound Room Layout (Continued)

Optional Desirable Ultrasound Room Facilities

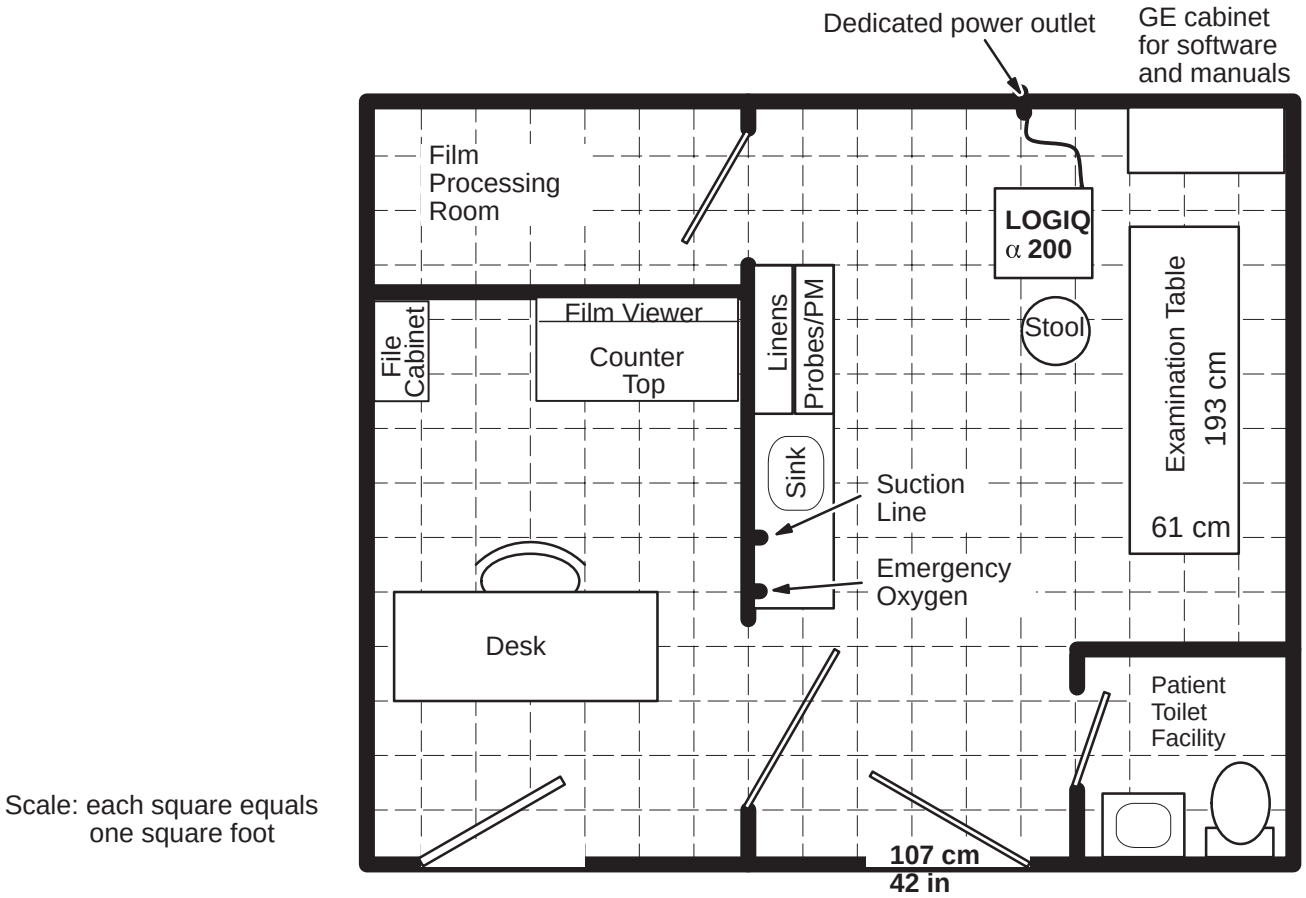
These facilities are:

1. Lab sink with hot and cold water.
2. Emergency oxygen supply.
3. Dimmer control for overhead lights.
4. Film viewer.
5. Film and linen storage.
6. Medical equipment storage.
7. Hospital grade equipment electrical outlet.
8. Document storage area for operating and service manuals.
9. Nearby waiting room, dressing room, lavatory.
10. Trash bin.

Recommended and Alternate Ultrasound Console Floor Plans

ILLUSTRATION 2–1 provides a recommended standard floor plan and a minimal floor plan for ultrasound equipment

2–1–4 Recommended Ultrasound Room Layout (Continued)



RECOMMENDED ULTRASOUND FLOOR PLAN
ILLUSTRATION 2–1

2–2 INSTALLATION

2–2–1 Introduction

This section contains many of the procedures required to install the LOGIQ α200 console.

2–2–2 Average Installation Time

The LOGIQ α200 has been designed to be installed and checked out by an experienced service technician in approximately three hours. LOGIQ α200 consoles with optional equipment may take slightly longer.

2–2–3 Installation Warnings

1. Since the LOGIQ α200 weighs approximately 76 kg (168 lbs) without options, preferably two people should unpack it. Two people are also preferable for installing any additional bulky items.

2. There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord. Only qualified service personnel should carry out servicing and troubleshooting.

Note

For information regarding packing labels, refer to ILLUSTRATION 2–3, LABELS ON PACKAGE.

3. After being transported, the unit may be very cold or hot. If this is the case, allow the unit to acclimate before you turn it on. It requires one hour for each 2.5°C increment if it's temperature is below 10°C or above 40°C.

CAUTION

Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.

TABLE 2– 2
TIME FOR SETTLEMENT

°C	60	55	50	45	40	35	30	25	20	15	10	5	0	–5	–10	–15	–20	–25	–30	–35	–40
°F	140	131	122	113	104	95	86	77	68	59	50	41	32	23	14	5	–4	–13	–22	–31	–40
hrs	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

2–2–4 Checking the Components

When a new system arrives, check that any components are not damaged and or missing. If shipping damage or shortages occur, contact the address shown in Chapter 1.

2–2–5 Unpacking LOGIQ α200

CAUTION

Do not lift the unit by the Keyboard or Monitor arm. Equipment damage may result.

CAUTION

The unit weighs approximately 76 kg (168 lbs). Be prepared for a sudden shift of weight as the unit is removed from its base (pallet).

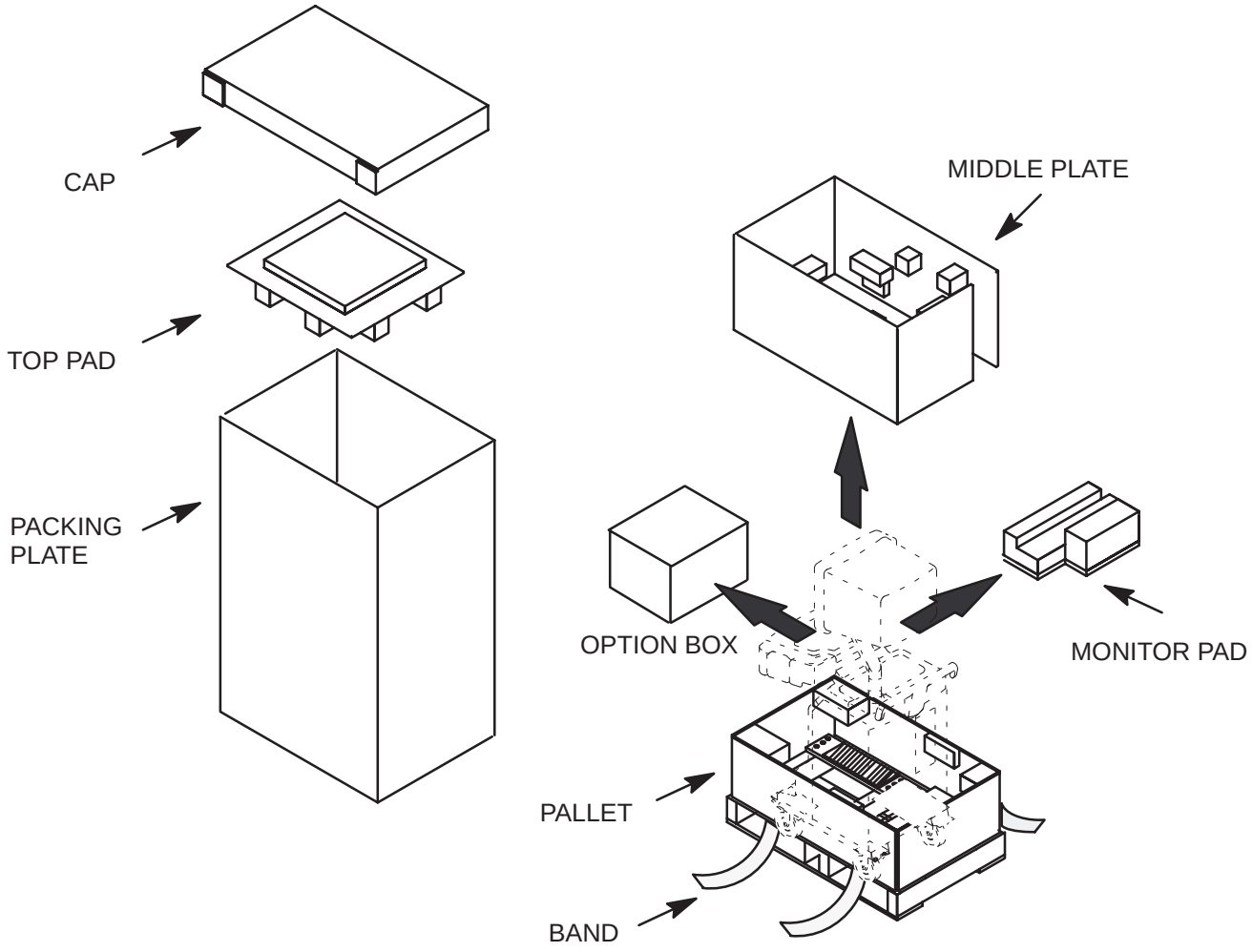
Refer to ILLUSTRATION 2–2 while performing the following procedure.

1. Cut the two BANDs.
2. Lift the CAP up and off.
3. Lift the TOP PAD up and off.
4. Remove the OPTION BOX.
5. Remove the VINYL COVER.
6. Remove the MIDDLE PLATE ASSY.
7. Remove the MONITOR COVER.
8. Lift the PACKING CASE up and off.
9. Lift the Monitor up by pressing the <UP/DOWN> button located on the Monitor Arm.
10. Remove the MONITOR PAD.
11. Return the Monitor arm to its lowest position.
12. Carefully roll the LOGIQ α200 from the PALLET.
13. Remove the Caution Label attached on the CRT Filter and clean the CRT Filter.

Note

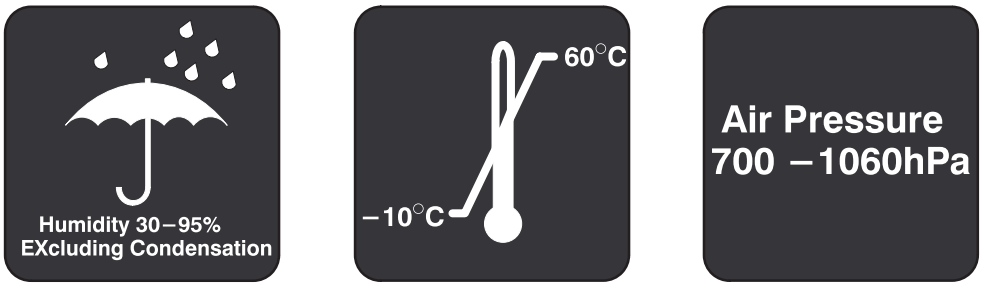
Check the shipping container for special instructions. Verify that the container is intact. In some cases a secondary container may be used. If so, ask the carrier for unpacking instructions.

2–2–5 Unpacking LOGIQ α200 (Continued)



UNPACKING LOGIQ α200
ILLUSTRATION 2–2

2–2–5 Unpacking LOGIQ α200 (Continued)



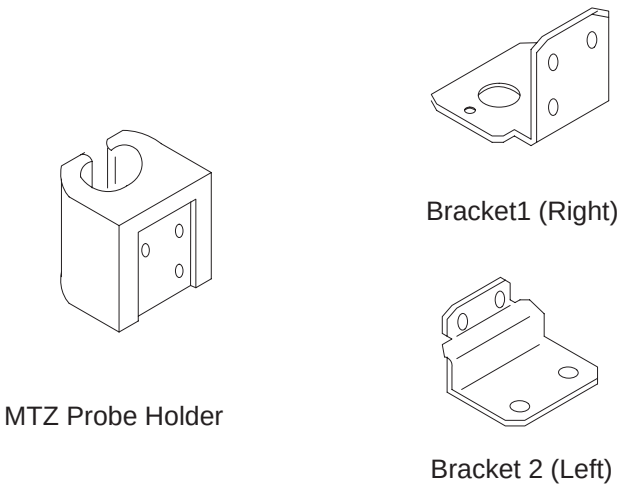
LABELS ON PACKAGE
ILLUSTRATION 2–3

2–2–6 MTZ Probe Holder Installation (Option)

One MTZ probe holder and two brackets are supplied with the LOGIQ α200 console as shown in ILLUSTRATION 2–4.

Note

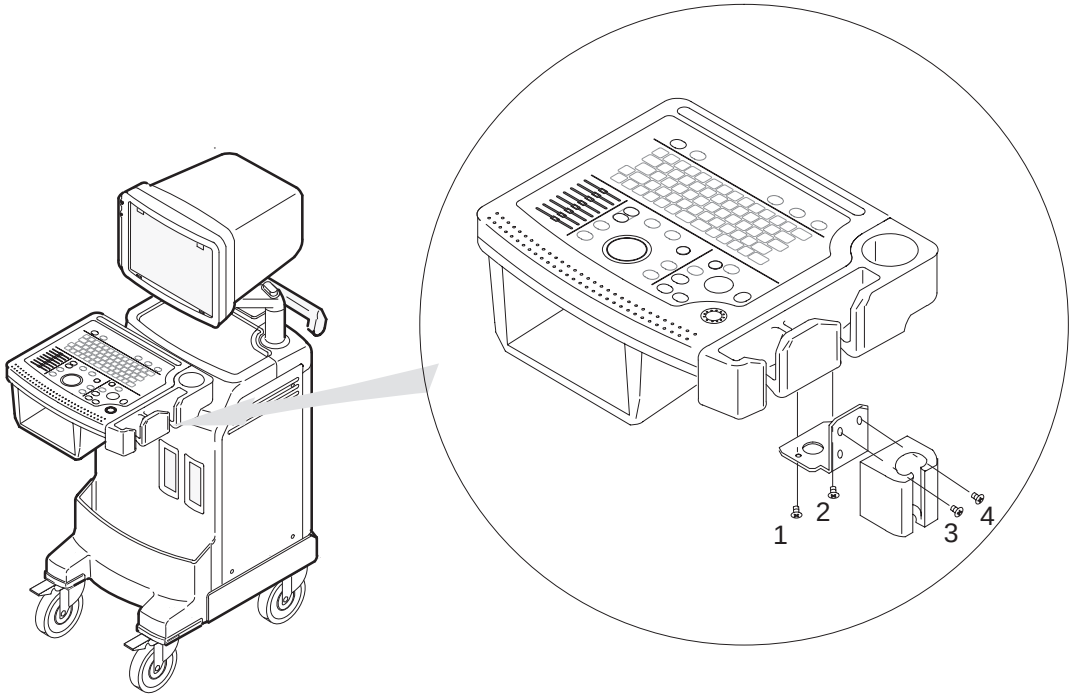
Two sets of screw holes are provided at the bottom of standard probe holder and left side of keyboard to install the MTZ probe holder. You can choose the most convenient position for your customer between the two sets of screw holes.



MTZ PROBE HOLDER SET
ILLUSTRATION 2–4

2–2–6 MTZ Probe Holder Installation (Option) (Continued)

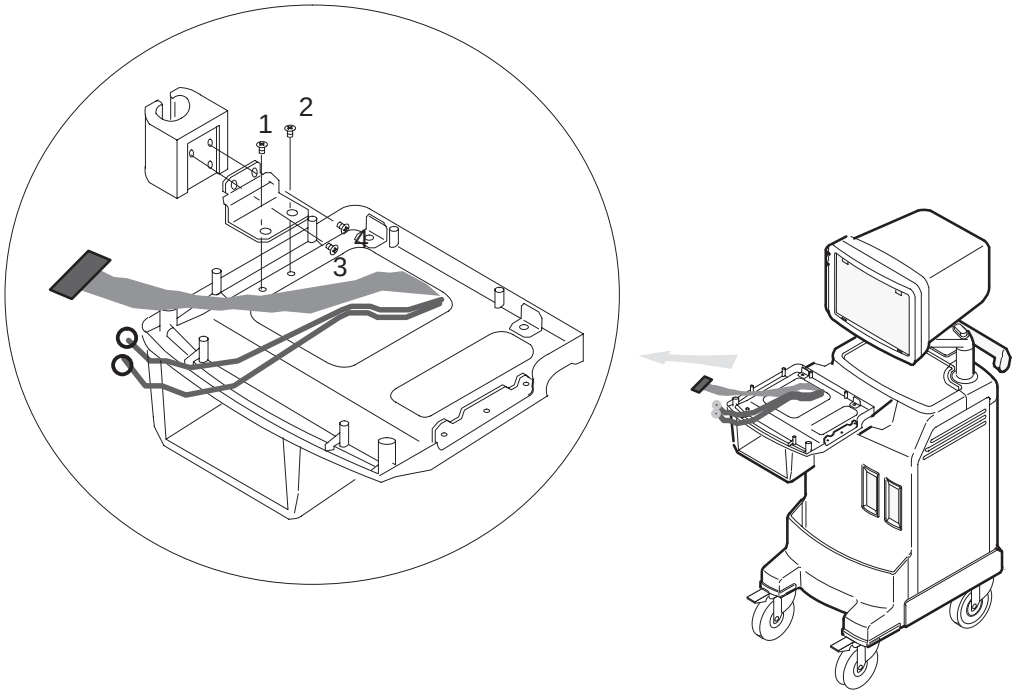
1. Assemble the MTZ probe holder at the bottom of standard probe holder by screwing four (1 – 4) screws as shown in ILLUSTRATION 2–5.



MTZ PROBE HOLDER INSTALLATION (1)
ILLUSTRATION 2–5

2–2–6 MTZ Probe Holder Installation (Option) (Continued)

2. After removing the Keyboard Assy (Refer to 6–2–10, 6–2 DISASSEMBLY/RE-ASSEMBLY), Assemble the MTZ probe holder at the left side of keyboard by screwing four (1 – 4) screws as shown in ILLUSTRATION 2–6.



MTZ PROBE HOLDER INSTALLATION (2)
ILLUSTRATION 2–6

2–2–7 Transducer Connection

1. Connect a transducer to the left side connector slot #1, transducer receptacle as follows:
   a. Ensure that the transducer twist lock lever points towards the 12 o'clock position.
   b. Insert the transducer connector on the receptacle guide pin until it touches the receptacle mating surface.
   c. Twist the transducer twist lock lever to the 4 o'clock position to lock it in place. Twist the lever to the 12 o'clock position to disconnect the transducer.

Note

It is not necessary to turn OFF power to connect or disconnect a transducer.

2. Connect the main power cable to a hospital grade power receptacle with the proper rated voltage checked during preinstallation. Never use a three–to–two prong adapter; this defeats the safety ground.

2–2–8 Moving into Position

CAUTION

Do not lift the unit by the Keyboard.
Do not tilt the unit more than 5 degrees to avoid tipping it over.
To avoid injury by tipping over. Set the monitor to the lowest position before moving.

CAUTION

Equipment Damage Possibility. Lifting the console by holding covers may damage the covers. Do not lift the console by holding any covers.

In general, a single adult can move the LOGIQ α200. (It is better to pull from the rear rather than push from the front of the unit). Before moving, store all loose parts in the unit. Wrap transducers in soft cloth or foam to prevent damage.

2–2–9 Adjusting System Clock

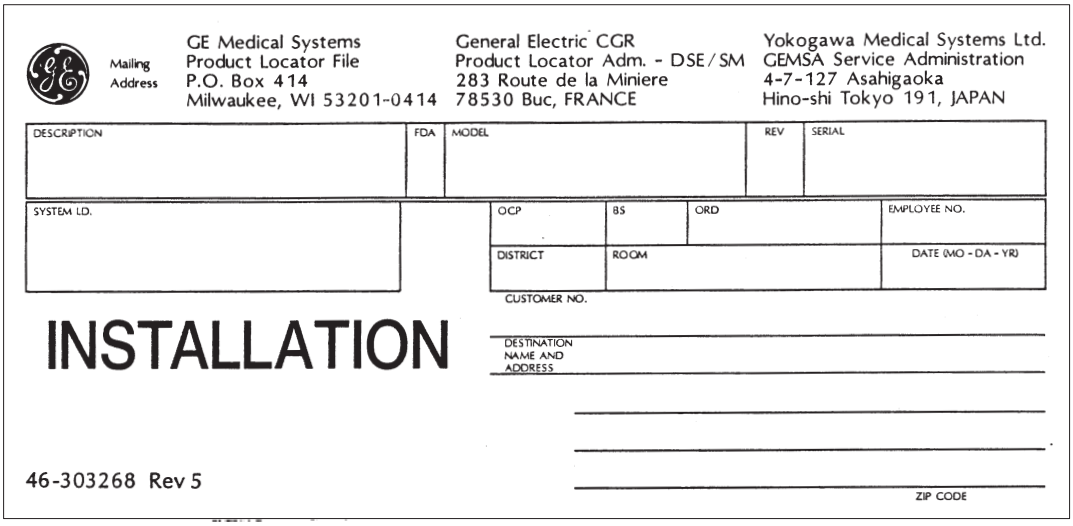
Set system clock for the LOGIQ α200to the local time. For procedure of adjusting the System clock, refer to "Customizing Your System" in the Users manual.

2–2–10 Product Locator Installation Card

Fill out proper customer Information the Product Locator Installation Card. Refer to ILLUSTRATION 2–7. Mail this Installation Card “Product Locator” to the address corresponding to your pole.

Note

The Product Locator Installation Card shown in ILLUSTRATION 2–7 may not be same as the provided Product Locator card.



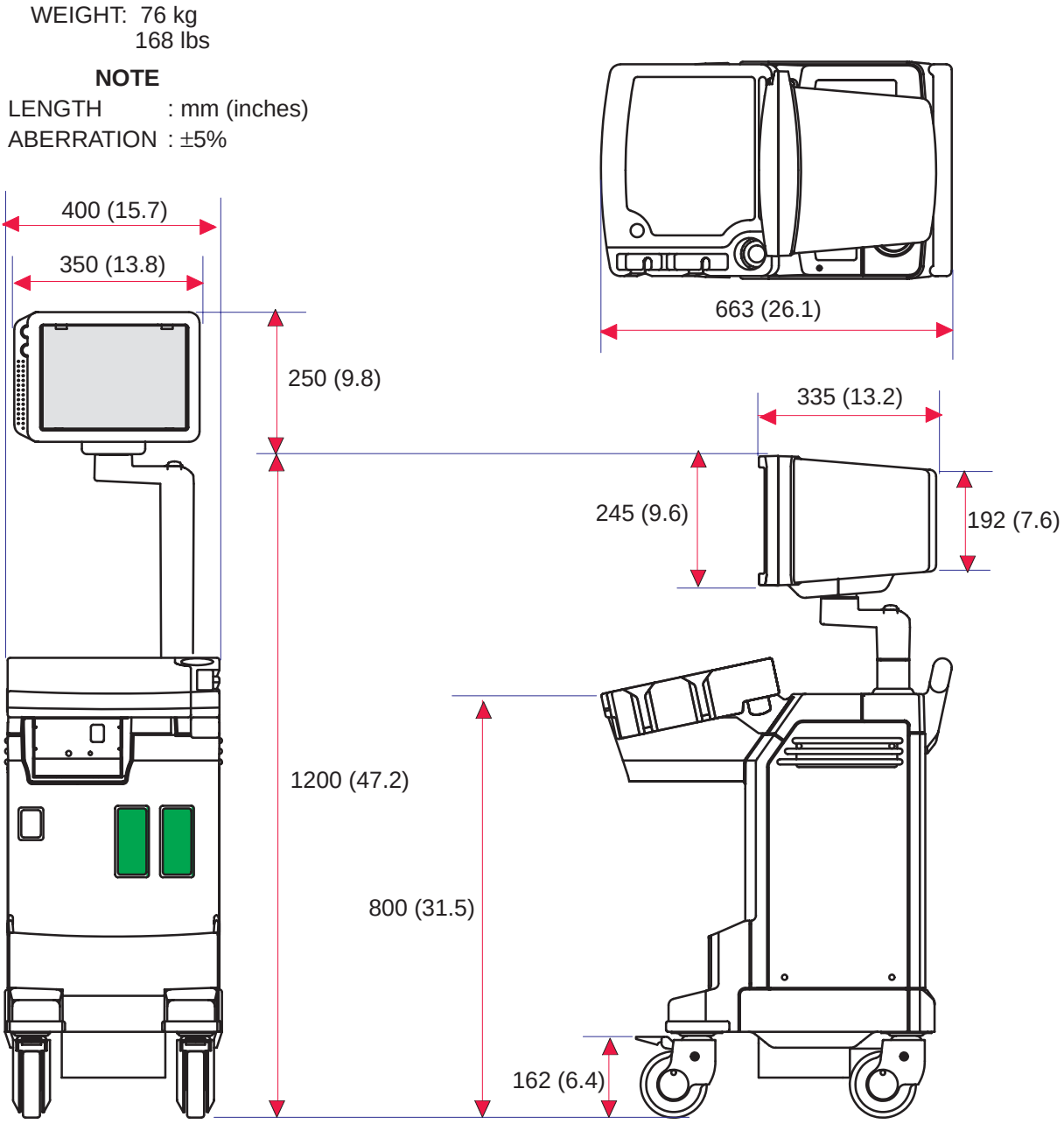
PRODUCT LOCATOR INSTALLATION CARD
ILLUSTRATION 2–7

3–1 INTRODUCTION

This chapter describes system configuration and specifications.

3–2 DIMENSIONS

Regarding LOGIQ α200 dimensions, Refer to ILLUSTRATION 3–1 for planning the position of your LOGIQ α200.



OVERALL DIMENSIONS
ILLUSTRATION 3–1

3–3 ELECTRICAL SPECIFICATIONS

Electrical conduit, junction boxes, outlets, circuit breakers, and switches should be in place before installing the LOGIQ α200 console.

3–3–1 Power Supply

Voltage setup is performed in the factory. Different power cables and circuit breakers are used for the 100 (115) Vac and 220 (240) Vac versions.

3–3–2 Facility Power Receptacle

A separate power outlet with a 10 amp circuit breaker for 100 (115) Vac units, or a 5 amp circuit breaker for 220 (240) Vac units, is recommended. The specific power receptacle used depends on your country's power line standards.

The receptacle should have International Electrotechnical Commission (IEC) approval, or equivalent.

3–4 STORAGE AND OPERATION REQUIREMENTS

Probes and peripherals are shipped in separate containers. Shipping weight is approximately 210 lbs (96 kg).

The size of the container is L82 cm x W53 cm x H140 cm (32 in. x 21 in. x 55 in). Table 3–1 provides a summary of temperature, atmospheric pressure, and humidity tolerances for shipping, installation, and operation.

TABLE 3– 1
STORAGE AND OPERATION REQUIREMENTS

PARAMETER	STORAGE	OPERATION
TEMPERATURE (°C) (°F)	–10 to 60 14 to 140	10 to 40 50 to 104
ATMOSPHERIC PRESSURE (hPa)	700 to 1060	700 to 1060
HUMIDITY (%) (Non–condensing)	5 to 90	5 to 90

3–5 OPTIONAL PERIPHERALS

3–5–1 Peripherals/Accessories Connector Panel

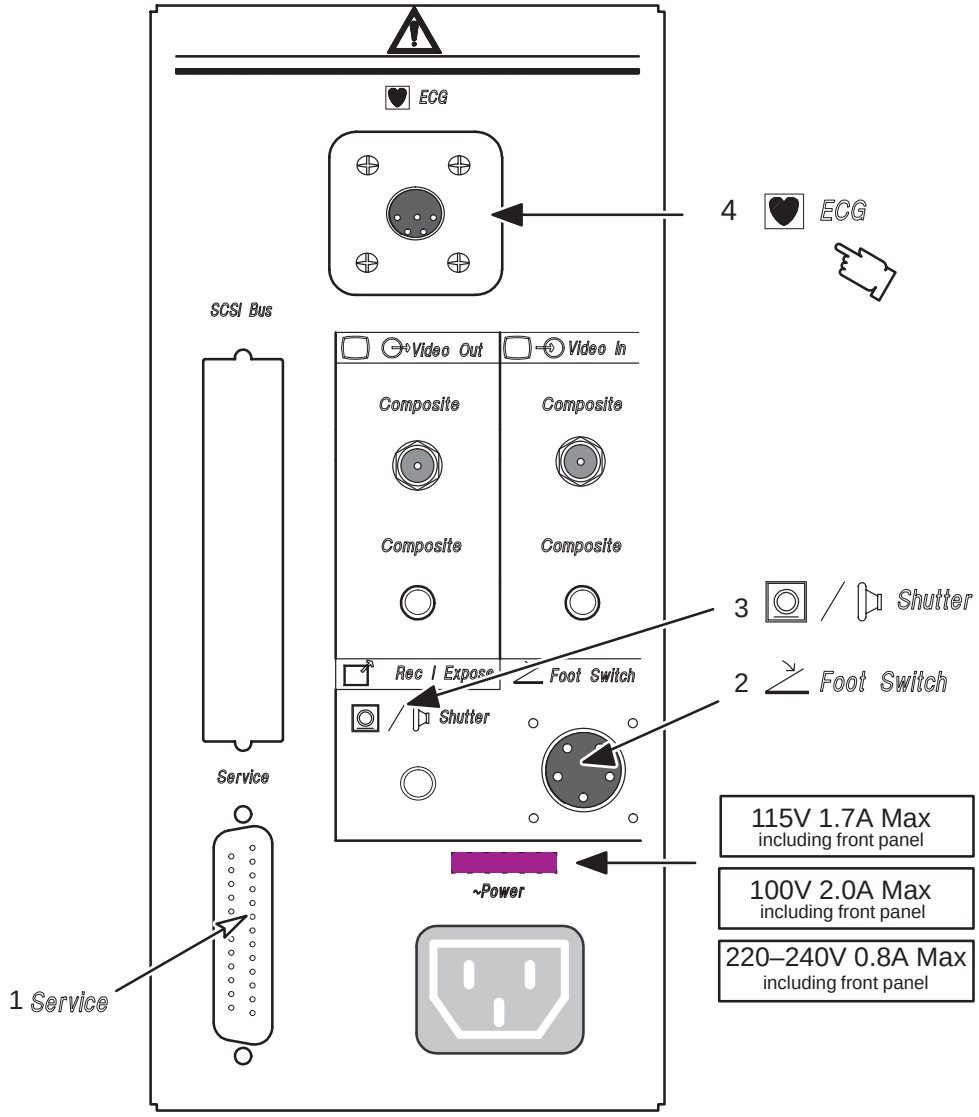
LOGIQ α200 peripherals and accessories can be properly connected using the rear connector panel.

Located on the panel are video input and output connectors, camera expose connector, foot switch connector, power connector and service tools.

This section indicates the pin assignment for each connector (1 – 4 in ILLUSTRATION 3–2) at pages 3–6 through 3–7.

Note

The optional ECG connector is available only for the console with the system software version 2.00 or later.



REAR CONNECTOR PANEL
ILLUSTRATION 3–2

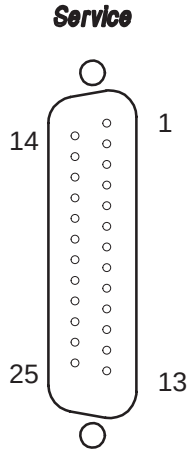
3–5–1 Peripherals/Accessories Connector Panel (Continued)

Note

Each outer (case) ground line of peripheral/accessory connectors are protectively grounded. Signal ground lines are Not Isolated.

1. Pin Assignment of RS232C for Service
   Connector : Female, D–SUB, 25–pin

Pin No.	Signal	Pin No.	Signal
1	Frame GND	14	
2	TXD	15	
3	RXD	16	
4	RTS	17	
5	CTS	18	
6	DSR	19	
7	Signal GND	20	DTR
8	DCD	21	
9		22	Ring Indicator
10		23	
11		24	
12	+ 5 V[*1](300mA Max)	25	
13			



[*1] : This voltage shall be apply to this Pin in case of MODEM usage.

Note

Output level of RS232C signals :

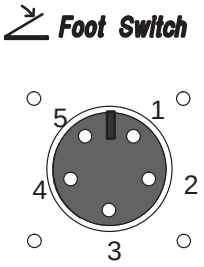
High	+3V to +15V
Low	–15V to 0V

3–5–1 Peripherals/Accessories Connector Panel (Continued)

2. Pin Assignment of Foot Switch

Connector : Round 5–pin connector

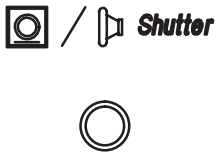
Pin No.	Output Signal	Pin No.	Output Signal
1	FOOT SW	4	
2	FOOT SW_G	5	Frame GND
3			



3. Pin Assignment of Mini Jack for Controlling B/W Printer

Connector :Stereo Mini Jack

Pin No.	Output Signal	Pin No.	Output Signal
1	PRINT*1	2	Signal GND



*1 : Printer starts printing by receiving the LOW pulse more than 100ms.

Note

Output level of control signals indicated in the above tables are TTL level.

3–5–2 List of Optional Peripherals

The tables below shows the suggested optional peripherals for LOGIQ α200.

1. RECORDING DEVICES

TABLE 3– 2
LIST OF RECORDING DEVICES

DEVICE	MANUFACTURER	MODEL	CATALOG No.	VIDEO SIGNAL
Video Cassette Recorder	SONY	SVO-9500MD	Local	NTSC
	SONY	SVO-9500MDP	Local	PAL
Video Graphic Printer	SONY	UP890	Local	
	MITSUBISHI	P90	Local	
Multi Image Camera	International Imaging Electronics	IIE460	Local	

Note

See each option installation instructions for installation and connection procedures.

2. TRANSDUCER (PROBE)

TABLE 3– 3
LIST OF TRANSDUCERS

PROBE NAME	MATERIAL OF HEADSHELL	AREA OF USING	TYPE	CATALOG NO.	REQUIRED ADAPTER	PART NO. FOR JAPAN	PART NO.
CBF	PES	Abdom.	Convex	H46022CB	Not Required	P9603AA	P9603AD
CAE	PES	Abdom.	Convex	H46022CA	Not Required	P9603AB	P9603AE
MTZ	PES	Intercavity	Convex	H46022MT	Not Required	P9603AL	P9603AU
CZB	NORYL	Neonatal	Convex	H45202CZ	Not Required	2152402	2152422
CS	PES	Abdom.	Convex	H45222CS	Not Required	2202315	2202320
ATR	PES	Urology	Convex	H4061PR	Not Required	2201223	2201222
LH	PES	Superficial	Linear	H46022LH	Not Required	P9601AC	P9601AS
LE	PES	OB/Gyn.	Linear	H46022LE	Not Required	P9601AB	P9601AR
LI	PES	Intraoperative	Linear	H46022LI	Not Required	P9601AG	P9601AW
LT	PES	Intraoperative	Linear	H46022LT	Not Required	P9601AJ	P9601AX
LB	PES	OB/Gyn.	Linear	H46022LB	Not Required	P9601AA	P9601AQ
LD	NORYL	Intraoperative	Linear	H45202LD	Not Required	P9601AD	2124317

3–5–2 List of Optional Peripherals (Continued)

CAUTION

Equipment damage possibility. Be sure to use the following recommended connecting cables to connect recording devices with LOGIQ α200 console.

1. CONNECTING CABLES

TABLE 3– 4
LIST OF CONNECTING CABLES

NAME	PART NO.	FIGURE	NOTE
Printer Install Kit	2176459	Printer Cable Assy, BNC cable, Shutter cable	For B/W Printer

3–5–3 Power Consumption of Optional Peripherals

The table below shows the power consumption of each optional peripheral for LOGIQ α200.

TABLE 3– 5
POWER CONSUMPTION OF OPTIONAL RECORDING DEVICES

DEVICE	MODEL	POWER CONSUMPTION
Video Cassette Recorder	SVO-9500MD	64 W
	SVO-9500MDP	
Video Graphic Printer	UP890	110 W
Multi Image Camera	IIE460	60 W

3–6 TEST POINT, LED, DIP SWITCH AND RESET SWITCH

3–6–1 Test Point List

The table below shows The Test Point list for LOGIQ α200**.**

TABLE 3– 6
TEST POINT

LOCATION	NAME	DESCRIPTION	POSITION
DSC ASSY	TP1	**M–mode enable signal**	Edge of board
	TP3	**Mapping clock**	–
	TP4	**Horizontal driving signal**	–
	TP5	**Vertical driving signal**	–
	TP6	**Anti–alasing filter output**	–
	TP7	**Scan line No.0**	–
	TP8	**Scan line No.8**	–
	TP9	**–5V for analog/digital**	–
	TP10	**Input echo signal from the ESP Assy**	–
	TP V5_1	**+5V for digital**	Edge of board
MST ASSY	TP601	**Gnd**	Edge of board
	TP602	**+5V for digital**	Edge of board
	FOOT S/W	**Foot switch status**	–
	CLK2_25M	**25MHz clock**	–
	CLK 9M	**9MHz clock**	–
	CLK36M	**36MHz clock**	–
RTC ASSY	+5V	**+5V for digital**	Edge of board
	+15V	**+15V for analog**	Edge of board
	–15V	**–15V for analog**	Edge of board
	THV	**High voltage for transmitting**	Edge of board
	RTC_WE	**RTC write enable signal**	–
	CDA	**D/A output for continuous dynamic aperture (CDA)**	–
	CIM	**Not used**	–
	CDF	**D/A output for continuous dynamic focusing (CDF)**	–
	PGC	**D/A output for Pre–gain control (PGC)**	–
	TFC	**D/A output for time frequency control (TFC)**	–

3–6–1 Test Point List (continued)

The table below shows The Test Point list for LOGIQ α200**.**

TABLE 3– 7
TEST POINT

LOCATION	NAME	DESCRIPTION	POSITION
RTC ASSY	TGC	**Data Output for Time Gain Control (TGC)**	–
	HV_REF	**Data output for HV control**	–
	TRIGB	**Trigger signal**	–
HV ASSY	TP_THV	**High Voltage for transmitting**	–
	TP_SHV	**High Voltage for High Voltage switch on CONN Assy**	–
	TP HV_REF	**D/A output for HV control**	–
ESP ASSY	V–15	**–15V for Analog**	Edge of board
	V–5	**–5V for analog/digital**	Edge of board
	V5	**+5V for digital**	Edge of board
	CDA–H	**High position of aperture reference voltage**	Edge of board
	CDA–L	**Low position of aperture reference voltage**	Edge of board
	CDA–ADJ	**For Adjusting aperture reference voltage**	–
	CDFT–OUT	**Positive control voltage of CDF**	–
	CDFN–OUT	**Negative control voltage of CDF**	–
	CDF–ADJ	**For adjusting CDF control circuit**	–
	TFC–OUT	**Output of TFC control voltage**	–
	TFC–ADJ	**For adjusting TFC control circuit.**	–
	TGC–OUT	**Output of TGC control voltage**	–
	PGC–OUT	**Output of PGC control voltage**	–
	OFFSET–ADJ	**For adjusting offset voltage of Log Amp**	
	FEC	**Output signal of Delay line**	
	RFI	**Output of RFI filter**	–
	D–OUT	**Output of dynamic filter**	–
	NVE	**Output Signal of ESP Assy**	–

3–6–1 Test Point List (continued)

TABLE 3– 8
TEST POINT

LOCATION	NAME	DESCRIPTION	POSITION
ESP ASSY	TP3	**GND**	
	TP6	**GND**	
	V15	**+15V for Analog**	
CONN ASSY	+5V	**+5V for digital**	Edge of board
	–15V	**–15V for analog**	Edge of board
	SHV	**High voltage for high voltage switch**	Edge of board

3–6–2 LED List

The table below shows the LED list for LOGIQ α200.

TABLE 3–7
LED

LOCATION	NAME	DESCRIPTION	POSITION	NORMAL	ABNORMAL
MST ASSY	V5	**+5V for digital**	Edge of board	ON	OFF
	WOTOUT	**Watchdoc timer out, Reserved**	Edge of board	–	–
	D3~D10	**Reserved**	Edge of board	–	–
DSC ASSY	DS1	**+5V for digital**	Edge of board	ON	OFF
	DS2	**Mapping clock**	Edge of board	**Refer to Note**	NO
	DS3	**Mapping clock**	Edge of board		
	DS4	**Mapping clock**	Edge of board		
	DS5	**DSP running**	Edge of board	ON	OFF
HV ASSY	DS1	**HV ASSY status (ON:normal)**	Edge of board	ON	OFF
SMPS ASSY	GREEN LED	**SMPS ASSY status (ON:normal)**	SMPS ASSY	ON	OFF

Note

Three LED (DS2~DS4) should be blinked when the system operated with the Probe.

3–6–3 DIP Switch

The table below shows the DIP Switch list for LOGIQ α200.

TABLE 3–8
DIP SWITCH Setting

LOCATION	NAME	Switch No.	DESCRIPTION	POSITION
MST ASSY	S1	1	**Initiate the SRAM data to factory Setup value**	Edge of board
		7	**Select AAF Filter (ON:Other countries, OFF:Japan)**	
		2~ 6	**Not Assigned**	
		8	**Select NTSC or PAL (ON:PAL, OFF:NTSC)**	
DSC ASSY	S1	1 ~8	**Not Assigned**	Edge of board

3–6–4 Reset Switch

Reset switch (S2) on edge of MST Assy used for resetting the system.

4–1 INTRODUCTION

This chapter provides procedures for quickly checking major functions of the LOGIQ α200 console, and SMPS adjustments.

4–1–1 Required Equipment

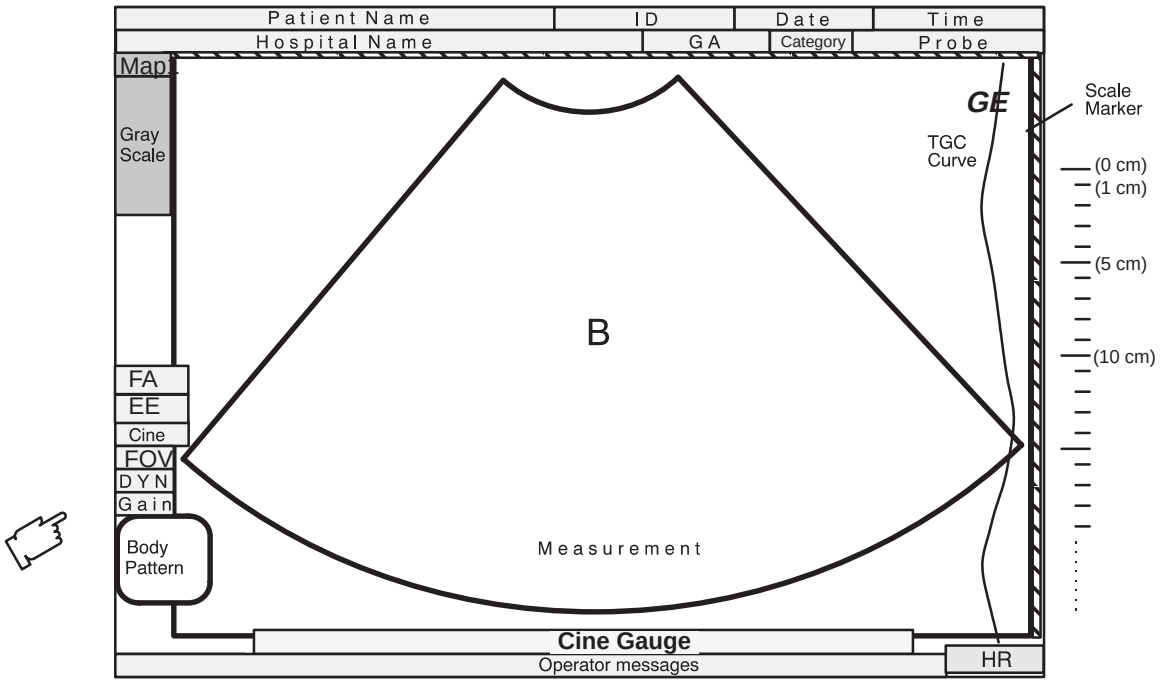
To perform these tests, you'll need a linear, or a convex transducer.

4–2 FUNCTIONAL CHECK PROCEDURES

4–2–1 Basic Controls

Step	Check	Expected Result
1	Connect the convex transducer to "Probe 1" connector.	
2	Power On	After few seconds, the B mode screen should appears as shown in ILLUSTRATION 4–1.
3	Rotate **B/M Gain** knob	Image gets lighter with CW rotation and darker with CCW.
4	Press **Map** key to select another gray scale Map.	The gray scale adjusts to each new Map selected.
5	Press **Dyn Rang**e Arrow up or down key.	At lower Dynamic Range settings, image speckle fades and prominent objects in the display are more pronounced from the background image.
6	Rotate **Depth** knob.	The depth of image should be increased /decreased.
7	Slide **TGC** potentiometers (pots)	Image grows darker or brighter at depth equivalent to pot's location.
8	Press **Zoom**. key. Press it again to exit.	The image should increase to X2 size.
9	Press **Frame Avg** key.	Image speckle fades and probe or wire movement is smeared.
10	Press **Edge Enhc** key.	The edges inside the focal area(s) should become lighter when you increase and darker as you decrease its value.
11	Press **Reverse** key.	The image reverses the left/right orientation.
12	Press **Reverse** key again.	The image reverses again.

4–2–1 Basic Controls (Continued)

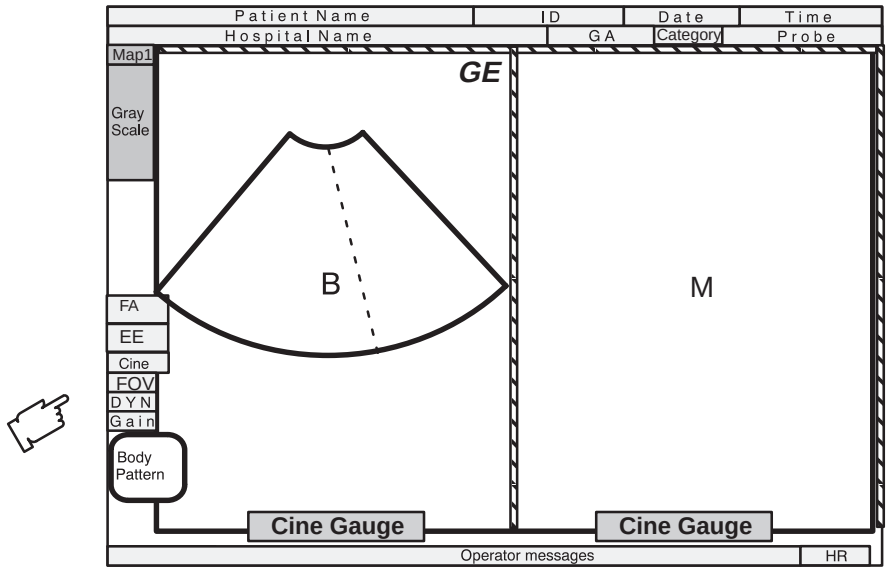


B–MODE DISPLAY SCREEN
ILLUSTRATION 4–1

4–2–2 M-Mode Check

Step	Check	Expected Result
13	Press **M** key.	The M mode timeline should appear next to the B image as shown in ILLUSTRATION 4–2. Whether it takes half the screen or two–thirds depends on the preset.
	Roll trackball, position cursor over area you want to see in motion.	The Mode cursor should follow trackball movement and the timeline should update for new location of focus.
	Press **M** key again.	The full M-mode should appear on the CRT monitor.
14	Rotate **B/M Gain** knob	The M timeline should get brighter with CW rotation and darker with CCW.
15	Press **Dyn Range** Arrow up or down key.	Dynamic Range affects grays and the last added scan mode; to adjust the basic B, M must be off. Turn Dynamic Range down to increase contrast, turn up to soften.
16	Press **Sweep Speed** key Press it again to exit.	The timeline speed should increase to 4 second sweeps and decrease to 16 second sweeps. Fast=4 Medium=8 Slow=16
17	Press **Freeze** key. Press it again to exit.	The image should freeze. The image revives acquisition.
18	Press **Edge Enhc** key.	Changes the M image
19	Press **B** key.	The M Mode timeline should disappear and the B-mode image should appear as shown in ILLUSTRATION 4–1.

4–2–2 M-Mode Check (Continued)



M–MODE DISPLAY SCREEN
ILLUSTRATION 4–2

Note

You can select several types of display formats by using the Setup Menu. For the Preset Menu, refer to Customizing Your System in the LOGIQ α200 User Manual.

4–3 SMPS ADJUSTMENTS

This section provides SMPS adjustment procedures for the LOGIQ α200. Adjustments should be only made when necessary. SMPS adjustments should be made in accordance with the schedule for periodic maintenance in Chapter 7 of this manual.

Before beginning the SMPS adjustments procedure, make sure the power outlet conforms to the proper power line standards. Refer to Chapter 2, Installation.

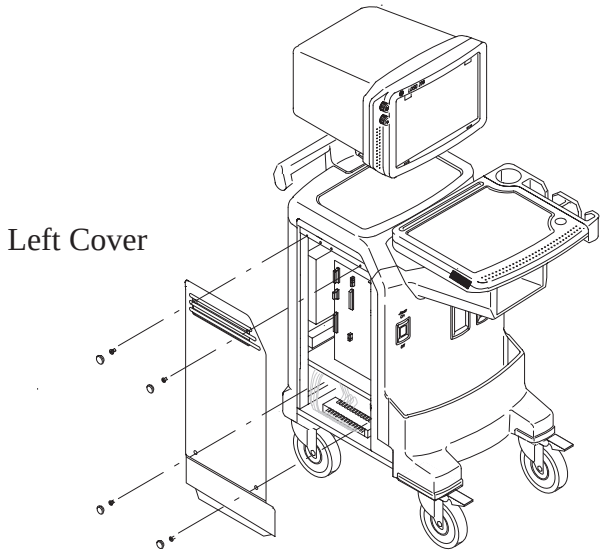
Note

If the adjustment pot is turned to far clockwise, the SMPS output shuts down to protect the circuits against the over–voltage. In that case, power the LOGIQ α200 OFF and turn the pot counterclockwise all the way. Then power it ON and try to adjust the SMPS again.

The SMPS Assy is in the bottom of the LOGIQ α200 as shown in ILLUSTRATION 4–6.

4–3–1 SMPS Assy Access

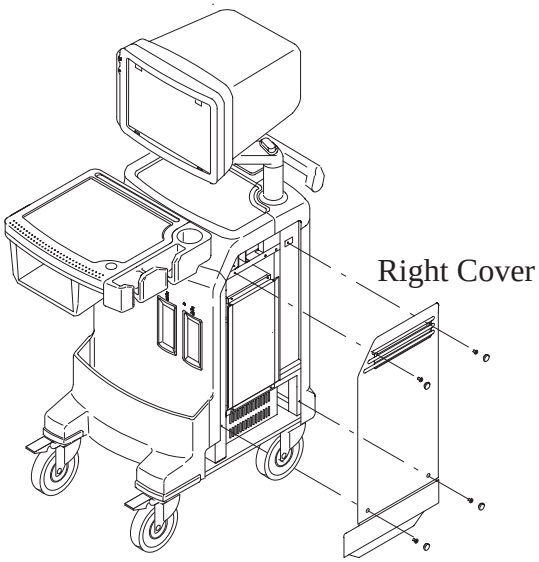
1. Remove the four screw caps and unscrew the screws to remove the Left Cover as shown in the ILLUSTRATION 4–3.



LEFT COVER REMOVAL
ILLUSTRATION 4–3

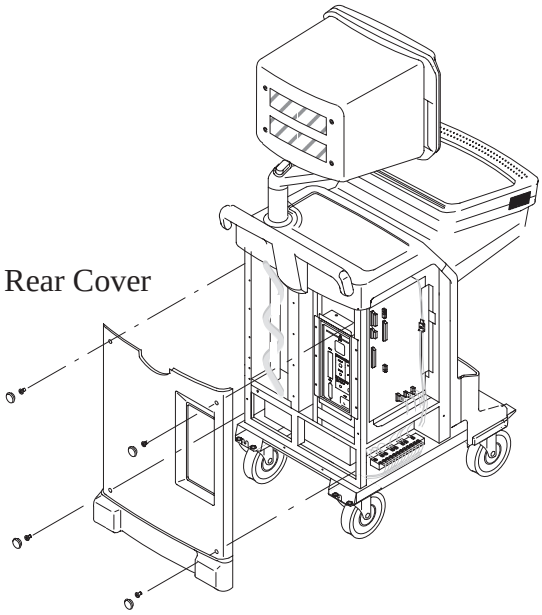
4–3–1 SMPS Assy Access (Continued)

2. Remove the four screw caps and unscrew the screws to remove the Right Cover as shown in the ILLUSTRATION 4–4.



RIGHT COVER REMOVAL
ILLUSTRATION 4–4

3. Remove the four screw caps and unscrew the screws to remove the Rear Cover as shown in the ILLUSTRATION 4–5.



REAR COVER REMOVAL
ILLUSTRATION 4–5

4–3–2 SMPS Adjustment Procedure

1. Power LOGIQ α200 ON. Wait for about 30 seconds to warm up the console.
2. Connect a DVM to the appropriate place shown in Table 4–1.
3. Verify that the voltages are as shown in Table 4–2.

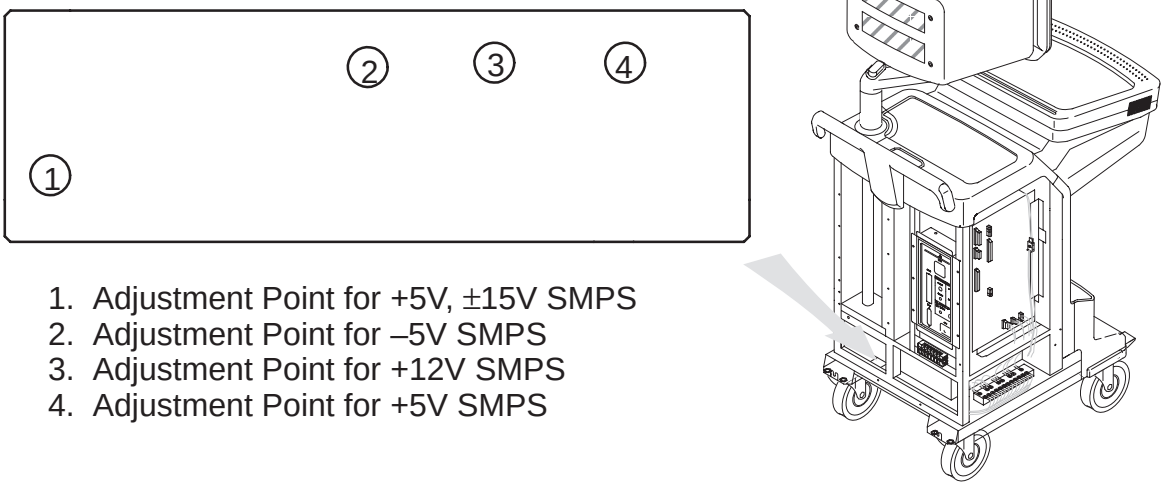
TABLE 4– 1
SMPS MEASUREMENT LOCATION

SMPS	MEASURE AT	RETURN AT	ADJUST AT
+5V,± 15V for Analog	V5 (+5V), V–15 (–15V), V15 (+15V) on ESP BD ASSY	TP3 (Ground) on ESP BD ASSY	1 on SMPS ASSY See ILLUSTRATION 4–6
–5V for Analog/Digital	V–5 (–5V) on ESP BD ASSY	TP3 (Ground) on ESP BD ASSY	2 on SMPS ASSY See ILLUSTRATION 4–6
+12 for Monitor	B+ (+12V) on Monitor Input Connector	GND on Monitor Input Connector	3 on SMPS ASSY See ILLUSTRATION 4–6
+5V for Digital	TP 602 (+5V) on MST BD ASSY	TP 601 (GND) on MST BD ASSY	4 on SMPS ASSY See ILLUSTRATION 4–6

TABLE 4–2
SMPS MEASUREMENT TOLERANCES

SMPS	MIN	MAX
+5V, ± 15V for Analog	+4.8 V –15.75V +14.25 V	+5.2 V –14.25 V +15.75 V
–5V for Analog/Digital	–4.8 V	–5.2 V
+12 for Monitor	+11.8 V	+12.2 V
+5V for Digital	+4.8 V	+5.2 V

4–3–2 SMPS Adjustment Procedure (Continued)



1. Adjustment Point for +5V, ±15V SMPS
2. Adjustment Point for –5V SMPS
3. Adjustment Point for +12V SMPS
4. Adjustment Point for +5V SMPS

SMPS ASSY
ILLUSTRATION 4–6

5–1 INTRODUCTION

LOGIQ α200 is a compact ultrasound scanner supporting a wide range of probes. This gives the system added benefits and flexibility to meet diverse applications.

5–2 LOGIQ α200 SYSTEM

The LOGIQ α200 has a 48 channel beamformer that digitizes the RF signal. It uses analog delays to focus the acoustic beam. It offers parallel receive beam formation which can increase frame rate by a factor of two in time critical applications. This system also features many advanced image processing controls.

User surveys and the latest technology were used to increase console ease-of-use.

System Features

The key design goals of this system are:

- High Image Quality
- Increased User Productivity
- Multiple Clinical Applications
- Planned Upgradeability
- High Mobility

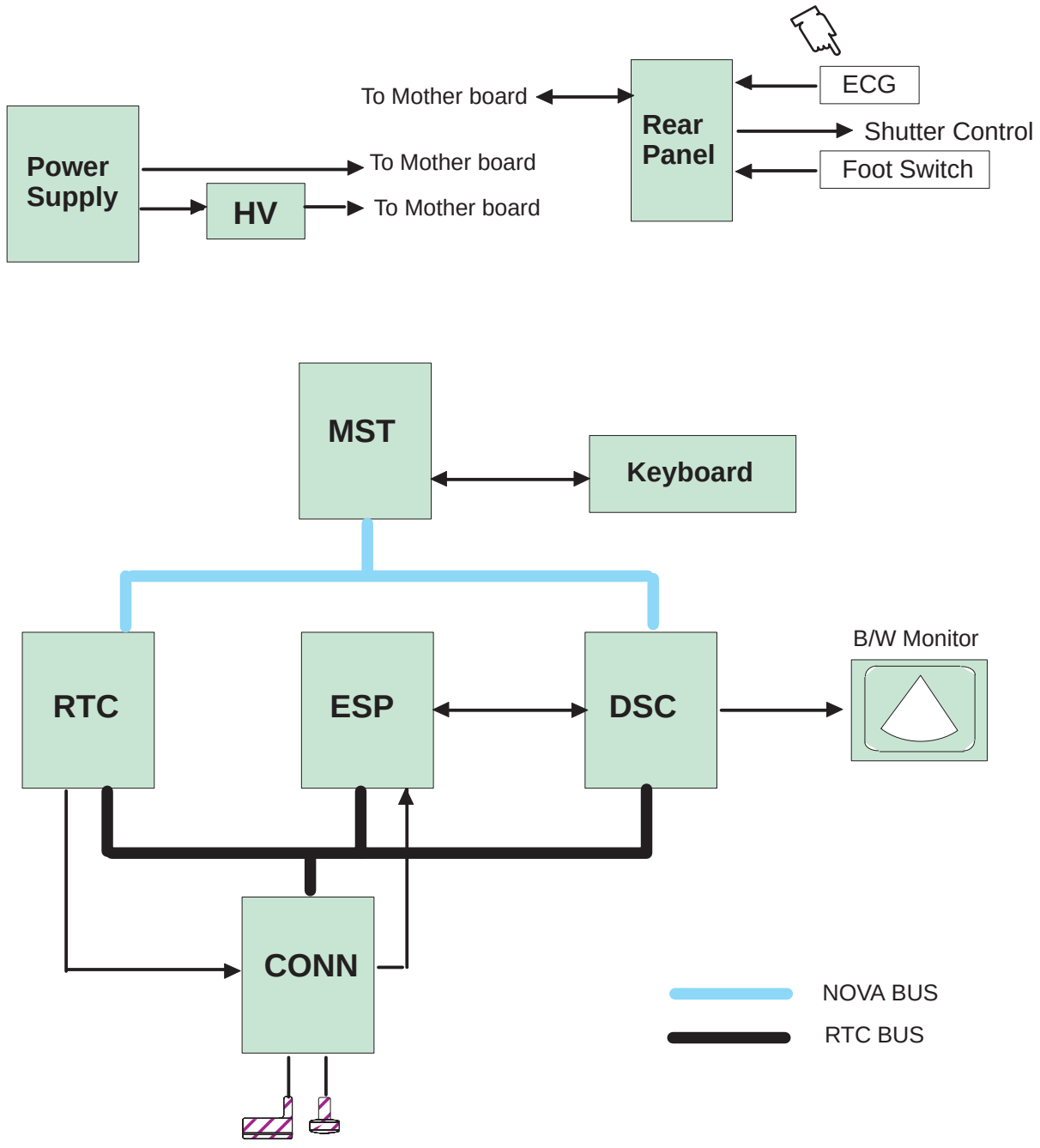
Types of Applications

The system supports many clinical uses. Scan and display parameters may be user selected to default to desired values for each application. The system presets many parameters to clinically determined, optimal values.

- RAD/ABDOMEN
- OB/GYN
- UROLOGY
- SMALL PARTS
- UROLOGY
- CARDIOLOGY

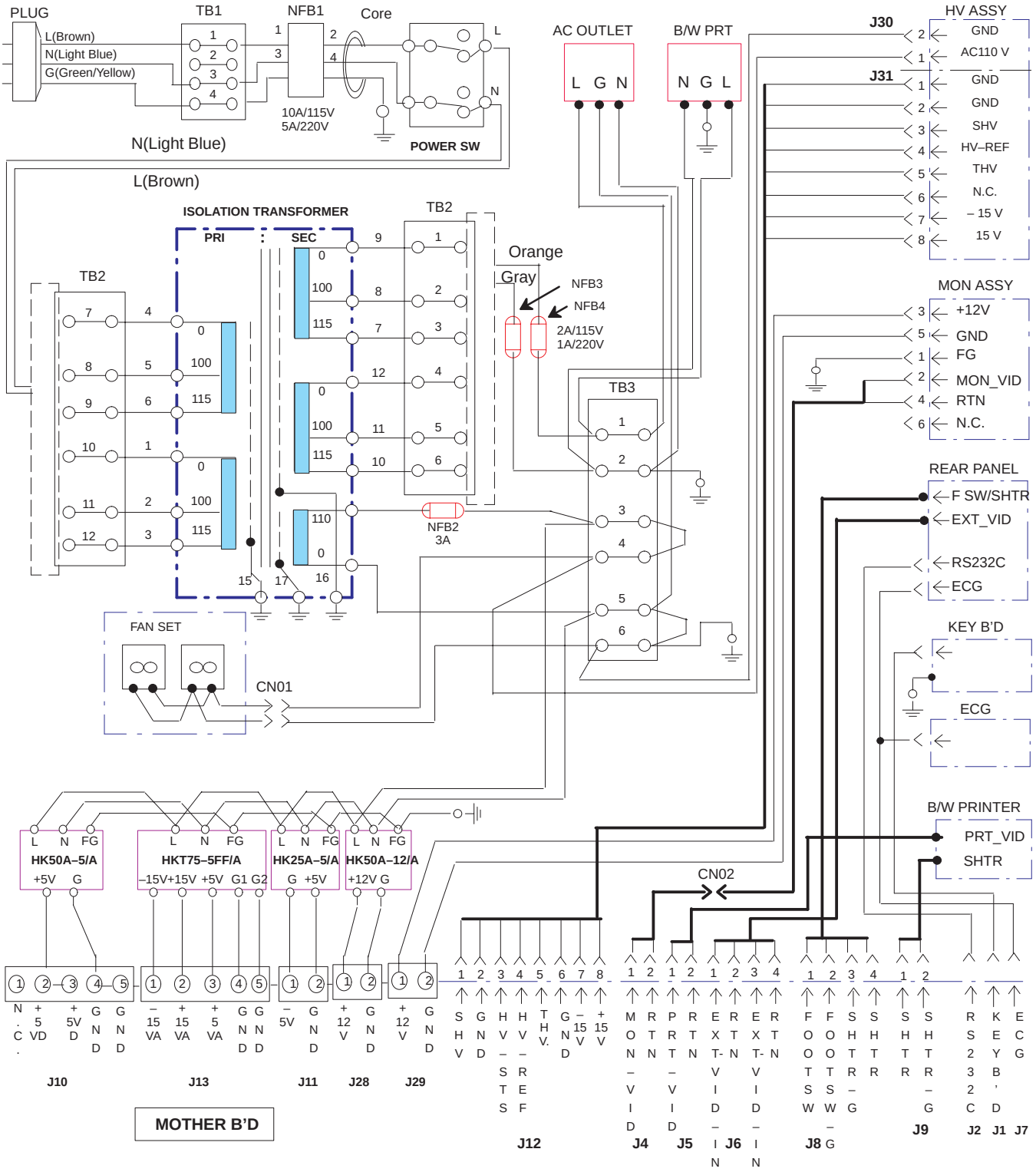
See Illustration 5–1, the LOGIQ α200 system can be divided into an analog signal processing section, a digital signal processing section. The digital section has the microprocessor driven system control section, which controls the system based on operator commands and system status information.

5–3 BLOCK DIAGRAM



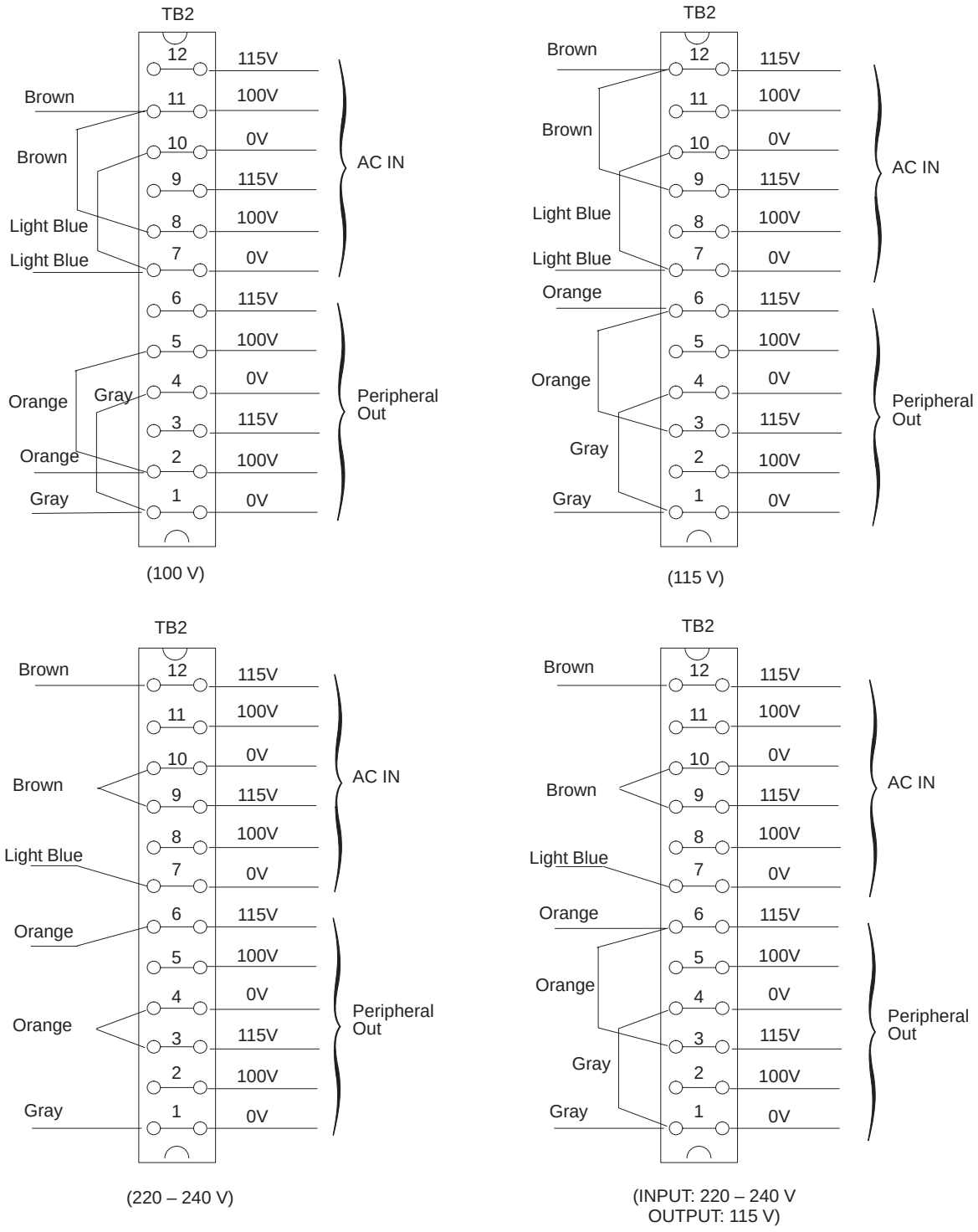
LOGIQ α200 SYSTEM BLOCK DIAGRAM
ILLUSTRATION 5–1

5–4 WIRING DIAGRAM



LOGIQ α200 SYSTEM WIRING DIAGRAM
ILLUSTRATION 5–2

5–4 WIRING DIAGRAM (Continued)



LOGIQ α200 SYSTEM WIRING DIAGRAM (CONTINUED)
ILLUSTRATION 5–3

5–5 CIRCUIT BOARD DESCRIPTION

The following table lists circuit boards and their respective card cage slot assignments on the mother board of the LOGIQ α200 system.

TABLE 5– 1
CIRCUIT BOARD DESCRIPTION

CARD CAGE SLOT	BOARD NAME	DESCRIPTION	NOTE
1	ESP BD ASSY	Echo Signal Processor Board Assembly	
2	RTC BD ASSY	Real Time Controller Board Assembly	
3	DSC BD ASSY	Digital Scan Convertor Board Assembly	
4	MST BD ASSY	Master Board Assembly	
	CONN BD ASSY	Connector Board Assembly	
	HV BD ASSY	High Voltage Board Assembly	
	MOTHER ASSY	Motherboard Assembly	

6–1 RENEWAL PARTS

LOGIQ α200

MATERIAL LIST (1/3)

PART NAME	PART NO.	QUANTITY									DESCRIPTION
OPERATOR CONSOLE ASSY	2157726	1									220V, NTSC, 4 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157727		1								100V, NTSC, 4 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157728			1							115V, NTSC, 4 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157729				1	1					220V, PAL, 4 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157858						1				220V, PAL, 4 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157730							1			115V, NTSC, 2 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157731								1		220V, PAL, 2 SWIVEL VER0.3
OPERATOR CONSOLE ASSY	2157732									1	220V, NTSC, 2 SWIVEL VER0.3
CABLE HOOK ARM	2170597	1	1	1	1	1	1	1	1	1	
MTZ HOLDER ASSY	2175435										RIGHT
MTZ HOLDER ASSY	2175436										LEFT
FOOT SWITCH ASSY	2162242										
CINE	2174971		1				1	1	1	1	
PRINTER INSTALL KIT	2176459	1	1	1	1	1	1	1	1	1	
OPERATOR MANUAL	2138852–100	1		1	1	1		1	1	1	English
SERVICE MANUAL	2138853							1	1	1	English
QUICK MANUAL	2164878–100							1	1	1	English

KOREA — CHILE

JAPAN — BRAZIL

TAIWAN,PHILLIPPINES — USA, CANADA, MEXICO

CHINA, HONG KONG, SOUTHEAST ASIA — EUROPE

INDIA,AUSTRALIA,NEW ZEALAND

6–1 RENEWAL PARTS (continued)

LOGIQ α200

MATERIAL LIST (2/3)

PART NAME	PART NO.	QUANTITY									DESCRIPTION
OPERATOR CONSOLE ASSY	2184999	1									220V, NTSC, 4 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2185000		1								100V, NTSC, 4 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2185001			1							115V, NTSC, 4 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2185002				1	1					220V, PAL, 4 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2183920						1				220V, PAL, 4 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2184519							1			115V, NTSC, 2 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2184520								1		220V, PAL, 2 SWIVEL VER1.1
OPERATOR CONSOLE ASSY	2184521									1	220V, NTSC, 2 SWIVEL VER1.1
CABLE HOOK ARM	2170597	1	1	1	1	1	1	1	1	1	Include hook arm space
MTZ HOLDER ASSY	2175435										RIGHT
MTZ HOLDER ASSY	2175436										LEFT
FOOT SWITCH ASSY	2162242							1	1	1	
CINE	2174971		1		1		1	1	1	1	
PRINTER INSTALL KIT	2176459	1	1	1	1	1	1	1	1	1	
OPERATOR MANUAL	2183922–100	1		1	1	1		1	1	1	English
SERVICE MANUAL	2138853						1	1	1	1	English
QUICK MANUAL	2164878–100							1	1	1	English

KOREA (H43002LA)
JAPAN (H43002LJ)
TAIWAN,PHILLIPPINES (H43002LC)
CHINA, HONG KONG, SOUTHEAST ASIA (H43012LA)
INDIA,AUSTRALIA,NEW ZEALAND (H43002LD)
(H43002LS) CHILE
(H43002LW) BRAZIL
(H43002LT) USA, CANADA, MEXICO
(H43012LC) EUROPE

6–1 RENEWAL PARTS (continued)

LOGIQ α200

MATERIAL LIST (3/3)

PART NAME	PART NO.	QUANTITY										DESCRIPTION
CONSOLE ASSY	2205669	1										220V, NTSC, 4SW, VER 2.01
CONSOLE ASSY	2205670		1									100V, NTSC, 4SW, VER 2.01
CONSOLE ASSY	2205671			1								115V, NTSC, 4SW, VER 2.01
CONSOLE ASSY	2205672				1	1						220V, PAL, 4SW, VER 2.01
CONSOLE ASSY	2205674						1		1			220V, PAL, 4SW, VER 2.01
CONSOLE ASSY	2205675									1		115V, NTSC, 2SW, VER 2.01
CONSOLE ASSY	2205676										1	220V, PAL, 2SW, VER 2.01
CONSOLE ASSY	2205677											220V, NTSC, 2SW, VER 2.01
PROBE CABLE ARM	2215992									1	1	1	
2.0 UPGRADE KIT	2217555											Include CINE
2.0 UPGRADE KIT	2211832											
CABLE HOOK ARM	2170597	1	1	1	1	1	1		1	1	1	1	Include hook arm space
MTZ HOLDER ASSY	2175435											RIGHT
MTZ HOLDER ASSY	2175436											LEFT
FOOT SWITCH ASSY	2162242									1	1	1	
CINE	2174971	1	1			1	1			1	1	1	
PRINTER INSTALL KIT	2176459	1	1	1	1	1	1		1	1	1	1	
VINYL COVER	2189467		1										
INSITE KIT	2208446												
OPERATOR MANUAL	2200294–100	1		1	1	1				1	1	1	English
SERVICE MANUAL	2138853						1		1	1	1	1	English
QUICK MANUAL	2206747–100									1	1	1	English
SONY B/W PRINTER	2215797									1	1	1	
ECG INSTALL KIT	2208447												
L500 ECG CABLES	P9509KH												Clip type
ECG CABLE SET	2137161												Rod type
ECG CABLE ASSY	P9509KG												Japan only, Clip type
ECG CABLE ASSY	2137160												Japan only, Rod type

KOREA (H43022LA)

JAPAN (H43022LB)

TAIWAN. PHILIPPINES (H43022LC)

CHINA, HONGKONG, INDIA,(H43022LD)

SOUTHEAST ASIA, AUSTRALIA (H43022LE)

EUROPE (H43022LF)

CHILE(H43022LK)

BRAZIL(H43022LJ)

USA (H43022LH)

EUROPE(H43022LG)

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OPERATOR CONSOLE ASSY

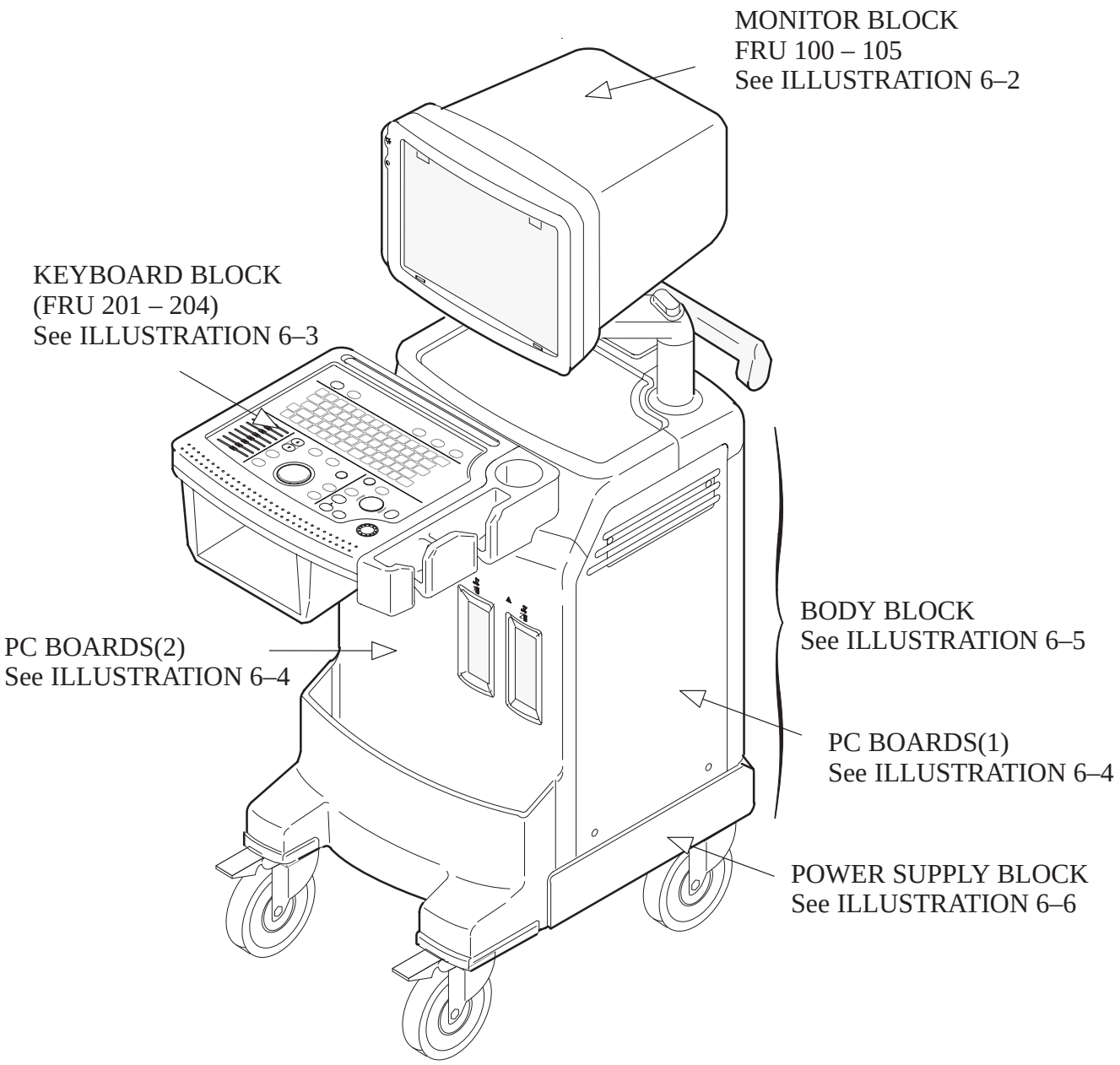

ILLUSTRATION 6–1

OPERATOR CONSOLE ASSY 1/7

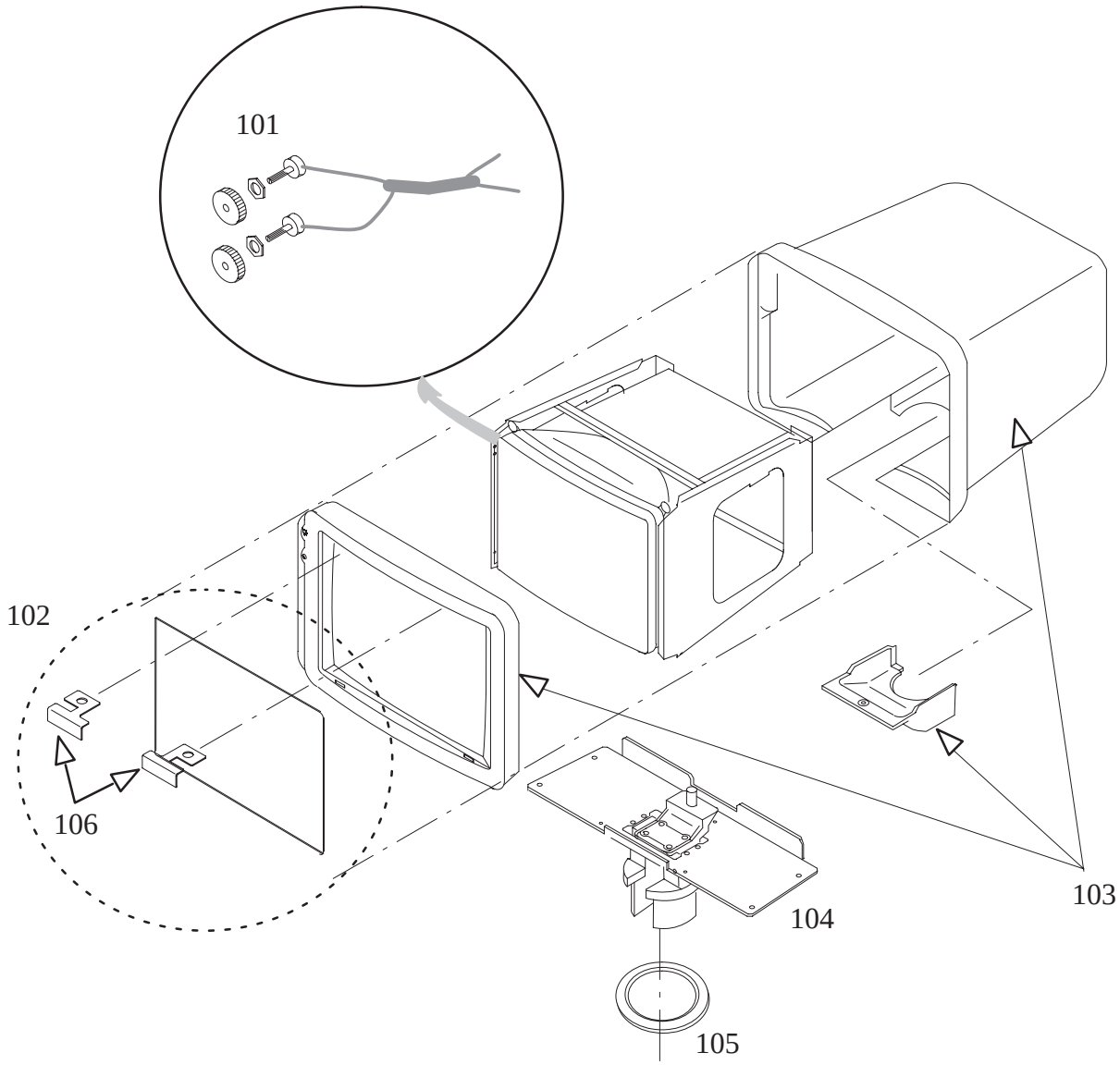

ILLUSTRATION 6–2

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (1/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
100	MONITOR ASSY (NTSC)	2167603–2	1	1	Including Caution Label , Plastic Filter	6–2–1
	MONITOR ASSY (PAL)	2167604–2	1	1	Including Caution Label , Plastic Filter	6–2–1
	MONITOR ASSY (NTSC)	2167605–2	1	1	Including Caution Label , Glass Filter For America (USA, Chile)	6–2–1
	MONITOR ASSY (PAL)	2167606–2	1	1	Including Caution Label , Glass Filter For America (Brazil)	6–2–1
101	POT SET ASSY	2148193	1	2	Bright and Contrast, Include Knob	6–2–2
102	CRT FILTER (PLASTIC)	2175437	1	2	Include 2 brackets For Japan, Taiwan, Phillippines, China, Hongkong, India, Southeast Asia, Australia, Europe.	6–2–3
	CRT FILTER (GLASS)	2175438	1	2	Include 2 brackets For USA, Brazil, Chile, Korea.	6–2–3
103	MONITOR COVER SET	2148195	1	2	Front, Rear, Bottom	6–2–4
104	TILT ASSY	2148196	1	2		6–2–5
105	MONITOR SPACE PLATE	2148197	1	1	White Plastic Washer	6–2–6
106	FILTER CLAMP SET	2214397	1	2	For Plastic Filter	6–2–3
		2214398			For Glass Filter	

OPERATOR CONSOLE ASSY 2/7

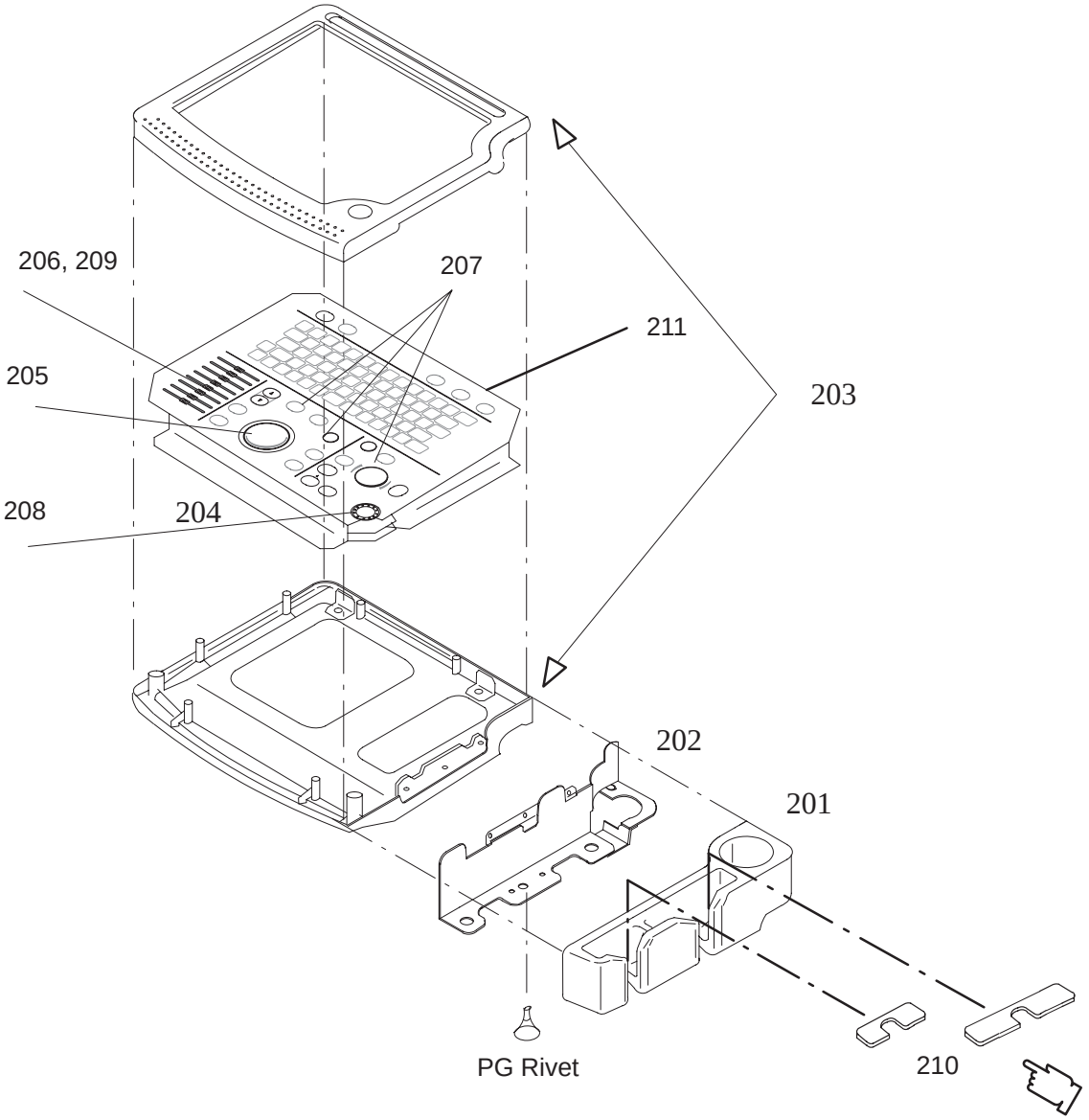

ILLUSTRATION 6–3

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (2/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
201	PROBE HOLDER	2175439	1	2	Include Probe Cup Holder and Probe Sheet	6–2–7
202	HOLDER BRACKET ASSY	2148199	1	2	Include PG Rivet	6–2–8
203	KEYBOARD COVER SET	2148200	1	2	Top, Bottom with Holder Brkt In	6–2–9
204	KEYBOARD ASSY	2158943–1	1	1	Include FRU 205–208	6–2–10
		2158943–2	1	1	For S/W Version 2.0	6–2–10
205	TRACKBALL ASSY	2174984	1	1		6–2–11
206	TGC ASSY	2174985	1	1		6–2–12
207	ENCODER SET	2174986	1	1		6–2–13
208	FREEZE/RECORD KEY ASSY	2174987	1	1		6–2–14
209	TGC KNOB SET	2214594	1	2	8 Knobs	6–2–15
210	PROBE PROTECTOR SHEET SET	2238146	1	1	2 sizes of inserts	6–2–16
211	KEY SHEET ASSY	2229673	1	1		6–2–17

OPERATOR CONSOLE ASSY 3/7

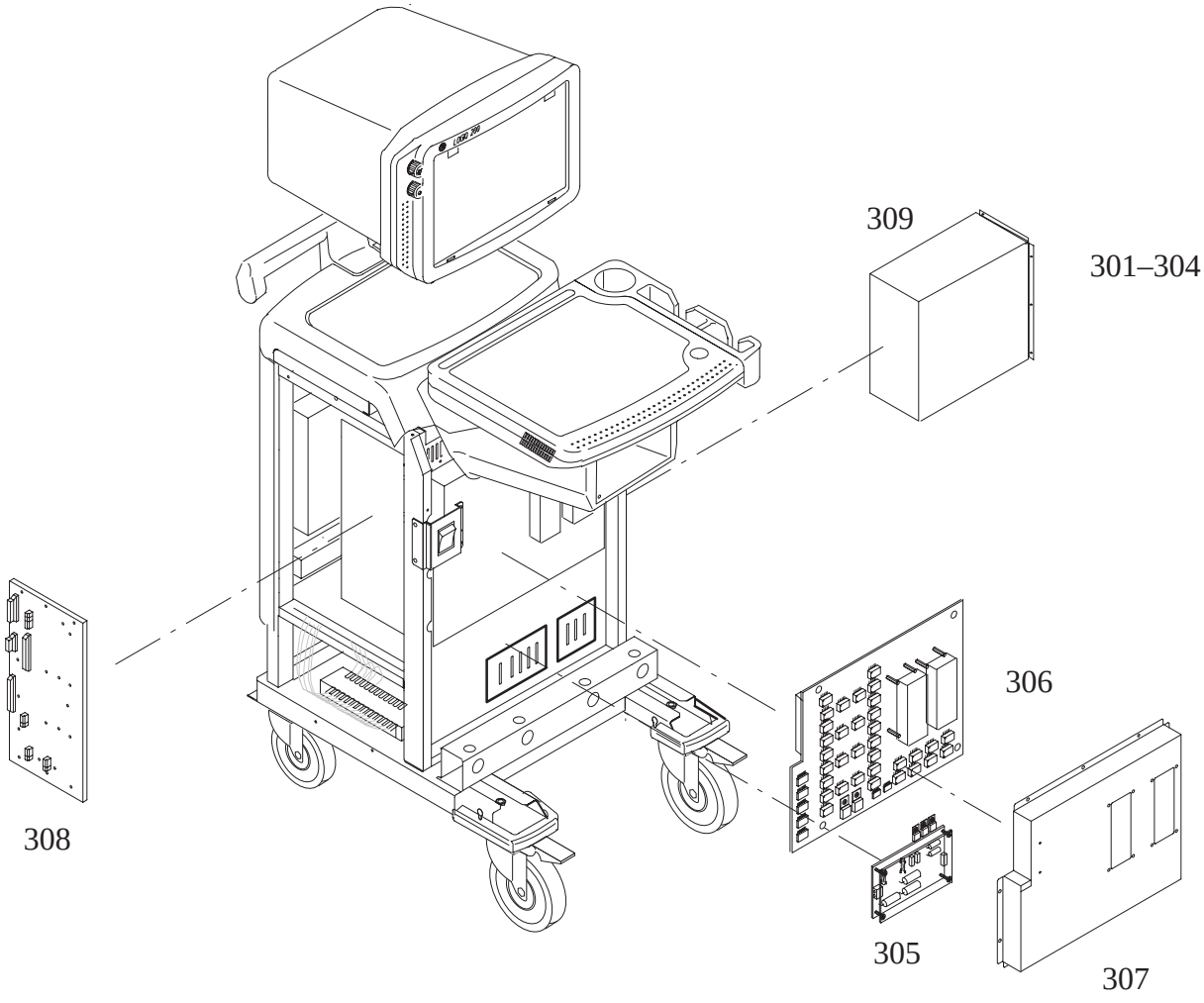

ILLUSTRATION 6–4

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (3/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
301	MST ASSY	2185497–3	1	1	Version 1.2 software	6–2–18
		2211942–5	1	1	Version 2.01 software	6–2–18
302	DSC ASSY	2148203–2	1	1	Version 1.2 software	6–2–18
		2199767–2	1	1	Version 2.01 software	6–2–18
		2243263	1	1	Version 1.2 software (including Cine)	6–2–18
		2243262	1	1	Version 2.01 software (including Cine)	6–2–18
303	RTC ASSY	2185498	1	1	Version 1.2 software	6–2–18
		2218506	1	1	Version 2.0 software	6–2–18
		2218506–2	1	1	Version 2.01 software	6–2–18
304	ESP ASSY	2148205–3	1	1	Version 1.2 software	6–2–18
		2206668	1	1	Version 2.0 software	6–2–18
305	HV ASSY	2148206–2	1	1		6–2–19
306	CONN ASSY	2148207	1	1	Include Bracket Probe	6–2–20
307	SHIELD PANEL	2148208	1	2		6–2–21
308	MOTHER ASSY	2148210	1	1		6–2–22
309	NEST BOX	2205822	1	2		6–2–25

OPERATOR CONSOLE ASSY 4/7

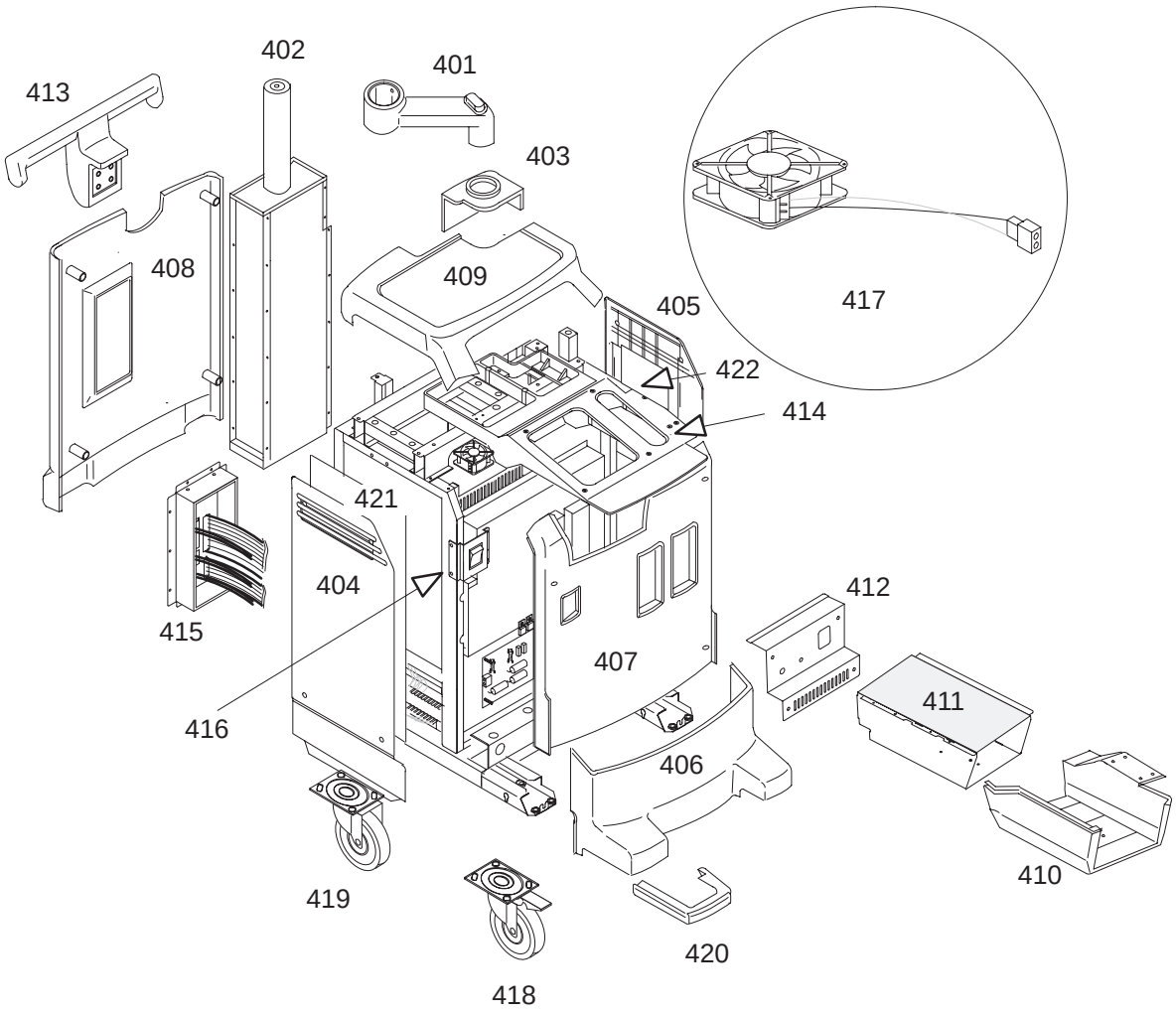

ILLUSTRATION 6–5

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (4/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
401	SWING ARM ASSY	2148212	1	1		6–2–24
402	PIPE ASSY	2148213–2	1	1	Include Cable Assy	6–2–25
403	POLE COVER	2148214	1	2	Include Cover Pole, Curtain Pole	6–2–26
404	LEFT COVER	2158024	1	1		6–2–27
405	RIGHT COVER	2158053	1	1		6–2–28
406	FRONT BASE COVER	2148217	1	1		6–2–29
407	FRONT COVER	2148218	1	1		6–2–30
408	REAR COVER	2175441	1	2	Include Caution Label	6–2–31
409	TOP COVER	2158086	1	1		6–2–32
410	PRINTER COVER	2148220	1	2		6–2–32
411	PRINTER BRACKET ASSY	2167717	1	2	For Korea, Taiwan, Phillippines, USA, Chile	6–2–34
	PRINTER BRACKET ASSY	2167718	1	2	For Japan	6–2–34
	PRINTER BRACKET ASSY	2167719	1	2	For China, Hongkong, Southeast Asia, India, Auatralia, Europe, Brazil	6–2–34
412	BACK BRACKET ASSY	2169268	1	2	Include Printer Panel For Korea, Taiwan, Phillippines, USA, Chile	6–2–34
	BACK BRACKET ASSY	2169269	1	2	Include Printer Panel For Japan	6–2–34
	BACK BRACKET ASSY	2169270	1	2	Include Printer Panel For China, Hongkong, Southeast Asia, India, Auatralia, Europe, Brazil	6–2–34

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (4/7)(Continued)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
413	REAR HANDLE	2148222	1	2		6–2–35
414	NECK FRAME	2148223	1	2		6–2–36
415	REAR PANEL ASSY	2167619	1	1	For Korea, Taiwan, Phillippines, USA, Chile	6–2–37
	REAR PANEL ASSY	2167620	1	1	For Japan	6–2–37
	REAR PANEL ASSY	2167621	1	1	For China, Hongkong, Southeast Asia, India, Auatralia, Europe, Brazil	6–2–37
416	POWER S/W ASSY	2148226	1	1		6–2–38
417	AC FAN ASSY	2175652	1	1	Ver 0.3, Ver 1.1	6–2–39
		2206020			Ver 2.0	
		2245589			Ver 2.01	
418	FRONT CASTER	2148228	2	1		6–2–40
		2192111				
419	REAR CASTER	2148051	2	1	Swivel For Japan, Taiwan, Phillippines, China, Hongkong, Southeast Asia, India, Auatralia, Europe	6–2–41
		2192112				
	REAR CASTER	2161575	2	2	Fixed For USA, Brazil, Chile	
		2192113				
420	BUMPER SET	2148230	1	2		6–2–42
421	EMI COVER L	2169025	1	2		6–2–43
422	PCB GUIDE ASSY	2169263	1	2		6–2–44

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OPERATOR CONSOLE ASSY 5/7

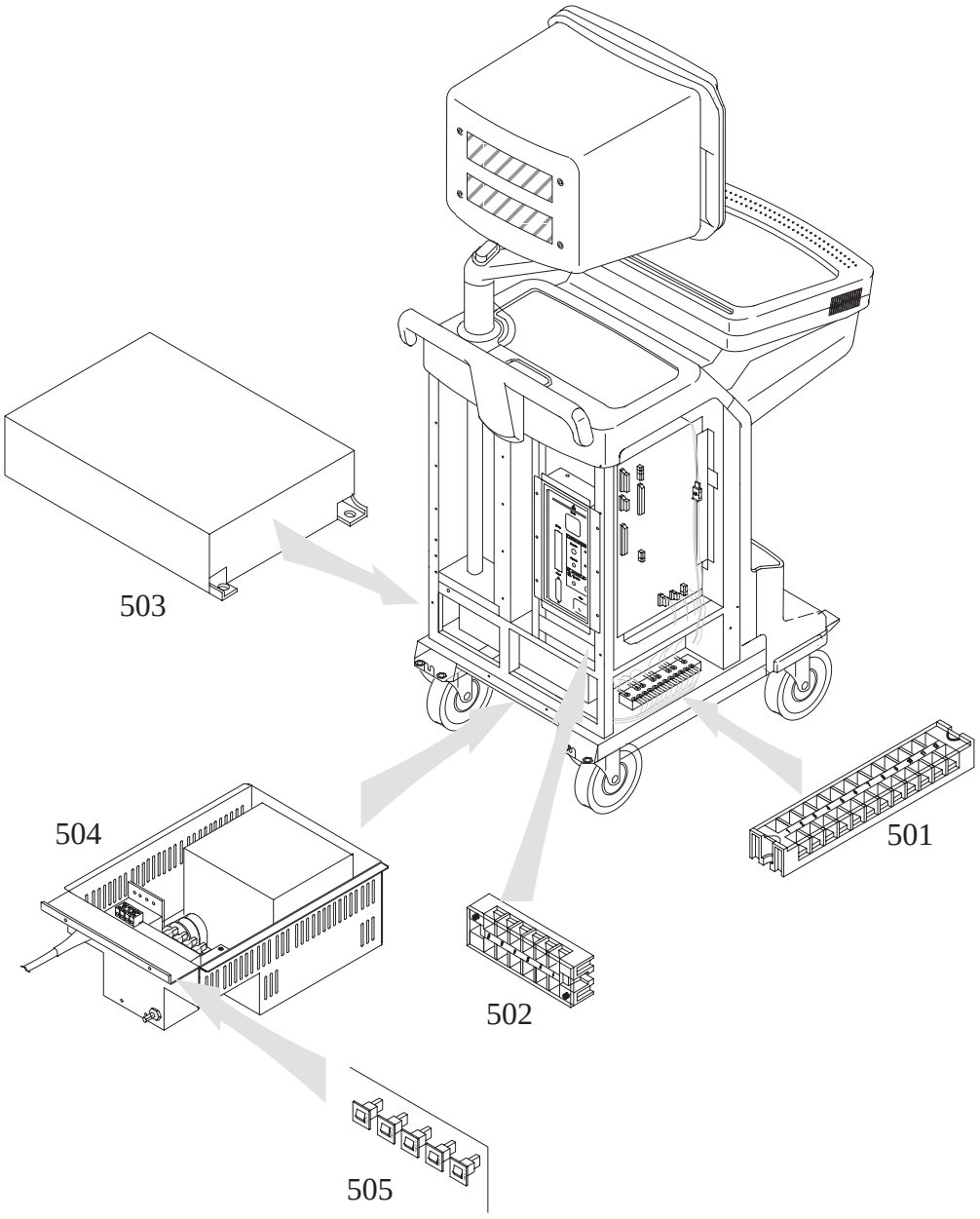


ILLUSTRATION 6–6

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (5/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
501	TERMINAL BLOCK 12 ASSY	2148231	1	2	12 pins	6–2–45
502	TERMINAL BLOCK 6 ASSY	2148232	1	2	6 pins	6–2–46
503	SMPS ASSY	2148233	1	1		6–2–47
504	POWER TRANS ASSY (INPUT:220V–OUTPUT:115V)	2167617	1	1	For Korea, Chile	6–2–48
	POWER TRANS ASSY (INPUT:100V–OUTPUT:100V)	2167618	1	1	For Japan	6–2–48
	POWER TRANS ASSY (INPUT:115V–OUTPUT:115V)	2170698	1	1	For Taiwan, Phillippines, USA	6–2–48
	POWER TRANS ASSY (INPUT:220V–OUTPUT:220V)	2170699	1	1	For China, Hongkong, India, Southeast Asia, Australia, Europe, Brazil	6–2–48
505	CIRCUIT BREAKER SET	2174991	1	1	2A(2),3A, 5A , For Korea, Chile	6–2–49
	CIRCUIT BREAKER SET	2174992	1	1	2A(2), 3A, 10A For Japan, Taiwan, Phillippines, USA	6–2–49
	CIRCUIT BREAKER SET	2174993	1	1	1A(2), 3A, 5A For China, Hongkong, India, Southeast Asia, Australia, Europe, Brazil	6–2–49

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (6/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
601	FUSE SET	2148236	1	1	1A(250V), 500mA(250V), 2A(125V)	6–3
602	FLAT CABLE SET	2148237	1	1	Cable Assy 49, 51	——
603	CABLES SET	2148238	1	1	Cable Assy 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 61, 62, 63, 64, 65	——
604	HARDWARE SET	2148239	1	2	2157994, 2166804(4), 2157951(12), 2158063, 2157971, 2157973, 2158077(2), 2160325, 2159642(10) , 2159634(10) , 2159625(10) , 2162241(10) , 2173177(5)	——
605	CABLE HOOK ARM SET	2170597	1	2	Include Washer	——
606	TOP COVER SHEET	2158087	1	2		——
607	BATTERY	2160331	1	1	3V, CR2450	7–2–4

LOGIQ α200
2157726, 2157727, 2157728, 2157729, 2157858, 2157730, 2157731, 2157732 2184999, 2185000, 2185001, 2185002, 2183920, 2184519, 2184520, 2184521 2205669, 2205670, 2205671, 2205672, 2205674, 2205675, 2205676, 2205677

MATERIAL LIST (7/7)

FRU NO.	PART NAME	PART NO	QTY.	FRU	DESCRIPTION	SECTION FOR REFERENCE
701	CBF PROBE	P9603AD	1	1		——
		P9603AA	1	1	For Japan Only	——
702	CAE PROBE	P9603AE	1	1		——
		P9603AB	1	1	For Japan Only	——
703	MTZ PROBE	P9603AU	1	1	Not Include MTZ HOLDER ASSY	——
		P9603AL	1	1	Not Include MTZ HOLDER ASSY For Japan Only	——
704	CZB PROBE	2152422	1	1		——
		2152402	1	1	For Japan Only	——
705	LH PROBE	P9601AS	1	1		——
		P9601AC	1	1	For Japan Only	——
706	LE PROBE	P9601AR	1	1		——
		P9601AB	1	1	For Japan Only	——
707	LI PROBE	P9601AW	1	1		——
		P9601AG	1	1	For Japan Only	——
708	LT PROBE	P9601AX	1	1		——
		P9601AJ	1	1	For Japan Only	——
709	LB PROBE	P9601AQ	1	1		——
		P9601AA	1	1	For Japan Only	——
710	LD PROBE	2124317	1	1		——
		P9601AD	1	1	For Japan Only	——
711	FOOT SWITCH ASSY	2162242	1	2		——
712	MTZ HOLDER ASSY	2175435	1	2	Right	——
713	MTZ HOLDER ASSY	2175436	1	2	Left	——
714	ATR PROBE	2201222	1	1		——
		2201223	1	1	For Japan Only	——
715	CS PROBE	2202320	1	1		——
		2202315	1	1	For Japan Only	——

6–2 DISASSEMBLY/RE-ASSEMBLY

WARNING!

ONLY QUALIFIED SERVICE PERSONNEL SHOULD REMOVE ANY COVERS OR PANELS.
ELECTRICAL HAZARDS EXISTS AT SEVERAL POINTS INSIDE. BECOME THOROUGHLY FAMILIAR WITH ALL HAZARDOUS VOLTAGES AND HIGH CURRENT LEVELS TO AVOID ACCIDENTAL CONTACT

CAUTION

Do not wear the ESD wrist strap when you remove the SMPS Assy. Turn OFF power and unplug the power cord before removing any part of SMPS Assy. However be sure to turn off power and wear the strap before you remove a circuit boards.

CAUTION

Do NOT unplug the power cord before turning OFF the power switch.

6–2–1 Monitor Assy (FRU No. 100)

Time Required

5 Minutes

Tool Required

Screwdriver

Procedure

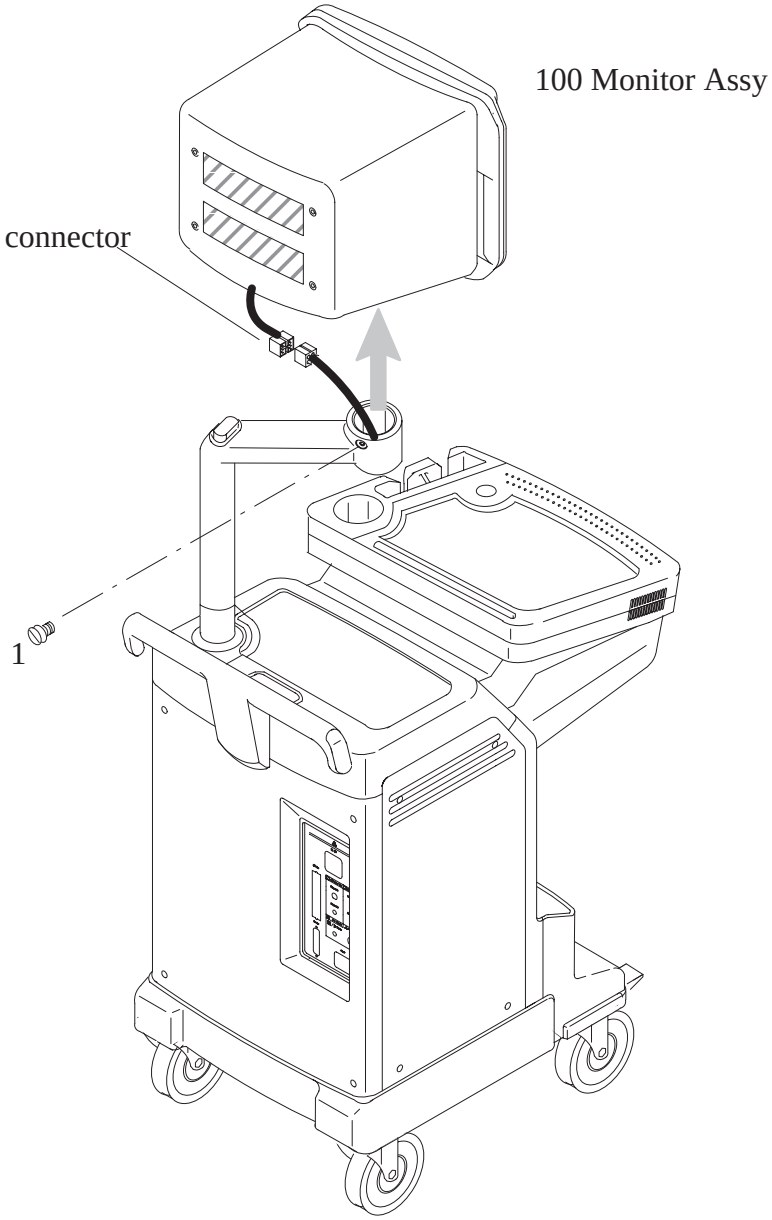
WARNING!

PERSONAL INJURY HAZARD. VIDEO MONITOR SUPPORT ARM IS SPRING LOADED. RELEASING ARM WHEN MONITOR IS NOT INSTALLED WILL CAUSE SUDDEN UPWARD MOVEMENT. KEEP YOUR HEAD AND BODY AWAY FROM ABOVE VIDEO MONITOR SUPPORT ARM.

Refer to ILLUSTRATION 6–7.

1. Turn OFF the system.
2. Lift and set the Monitor to the highest position by pushing down the Up/down Release Button located on the Swing Arm Assy.
3. Remove the Monitor Bottom Cover. Refer to 6–2–4.
4. Disconnect the connector.
5. Unscrew one screw (1).
6. Pull the Monitor Assy upwards.

6–2–1 Monitor Assy (FRU No. 100) (Continued)



MONITOR ASSY DISASSEMBLY
ILLUSTRATION 6–7

6–2–2 Pot Set Assy (FRU No. 101)

Time Required

6 Minute

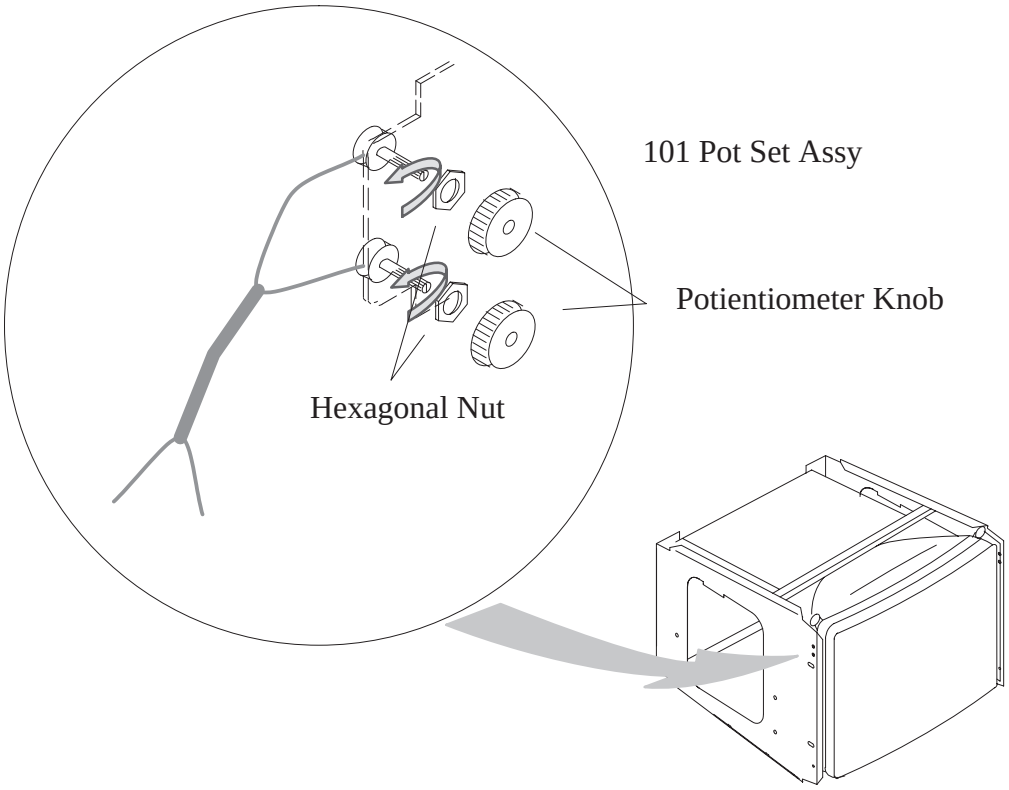
Tool Required

Screwdriver
Soldering Iron

Procedure

Refer to ILLUSTRATION 6–8.

1. Turn OFF the system.
2. Remove the Monitor Cover Set. Refer to 6–2–4.
3. Remove two Potientiometer Knob and unscrew two hexagonal nuts on each Pot.
4. Remove the wire from PCB with Soldering Iron.
5. Remove the Pot Set Assy.



POT SET DISASSEMBLY
ILLUSTRATION 6–8

6–2–3 CRT Filter(FRU No. 102)

Time Required

2 Minutes

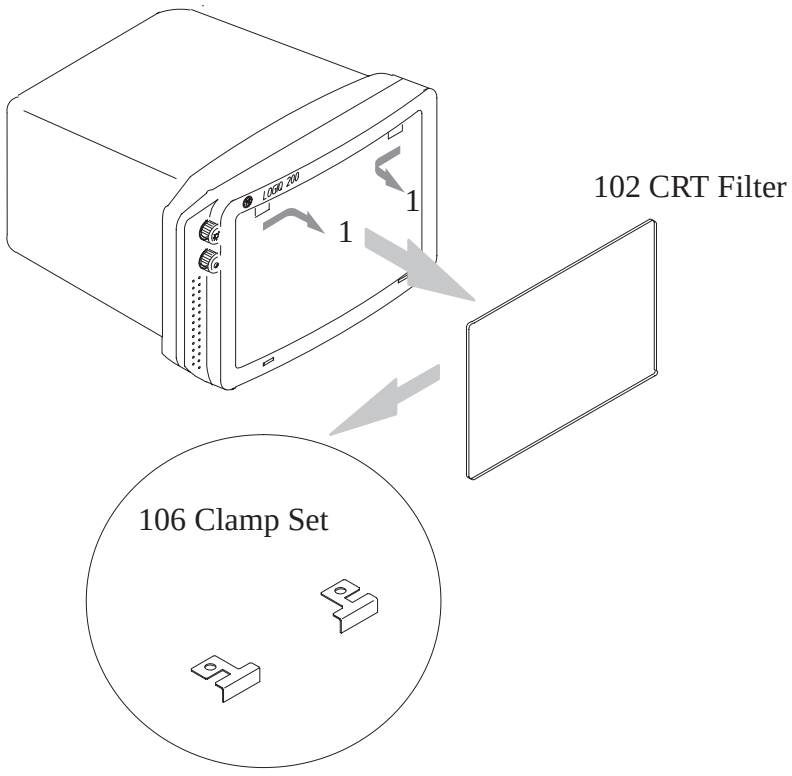
Tool Required

Not necessary

Procedure

Refer to ILLUSTRATION 6–9.

1. Turn OFF the system.
2. Push the two Filter Clamp Assy inward (1) as shown in ILLUSTRATION 6–9 and remove Filter Clamp Assy.
3. Pull forward CRT Filter.



CRT FILTER DISASSEMBLY
ILLUSTRATION 6–9

6–2–4 Monitor Cover Set (FRU No. 103)

Time Required

4 Minutes

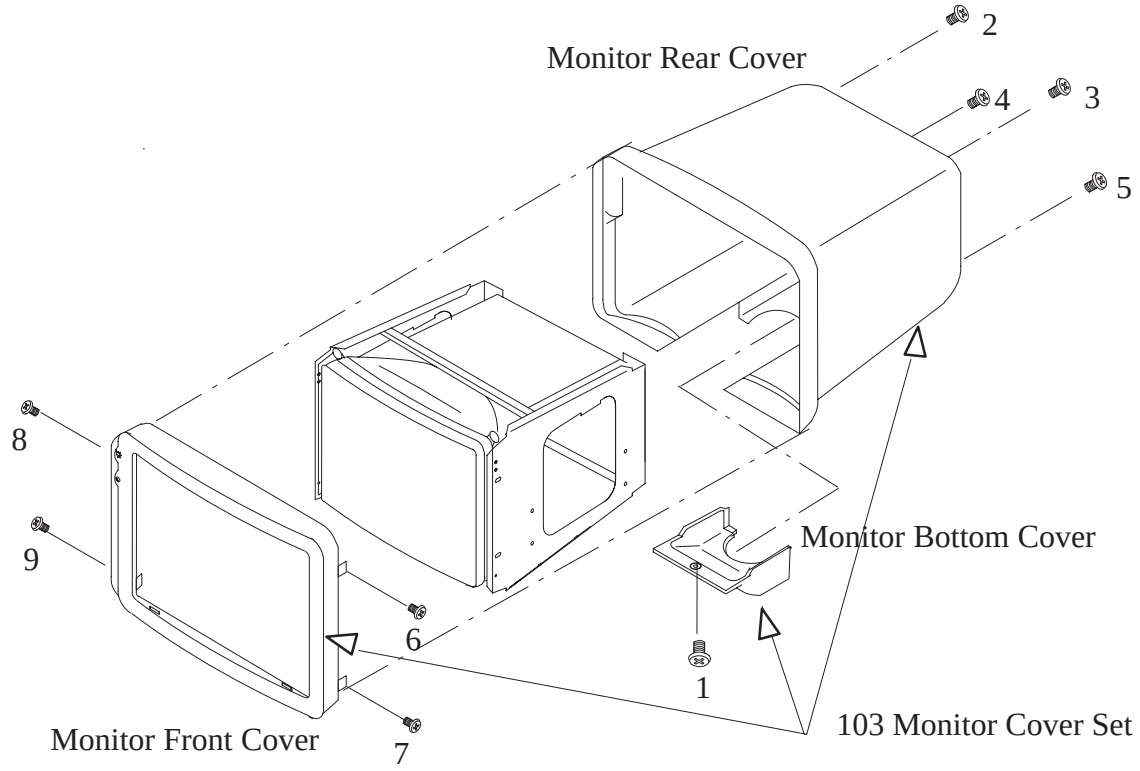
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–10.

1. Turn OFF the system.
2. Lift and set the Monitor to the highest position by pushing down the Up/down Release Button located on the Swing Arm Assy.
3. Unscrew one screws (1) and remove the Monitor Bottom Cover.
4. Unscrew four screws (2 – 5) and remove the Monitor Rear Cover.
5. Unscrew four screws (6 – 9) and remove the Monitor Front Cover.



MONITOR COVER ASSY DISASSEMBLY
ILLUSTRATION 6–10

6–2–5 Tilt Assy(FRU No. 104)

Time Required

8 Minutes

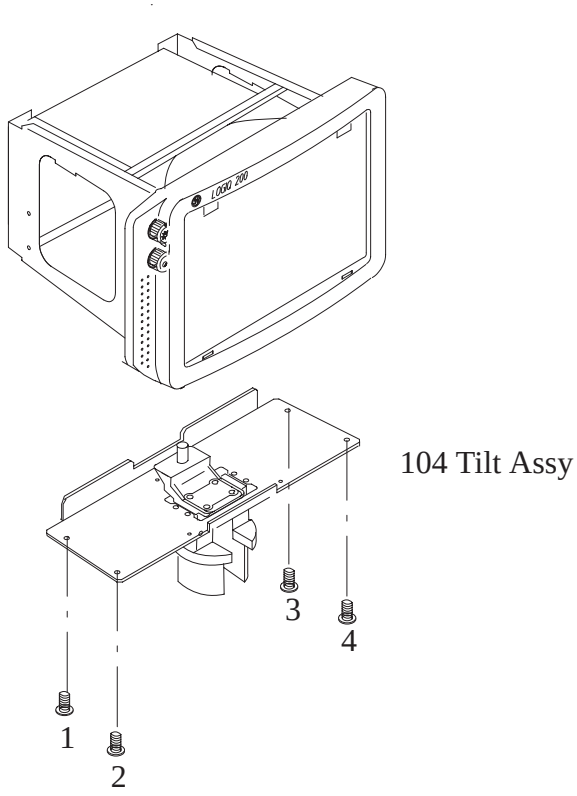
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–11.

1. Turn OFF the system.
2. Remove the Monitor Assy (FRU No. 100) from the Swing Arm Assy. Refer to 6–2–1.
3. Remove the Monitor Rear Cover. Refer to 6–2–4.
4. Unscrew four screws (1 – 4).
5. Remove the Tilt Assy.



TILT ASSY DISASSEMBLY
ILLUSTRATION 6–11

6–2–6 Monitor Space Plate (FRU No. 105)

Time Required

6 Minutes

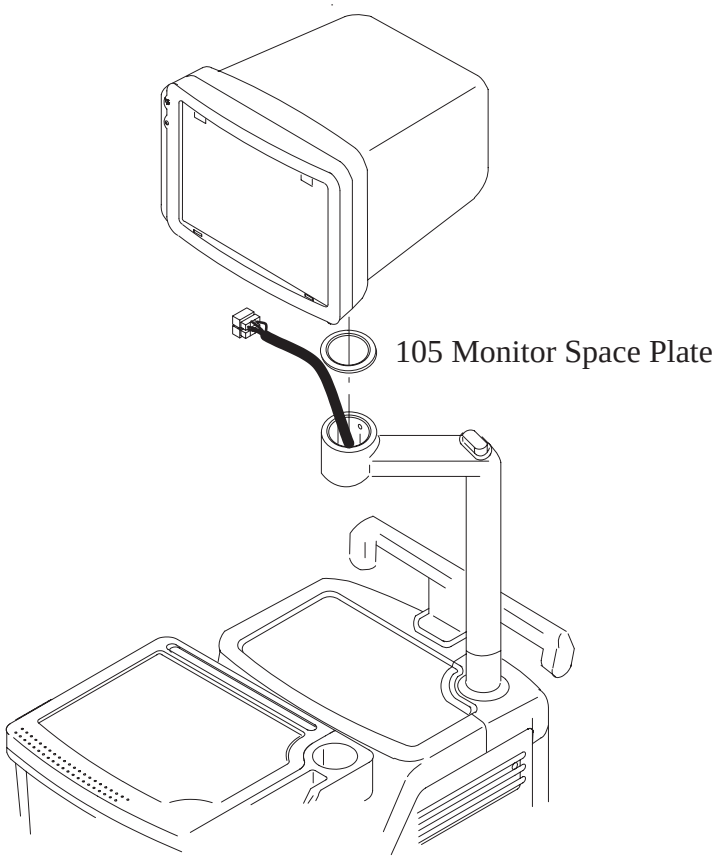
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–12.

1. Turn OFF the system.
2. Remove the Monitor Assy (FRU No. 100) from the Swing Arm Assy. Refer to 6–2–1.
3. Remove the Monitor Space Plate.



MONITOR SPACE PLATE DISASSEMBLY
ILLUSTRATION 6–12

6–2–7 Probe Holder (FRU No. 201)

Time Required

2 Minutes

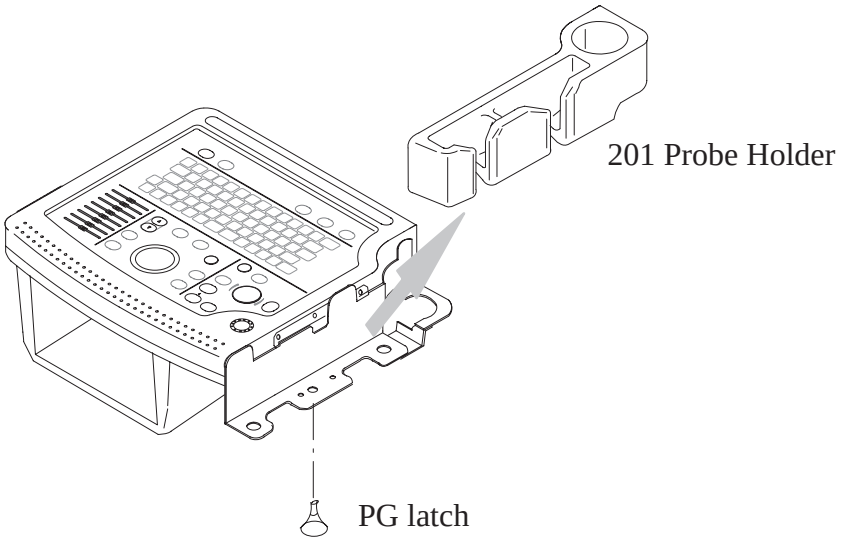
Tool Required

Not necessary

Procedure

Refer to ILLUSTRATION 6–13.

1. Turn OFF the system.
2. Pull the PG latch located at bottom of the Probe Holder.
3. Pull the Probe Holder out as shown in ILLUSTRATION 6–13.



PROBE HOLDER DISASSEMBLY
ILLUSTRATION 6–13

6–2–8 Holder Bracket Assy (FRU No. 202)

Time Required

3 Minutes

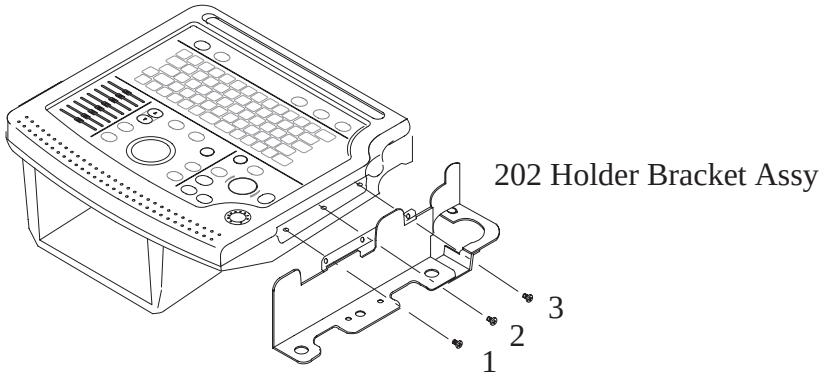
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–14.

1. Turn OFF the system.
2. Remove the Probe Holder (FRU No. 201). Refer to 6–2–7.
3. Unscrew three screws (1 – 3).
4. Remove the Holder Bracket Assy.



HOLDER BRACKET ASSY DISASSEMBLY
ILLUSTRATION 6–14

6–2–9 Keyboard Cover Set (FRU No. 203)

Time Required

11 Minutes

Tool Required

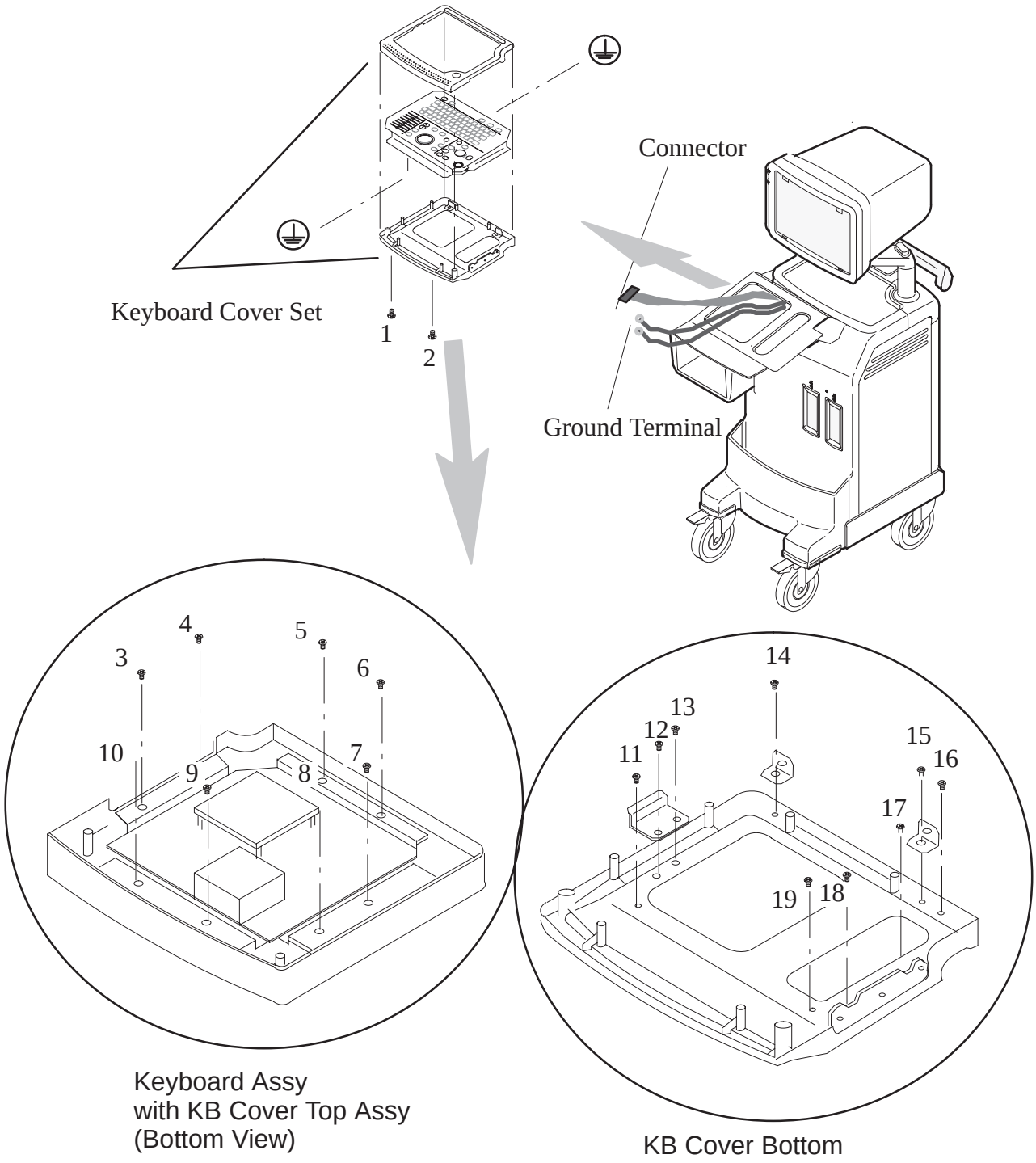
Screwdriver

Procedure

Refer to ILLUSTRATION 6–15.

1. Turn OFF the system.
2. Remove the Probe Holder (FRU No. 201). Refer to 6–2–7.
3. Remove the Holder Bracket Assy (FRU No.202) Refer to 6–2–8.
4. Unscrew two ground screws (1 and 2) on the front bottom of Keyboard .
5. Unscrew three screws on the PCB that hold Ground Terminal wire and remove three clamps.
6. Unscrew two screws (⏚) and remove two Ground Terminals.
7. Disconnect the connector and cut the tie wraps off.
8. Remove the KB Cover Top Assy with Keyboard Assy (FRU No. 204).
9. Unscrew eight screws (3 – 10) and remove the KB Cover Top Assy.
10. Unscrew nine screws (11 – 19) and remove the KB Cover Bottom.

6–2–9 Keyboard Cover Set (FRU No. 203) (Continued)



KEYBOARD COVER SET DISASSEMBLY
ILLUSTRATION 6–15

6–2–10 Keyboard Assy (FRU No. 204)

Time Required

6 Minutes

Tool Required

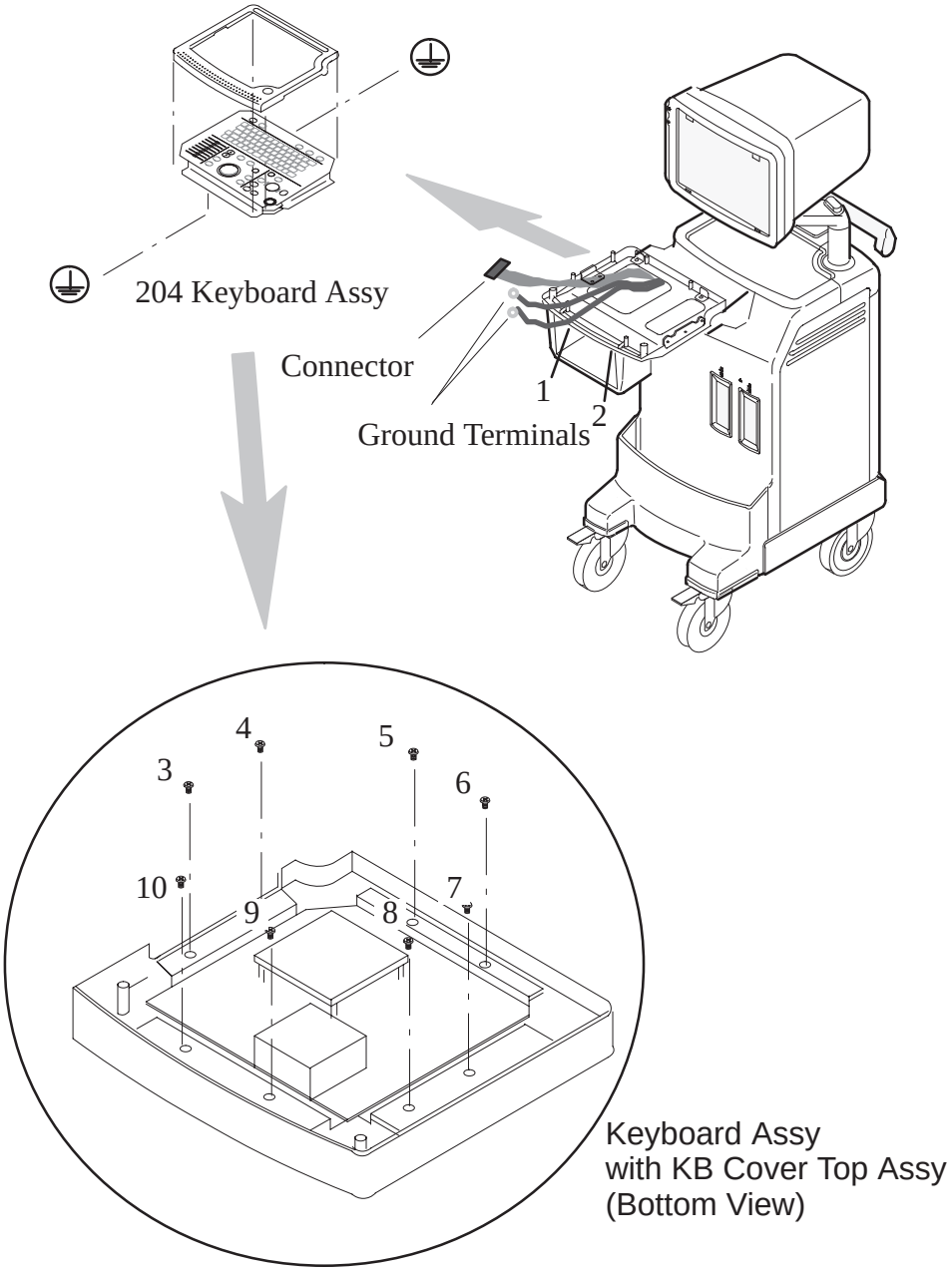
Screwdriver

Procedure

Refer to ILLUSTRATION 6–16.

1. Turn OFF the system.
2. Unscrew two screws (1 and 2) on the front bottom of Keyboard.
3. Unscrew three screws on the PCB that hold Ground Terminal wire and remove three clamps.
4. Unscrew two ground screws (⏚) and remove two Ground Terminals .
5. Disconnect the connector and cut the tie wraps off.
6. Pull the Keyboard Assy out with KB Cover Top Assy.
7. Unscrew eight screws (3 – 10) and remove KB Cover Top Assy.

6–2–10 Keyboard Assy (FRU No. 204)) (Continued)



KEYBOARD ASSY DISASSEMBLY
ILLUSTRATION 6–16

6–2–11 Trackball Assy (FRU No. 205)

Time Required

8 Minutes

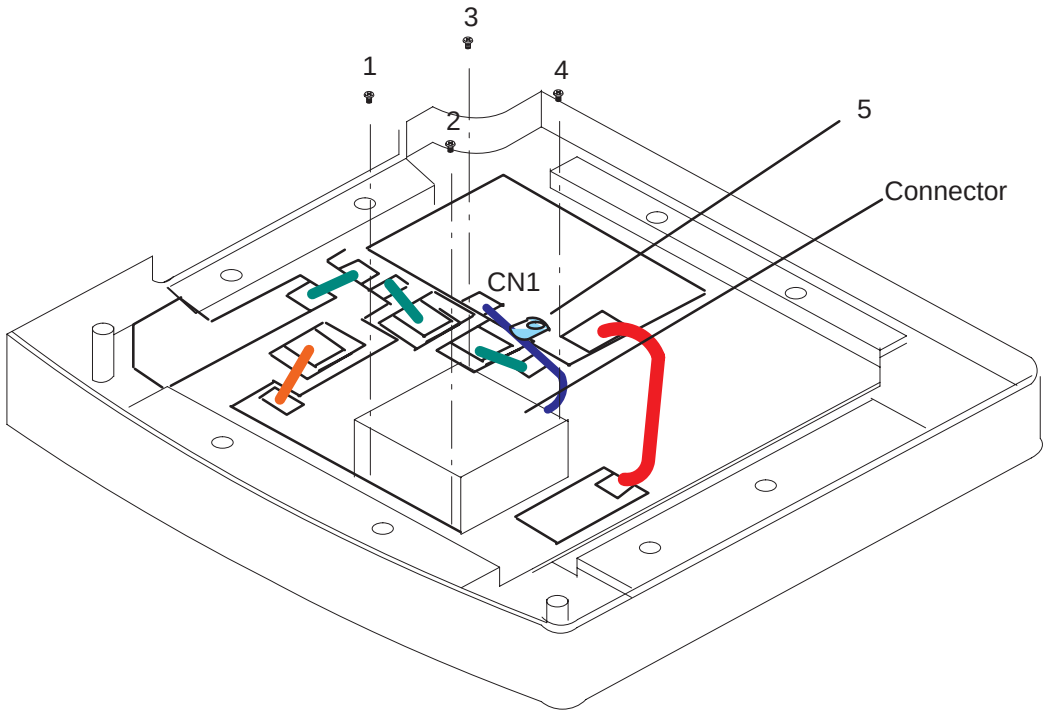
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–17.

1. Turn OFF the system.
2. Pull the Keyboard Assy out with KB Cover Top Assy. Refer to 6–2–10.
3. Unscrew five screws (1 – 5) and disconnect one connect on Trackball Assy.
4. Remove Trackball Assy.



TRACKBALL ASSY DISASSEMBLY
ILLUSTRATION 6–17

6–2–12 TGC Assy (FRU No. 206)

Time Required

8 Minutes

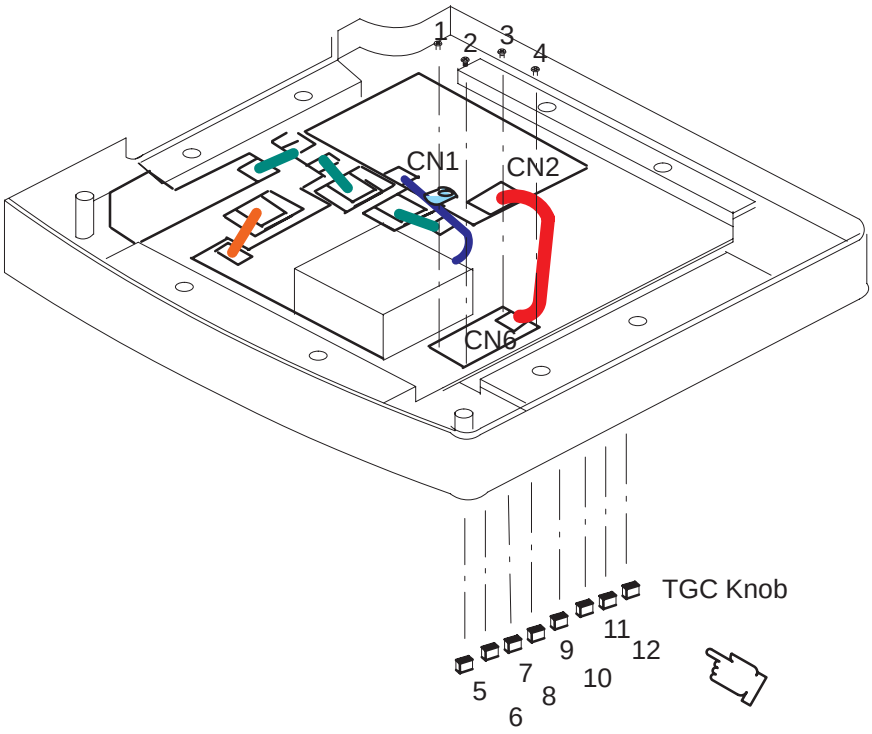
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–18.

1. Turn OFF the system.
2. Pull the Keyboard Assy out with KB Cover Top Assy. Refer to 6–2–10.
3. Pull out the TGC Knobs (5 – 12) on Keyboard Assy.
4. Unscrew four screws (1 – 4) and disconnect one connect (CN2).
5. Remove TGC Assy.



KEYBOARD ASSY DISASSEMBLY
ILLUSTRATION 6–18

6–2–13 Encoder Set (FRU No. 207)

Time Required

14 Minutes

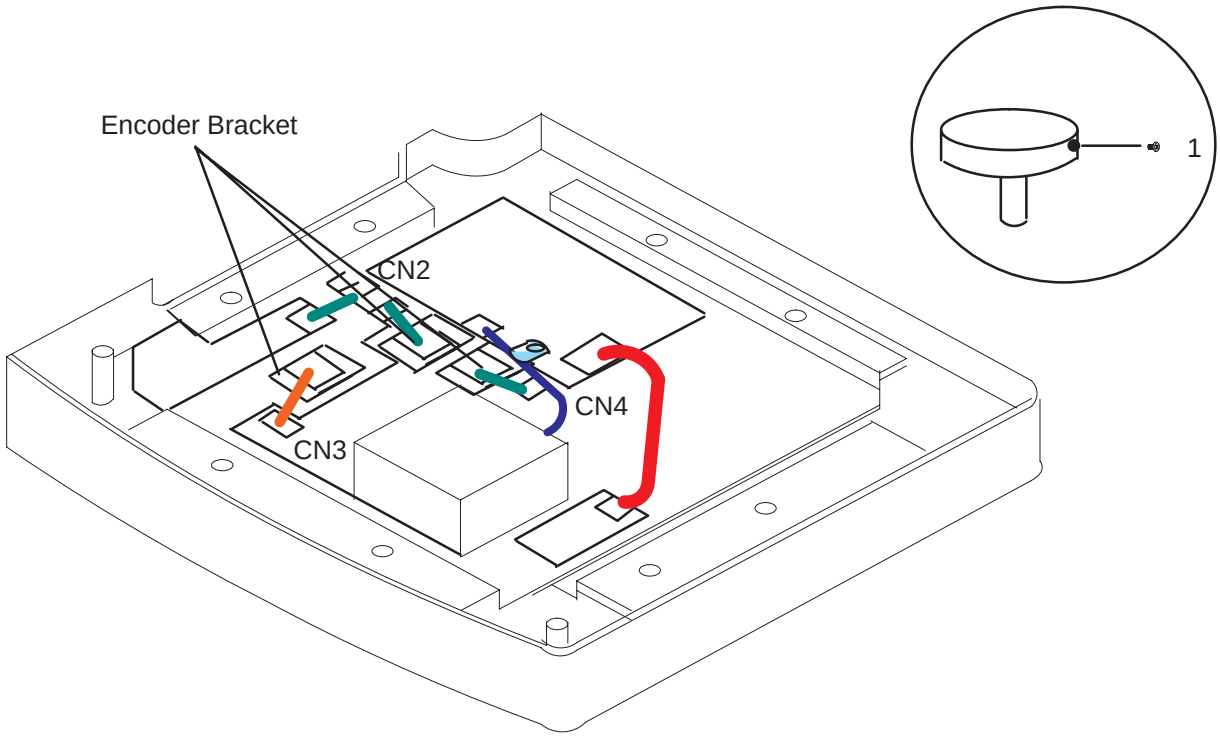
Tool Required

Screwdriver, Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–19

1. Turn OFF the system.
2. Pull the Keyboard Assy out with KB Cover Top Assy. Refer to 6–2–10
3. Unscrew hexagonal screws (1) on each Encoder Knob and remove three knobs.
4. Unscrew four screws on each Encoder Bracket and disconnect three connects (CN2 –CN4).
5. Remove Encoder Set.



ENCODER SET DISASSEMBLY
ILLUSTRATION 6–19

6–2–14 Freeze/Record Key Assy (FRU No. 208)

Time Required

10 Minutes

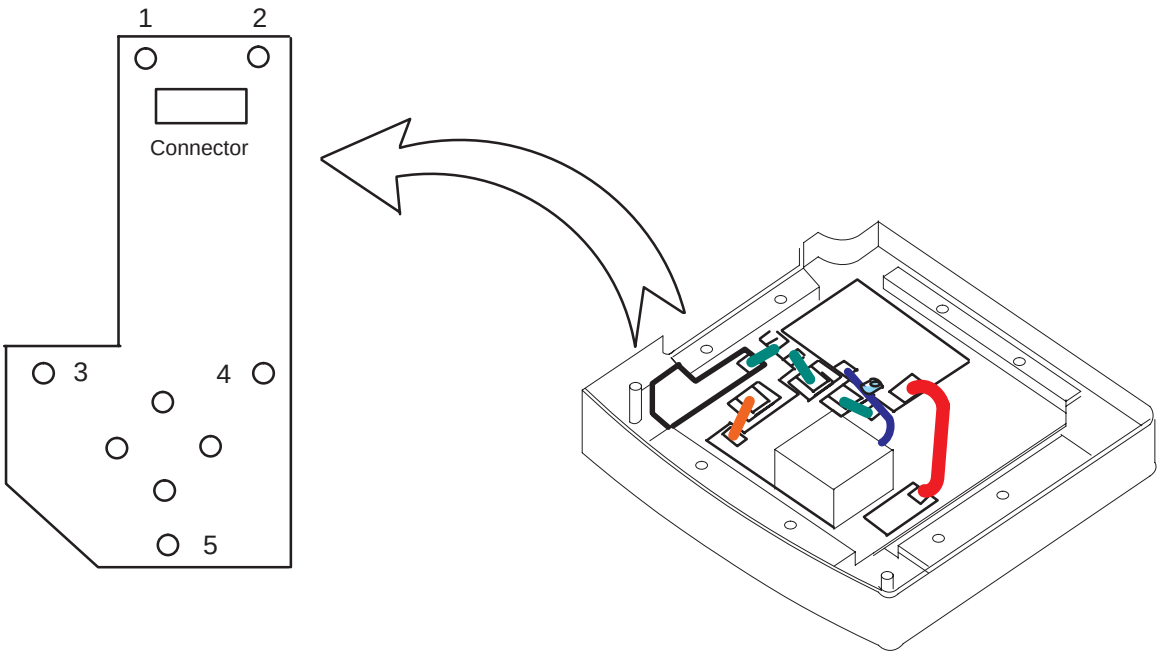
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–20.

1. Turn OFF the system.
2. Pull the Keyboard Assy out with KB Cover Top Assy. Refer to 6–2–10.
3. Unscrew five screws (1 – 5) and disconnect the connect.
4. Remove Freeze/Record Key Assy.



FREEZE/RECORD KEY ASSY DISASSEMBLY
ILLUSTRATION 6–20

6–2–15 TGC Knob Set (FRU No. 209)

Time Required

5 Minutes

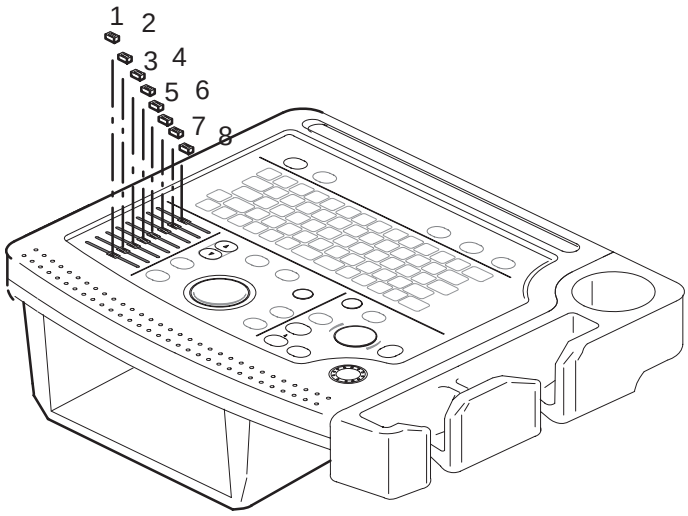
Tool Required

None

Procedure

Refer to ILLUSTRATION 6–21.

1. Turn OFF the system.
2. Pull out the TGC Knobs (1 – 8).



TGC KNOB SET DISASSEMBLY
ILLUSTRATION 6–21

6–2–16 Probe Protector Sheet Set (FRU No. 210)

Time Required

1 Minutes

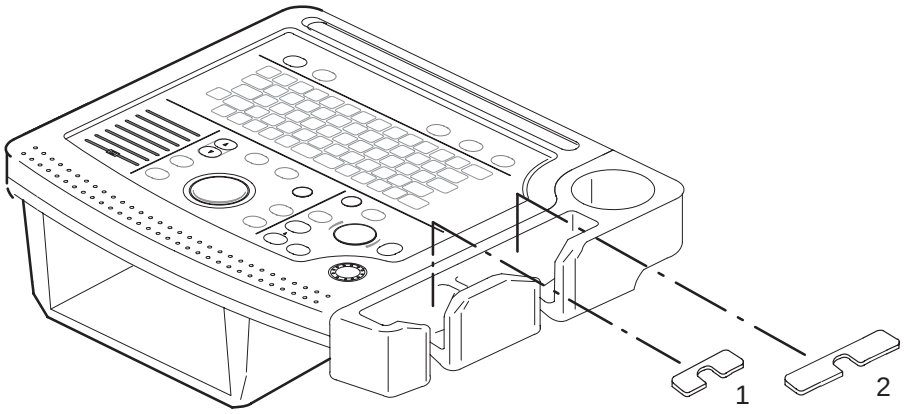
Tool Required

None

Procedure

Refer to ILLUSTRATION 6–22.

1. Turn OFF the system.
2. Insert the Probe Protector Sheets (1 – 2).



PROBE PROTECTOR SHEET SET
ILLUSTRATION 6–22

6–2–17 Key Sheet Assy (FRU No. 211)

Time Required

25 Minutes

Tool Required

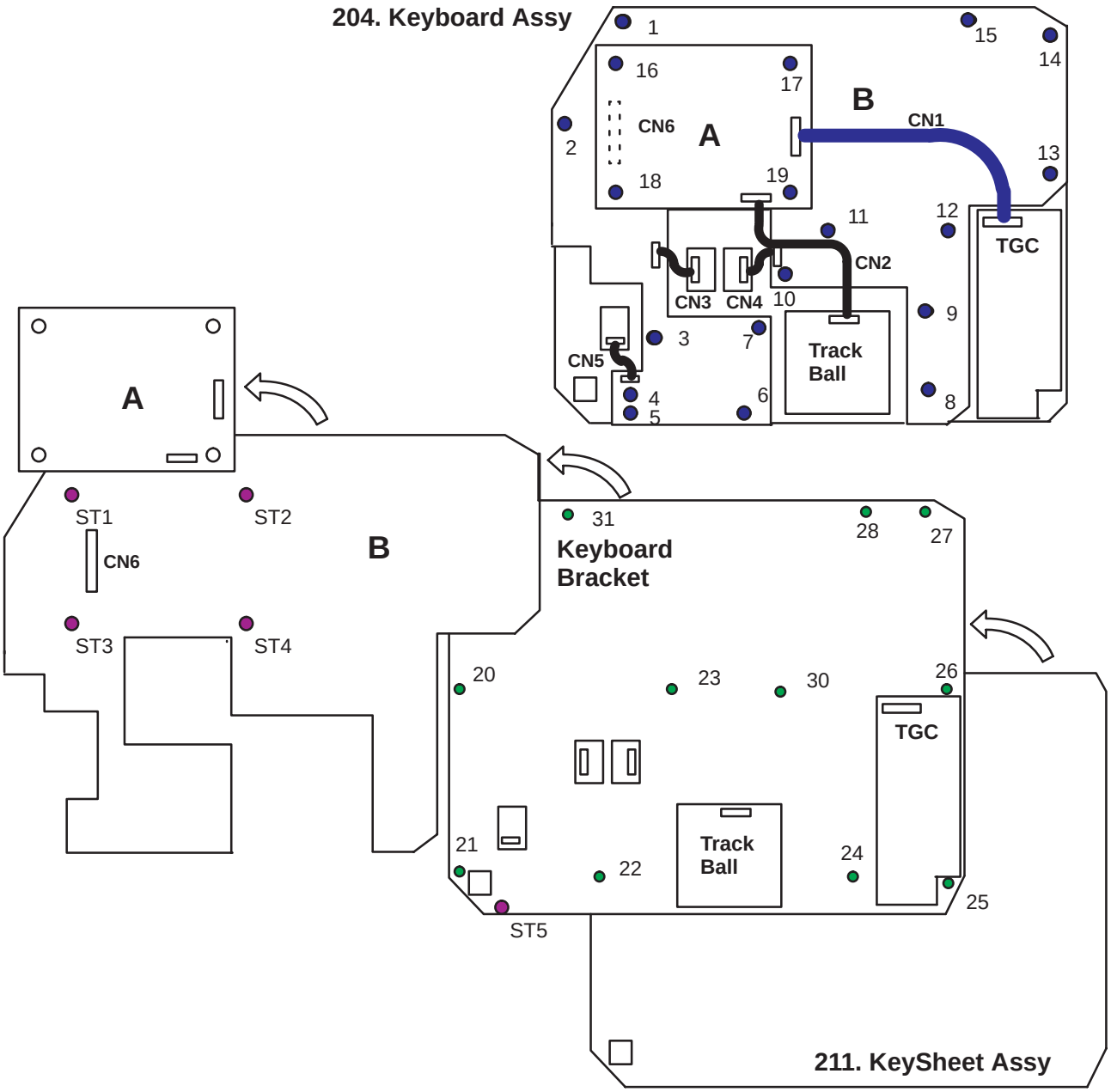
Screw Driver, Hexagonal Wrench, Boxer(5mm).

Procedure

Refer to ILLUSTRATION 6–23.

1. Turn OFF the system.
2. Remove the Keyboard assy. Refer to 6–2–10.
3. Pull out the TGC knobs. Refer to 6–2–15.
4. Using the hexagonial wrench, remove the three Encoder knobs. Refer to 6–2–13.
5. Remove the Freeze/Record key. Refer to 6–2–14.
6. Disconnect five connectors (CN1–CN5).
7. Unscrew 4 screws (16–19) and disconnect the connector (CN6) in the the circuit board A from the circuit board B.
8. Using the boxer (5mm), unscrew four studs (ST1–ST4) .
9. Unscrew fifteen screws (1–15) and remove the circuit board B from the keyboard bracket.
10. Unscrew eleven screws (20–31) and one knob (ST5) and carefully (not to up side down the keyboard bracket) lift the keyboard bracket from the key sheet assy.

6–2–17 Key Sheet Assy (continued) (FRU No. 211)



KEY SHEET ASSY DISASSEMBLY
ILLUSTRATION 6–23

6–2–18 P.C.Board(s) (FRU No.301 through 304)

Time Required

7 Minutes

Tool Required

Screwdriver

Procedure

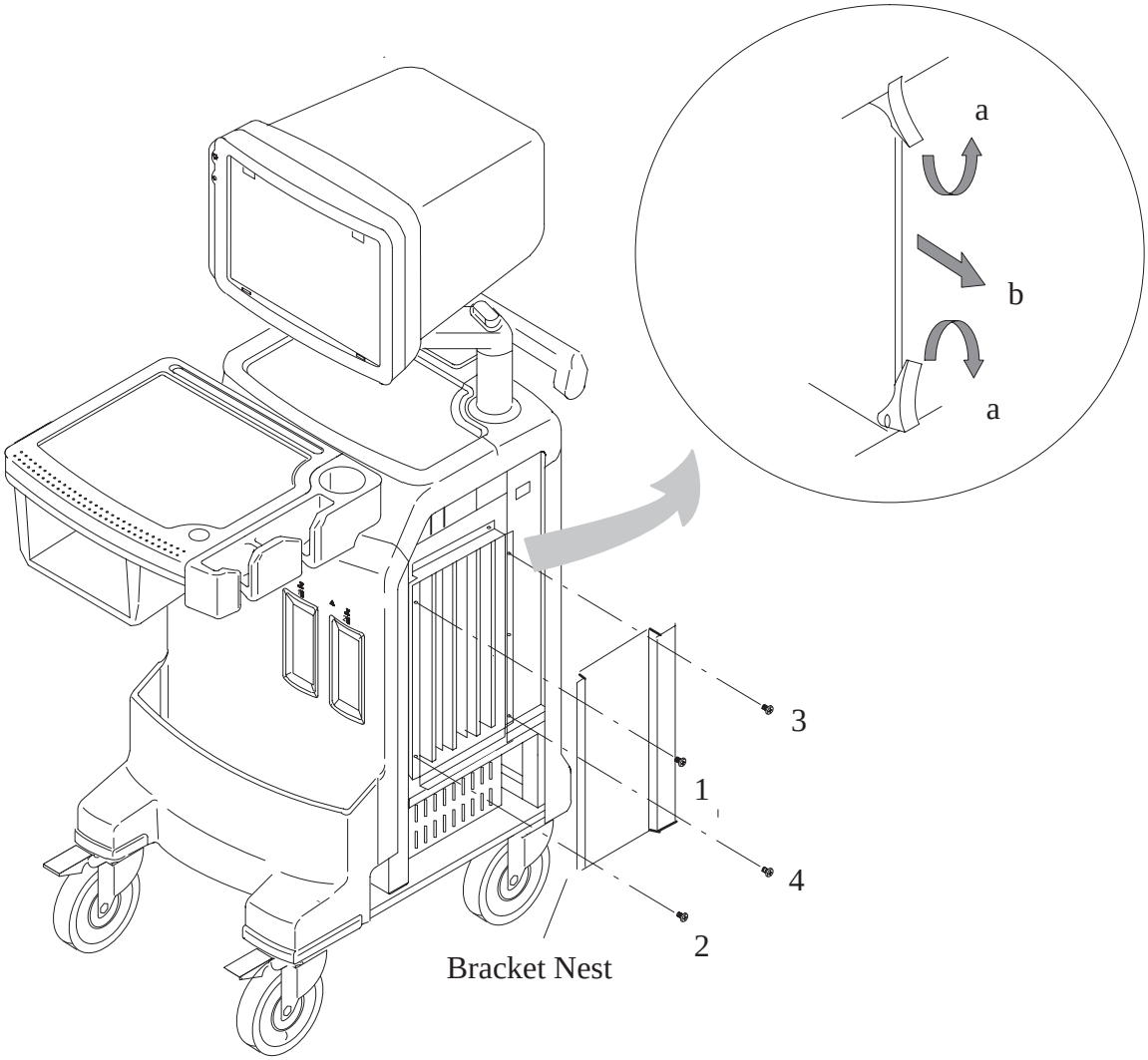
CAUTION

An electrostatic discharge may damage a component. Turn OFF power and wear the wrist strap before you remove a circuit boards. Do not unplug the power cord to keep ground continuity.
Do not bend or flex the boards when mounting/dismounting each board. Surface mount IC boards are very susceptible to damage from flex/torque.
Make sure the Dip switch position is set correctly before changing the MST Assy. Refer to chapter 3, section 3–6–3 DIP Switch for correct setting.
.

Refer to ILLUSTRATION 6–24.

1. Turn OFF the system.
2. Remove the Right Cover(FRU 405). Refer to 6–2–28.
3. Remove the PCB Guide Assy (FRU 422). Refer to 6–2–44.
4. Unscrew four screws (1 – 4) and Remove the Bracket Nest.
5. Move the upper and lower ejector in the direction indicated by the arrows(a). Refer to ILLUSTRATION 6–24.
6. Pull out the board, do not bend it (b).

6–2–18 P.C.Board(s) (FRU No.301 through 304) (Continued)



Cardcage No.	Board
1	ESP
2	RTC
3	DSC
4	MST

P.C.BOARD(S) REMOVAL
ILLUSTRATION 6–24

6–2–19 HV Assy (FRU No. 305)

Time Required

10 Minutes

Tool Required

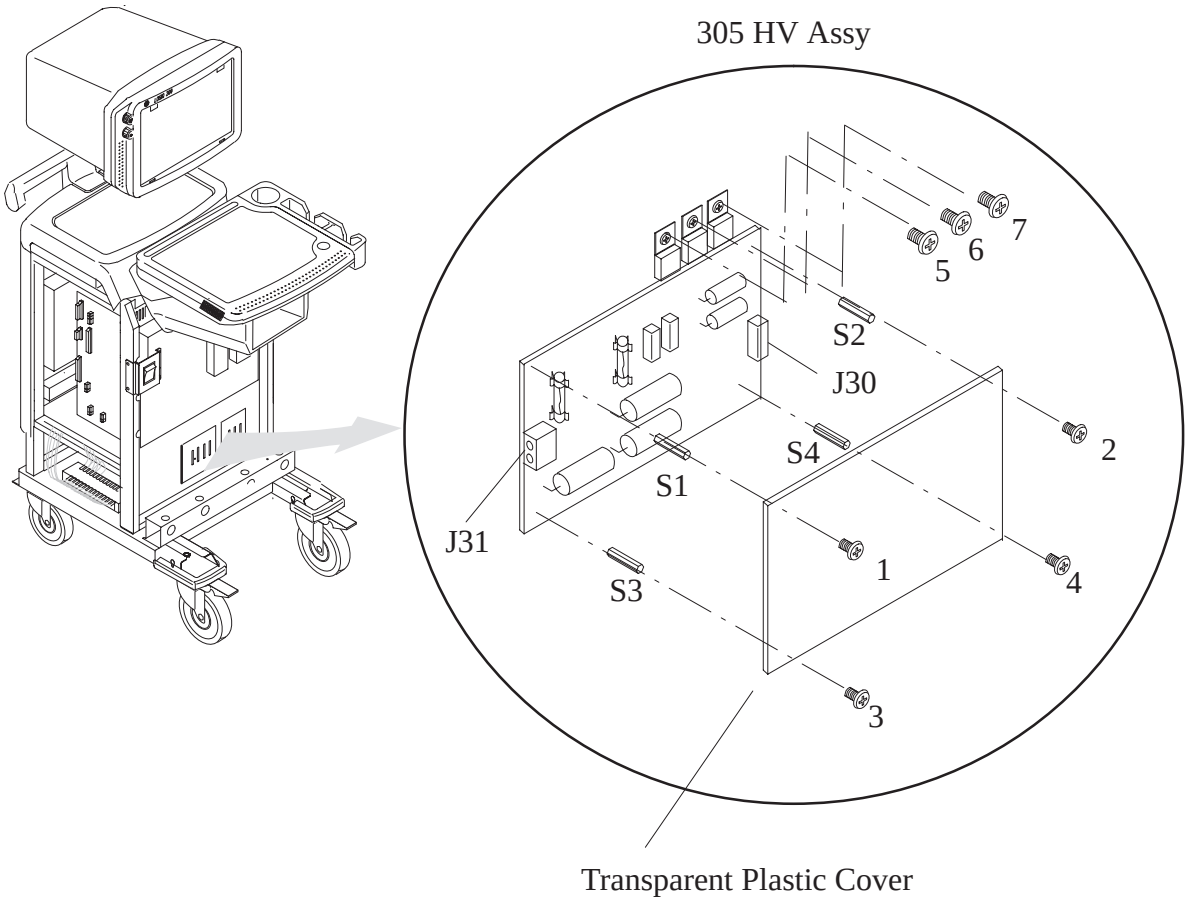
Screwdriver

Procedure

Refer to ILLUSTRATION 6–25.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover (FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Unscrew four screws (1 – 4), and remove transparent plastic cover.
7. Remove the EMI Core (8).
8. Unscrew three screws (5 – 7) being used fixing TR.
9. Disconnect a connector (J31) and connector(J12) on the Mother Assy.
10. Unscrew and remove four supporters(S1 – S4).
11. Remove the HV Assy.

6–2–19 HV Assy (FRU No. 305) (Continued)



HV ASSY DISASSEMBLY
ILLUSTRATION 6–25

6–2–20 CONN Assy (FRU No. 306)

Time Required

13 Minutes

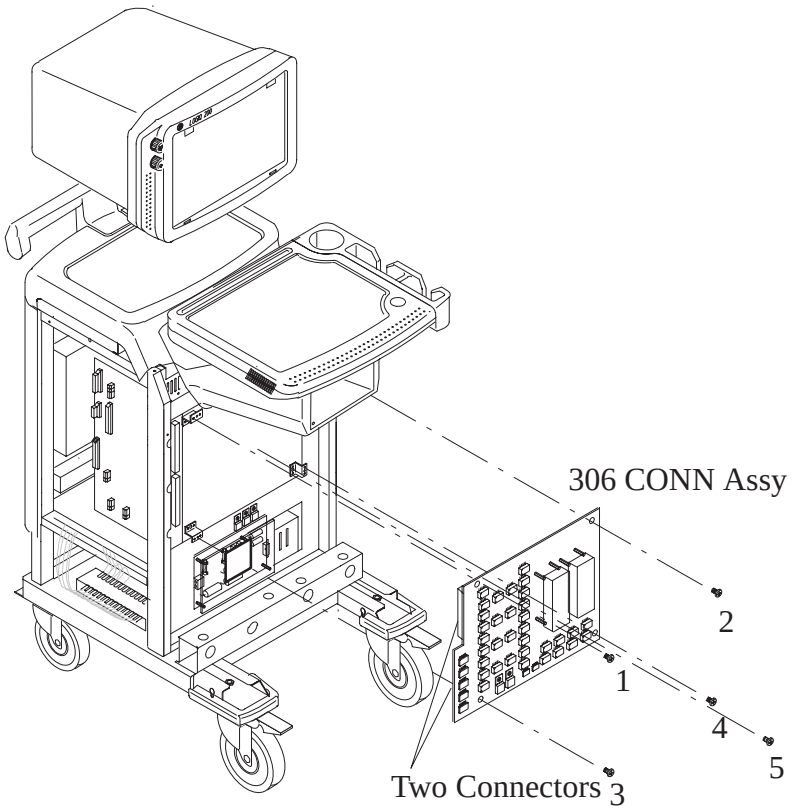
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–26.

1. Turn OFF the system and plug out.
2. Remove the Shield Panel (FRU 307). Refer to 6–2–21.
3. Unscrew four screws (1 – 5).
4. Disconnect two connector.
5. Pull out the Probe CONN Assy.



CONN ASSY DISASSEMBLY
ILLUSTRATION 6–26

6–2–21 Shield Panel (FRU No. 307)

Time Required

11 Minutes

Tool Required

Screwdriver

Procedure

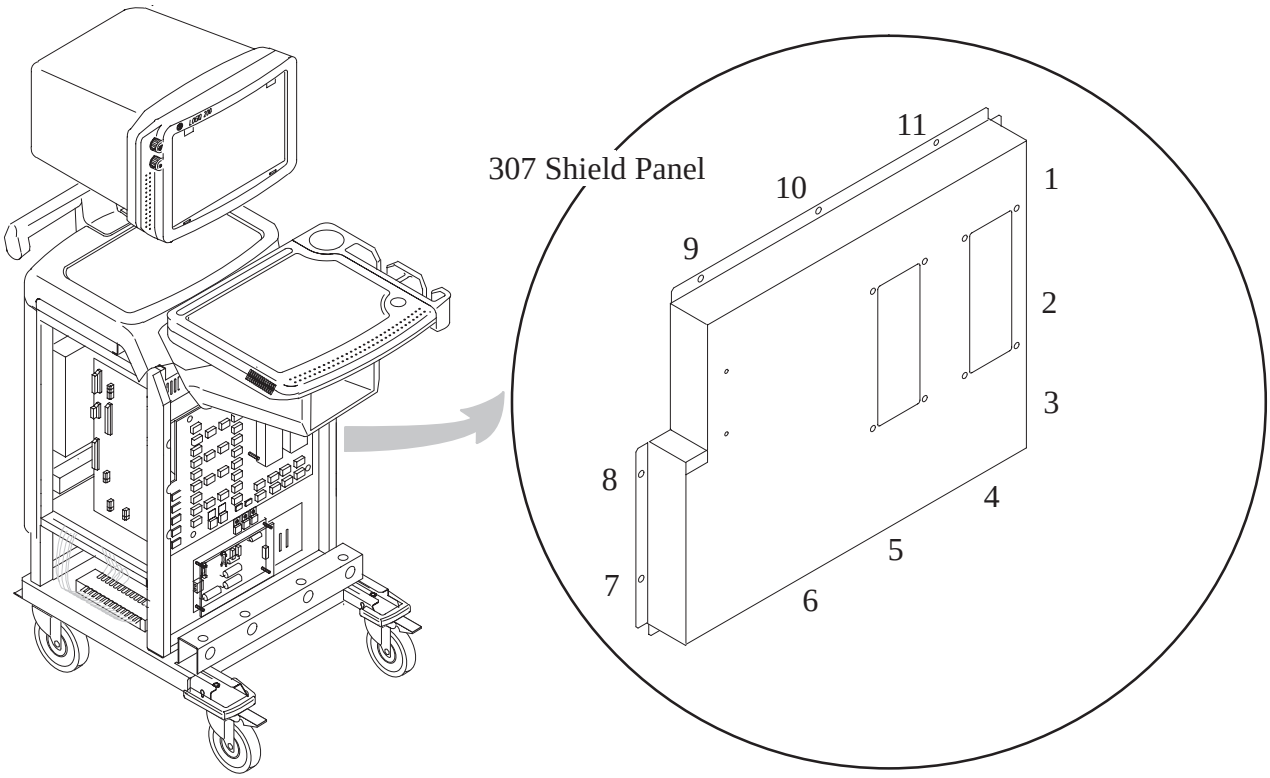
CAUTION

Do NOT unplug the power cord before OFF the power switch.

Refer to ILLUSTRATION 6–27.

1. Turn OFF the system & plug out
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover (FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Remove the Power S/W Assy (FRU 416). Refer to 6–2–38.
7. Unscrew eleven screws (1 –11).
8. Remove the Shield Panel (FRU 307).

6–2–21 Shield Panel (FRU No. 307) (Continued)



SHIELD PANEL DISASSEMBLY
ILLUSTRATION 6–27

6–2–22 Mother Assy (FRU No. 308)

Time Required

0.5 Hours

Tool Required

Screwdriver
Hexagonal Wrench

Procedure

CAUTION

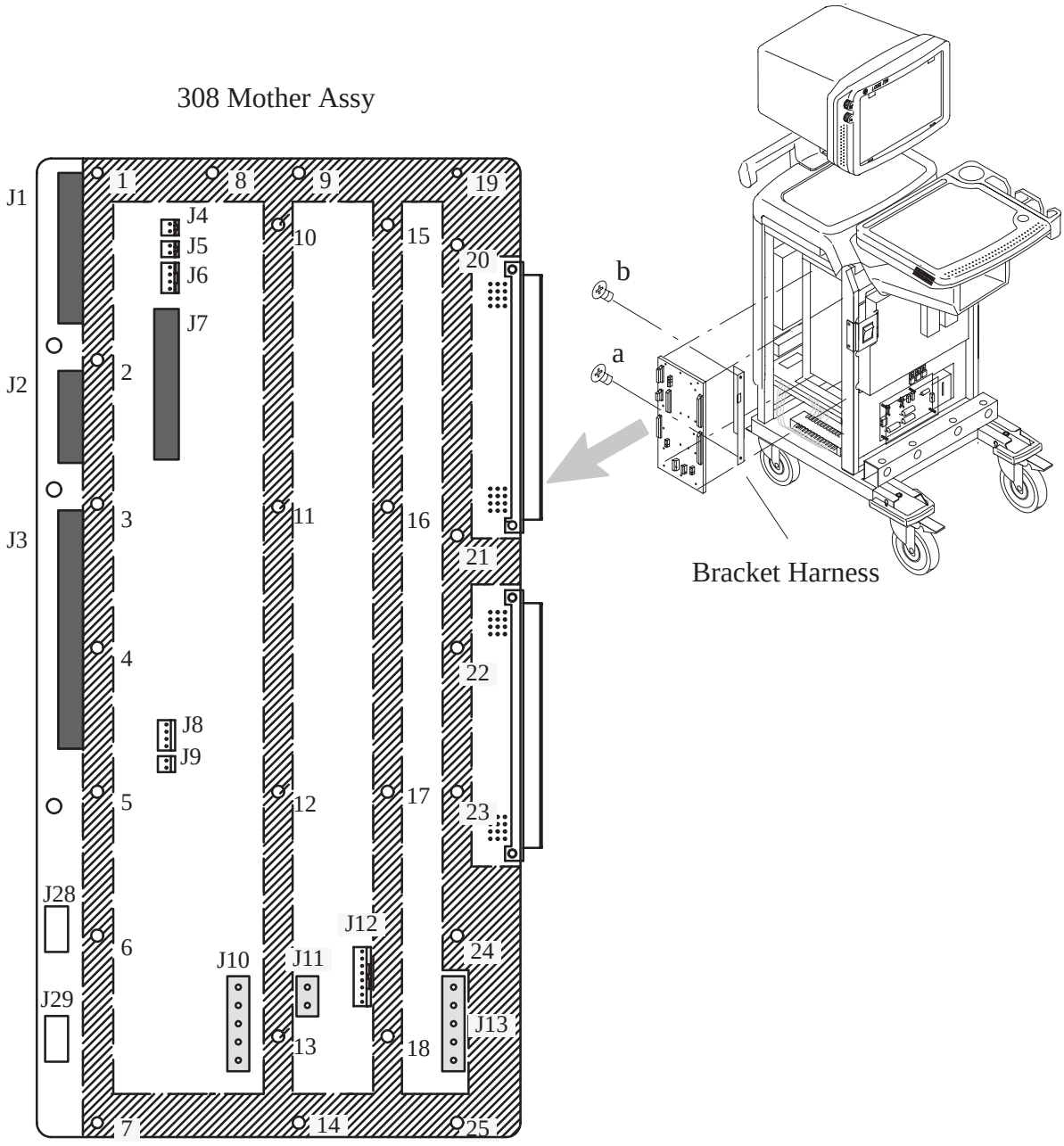
An electrostatic discharge may damage a component. Turn OFF power and wear the wrist strap before you remove a circuit boards. Do not unplug the power cord to keep ground continuity.

Do not bend or flex the boards when mounting/dismounting each board. Surface mount IC boards are very susceptible to damage from flex/torque.

Refer to ILLUSTRATION 6–28.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Remove the EMI Cover L (FRU 421). Refer to 6–2–43.
7. Remove the four PCB Guide Assy (FRU 422). Refer to 6–2–44.
8. Remove the four P.C.Boards (FRU 301 to 304). Refer to 6–2–18.
9. Remove the Shield Panel (FRU 307). Refer to 6–2–21.
10. Disconnect fifteen connectors connected with the mother board. (J1 – J13, J18 – J29)
11. Unscrew two screws (a and b), and remove the Bracket Harness. If necessary, cut the tie wrap.
12. Unscrew 25 screws (1 – 25).
13. Remove the Mother Assy (FRU No. 308).

6–2–22 Mother Assy (FRU No. 308) (Continued)



NEST MOTHER ASSY DISASSEMBLY
ILLUSTRATION 6–28

6–2–23 Nest Box (FRU No. 309)

Time Required

0.6 Hour

Tool Required

Screwdriver
Hexagonal Wrench

CAUTION

An electrostatic discharge may damage a component. Turn OFF power and wear the wrist strap before you remove a circuit boards. Do not unplug the power cord to keep ground continuity.

Do not bend or flex the boards when mounting/dismounting each board. Surface mount IC boards are very susceptible to damage from flex/torque.

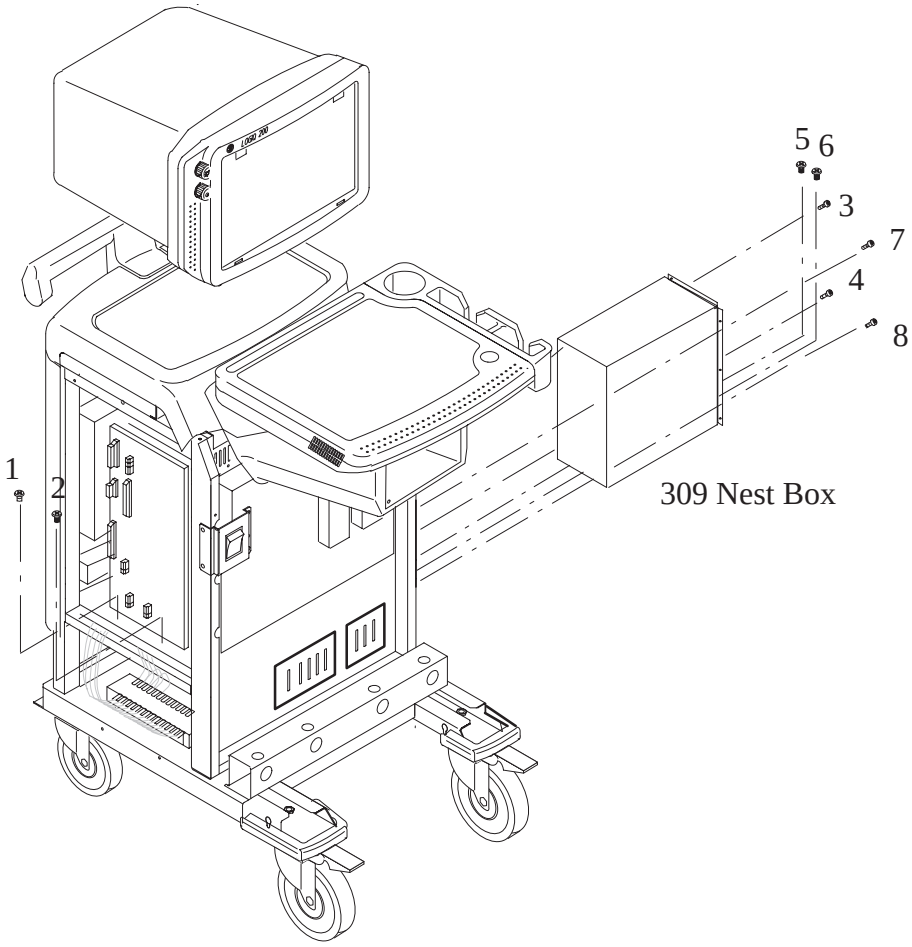
Procedure

Refer to ILLUSTRATION 6–29.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
7. Remove the EMI Cover L (FRU 421). Refer to 6–2–43.
8. Remove the four PCB Guide Assy (FRU 422). Refer to 6–2–44.
9. Remove the four P.C.Boards (FRU 301 to 304). Refer to 6–2–18.
10. Remove the Shield Panel (FRU 307). Refer to 6–2–21.

6–2–23 Nest Box (FRU No. 309) (Continued)

11. Remove the CONN Assy (FRU 306). Refer to 6–2–20.
12. Remove the Mother Assy (FRU 308). Refer to 6–2–22.
13. Remove the eight Screws (1 – 8) on both side of the Nest Box. Refer to ILLUSTRATION 6–29.
14. Remove the Nest Box (FRU 309).



NEST BOX DISASSEMBLY
ILLUSTRATION 6–29

6–2–24 Swing Arm Assy (FRU No. 401)

Time Required

0.6 Hour

Tool Required

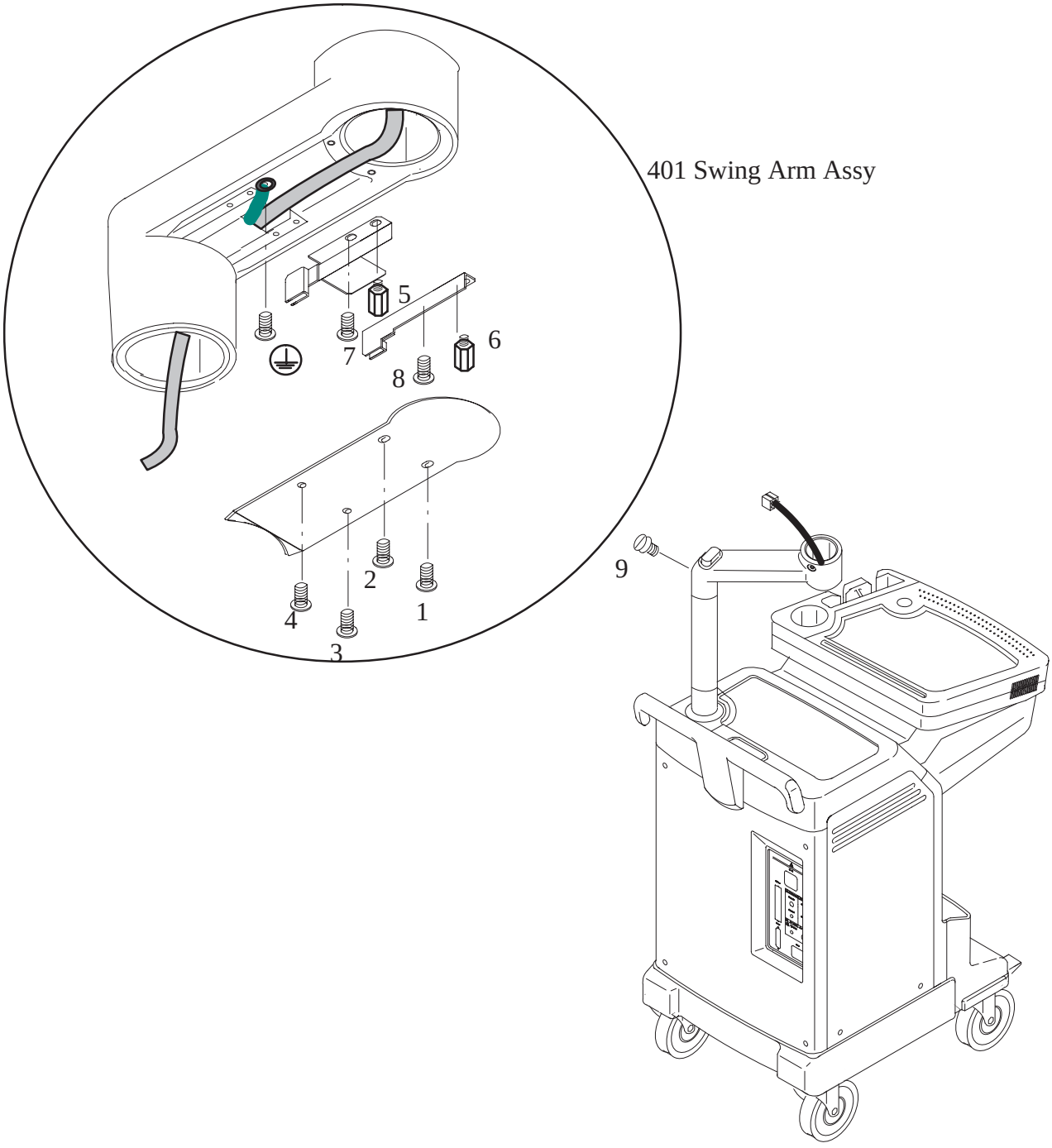
Screwdriver
Hex Wrench

Procedure

Refer to ILLUSTRATION 6–30.

1. Turn OFF the system and unplug the power cord from outlet.
2. Remove the Monitor Assy (FRU No. 100) from the Swing Arm Assy. Refer to 6–2–1.
3. Remove the Monitor Space Plate (FRU No.105). Refer to 6–2–6.
4. Unscrew four screws (1 –4) and remove the Cover located at the bottom of the Swing Arm Assy.
5. Unscrew one screw to remove Ground Terminal (⏚).
6. Unscrew two supporters (5 and 6) and two screws (7 and 8).
7. Remove the Guide.
8. Unscrew one screws (10).
9. Remove the Swing Arm Assy (FRU No.401).

6–2–24 Swing Arm Assy (FRU No. 401) (Continued)



NECK ASSY DISASSEMBLY
ILLUSTRATION 6–30

6–2–25 Pipe Assy (FRU No. 402)

Time Required

0.4 Hour

Tool Required

Screwdriver
Hex Wrench

Procedure

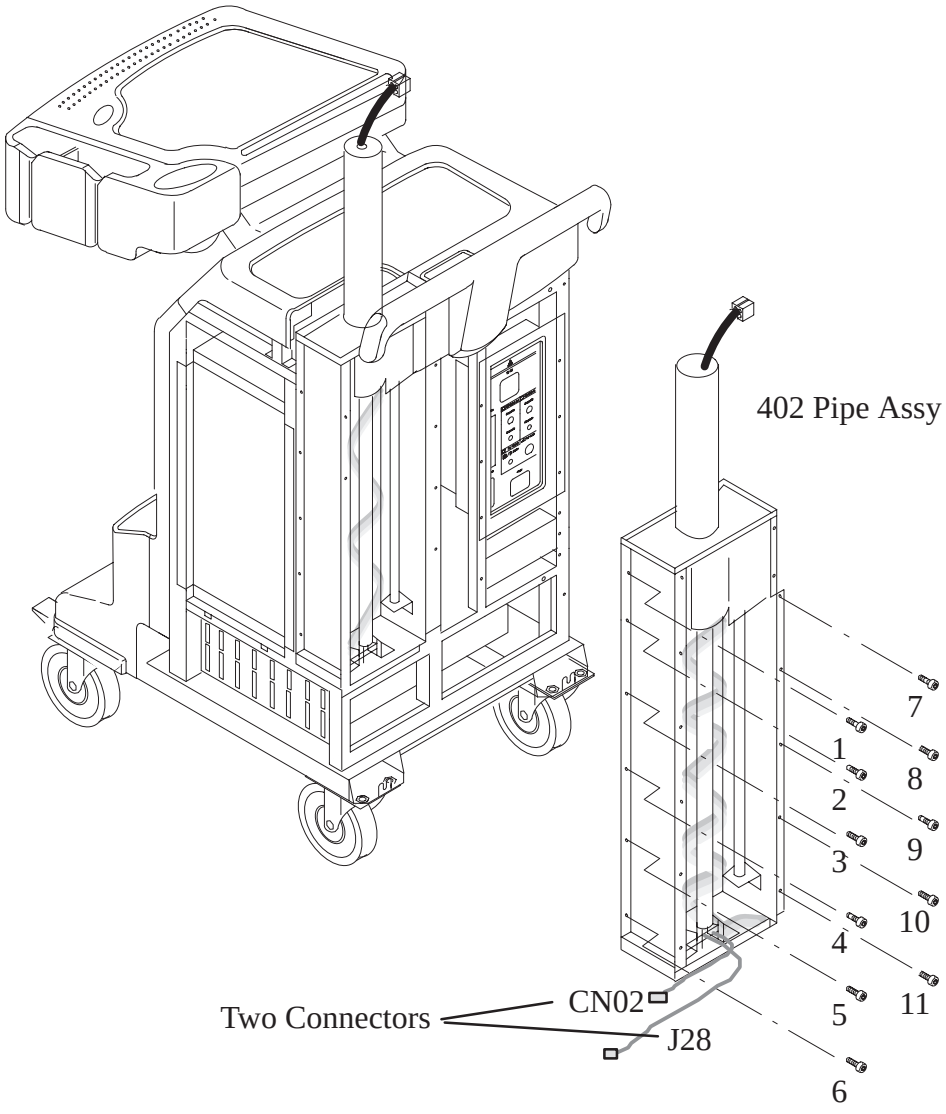
Refer to ILLUSTRATION 6–31.

1. Turn OFF the system and unplug the power cord from outlet.
2. Remove the Monitor Assy (FRU No. 100) from the Swing Arm Assy. Refer to 6–2–1.
3. Remove the Swing Arm Assy (FRU 401). Refer to 6–2–24.
4. Remove the Left Cover (FRU 404). Refer to 6–2–27.
5. Remove the Right Cover(FRU 405). Refer to 6–2–28.
6. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
7. Remove the Pole Cover (FRU 403) Refer to 6–2–26.
8. Remove eleven hexagonal bolts (1 – 11).
9. Disconnect one connector(CN02,J28).
10. Remove the Pipe Assy.

NOTE

When assembling the Tilt assy, fix two screw(1,7) with one drop of Loctite262.

6–2–25 Pipe Assy (FRU No. 402)) (Continued)



NECK ASSY DISASSEMBLY
ILLUSTRATION 6–31

6–2–26 Pole Cover (FRU No. 403)

Time Required

20 Minutes

Tool Required

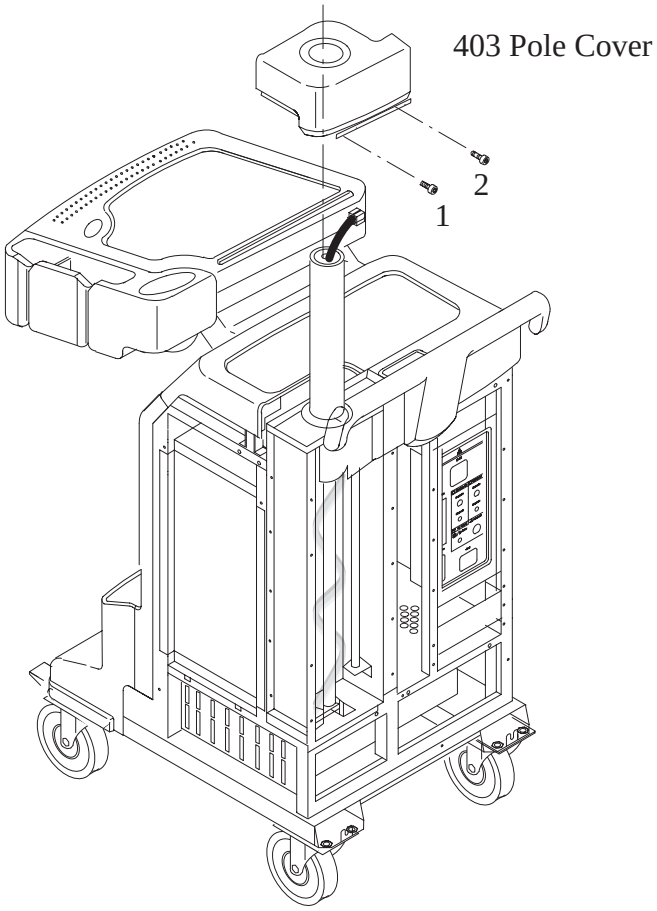
Screwdriver

Procedure

Refer to ILLUSTRATION 6–32.

1. Turn OFF the system.
2. Remove the Monitor Assy (FRU No. 100) from the Swing Arm Assy. Refer to 6–2–1.
3. Remove the Swing Arm Assy (FRU 401). Refer to 6–2–24.
4. Remove the Left Cover (FRU 404). Refer to 6–2–27.
5. Remove the Right Cover(FRU 405). Refer to 6–2–28.
6. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
7. Unscrew two screws (1and 2).
8. Pull upward the Pole Cover.

6–2–26 Pole Cover (FRU No. 403)) (Continued)



POLE COVER DISASSEMBLY
ILLUSTRATION 6–32

6–2–27 Left Cover (FRU No. 404)

Time Required

5 Minutes

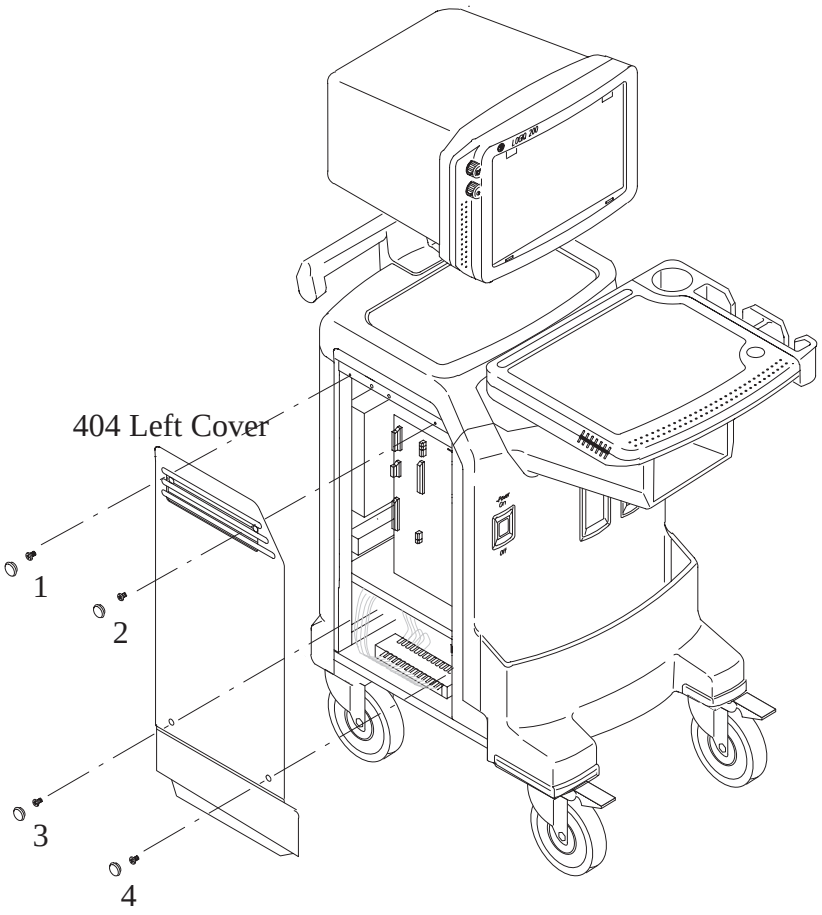
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–33.

1. Turn OFF the system.
2. Remove four screw caps and unscrew four screws (1 – 4).
3. Remove the Left Cover (FRU 404).



LEFT COVER DISASSEMBLY
ILLUSTRATION 6–33

6–2–28 Right Cover (FRU No. 405)

Time Required

5 Minutes

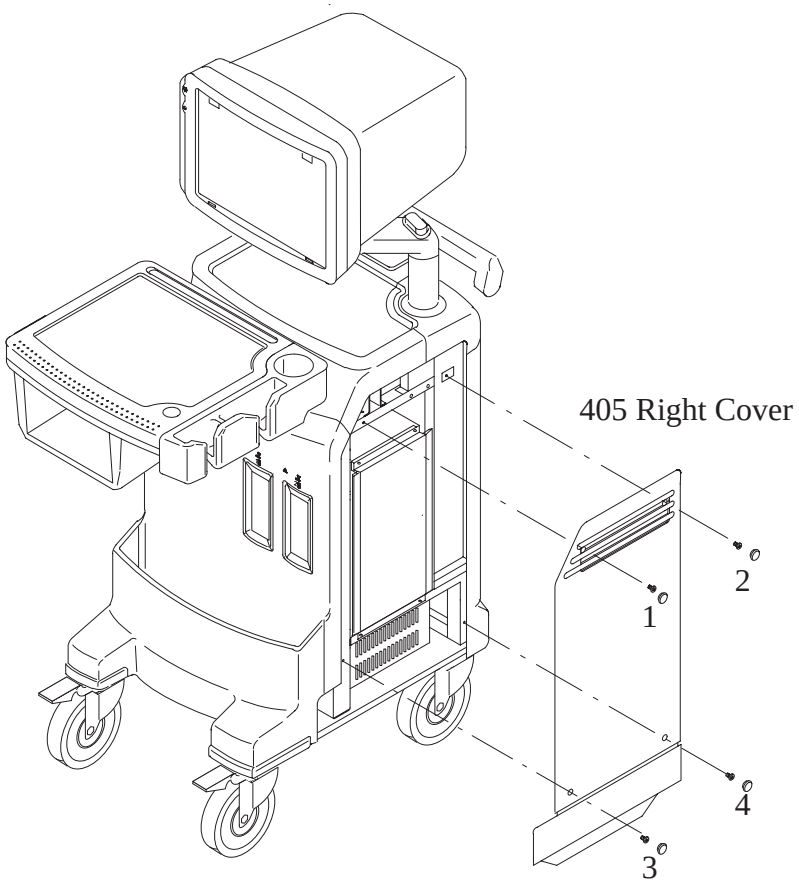
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–34.

1. Turn OFF the system.
2. Remove the four screw caps and unscrew four screws (1 – 4).
3. Remove the Right Cover (FRU 405).



RIGHT COVER DISASSEMBLY
ILLUSTRATION 6–34

6–2–29 Front Base Cover (FRU No. 406)

Time Required

5 Minutes

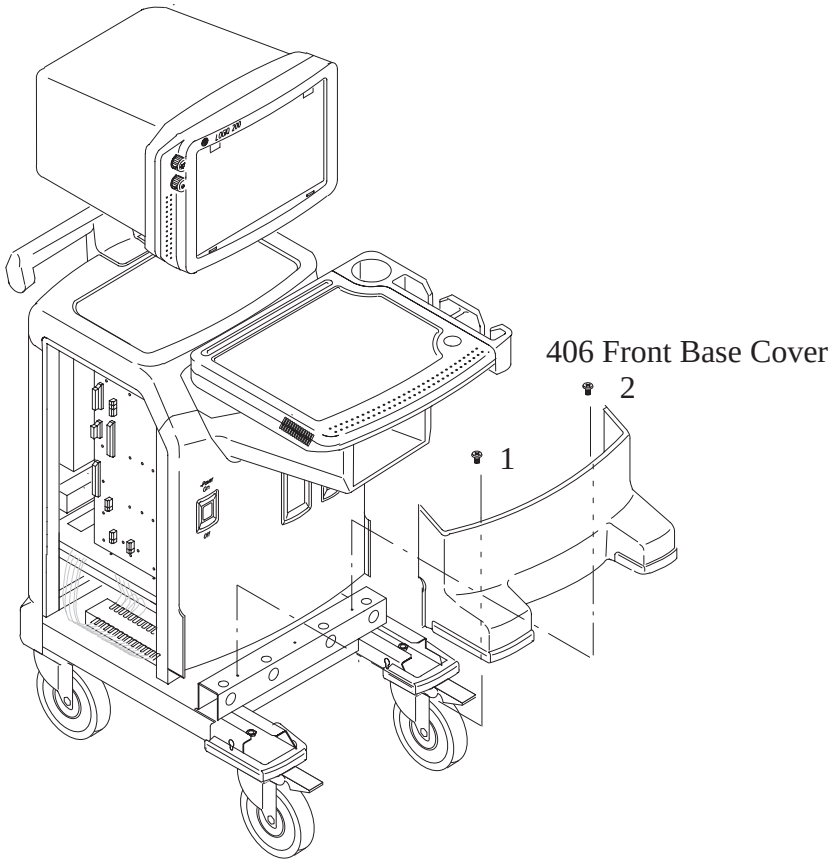
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–35.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Unscrew two screws (1 and 2).
5. Remove the Front Base Cover (FRU 406).



FRONT BASE COVER DISASSEMBLY
ILLUSTRATION 6–35

6–2–30 Front Cover (FRU No. 407)

Time Required

5 Minutes

Tool Required

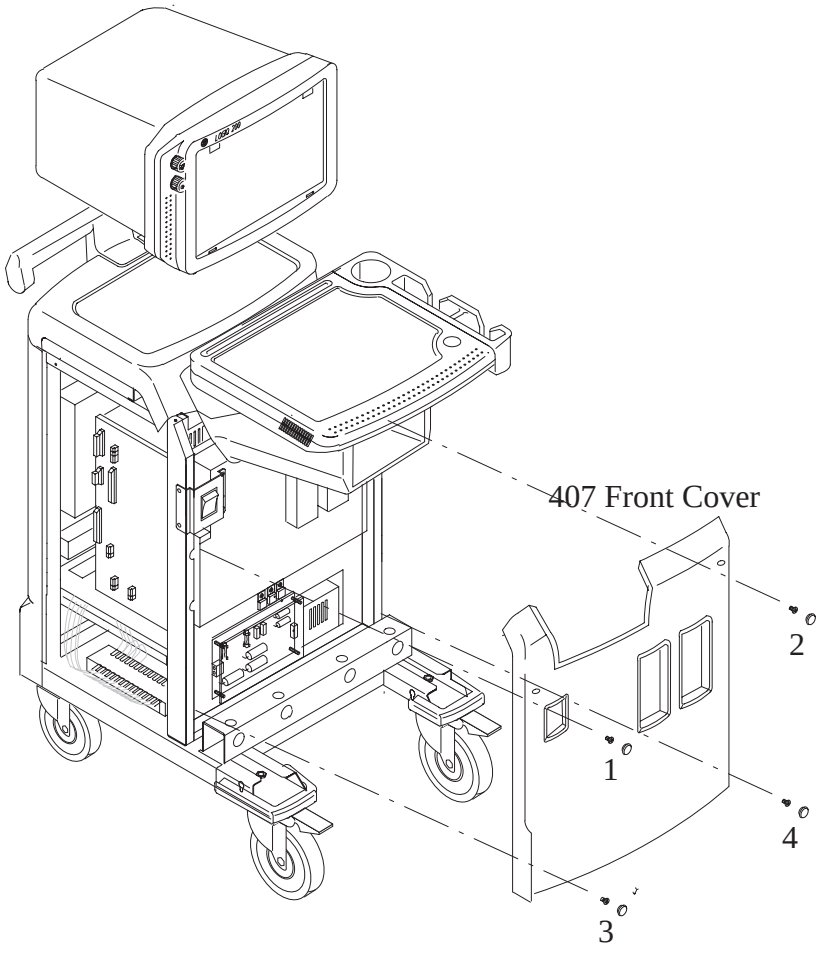
Screwdriver

Procedure

Refer to ILLUSTRATION 6–36.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the fore screw caps and unscrew fore screws (1 – 4).
6. Remove the Front Cover (FRU 407).

6–2–30 Front Cover (FRU No. 407) (Continued)



FRONT COVER DISASSEMBLY
ILLUSTRATION 6–36

6–2–31 Rear Cover (FRU No. 408)

Time Required

5 Minutes

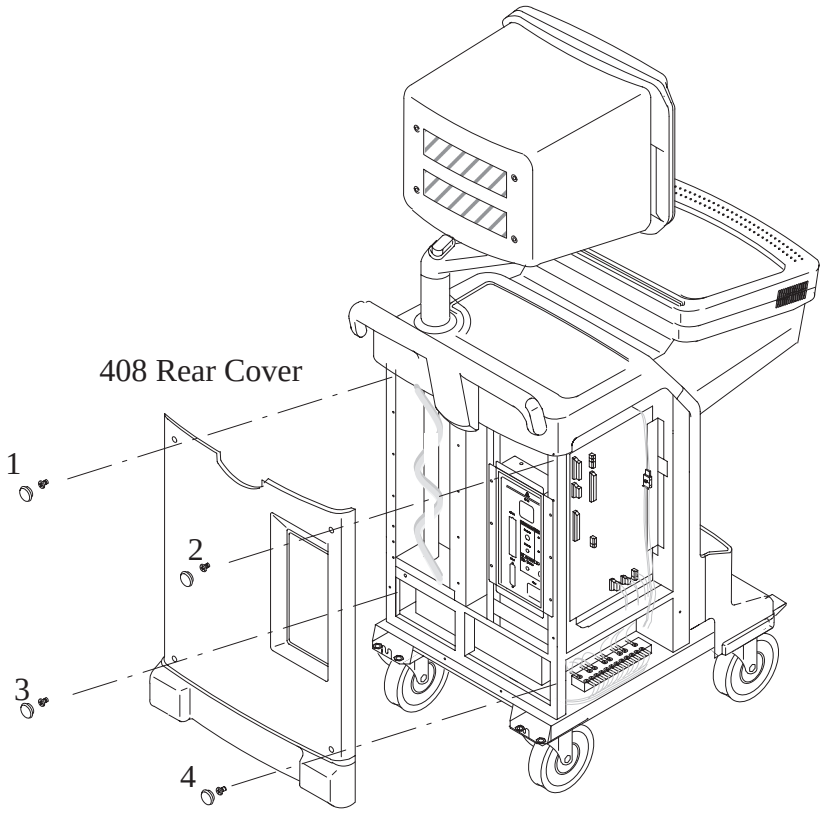
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–37.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the four screw caps and unscrew four screws (1 – 4).
5. Remove the Rear Cover(FRU No. 408).



REAR COVER DISASSEMBLY
ILLUSTRATION 6–37

6–2–32 Top Cover (FRU No. 409)

Time Required

5 Minutes

Tool Required

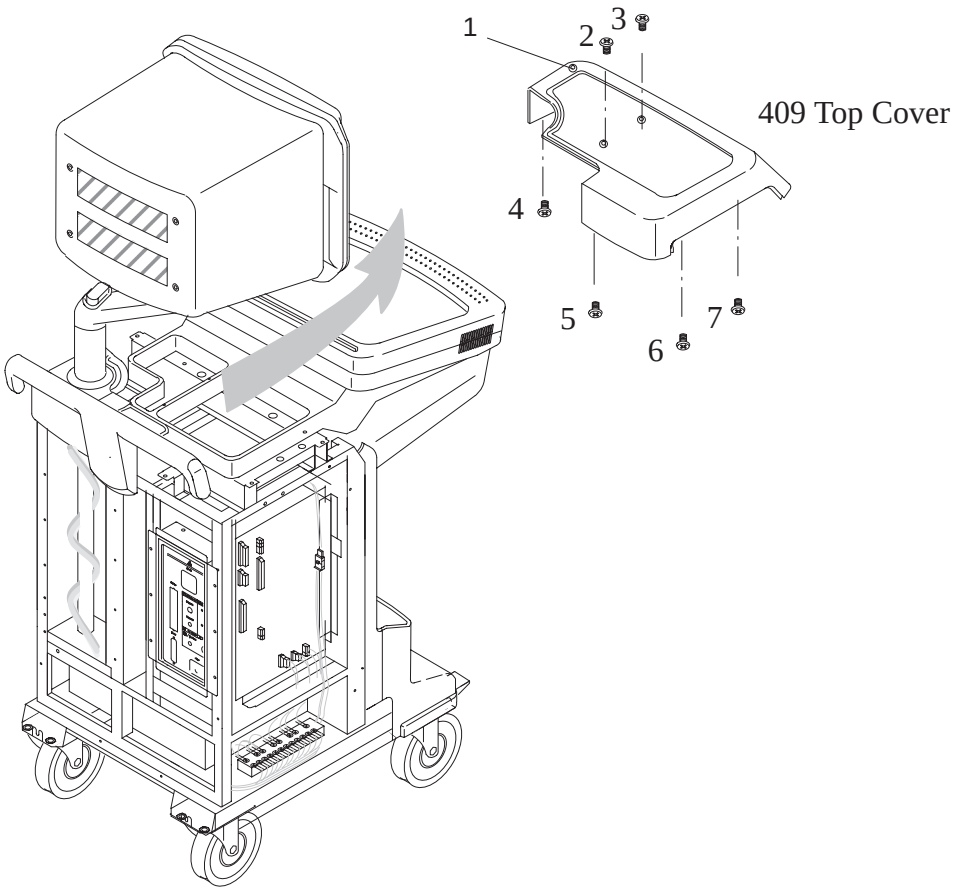
Screwdriver

Procedure

Refer to ILLUSTRATION 6–38.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
5. Pull up the Pole Cover (FRU 403). Refer to 6–2–22.
6. Remove the Cable Hook Arm (1)
7. Unscrew five screws (2 – 3) and four bolts (4 –7).
8. Remove the Top Cover.

6–2–32 Top Cover (FRU No. 409) (Continued)



REAR COVER DISASSEMBLY
ILLUSTRATION 6–38

6–2–33 Printer Cover (FRU No. 410)

Time Required

5 Minutes

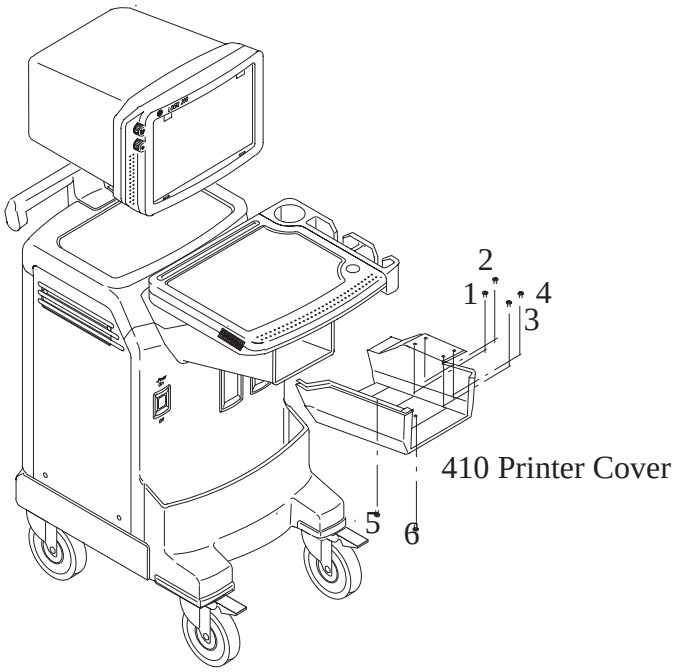
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–39.

1. Turn OFF the system.
2. Remove the Front Cover (FRU 407). Refer to 6–2–30.
3. Remove the Top Cover (FRU 409). Refer to 6–2–32.
4. Unscrew the six screw (1 – 6).
5. Remove the Printer Cover (FRU No. 410).



PRINTER COVER DISASSEMBLY
ILLUSTRATION 6–39

6–2–34 Printer Bracket Assy(FRU No. 411), Back Bracket Assy (FRU No. 412)

Time Required

30 Minutes

Tool Required

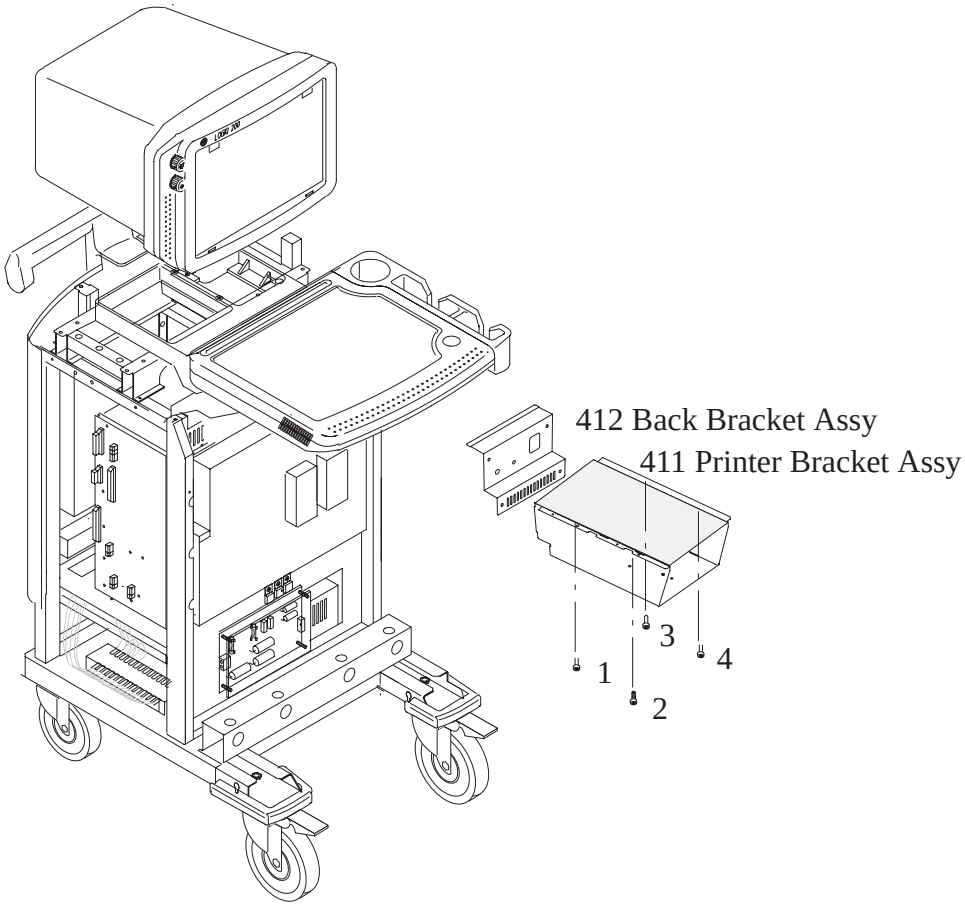
Screwdriver
Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–40.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Remove the Top Cover (FRU 409). Refer to 6–2–32.
7. Remove the Printer Cover (FRU 410). Refer to 6–2–33.
8. Disconnect three cables connected to Back Bracket Assy (FRU 412) as listed below. Cut the tie wraps off if necessary.
   a. Unscrew and Disconnect two ring terminals (1 and 2) from the Terminal Block 6 Assy. Refer to 6–2–46, ILLUSTRATION 6–52.
   b. Unscrew and disconnect one ring terminals(Protective Earth) from the chassis.
   c. Disconnect two connectors (J5 and J9) from the Mother Assy. Refer to 6–2–22, ILLUSTRATION 6–28.
9. Remove four hexagonal bolts (1 – 4) and pull out Printer Bracket Assy with Back Bracket Assy.
10. Unscrew the four screw (5 – 8).
11. Disassemble Printer Bracket Assy (FRU411) and Back Bracket Assy (FRU412).

6–2–34 Printer Bracket Assy(FRU No. 411), Back Bracket Assy (FRU No. 412) (Continued)



PRINTER BRACKET ASSY AND BACK BRACKET ASSY DISASSEMBLY
ILLUSTRATION 6–40

6–2–35 Rear Handle (FRU No. 413)

Time Required

1 Hours

Tool Required

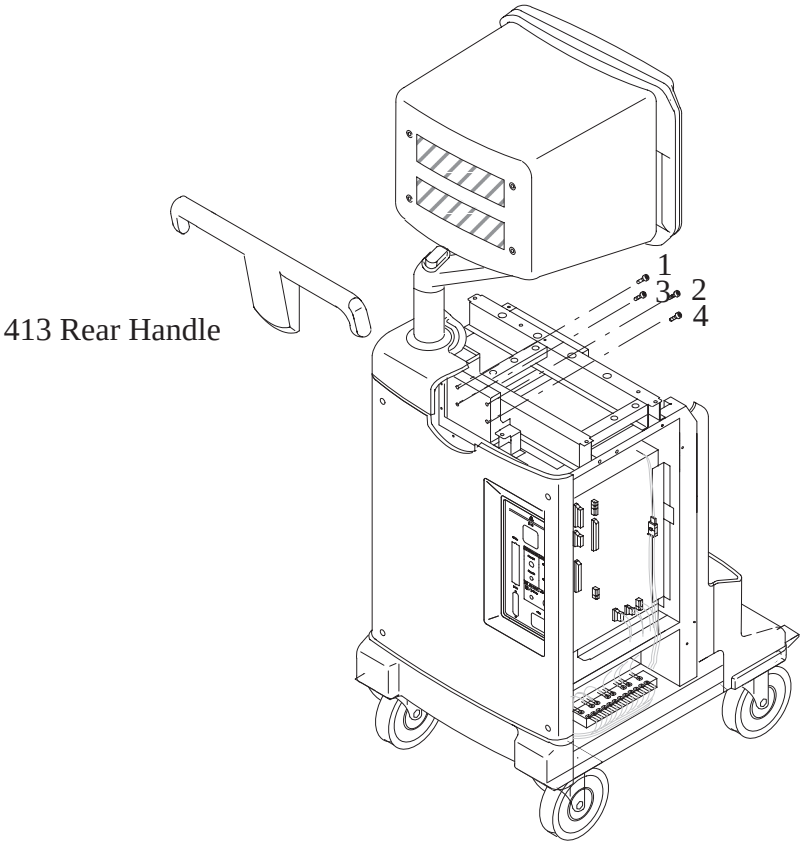
Screwdriver
Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–41.

1. Turn OFF the system.
2. Remove the Keyboard Assy (FRU 204). Refer to 6–2–10.
3. Remove the Left Cover (FRU 404). Refer to 6–2–27.
4. Remove the Right Cover(FRU 405). Refer to 6–2–28.
5. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
6. Remove the Front Cover (FRU 407). Refer to 6–2–30.
7. Remove the Top Cover (FRU 409). Refer to 6–2–32.
8. Remove the Printer Cover (FRU 410). Refer to 6–2–33.
9. Remove the Neck Frame (FRU 414). Refer to 6–2–36.
10. Remove four hexagonal bolts (1 – 4).
11. Remove the Rear Handle.

6–2–35 Rear Handle (FRU No. 413) (Continued)



REAR HANDLE DISASSEMBLY
ILLUSTRATION 6–41

6–2–36 Neck Frame (FRU No. 414)

Time Required

0.5 Hours

Tool Required

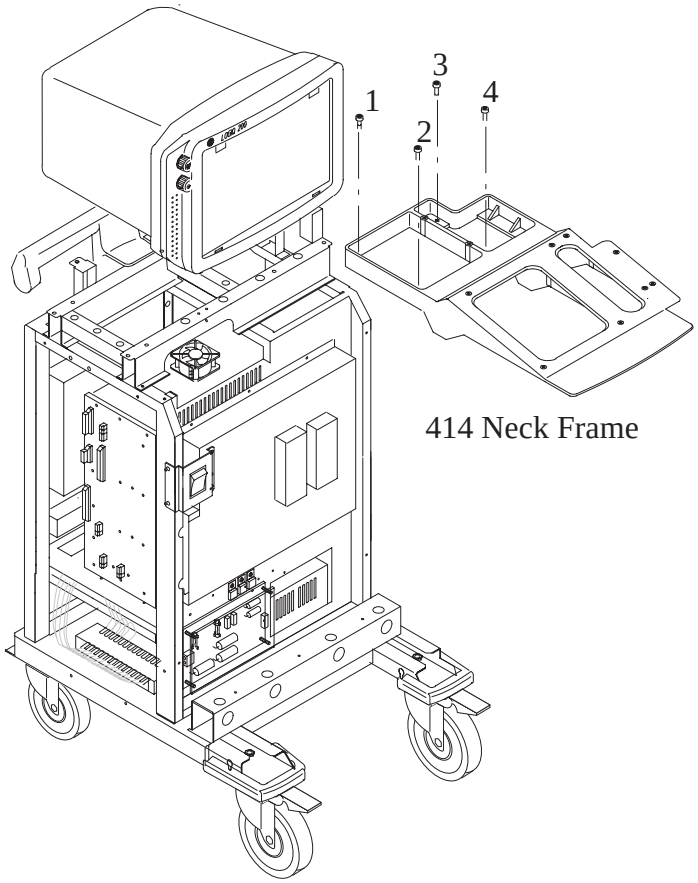
Screwdriver
Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–42.

1. Turn OFF the system.
2. Remove the Keyboard Assy (FRU No. 204). Refer to 6–2–10.
3. Remove the Left Cover (FRU 404). Refer to 6–2–27.
4. Remove the Right Cover(FRU 405). Refer to 6–2–28.
5. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
6. Remove the Front Cover (FRU 407). Refer to 6–2–30.
7. Remove the Top Cover (FRU 409). Refer to 6–2–32.
8. Remove the Printer Cover (FRU 410). Refer to 6–2–33.
9. Remove four hexagonal bolts (1 – 4).
10. Remove the Neck Frame (FRU No. 414).

6–2–36 Neck Frame (FRU No. 414) (Continued)



NECK FRAME DISASSEMBLY
ILLUSTRATION 6–42

6–2–37 Rear Panel Assy (FRU No. 415)

Time Required

0.5 Hour

Tool Required

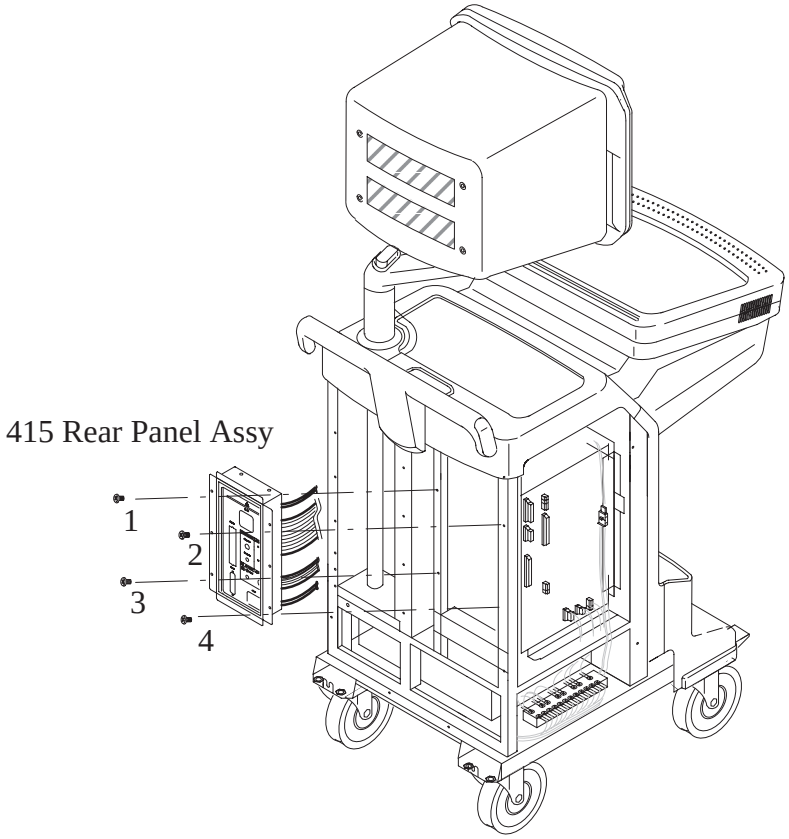
Screwdriver

Procedure

Refer to ILLUSTRATION 6–43.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
5. Remove the EMI Cover (FRU 421). Refer to 6–2–39.
6. Disconnect all connectors out of the Rear Panel assy. If necessary, cut tie wraps. Connectors are listed below.
   a. Unscrew and disconnect three ring terminals (1A, 2A and 5A) from the Terminal Block 6 Assy. Refer to 6–2–46, ILLUSTRATION 6–52.
   b. Disconnect four connectors (J2,J3,J6 and J8) from the Mother Assy. For each cable, refer to 6–2–22, ILLUSTRATION 6–28.
7. Unscrew four screws (1 – 4) and pull the Rear Panel Assy out.
8. Remove the Rear Panel Assy.

6–2–37 Rear Panel Assy (FRU No. 415) (Continued)



REAR PANEL ASSY DISASSEMBLY
ILLUSTRATION 6–43

6–2–38 Power S/W Assy (FRU No. 416)

Time Required

10 Minutes

Tool Required

Screwdriver

Procedure

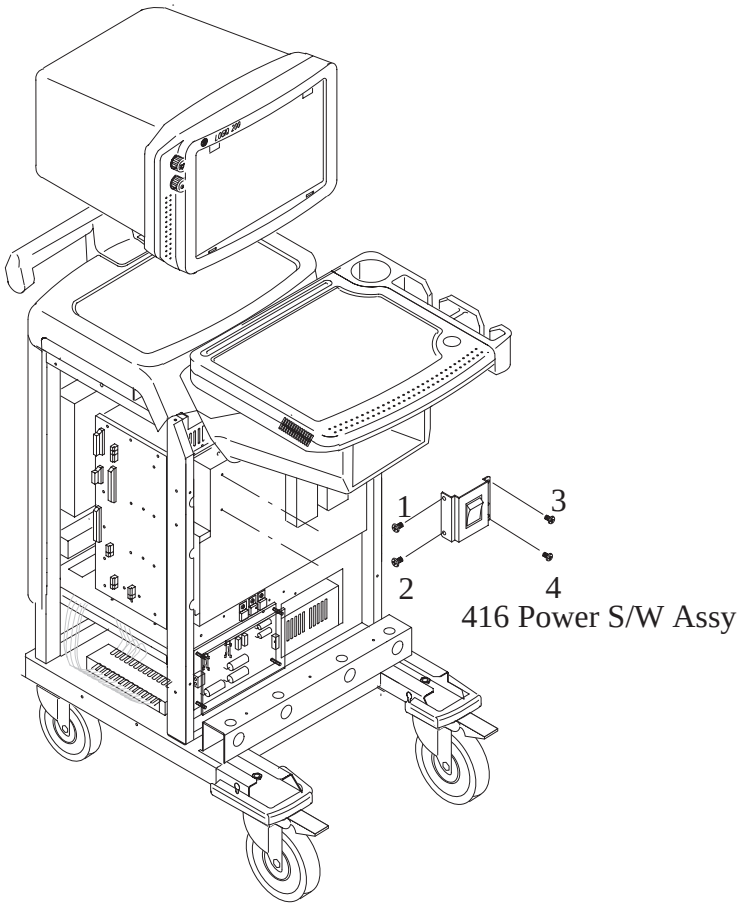
CAUTION

Do NOT unplug the power cord before OFF the power switch.

Refer to ILLUSTRATION 6–44.

1. Turn OFF the system and unplug the power cord from the outlet.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Unscrew four screws (1 – 4).
7. Disconnect fore Terminals from the Power S/W Assy.
8. Remove the Power S/W Assy.

6–2–38 Power S/W Assy (FRU No. 416) (Continued)



POWER S/W ASSY DISASSEMBLY
ILLUSTRATION 6–44

6–2–39 AC Fan Assy (FRU No. 417)

Time Required

45 Minutes

Tool Required

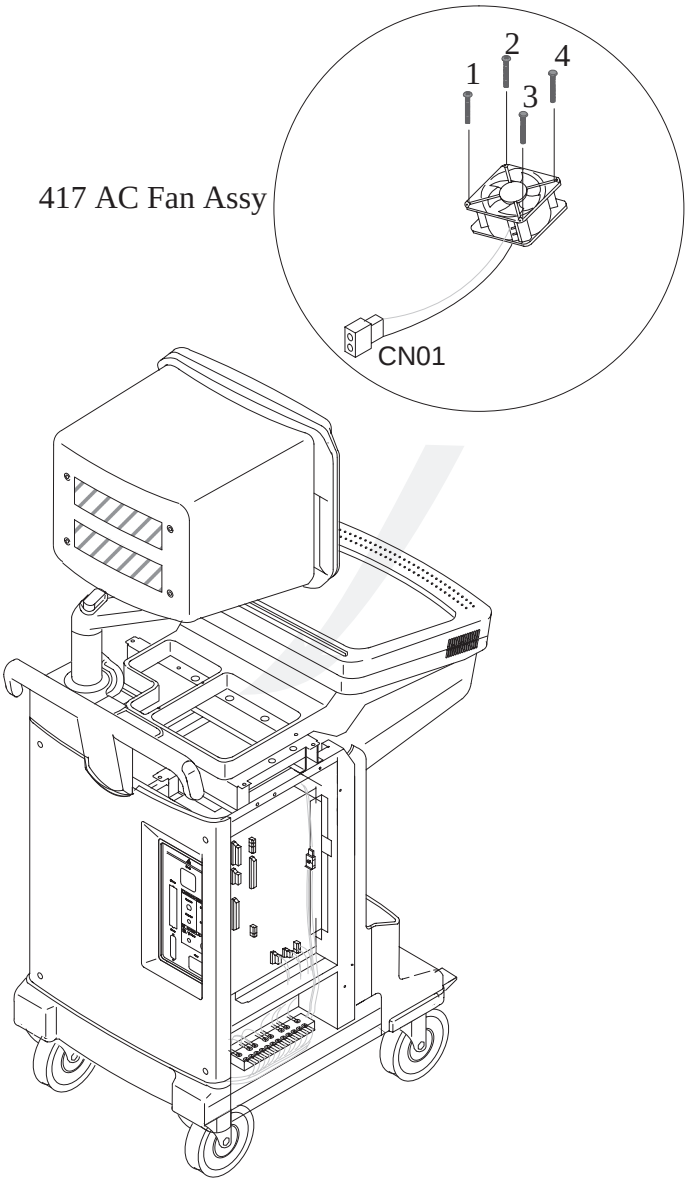
Screwdriver

Procedure

Refer to ILLUSTRATION 6–45.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Top Cover (FRU 409). Refer to 6–2–32.
5. Disconnect one connector (CN01).
6. Unscrew four screws (1 – 4) on the fan.
7. Pull out the Fan Assy outwards.

6–2–39 AC Fan Assy (FRU No. 417) (Continued)



AC FAN ASSY DISASSEMBLY
ILLUSTRATION 6–45

6–2–40 Front Caster (FRU No. 418)

Time Required

15 Minutes

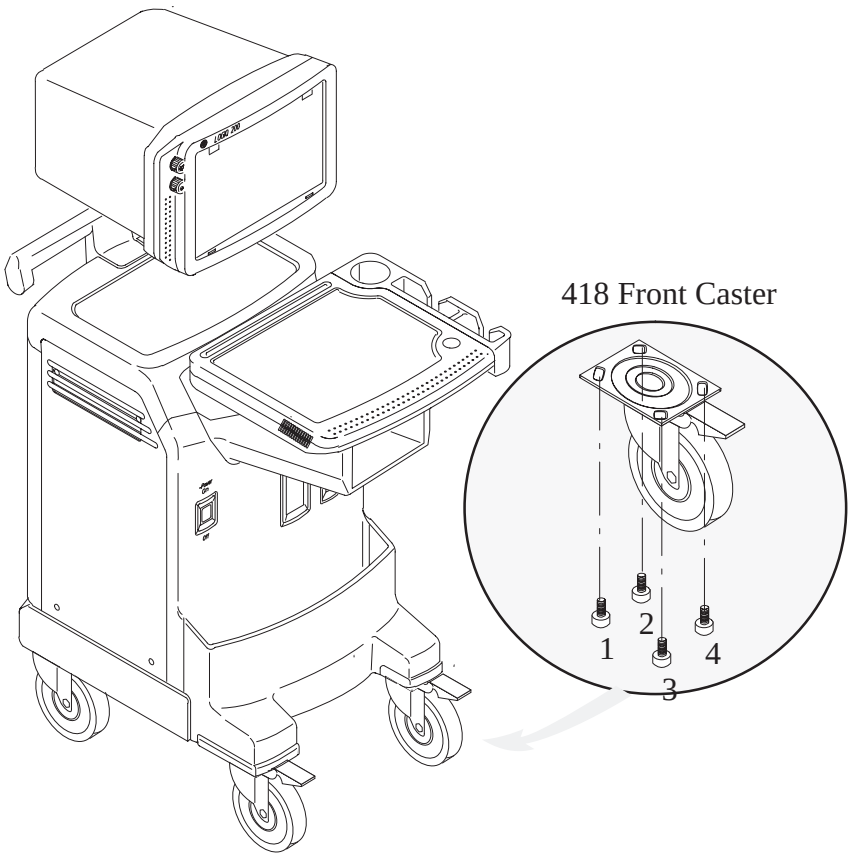
Tool Required

Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–46.

1. Turn OFF the system.
2. Put a box below the Power Trans box.
3. Unscrew four hexagonal bolts (1 – 4) on each Front Caster.
4. Remove the Front Caster.



FRONT CASTER DISASSEMBLY
ILLUSTRATION 6–46

6–2–41 Rear Caster (FRU No. 419)

Time Required

15 Minutes

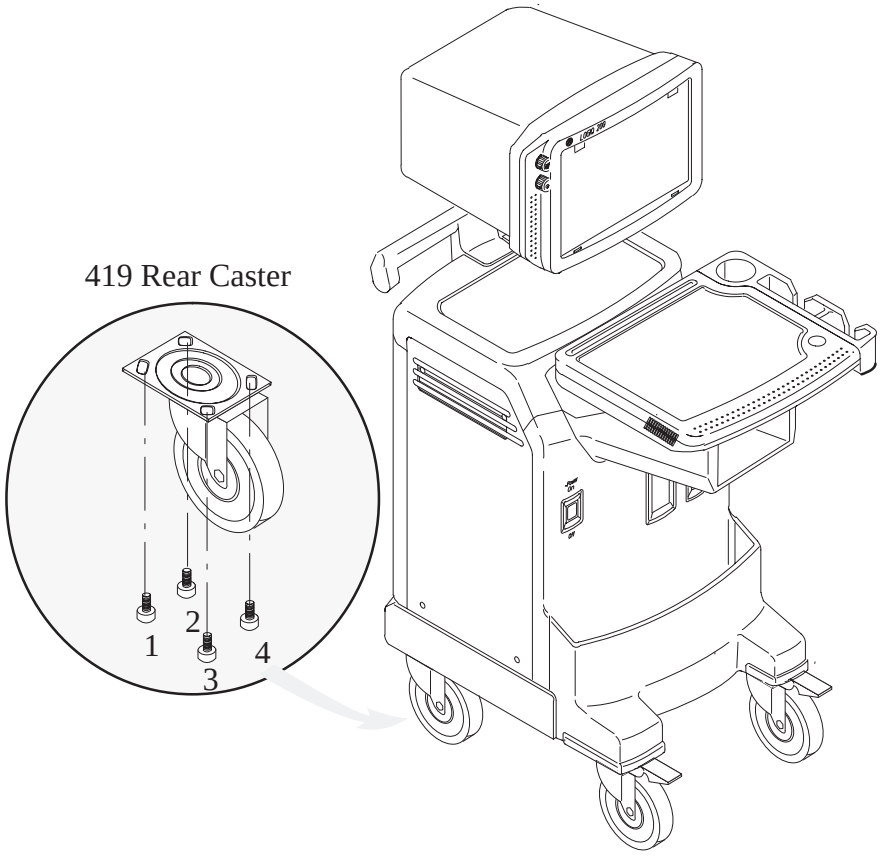
Tool Required

Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–47.

1. Turn OFF the system.
2. Put a box below the Power Trans box.
3. Unscrew four hexagonal bolts (1 – 4) on each Rear Caster.
4. Remove the Rear Caster.



REAR CASTER DISASSEMBLY
ILLUSTRATION 6–47

6–2–42 Bumper Set (FRU No. 420)

Time Required

10 Minutes

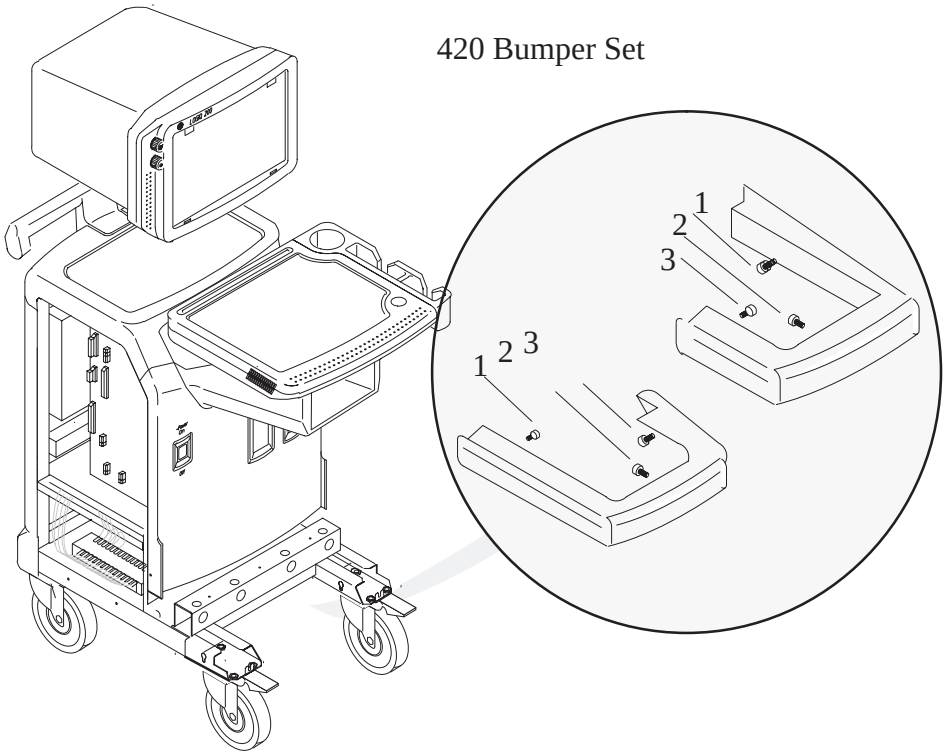
Tool Required

Screwdriver
Hexagonal Wrench

Procedure

Refer to ILLUSTRATION 6–48.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Unscrew three hexagonal bolts (1 – 3) on each Bumper Set
6. Remove the Bumper Set (FRU 420).



BUMPER SET DISASSEMBLY
ILLUSTRATION 6–48

6–2–43 EMI Cover L (FRU No. 421)

Time Required

5 Minutes

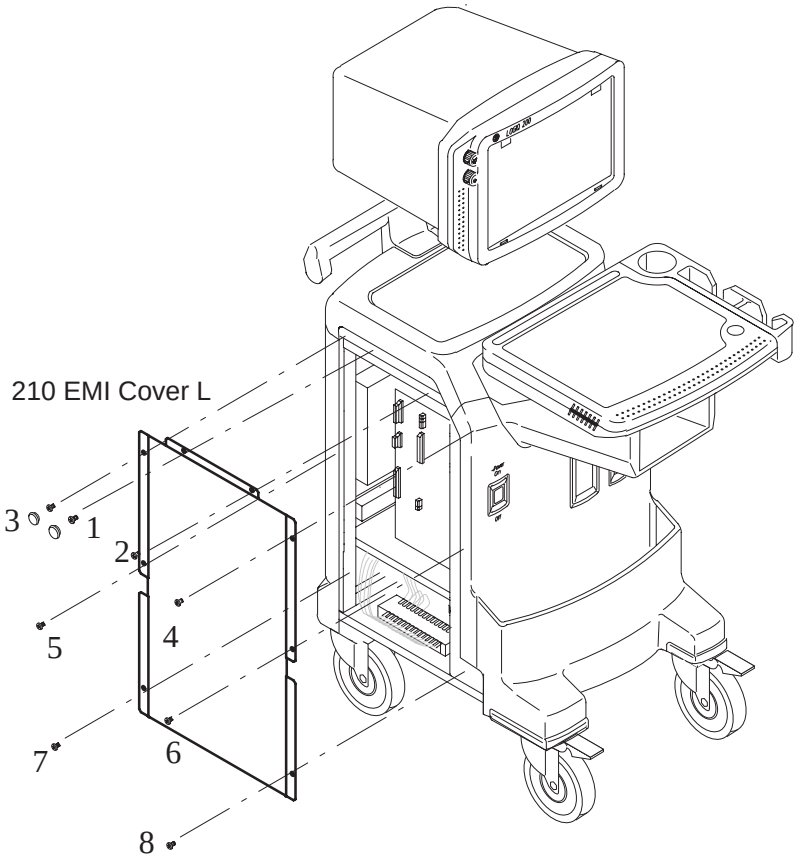
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–49.

1. Turn OFF the system.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Unscrew eight screws (1 – 8).
4. Remove the EMI Cover L (FRU 421).



EMI COVER L DISASSEMBLY
ILLUSTRATION 6–49

6–2–44 PCB Guide Assy (FRU No. 422)

Time Required

5 Minutes

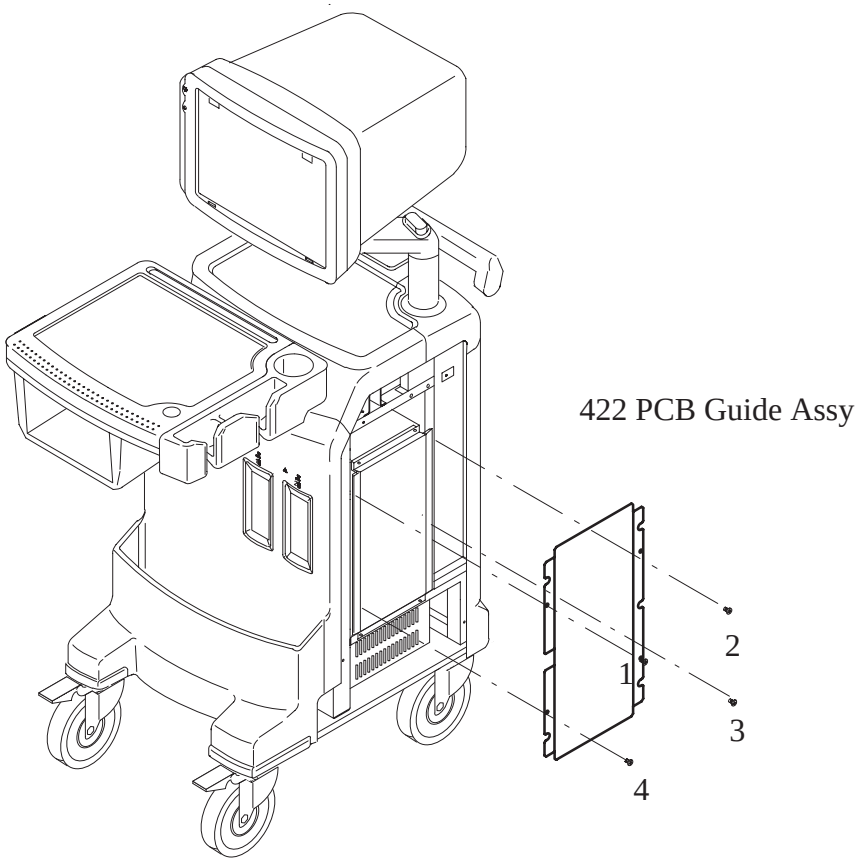
Tool Required

Screwdriver

Procedure

Refer to ILLUSTRATION 6–34.

1. Turn OFF the system.
2. Remove the Right Cover(FRU 405). Refer to 6–2–28.
3. Unscrew four screws (1 – 4).
4. Remove the PCB Guide Assy (FRU 422).



PCB GUIDE DISASSEMBLY
ILLUSTRATION 6–50

6–2–45 Terminal Block 12 Assy (FRU No. 501)

Time Required

10 Minutes

Tool Required

Screwdriver
Hexagonal Wrench

Procedure

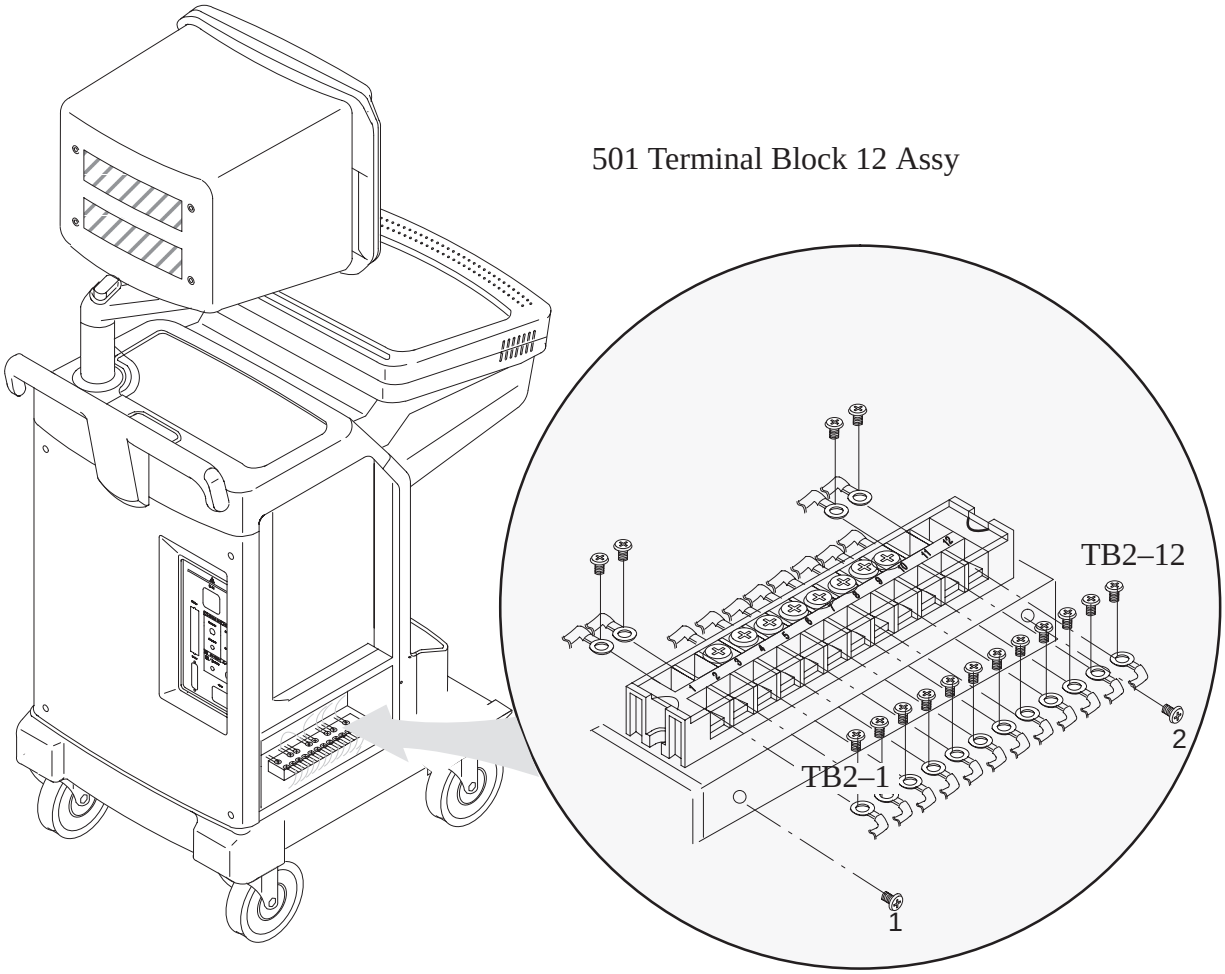
CAUTION

Do NOT unplug the power cord before OFF the power switch.

Refer to ILLUSTRATION 6–51.

1. Turn OFF the system and unplug the power cord from the outlet.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Unscrew the two screws (1 and 2) and pull out the Terminal Block 12 Assy.
4. Unscrew and Disconnect twelve ring terminals (TB2–1 ~ TB2–12). Refer to ILLUSTRATION 5–3,Chapter 5. Cut the tie wrap, if necessary.
5. Unscrew and Disconnect twelve ring terminals (TB2–1 ~ TB2–12).
6. Remove the Terminal Block 12 Assy.

6–2–45 Terminal Block 12 Assy (FRU No. 501) (Continued)



TERMINAL BLOCK 12 ASSY DISASSEMBLY
ILLUSTRATION 6–51

6–2–46 Terminal Block 6 Assy (FRU No. 502)

Time Required

10 Minutes

Tool Required

Screwdriver

Procedure

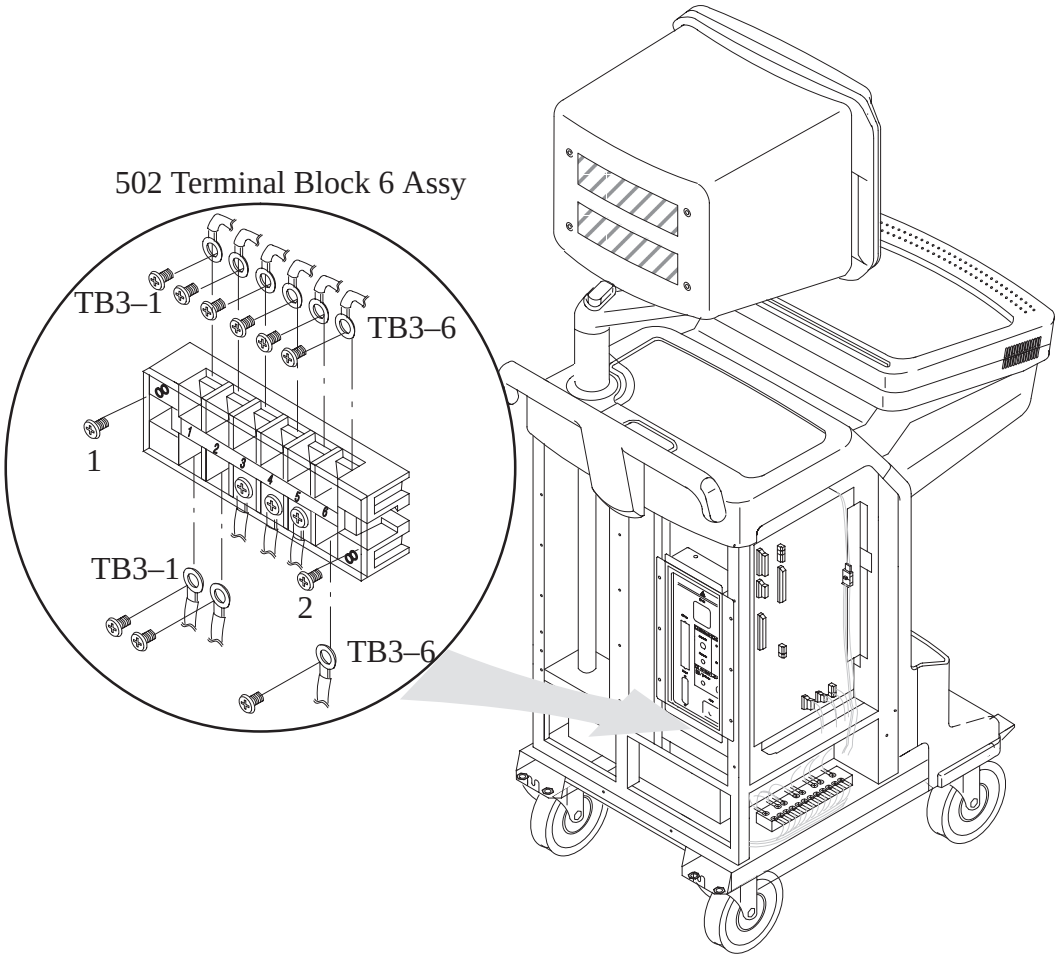
CAUTION

Do NOT unplug the power cord before OFF the power switch.

Refer to ILLUSTRATION 6–52.

1. Turn OFF the system and unplug the power cord from the outlet.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
5. Unscrew and Disconnect six ring terminals (TB3–1 ~TB3–6).
6. Unscrew and Disconnect six ring terminals (TB3–1 ~TB3–6).
7. Unscrew the two screws (1and 2) and pull out the Terminal Block 6 Assy.
8. Remove the Terminal Block 6 Assy.

6–2–46 Terminal Block 6 Assy (FRU No. 502) (Continued)



TERMINAL BLOCK 6 ASSY DISASSEMBLY
ILLUSTRATION 6–52

6–2–47 SMPS Assy (FRU No. 503)

Time Required

10 Minutes

Tool Required

Screwdriver
Hexagonal Wrench (Key Size: 4 mm)

Procedure

Refer to 6–4, SMPS Assy REPLACEMENT.

6–2–48 Power Trans Assy (FRU No. 504)

Time Required

20 Minutes

Tool Required

Screwdriver
Hexagonal Wrench

Procedure

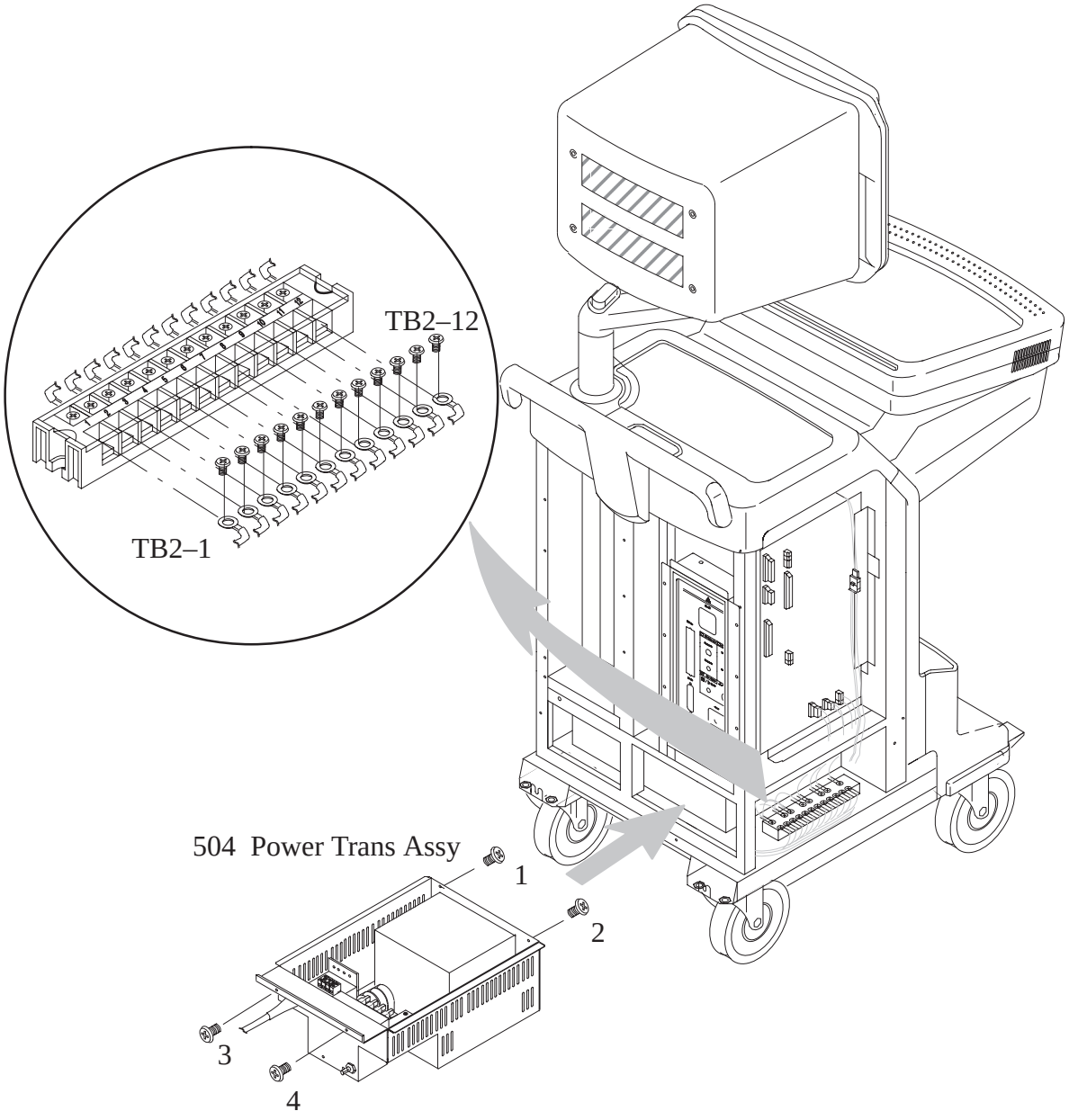
CAUTION

Do NOT unplug the power cord before OFF the power switch.

Refer to ILLUSTRATION 6–53.

1. Turn OFF the system and unplug the power cord from the outlet.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
6. Remove the SMPS Assy (FRU 503). Refer to Refer to 6–4, SMPS Assy REPLACEMENT..
7. Disconnect sixteen cables listed below. Cut the tie wraps off if necessary. For each cable, refer to ILLUSTRATION 6–53.
   a. Unscrew and Disconnect twelve ring terminals (TB2–1 ~ TB2–12) from the Terminal Block 12 Assy. Refer to 6–2–45.
   b. Unscrew and Disconnect two ring terminals. Refer to 6–2–46.
   c. Disconnect two terminals from the Power S/W Assy.
8. Unscrew two screws (1 and 2) of front side and two screws (3 and 4) of rear side of the system.
9. Pull out the Power Trans Assy to the backward of the system.

6–2–48 Power Trans Assy (FRU No. 504) (Continued)



POWER TRANS ASSY DISASSEMBLY
ILLUSTRATION 6–53

6–2–49 Circuit Breaker Set (FRU No. 505)

Time Required

30 Minutes

Tool Required

Screwdriver

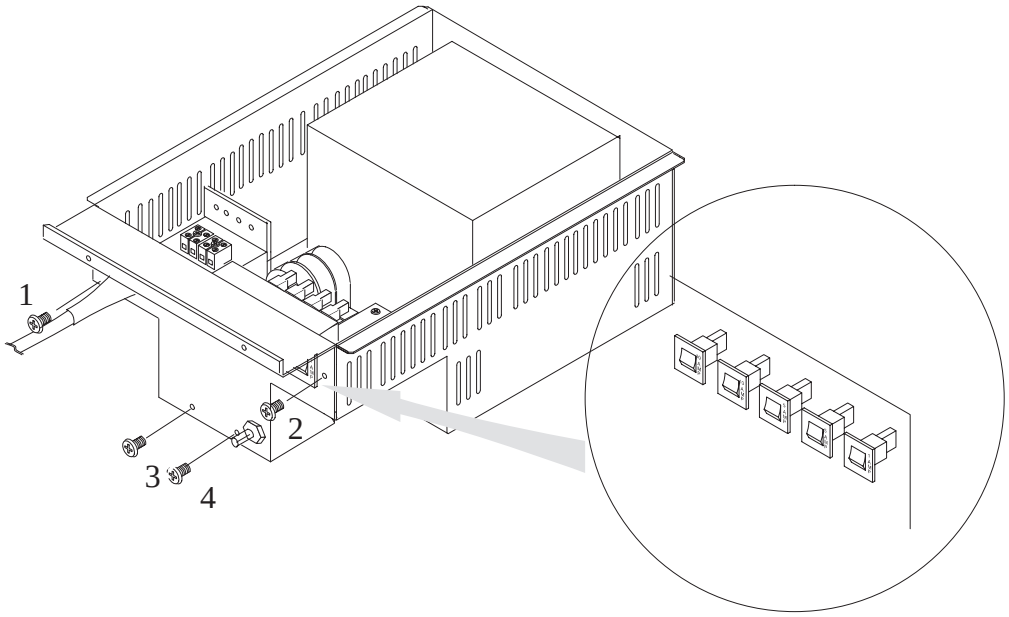
Procedure

CAUTION

Do NOT unplug the power cord before OFF the power switch.

Refer to ILLUSTRATION 6–54.

1. Turn OFF the system & unplug the power cord from the outlet.
2. Remove the Power Trans Assy (FRU 504). Refer to 6–2–48.
3. Unscrew four screws (1 – 4)on the front of Power Trans Assy. Refer to ILLUSTRATION 6–54.
4. Remove the defective Circuit Breaker.



CIRCUIT BREAKER DISASSEMBLY
ILLUSTRATION 6–54

6–3 FUSE REPLACEMENT

6–3–1 Introduction

LOGIQ α200 has three replaceable fuses. The table below states the items of those fuses.

TABLE 6– 1
REPLACEABLE FUSES

LOCATION	Ref. No.	RATING		REMARKS
HV Assy	F1	1 A, SB	250 V	(SB ; Slow Blow type)
HV Assy	F2	500 mA, SB	250 V	(SB ; Slow Blow type)
Monitor	F1	2 A, SB	125 V	(SB ; Slow Blow type)

6–3–2 Replacement Procedures

Concerning replacing each fuse of LOGIQ α200, refer to the following steps;

Note

This system contains no operator serviceable parts inside. Please refer servicing to qualified personnel from GE. (See Address of Chapter 1.)

Parts Required

FRU	PART NAME	QTY	PART #	REMARKS
601	FUSE SET	1	2148236	

Tools Required

Screwdriver
Hexagonal Wrench (Key Size: 3mm)

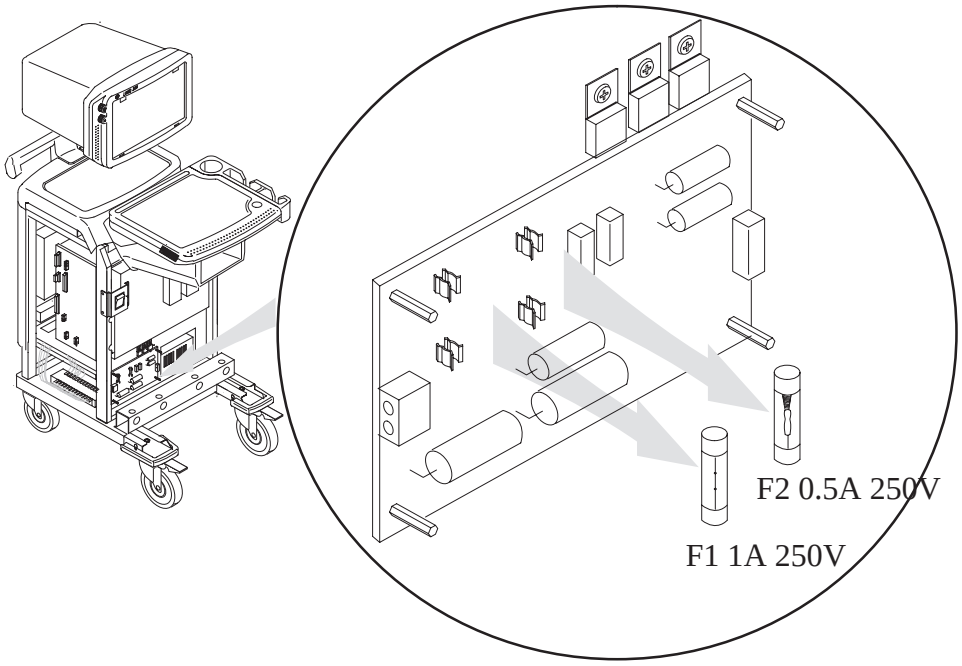
6–3–2 Replacement Procedures (Continued)

(A) F1 and F2 on HV Assy

CAUTION

Make sure that only fuse with the required rated current and of the same type is used for replacement.

1. Turn the system power OFF.and unplug the power cord from the outlet. Follow the OSHA Lockout/Tagout Requirements (29 CFR 1910.147, Direction 46–015902).
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Front Base Cover (FRU 406). Refer to 6–2–29.
5. Remove the Front Cover (FRU 407). Refer to 6–2–30.
6. Replace the defective fuse(s) with new one(s). For the location of fuses, refer to ILLUSTRATION 6–55.
7. Re-install the Covers.

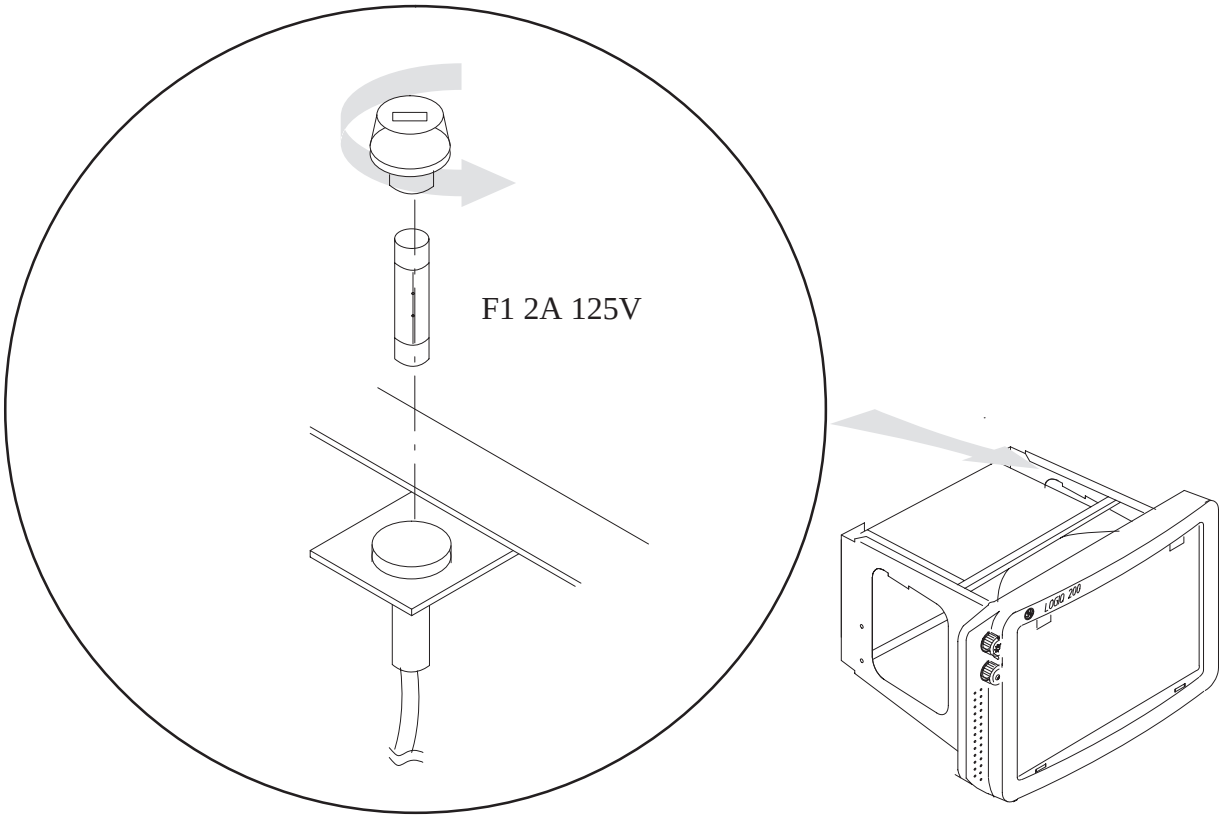


HV ASSY
ILLUSTRATION 6–55

6–3–2 Replacement Procedures (Continued)

(B) F1 on Monitor Assy

1. Turn the system power OFF. Follow the OSHA Lockout/Tagout Requirements (29 CFR 1910.147, Direction 46–015902).
2. Remove the Monitor Bottom Cover and Monitor Rear Cover. Refer to 6–2–4.
3. Replace the defective fuse with new one. For the location of fuses, refer to ILLUSTRATION 6–56. Make sure that only fuse with the required rated current and of same type is used for replacement.
4. Re–install the Monitor Bottom Cover and Monitor Rear Cover.



MONITOR ASSY
ILLUSTRATION 6–56

6–4 SMPS Assy REPLACEMENT

6–4–1 Introduction

This section describes the procedures for replacing the SMPS Assy unit of LOGIQ α200.

6–4–2 Replacement Procedure

READ and UNDERSTAND these instructions thoroughly before proceeding with the replacement. Perform each step in sequence and check it off when completed. If a problem occurs after completion, go back through the procedure and check for implementation errors before contacting your Ultrasound Region Engineer.

CAUTION

Possible operational damage. Failure to strictly follow ESD (Electrostatic Discharge) precautions during this upgrade may cause constant or intermittent operational abnormalities. Strictly follow all precautions.

Check each step as it is completed.

Parts Required

FRU	PART NAME	QTY	PART #	REMARKS
503	SMPS ASSY	1	2148233	

Time Required

Approximately one (1) hours

Tools Required

Standard field Service Tool kit

(A) Removing Covers

1. Turn the system power OFF and unplug the unit.
2. Remove the Left Cover (FRU 404). Refer to 6–2–27.
3. Remove the Right Cover(FRU 405). Refer to 6–2–28.
4. Remove the Rear Cover (FRU 408). Refer to 6–2–31.
5. Remove the EMI Cover L (FRU 421). Refer to 6–2–43.

6–4–2 Replacement Procedure (Continued)

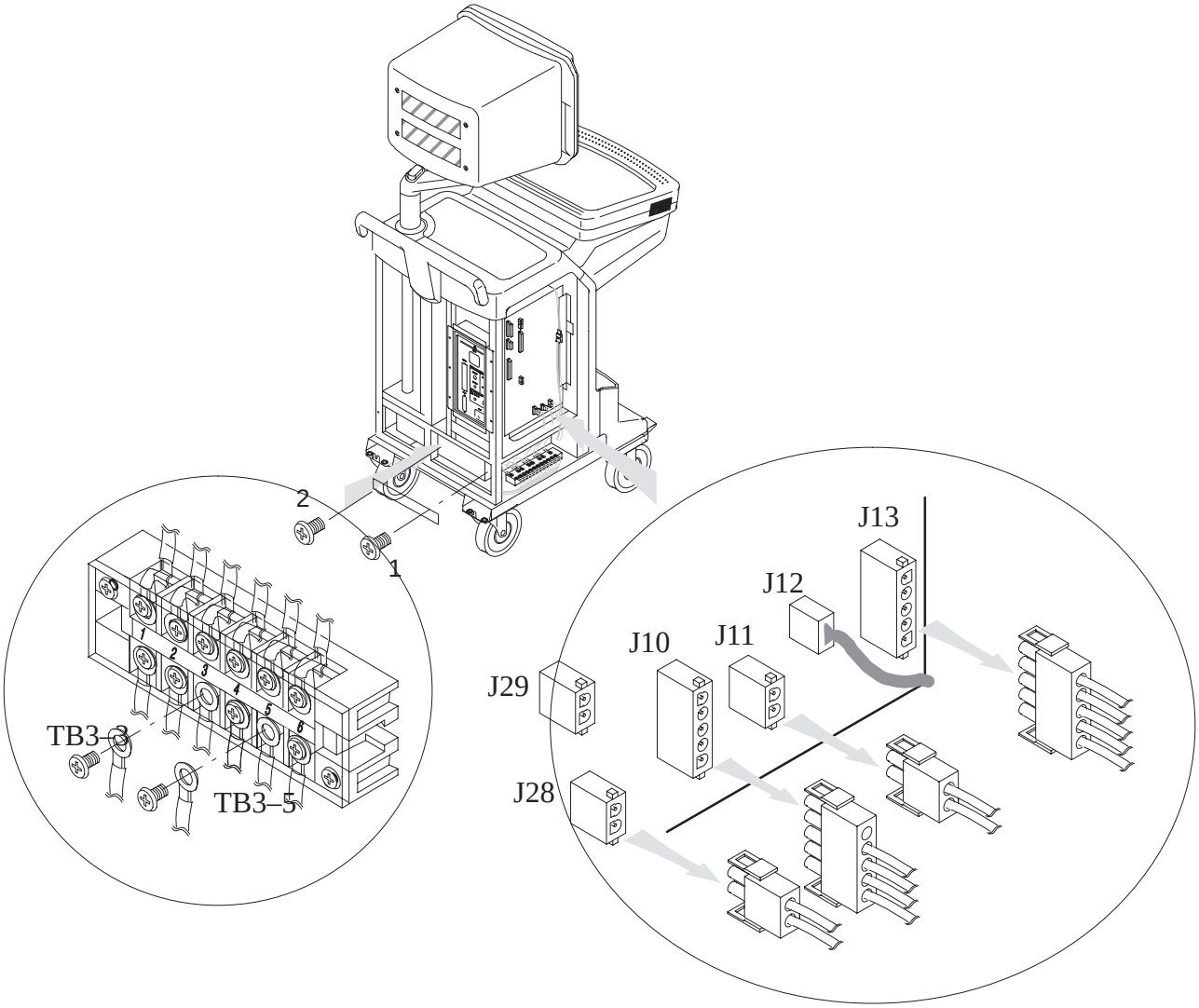
(B) Disconnecting Cables

1. Disconnect seven cables listed below. Cut the tie wraps off if necessary. For each cable, refer to ILLUSTRATION 6–57.

   a. Disconnect six connectors (J10 – J13, J28, and J29) from the Mother Assy.

   b. Unscrew and Disconnect two ring terminals (TB3–3 and TB3–5) from the Terminal Block 6 Assy.

   c. Unscrew two screws (1 and 2).



LEFT SIDE VIEW
ILLUSTRATION 6–57

6–4–2 Replacement Procedure (Continued)

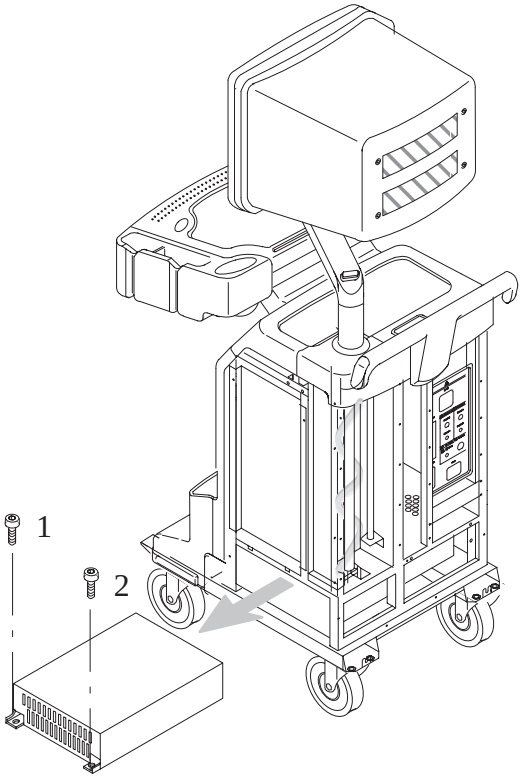
(C) Replacing SMPS Assy

1. Unscrew two hexagonal bolts (1 and 2). Two bolts are located at the front of SMPS Assy.
2. Pull out the SMPS Assy forewards. Refer to ILLUSTRATION 6–58.

WARNING!

PERSONAL INJURY HAZARD! SMPS ASSY UNIT WEIGHTS APPROXIMATELY 3.5 KILOGRAMS (7.8 POUNDS). PAY ATTENTION NOT TO BE INJURED.

3. Remove the SMPS Assy and place new one on the pallet.
4. Slide and move the pallet to the position just under the console. Make sure that the SMPS Assy unit is placed in the correct direction.
5. Screw two hexagonal screws to assemble new SMPS Assy unit to the console.



SMPS ASSY UNIT REMOVAL
ILLUSTRATION 6–58

6–4–2 Replacement Procedure (Continued)

(D) Final Procedure

1. Connect four cables with the appropriate connectors. For the details of cables, refer to 6–4–2, (B), Disconnecting Cables.
2. Re–assemble the removal parts.
3. Plug the system and power it ON.
4. Perform all SMPS Assy checks and leakage current test.
5. Perform functional checks to verify that the system is functioning properly. Refer to Chapter 4, FUNCTIONAL CHECKS, in this manual.
6. This completes the replacement of the SMPS Assy Unit.

7–1 INTRODUCTION

This chapter provides Periodic Maintenance procedures. It is an effective and efficient method of reducing equipment down time and service cost.

7–1–1 Periodic Maintenance

Periodic Maintenance consists of visual inspections, system performance checks, and periodic cleaning of certain critical parts. Perform this procedure at one year intervals. This schedule for maintenance is based on an estimated equipment usage of 40 hours per week.

7–2 PERIODIC MAINTENANCE PROCEDURE

7–2–1 Visual Inspection

1. Check all cables for cracks nicks and abrasions in their insulation.
2. Check that cable sheaths are securely clamped in cable ground/connector clamps where applicable.
3. Check that cables are correctly routed and secured.
4. Check that there are no missing screws or fasteners and replace if necessary.
5. Check that all detachable cable connectors are properly seated in their sockets.
6. Check that all equipment covers and fixtures are in place and undamaged.
7. Check that all plug–in boards are properly seated in cardcage connector.
8. Check that the keyboard keys, controls and Trackball function properly and that no mechanical damage is apparent.

7–2–2 Cleaning

1. Clean CRT filter.
2. Clean the Fans by using a vacuum cleaner and bristled brush.
3. Clean out the interior of the Console by using a vacuum cleaner.

7–2–3 Measurement

1. Make sure that electrical outlet of hospital should provide the power line standard.
   Refer to Chapter 2, Installation.
2. Ensure all SMPS voltages are within tolerance.
   Refer to section 4–3, SMPS ADJUSTMENT in Chapter 4, FUNCTIONAL CHECKS, for adjustment procedure.
3. Make sure that leakage currents are within tolerance.
   Refer to section 7–3, ELECTRICAL SAFETY TESTS in Chapter 7, PERIODIC MAINTENANCE, for measurement procedures.

7–2–4 Battery replacement

If “Battery Low” message is displayed on the monitor,replace the Battery on MST Assy.

1. Print out all user preset data for reference.
2. Remove MST Assy ,slot Number 4 from cardcage.
   Refer to 6–2–18, PC BOARD(S) in chapter 6, RENEWAL PARTS for disassembly procedures.
3. Insert new Battery into empty Battery socket (BAT2) on the edge of MST Assy. Make sure that polarity is correct (upside positive(+)).
4. Remove old Battery from socket (BAT1).
5. Check the user preset data.

CAUTION

If you do not replace Battery even if “Battery Low” message is displayed on the monitor, SRAM data should be lost and reset to the factory default.

7–2–5 Note

Visual inspection of probes (“head”, cable and connector)

7–3 ELECTRICAL SAFETY TESTS

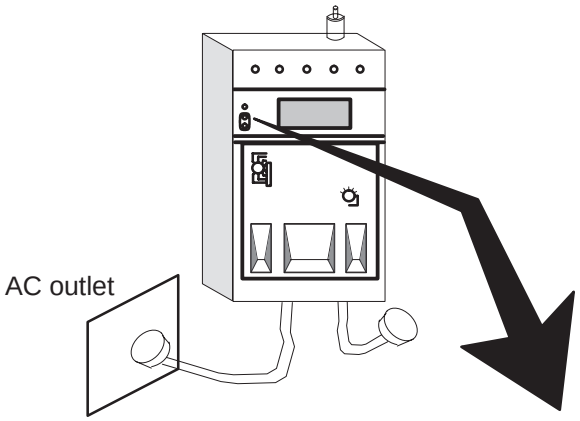
The following tests are performed at the factory and should be performed at the site. These tests are: grounding continuity, chassis leakage current, probe leakage current, and ECG leakage current. All measurements are made with an Electrical Safety Analyzer Model Dale 600/600E built by Dale Technology Corporation or equivalent device.

Recommended Tool

PART NUMBER	NAME	DESCRIPTION
46–285652G1	Electric Safety Analyzer DALE 600	For 110/115V Units
46–328406G2	Electric Safety Analyzer DALE 600E	For 220/240V Units
2113015	Leakage Current Ultrasound Kit	For 100/115V and 220/240V Units

7–3–1 Outlet Test Wiring Arrangement

Test all outlets in the area for proper wiring arrangement by plugging in the Dale 600/600E and noting the combination of lights that are illuminated (Refer to ILLUSTRATION 7–1).



Combination of Light					
Condition	**CORRECT WIRING**	**REVERSE POLARITY**	**OPEN GROUND**	**OPEN HOT**	**HOT/GROUND REVERSED**

OUTLET TEST
ILLUSTRATION 7–1

Note

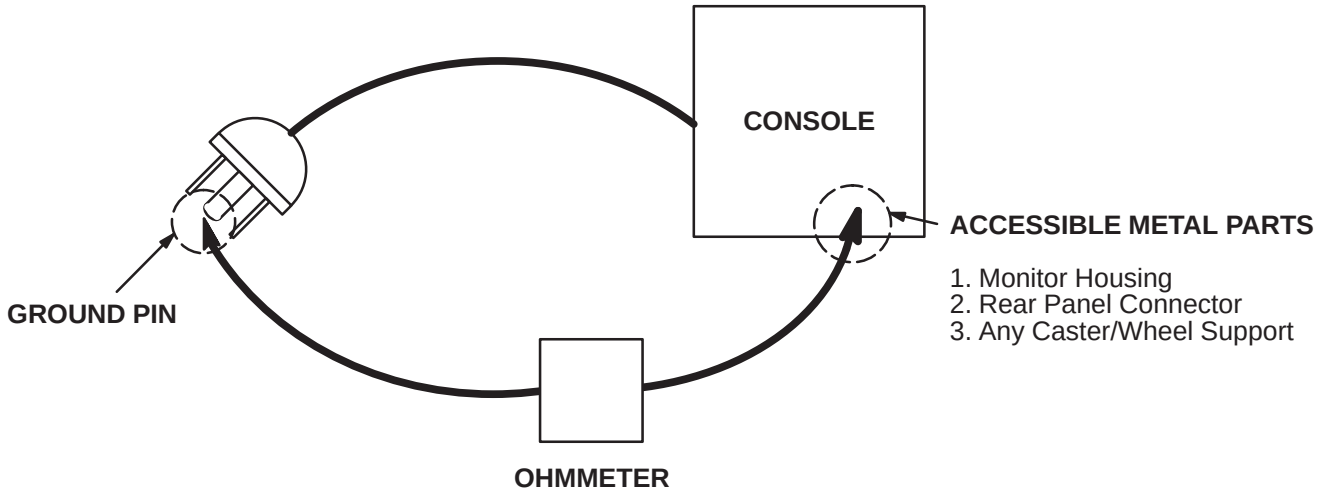
No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

7–3–2 Grounding Continuity

CAUTION

Electric Shock Hazard. The patient must not be contacted to the equipment during this test.

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case (ILLUSTRATION 7–2). The ground wire resistance should be less than **0.2** ohms.



GROUND CONTINUITY TEST
ILLUSTRATION 7–2

Meter Procedure

Follow these steps to test the ground wire resistance.

1. Turn the LOGIQ α200 unit OFF.
2. Plug the unit into the meter, and the meter into the tested AC wall outlet (Refer to ILLUSTRATION 7–2).
3. Plug the black chassis cable into the meter's "CHASSIS" connector and attach the chassis cable clamp to an exposed metal part of the LOGIQ α200 unit (Refer to ILLUSTRATION 7–2).
4. Set the meter's "FUNCTION" switch to the RESISTANCE position.
5. Set the meter's "POLARITY" switch to the OFF (center) position.
6. Measure the ground wire resistance and keep a record of the results with other hard copies of PM data kept on site.

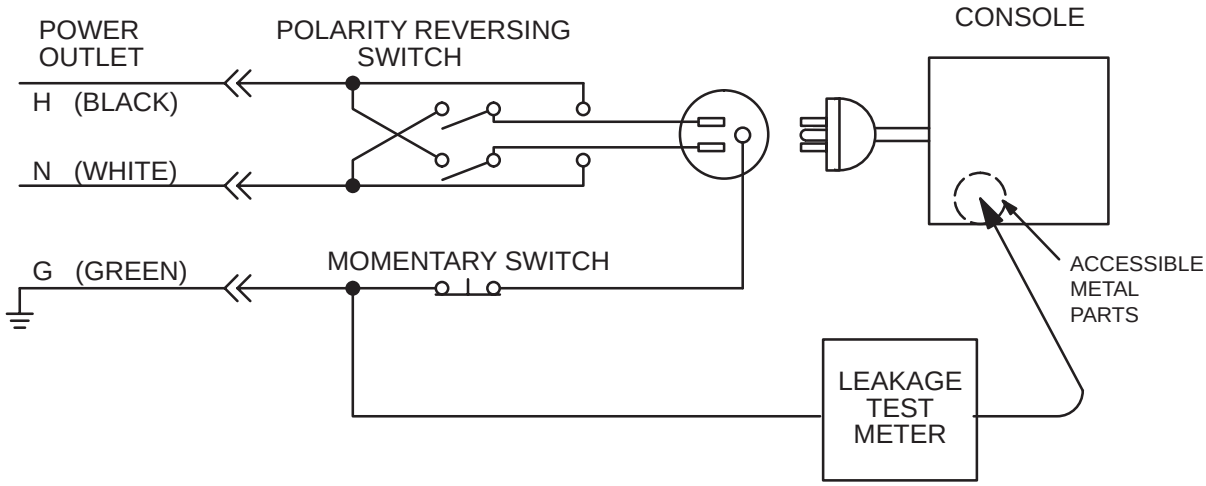
7–3–3 Chassis Leakage Current Test

Definition

Leakage current is the electrical current that could flow ground wire break. The unit, the probes, the ECG module, and all external peripherals must be tested.

Generic Procedure

The test verifies the isolation of the power line from the chassis. The testing meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit ON and OFF, with the power line polarity Normal and Reversed. **Record the highest reading of current.**



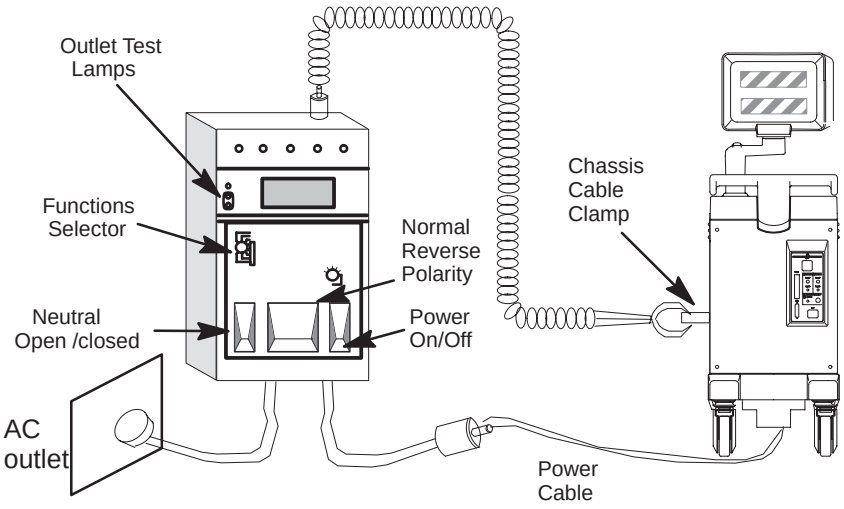
SETUP FOR CHASSIS SOURCE LEAKAGE CURRENT
ILLUSTRATION 7–3

7–3–3 Chassis Leakage Current Test (Continued)

Meter Procedure

Follow these steps to test the unit for leakage current.

1. Turn the LOGIQ α200 unit OFF.
2. Plug the unit into the meter, and the meter into the tested AC wall outlet (Refer to ILLUSTRATION 7–4).



GROUND AND CHASSIS LEAKAGE CURRENT TEST
ILLUSTRATION 7–4

3. Plug the black chassis cable into the meter's "CHASSIS" connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ α200 unit (Refer to ILLUSTRATION 7–4).
4. Set the tester's "FUNCTION" switch to CHASSIS position.
5. Follow the test conditions described in the following table for every test point on the unit.

TABLE 7– 1
CHASSIS LEAKAGE CURRENT TEST CONDITIONS

TEST	CONDITION
1	Mounting screw for transducer receptacle
2	Wheel support
3	Mounting screw for CRT housing
4	Mounting screw for peripheral plugged into unit
5	Mounting screw for other peripheral powered by unit

6. Keep a record of the results with other hard copies of PM data kept on site.

7–3–3 Chassis Leakage Current Test (Continued)

Data Sheet for Chassis Source Leakage Current

Follow the foregoing test procedure. The test passes when all readings measure less than the value shown in the table below (TABLE 7– 2).

TABLE 7– 2
MAXIMUM ALLOWANCE LIMIT FOR CHASSIS SOURCE LEAKAGE CURRENT

COUNTRY	NORMAL CONDITION	OPEN GROUND	REVERSE POLARITY	OPEN NEUTRAL
USA	N/A	0.3mA	0.3mA	N/A
OTHERS	0.1mA	0.5mA	0.5mA	0.5mA

CAUTION

Electric Shock Hazard. When the meter's ground switch is OPEN, don't touch the unit!

TABLE 7– 3
DATA SHEET FOR CHASSIS SOURCE LEAKAGE CURRENT

Unit Power	Tester POLARITY Switch	Tester NEUTRAL or GROUND Switch	Test1 Probe connector	Test2 wheel	Test3 CRT	Test4	Test5
Enter name of tested peripheral here:							
ON	NORM	OPEN					
ON	NORM	CLOSED					
ON	REV	OPEN					
ON	REV	CLOSED					
OFF	NORM	OPEN					
OFF	NORM	CLOSED					
OFF	REV	OPEN					
OFF	REV	CLOSED					

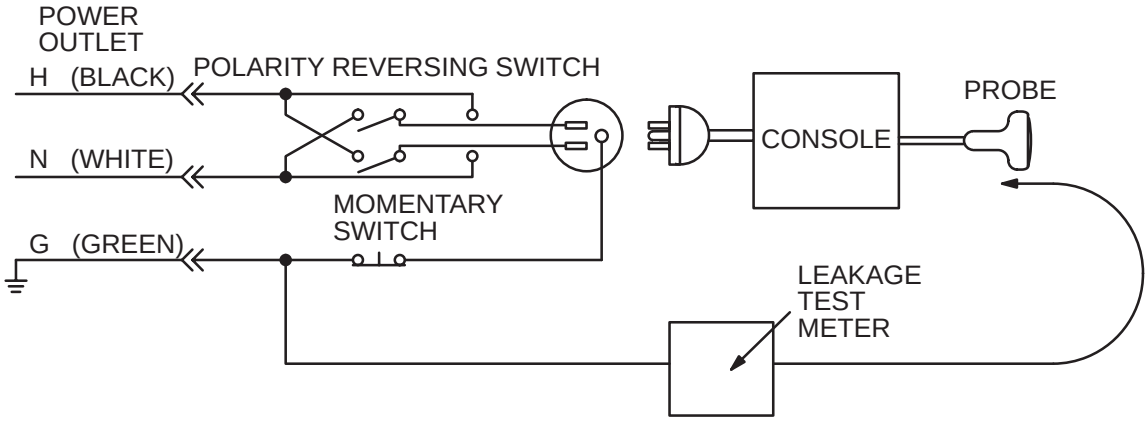
7–3–4 Probe Leakage Current Test

Definition

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

Generic Procedure

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On. For each combination, the probe must be active to find the worst case condition.



SETUP FOR PROBE LEAKAGE CURRENT
ILLUSTRATION 7–5

Note

Each probe will have some amount of leakage current, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement.

7–3–4 Probe Leakage Current Test (Continued)

Meter Procedure Using Probe Adapter

The Dale 600/600E provides a method for testing probes independently from the system. The meter utilizes a probe adapter to apply a test potential commonly to all connector pins.

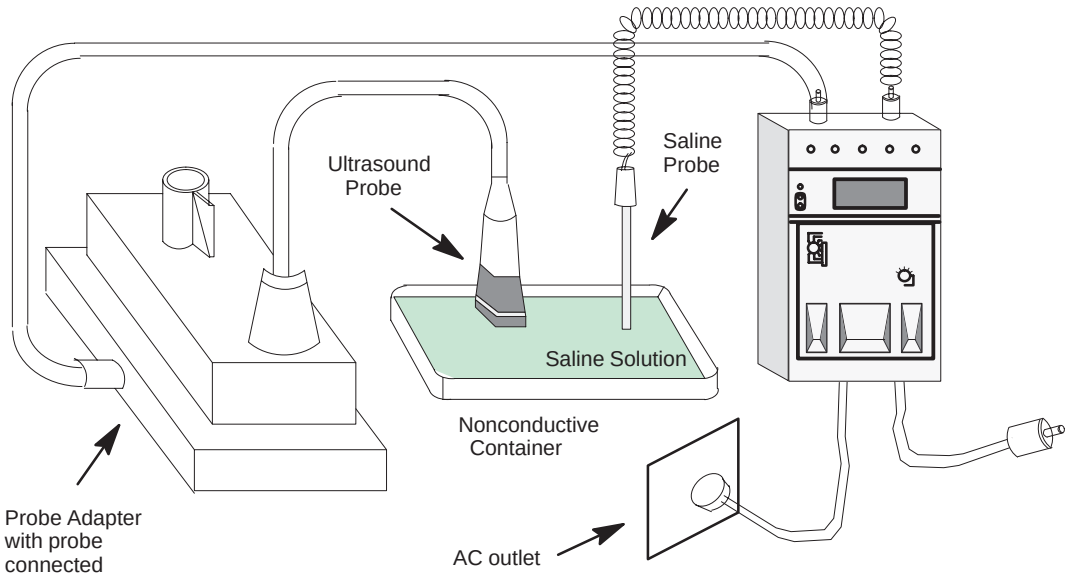
The probe's imaging area is immersed in a saline solution along with a grounding probe from the meter to complete the current path. Saline solution is a mixture of water and salt. The salt adds a free ion to the water, making it conductive. Normal saline solution is 0.9% salt or 1/2 gram salt per 1 liter of water. If saline is not available, a mixture of 1 quart water with one or more grams of table salt, mixed thoroughly, will substitute.

CAUTION

To avoid probe damage and possible electric shock, do not immerse probes into any liquid beyond the level indicated in the probe users manual. Do not touch the probe, conductive liquid or any part of the unit under test while the ISO TEST switch is depressed.

Follow these steps to test each transducer for leakage current.

1. Turn the LOGIQ α200 unit OFF.
2. Plug the unit into the test meter, and the meter into the tested AC wall outlet.
3. Connect the probe for test with the meter's appropriate adapter (Refer to ILLUSTRATION 7–6).
4. Plug the saline probe into the meter's "CHASSIS" connector (Refer to ILLUSTRATION 7–6).



TRANSDUCER SOURCE LEAKAGE CURRENT TEST
ILLUSTRATION 7–6

7–3–4 Probe Leakage Current Test (Continued)

5. Plug the probe adapter into the meter's connector marked "EXTERNAL" (Refer to ILLUSTRATION 7–6).
6. Set the meter's "FUNCTION" switch to EXTERNAL position.
7. Add the saline probe and the imaging area of the probe into the saline bath.
8. Have unit power ON for the first part; turn it OFF for the second half.
9. Depress the ISO TEST rocker switch and record the highest current reading.
10. Follow the test conditions described in the following table (TABLE 7– 5) for every transducer.
11. Keep a record of the results with other hand copies of PM data.

Meter Procedure

Follow these steps to test each transducer for leakage current.

1. Turn the LOGIQ α200 unit OFF.
2. Plug the unit into the test meter, and the meter into the tested AC wall outlet.
3. Plug the external probe into the meter's "EXTERNAL" connector.
4. Set the meter's "FUNCTION" switch to EXTERNAL position.
5. Connect the probe for test with the connector of the console.
6. Apply a liberal amount of gel to the transducer's lens.
7. Wrap the transducer in aluminum foil, making sure there is good contact with its acoustic aperture.
8. Either suspend the transducer by its cable or place it on an insulated surface.
9. Have unit power ON for the first part; turn it OFF for the second half.
10. Hold the external probe against the aluminum foil on the transducer when the unit is ready to scan.
11. Depress the ISO TEST rocker switch and record the highest current reading.
12. Follow the test conditions described in the following table (TABLE 7– 5) for every transducer.
13. Keep a record of the results with other hand copies of PM data.

7–3–4 Probe Leakage Current Test (Continued)

Data Sheet for Transducer Source Leakage Current

Follow the foregoing test procedure for every transducer. The test passes when all readings measure less than the value shown in the table below (TABLE 7– 4).

TABLE 7– 4
MAXIMUM ALLOWANCE LIMIT FOR PROBE LEAKAGE CURRENT

1. Type BF Applied Part Leakage Current Limits
   [Non–conductive (floating) Surface and Cavity Transducers]

COUNTRY	NORMAL CONDITION	OPEN GROUND	REVERSE POLARITY	OPEN NEUTRAL
USA	0.05mA	0.05mA	0.05mA	0.05mA
OTHERS	0.1mA	0.5mA	0.5mA	0.5mA

2. Type CF Applied Part Leakage Current Limits
   [Surgical Transducer and ECG Connections]

COUNTRY	NORMAL CONDITION	OPEN GROUND	REVERSE POLARITY	OPEN NEUTRAL
USA	0.01mA	0.01mA	0.01mA	0.01mA
OTHERS	0.01mA	0.05mA	0.05mA	0.05mA

TABLE 7– 5
DATA SHEET FOR TRANSDUCER SOURCE LEAKAGE CURRENT

Transducer tested:

LOGIQ α200 Unit Power	Tester Power Polarity Switch	Tester Ground or Neutral Switch	Measurement
ON	NORM	OPEN	
ON	NORM	CLOSED	
ON	REV	OPEN	
ON	REV	CLOSED	
OFF	NORM	OPEN	
OFF	NORM	CLOSED	
OFF	REV	OPEN	
OFF	REV	CLOSED	

7–3–5 When There's Too Much Leakage Current...

Chassis Fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part.

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet; verify it is grounded. Notify the user or owner to correct any deviations. As a work around, check the other outlets to see if they could be used instead.

Note

No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

Probe Fails

Test the probe in another transducer interface connector.

If excessive leakage current is slot dependent, inspect the Transducer Interface board for bent pins, poor connections, and ground continuity.

If the problem still has stayed with the probe, replace the probe.

Peripheral Fails

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

Still Fails

If all else fails, begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

New Unit

If the leakage current measurement tests fail on a new unit and if situation can not be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

8–1 INTRODUCTION

This chapter is provided to keep option installation instructions. Place all option installation instructions in this chapter after completing the installation of the options.

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