GE Medical Systems

Technical Publications

Direction 2304881

Revision 8

Signa® 1.5T Twin*Speed*

System Upgrade Installation

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Operating Documentation

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent, have notation **"damage in shipment"** written on **all** copies of the freight or express bill **before** delivery is accepted or "signed for" by a General Electric representative or a hospital receiving agent. Whether noted or concealed, damage **MUST** be reported to the carrier **immediately** upon discovery, or in any event, within **14** days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this **14** day period.

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

Rev. 08/15/2003

GE Medical Systems

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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 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。
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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。

REVISION HISTORY

REV	DATE	PRIMARY REASON FOR CHANGE
0	Nov 28, 2001	Initial Release.
1	Jan 20, 2002	Tab 2, Magnet Enclosure – Updated Direction 2309133 with new instructions for performing vacuum leak test, added gradient block gasket screw length determination, and other minor corrections. Updated Direction 2319224 with new instructions for performing vacuum leak test, added gradient block gasket screw length determination, corrected the mounting of front of split bridge, and other minor corrections. Tab 8, System Cabinet – Added transfer of Fast Receiver from Horizon 5.x cabinet. Tab 15, ACGD/PDU Cabinet – Added ribbon cable installation and ferrite filter installation on incoming power wires.
2	Jun 6, 2002	Overview Tab, Section 1 – Added equipment and material return info for GoldSeal. Updated Product Locator return info. Added catalog info for upgrading to 10.x 1.5T Twin*Speed* with EXCITE Technology. Updated existing Catalog info for upgrading to 9.x 1.5T Twin*Speed*. Added MGD upgrade info. Section 2 – Updated de–installation guidelines. Section 3 – Updated upgrade flow charts to include 10.x (MGD) alternatives and the addition of vacuum and coolant tests to be completed before Bridge installation. Section 4 – Updated cable removal info for upgrading to 10.x. Updated cable tables and cable maps for upgrading to 10.x. Section 5 – Updated Final Coordination info. Tab 1, System – Added Direction 2338872 10.x Fiber Optic installation instructions. Tab 2, Magnet Enclosure – For all instructions, added coolant tests, added cable connections to Crosspoint module in Rear Pedestal, revised vacuum hose connection, added Bridge alignment mark on front End Bell, and added install instructions for new cosmetic rings. Tab 4 – Penetration Panel – Revised picture of module. Tab 8, System Cabinet – Revised title of 2170004. Added Direction 2338502 for 10.x System Cabinet (MGD) Installation. Section 13, Operator Workspace – Added serial converter installation and new cables required for 10.x (MGD). Tab 15, ACGD/PDU – Added DIP switch info for the “I” setting. Tab 16, SRF Cabinet – Added Direction 2346942 for SRFD2 Cabinet installation. Tab 17, TAC – Updated cable connection information.
3	Sep 27, 2002	Overview Tab, Section 1 – Added GoldSeal information to Sec 1–4, Discarded Material Return Process. Switched Sections 2 and 3. Section 2 – Removed Head/Body systems Gain & SNR from flowchart calibration. Section 4 – Corrected gradient cable wire connection designators at the gradient coil on the cable maps. Tab 1 – Revised Direction 2308287 to reflect recent PCN’s that changed cable part numbers due to cable length changes . Also added new preterminated cable that connects to TAC cabinet from ACGD/PDU cabinet. Tab 2 – Added End Bell bridge leveling mark on page 4. Tab 4 – Added more information on attaching right angle heliax connectors to Pen Panel showing correct installation of O–rings (CQA 1029849). Tab 13 – Revised information on DIP switch settings on serial expansion box and replaced existing monitor with LCD monitor. Tab 15 – Added “I” DIP switch setting information for circuit breaker. Removed ferrite filter from main power and ground installation (CQA 1026740). Tab 16 – Added alternative power connection for SRF cabinet.
4	Jun 16, 2003	Tab 15 – Added neutral connection for SSM and TAC in PDU power cable connections table (SPR# MRIge82869). Revised wording on DIP switch settings. Tab 16 – Removed runs 745 and 748 from title in procedure C. These are 1.0T cables and are not used on TwinSpeed. Added note for location of UFI Label kit.
5	Jan 15, 2004	Added EXCITE II information through out manual. Removed references to EXCITE I (MGD). Overvew Tab: Section 1 – Updated all catalogs for EXCITE II information. Section 2 – Updated flowcharts for EXCITE II. Section 4 – Updated cable tables and cable maps for EXCITE II. Tab 1 – Added Times Microwave cable installation info. Added EXCITE II fiber otic cable installation. Tab 2 – Added magnet enclosure upgrade instructions for EXCITE II. Tab 4 – Added EXCITE II penetration panel upgrade instructions. Tab 8 – Added EXCITE II upgrade instructions for System Cabinet. Tab 13 – Added Operator Workspace Upgrade to EXCITE II instructions. Addded Linux OW installation instructions. Tab 15 – Revised existing instructions and added ACGD/PDU GP Module upgrade instructions. Tab 16 – Removed SRF installation instructions.
6	Aug 26, 2004	Overview Tab: Section 1 – Revised software load instructions in flowchart for upgrade to EXCITE 11.x.
7	Dec 15, 2006	Overview Tab: Section 2 – Corrected IIQ Kit catalog number from M3090PE to M3090NE in three places (MRIhc19864).
8	Nov 10, 2010	Overview Tab, Section 1 – Revised Ferrous Material Handling warning and 200 gauss plot illustration. Tab 1 – Directions 2308287, 2287106 & 2398342: Revised Ferrous Material Handling warnings. Tab 2 – Directions 2309132, 2309133, and 2319224: Revised instructions for instaling blower box and added Ferrous Material Warnings. Tab 3 – Direction 2326444: Added warning that insertion tool jack is ferrous. (CAPA 1859293)

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SECTION 1 – SYSTEM UPGRADE INFORMATION

1–1 UPGRADE INTRODUCTION

The procedures contained within this manual are used to upgrade an:

- Existing 1.5T non–Twin*Speed* system to a 1.5T Twin*Speed* system
- Existing 1.5T non–Twin*Speed* system to a EXCITE 1.5T Twin*Speed* system

Refer to Direction 2143793 for upgrading an Existing 1.5T Twin*Speed* system to EXCITE 1.5T Twin*Speed* system.

Signa Advantage 4.x/5.x, Horizon systems, and Signa LX systems that use a magnet other than LCC must have the existing magnet removed and replaced with a 1.5T Twin*Speed* magnet and enclosure. The instructions for the deinstallation any of these systems is contained in Direction 2316677, *Magnet and System Deinstallation for Upgrade to 1.5T TwinSpeed*. The deinstallation includes magnet & enclosure, and all affected cables, cabinets, or modules. This must be completed before the upgrade process outlined in this manual can start.

Note

Throughout this document references to Signa Twin*Speed* apply to both Signa EXCITE 1.5T Twin*Speed* and Signa 1.5T Twin*Speed* except where explicitly documented as different.

NOTICE:

During this hardware upgrade, the magnet may be ramped to full field strength. Individuals working in the magnet room must be MR safety trained.

WARNING!

FERROUS MATERIAL HAZARD!

DELIVERY EQUIPMENT AND OTHER TOOLS AND PARTS REQUIRED FOR THIS INSTALLATION CONTAIN FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME DANGEROUS PROJECTILES. KEEP ALL FERROUS TOOLS AS FAR FROM THE MAGNET AS POSSIBLE. THE BLOWER BOX REQUIRES TWO PEOPLE AND MUST BE OUTSIDE THE 200 GAUSS ZONE.

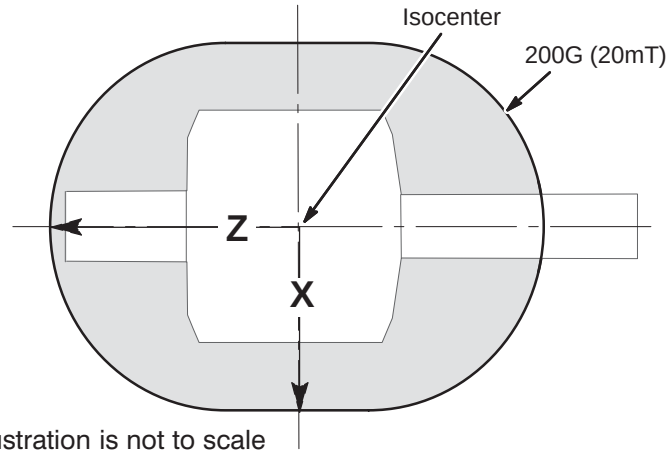


Illustration is not to scale

Approximate Distance from isocenter to 200G Line		
	X	Z
1.5T	150 cm (59 in)[1]	205 cm (81 in)[1]
Unshielded Magnet	Measure [2]	

Note 1:
These distances represent maximum distances for the magnet strength listed. Use gauss meter if needed.

Note 2:
For unshielded magnets, the magnetic field must be measured using a gauss meter.

1–2 SITE READY CHECK

Pre–installation work must be completed before equipment is delivered to avoid delays and confusion. Refer to *Direction 2304880, Signa TwinSpeed Upgrade Pre–installation,* Pre–installation Checklist tab.

Tools and test equipment to install and calibrate the Signa Horizon 8.x system are listed in *Direction 2304880, Signa TwinSpeed Upgrade Pre–installation*, Section 10, TOOLS AND TEST EQUIPMENT.

Service installation tools used in this manual that may not be included in above references lists include:

- 46–301450G1 Fiber Optic Cable Connector Repair kit
- 46–320362G1 Heliax Termination kit
- 2134776 Gradient Cable Termination kit

1–3 UPGRADE SCHEDULE CONSIDERATIONS

FMIs, periodic maintenance, installation of prerequisite upgrades and/or options (Multi–coil, Spectroscopy, etc.) will directly add to the man–hour and system down–time total. Be sure that all planned activity is considered when predicting the return of system to customer. Also verify Application Specialist is scheduled at the end of the installation to instruct users. Additional time must also be scheduled to instruct users following completion of upgrade.

1–4 PRODUCT LOCATOR

The Global Install Base Database (also known as Product Locator System) tracks shipment, trans–shipment, and field location of the serialized models. There are now two methods for submitting Product Locator information.

1. At this time, for **U.S. ONLY**, the preferred method of submitting information is the *FE Site Verification Web Site* at:
   http://gein2.med.ge.com/gib
   The FE Site Verification consists of three components that are available on the web from the main menu. They are:
   - Install/deinstall product locator model and serial numbers
   - Add/modify ship to address information
   - Update CARES FE data for primary/secondary FEs

To obtain a copy of the FE training tutorial for using this website, a downloadable copy is available at the following: Product Locator Support Central Page – http://supportcentral.ge.com/15563

2. One “Shipping Card” is filled out and submitted when shipped (extra cards are supplied for trans–shipments between storage and distribution points), and the “Installation Card” and extra shipment cards are attached.

Verify that serial and model number on each rating plate matches installation card numbers before removing installation card. Note that there may be one or more shipment cards and bar code labels with the installation card. These shipment cards are used to trace the transfer of serialized units between various inventory storage and distribution points until the product reaches its final installation destination. Process just the installation card and discard any extra shipment cards and labels.

1–5 DISCARDED MATERIAL RETURN PROCESS

The equipment or material being removed by the Signa 1.5T Twin*Speed* upgrade have a potential value for service of the installed base. The disposition of such must be controlled by GE. Disposition of the removed material is per GE Medical Systems Policy and Procedures.

Note

The following equipment or material removed by the 1.5T Twin*Speed* upgrade are ***required to be returned*** to GoldSeal:

- Octane Computer and Duplex with all associated cables and modules
- All parts, cables, modules, and equipment deinstalled for the EXCITE upgrade
- SGD or Gradient Cabinet
- System Cabinet
- Indigo Computer with all associated boards/cables (includes reflex board, cable kit, and audio cables)

Packaging and/or transportation details can be obtained through the local Installation Specialist. If unavailable, call GoldSeal.

1. Contact either of the following for disposition, with GoldSeal being the primary contact.
   - GoldSeal – Contact the MR Product Specialist at GoldSeal Logistics phone number 877–251–4468. If GoldSeal is accepting the returned equipment then all transportation arrangements and packaging will be processed through them. If GoldSeal is not accepting the return then they will advise you to contact GEMS Renewable Resources.
   - GEMS Renewable Resources – For coordination of transportation arrangements and packaging. Phone (414)–747–6997 or Dial Comm 8*579–6997; Fax (414)–747–6855; Field ASPEN 1–800–525–1516, Box #26041.
2. When calling, the following information is needed.
   - FDO (Future Delivery Order) number under which the upgrade was shipped.
   - Site name, address, and phone numbers.
   - Date of completed upgrade.
   - Name and Beeper number of Field Engineer that could be available when the equipment is picked up.
3. Regulations governing the disposal of this equipment or material vary from location to location and from country to country. In order to insure compliance with all local, state, or national environment, health, and safety regulations, dispose of all items in the per local GEMS policy and procedures and other applicable published guidance. Contact GEMS Recycling Center for assistance.
4. Process product locater cards for all serialized components removed from the system according to policy.
   - Yellow – Post–installation (Phantoms, Coils).

“Product Delivery Instructions” (PDI) specify box contents, part numbers, and shipping procedure. The PDI is numbered according to the catalog number (for example, PDI – M1090NC is for the Signa Horizon EchoSpeed Upgrade). Lists of items included with each box are detailed by separate checklists, or a separate sheet that provides a summery of that box contents. Refer to PDI and packing lists for information specific to your shipment.

A set of service and operator manuals is delivered with the Fixed Site Kit. Refer to checklists packed with “Technical Publication” boxes for a list of delivered documents.

1–6 PRODUCT DELIVERY INSTRUCTIONS AND PACKING

The “Shipping Document” lists catalog numbers delivered. **Review and confirm that order is delivered complete.** Check impact on installation schedule if Catalogs and/or packing boxes are missing and/or noted as shipped short.

Labels that are attached to the outside of packing boxes summarize box contents. The labels are color coded for different installation areas as follows:

- Green – Equipment Room
- Purple – Operator’s Room
- Orange – Magnet Room

1–7 UPGRADE SEQUENCE

Follow the system Upgrade Flow chart in SECTION 3 for best installation efficiency.

Note

All on–site construction must be completed before equipment is delivered and installation starts. Attempting to install the system while construction is being completed will impact installation efficiency and further delay site completion. Making sure that all preinstallation and construction work is completed before equipment is delivered will usually result in an earlier turnover date.

Note that many procedures may be performed in parallel and may be performed in any order according to the specific situation of each site. However all parallel tasks are to be completed prior to the next task.

Alternate tasks are noted above the task block to set them aside from parallel tasks.

The general sequence of events is:

- Verify that all required upgrades have arrived complete and site is ready to shut down.
- Shut site down.
- Remove obsolete equipment and cables.

Aside: Removing and installing cables is more efficient and accurate when the rooms are un–cluttered. It is strongly recommended that this be done after equipment is removed and before new equipment is positioned. This house cleaning will make the installation tasks much easier.

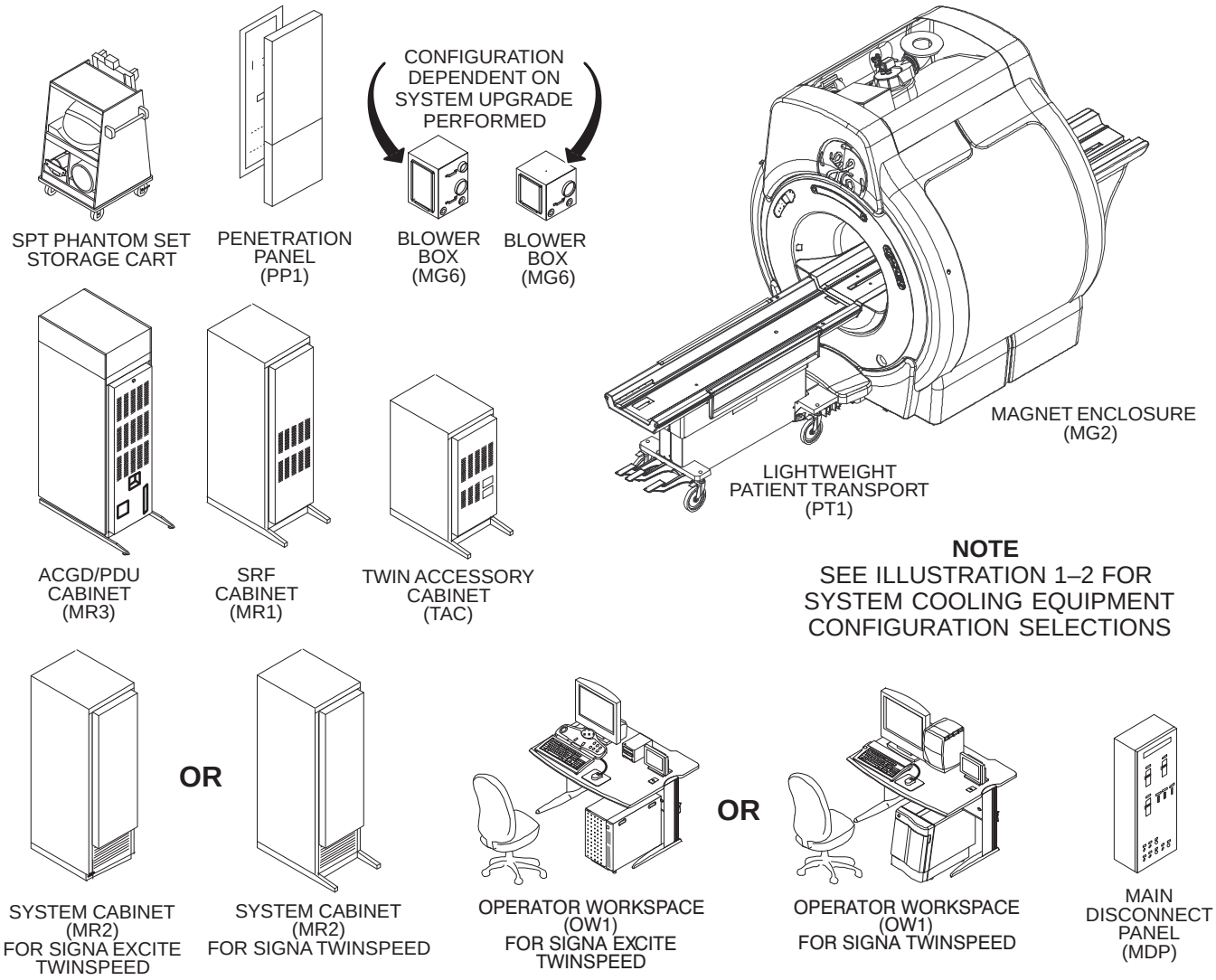
- Route new cables
- Install new equipment.
- All discarded material (i.e. removed/discarded hardware, packing material) must be returned in accordance with GE recycling policy
- Power up
- Functional Checks
- System calibrations
- System performance checks
- Cover replacement
- Complete final tasks and return site to customer.

1–8 SYSTEM UPGRADES TO EXCITE 1.5T Twin*Speed*

Illustrations 1–1 and 1–2 shows the system's major equipment after a Signa EXCITE 1.5T Twin*Speed* upgrade is complete. The upgrade content is dependent on the configuration of the system being upgraded. The following sub–sections provide an overview of the hardware required for upgrading to various Signa EXCITE 1.5T TwinSpeed.

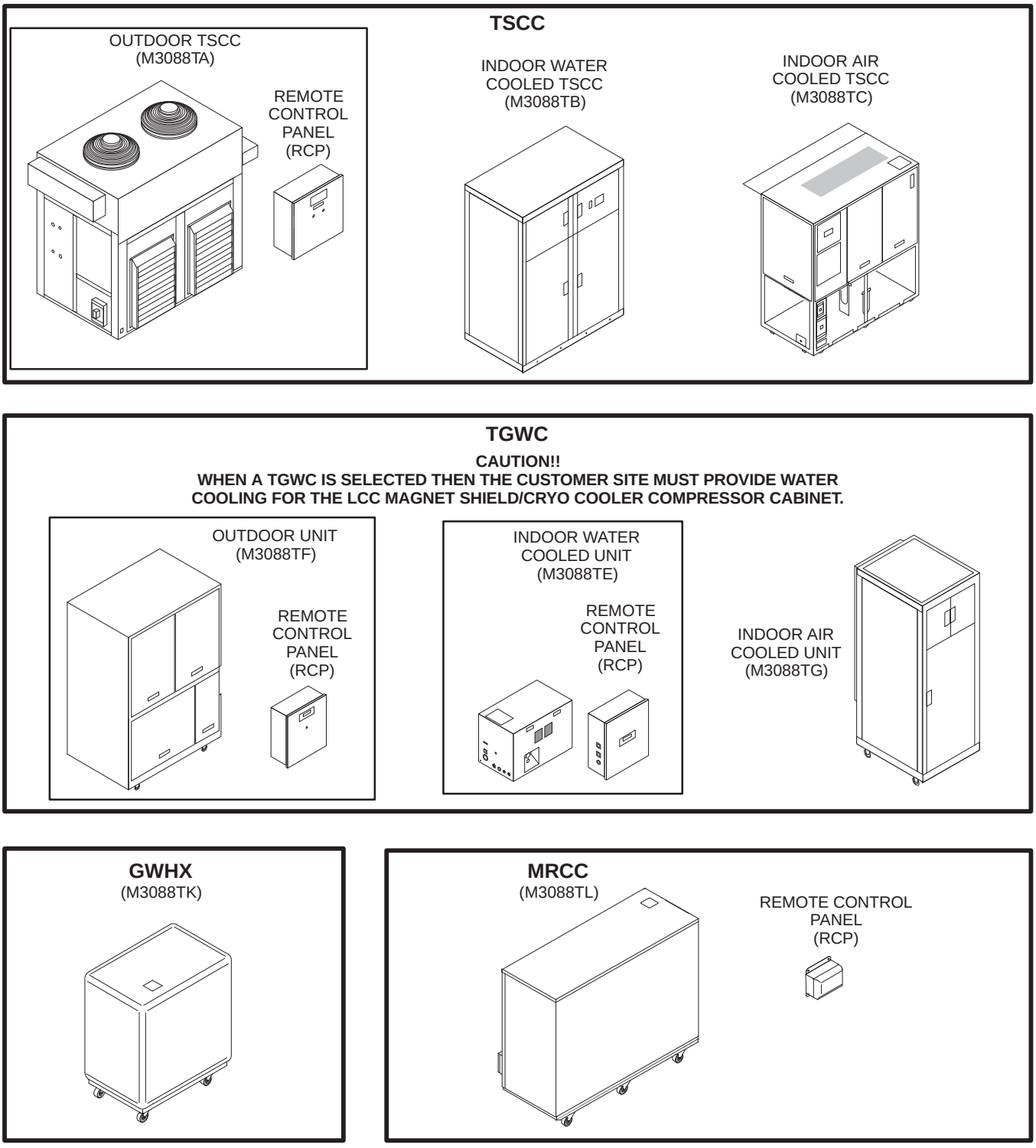
- SECTION 1–8–1 **Signa LX 1.5T With LCC Magnet Installed**
- SECTION 1–8–2 **Signa LX 1.5T Without LCC Magnet Installed**
- SECTION 1–8–3 **Signa Horizon**
- SECTION 1–8–4 **Signa Advantage 5.X & 4.X**

Refer to the appropriate section listed above for overview of the upgrade content, refer to the remainder of this publication for upgrade requirements.



SIGNA 1.5T TWINSPEED SYSTEM MAJOR EQUIPMENT
ILLUSTRATION 1–1

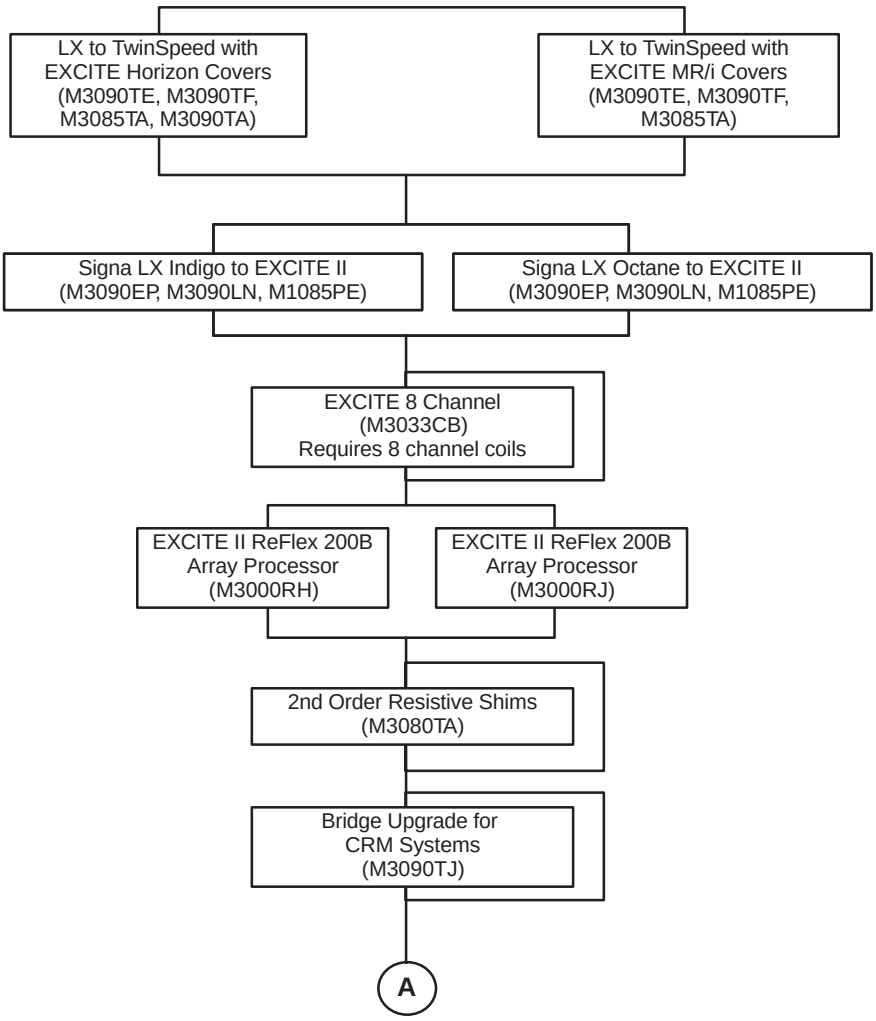
1–8 SYSTEM UPGRADE TO 1.5T Twin*Speed* WITH EXCITE TECHNOLOGY (Continued)



SYSTEM COOLING EQUIPMENT SELECTIONS
ILLUSTRATION 1–2

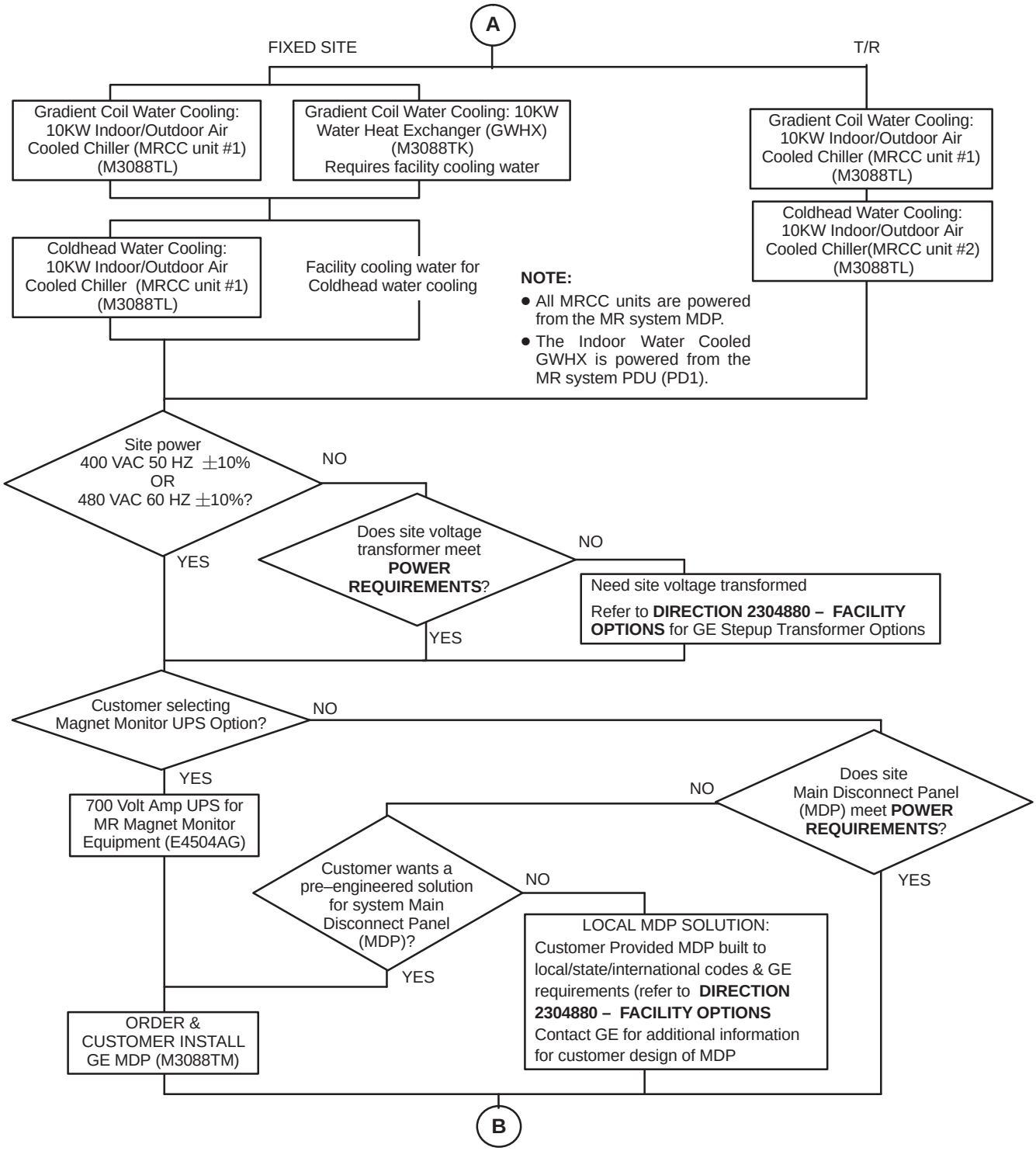
1–8–1 Signa LX 1.5T With LCC Magnet Installed

The flowchart shown in Illustrations 1–3 through 1–5 lists the upgrade catalogs for a Signa LX 1.5T (with ACGD or SGD) and current system installed magnet is an LCC Magnet upgrading to Signa EXCITE 1.5T TwinSpeed. Illustrations 1–6 through 1–7 show the major equipment replaced and modified by the catalogs listed in the flowchart.



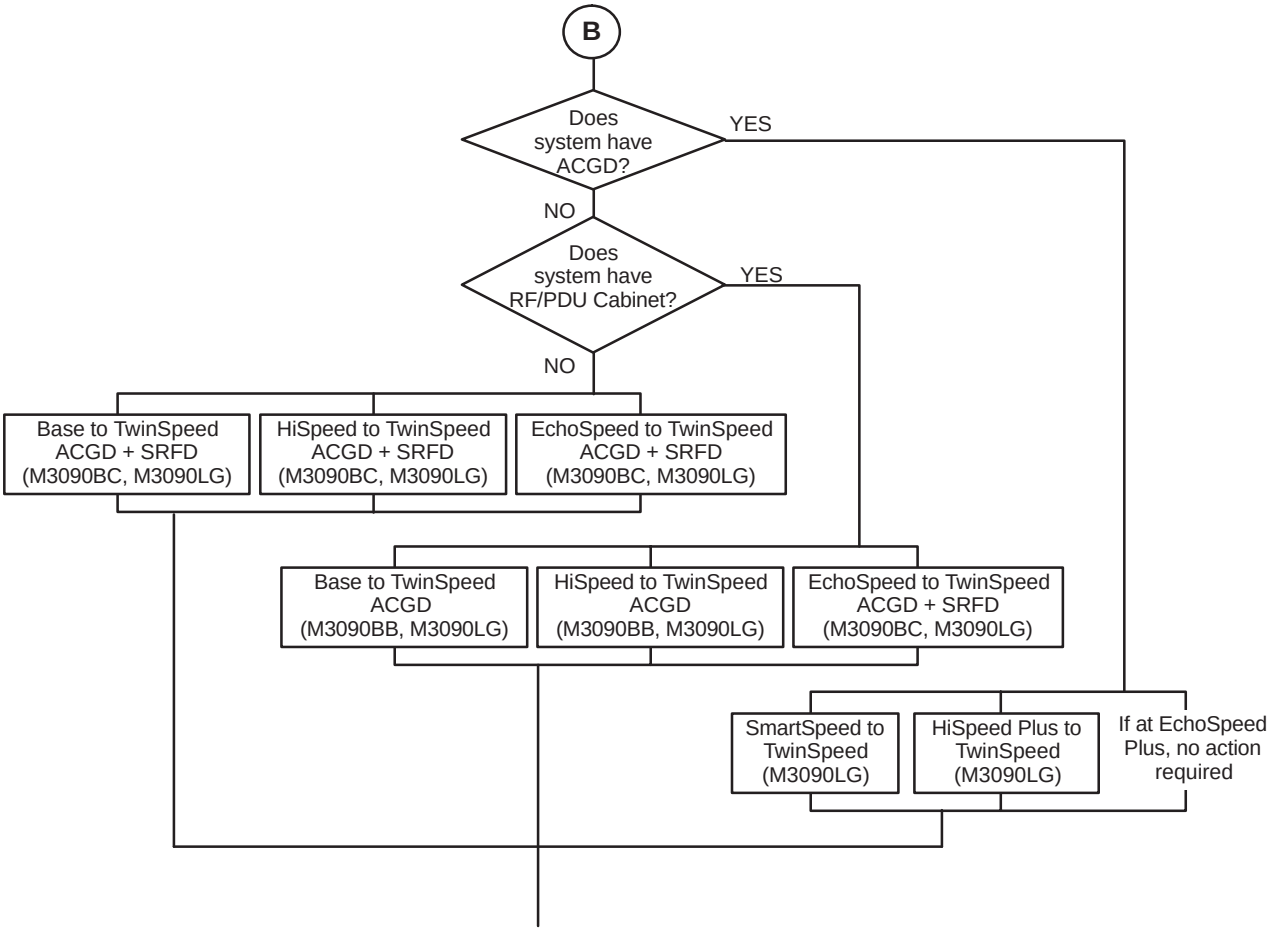
SIGNA LX 1.5T WITH LCC MAGNET INSTALLED UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1–3

1–8–1 Signa LX 1.5T With LCC Magnet Installed



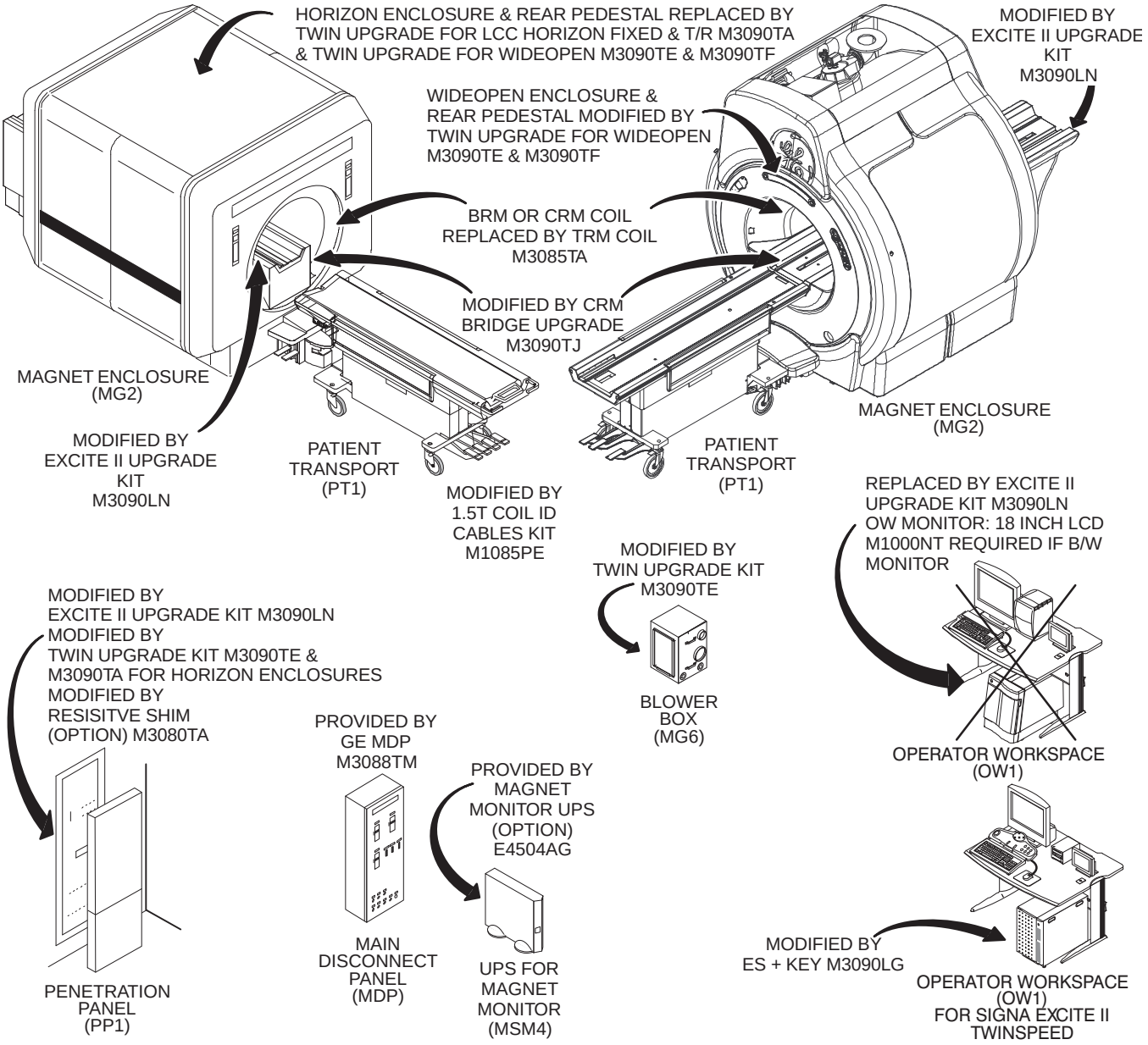
SIGNA LX 1.5T WITH LCC MAGNET INSTALLED UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1–4

1–8–1 Signa LX 1.5T With LCC Magnet Installed (Continued)



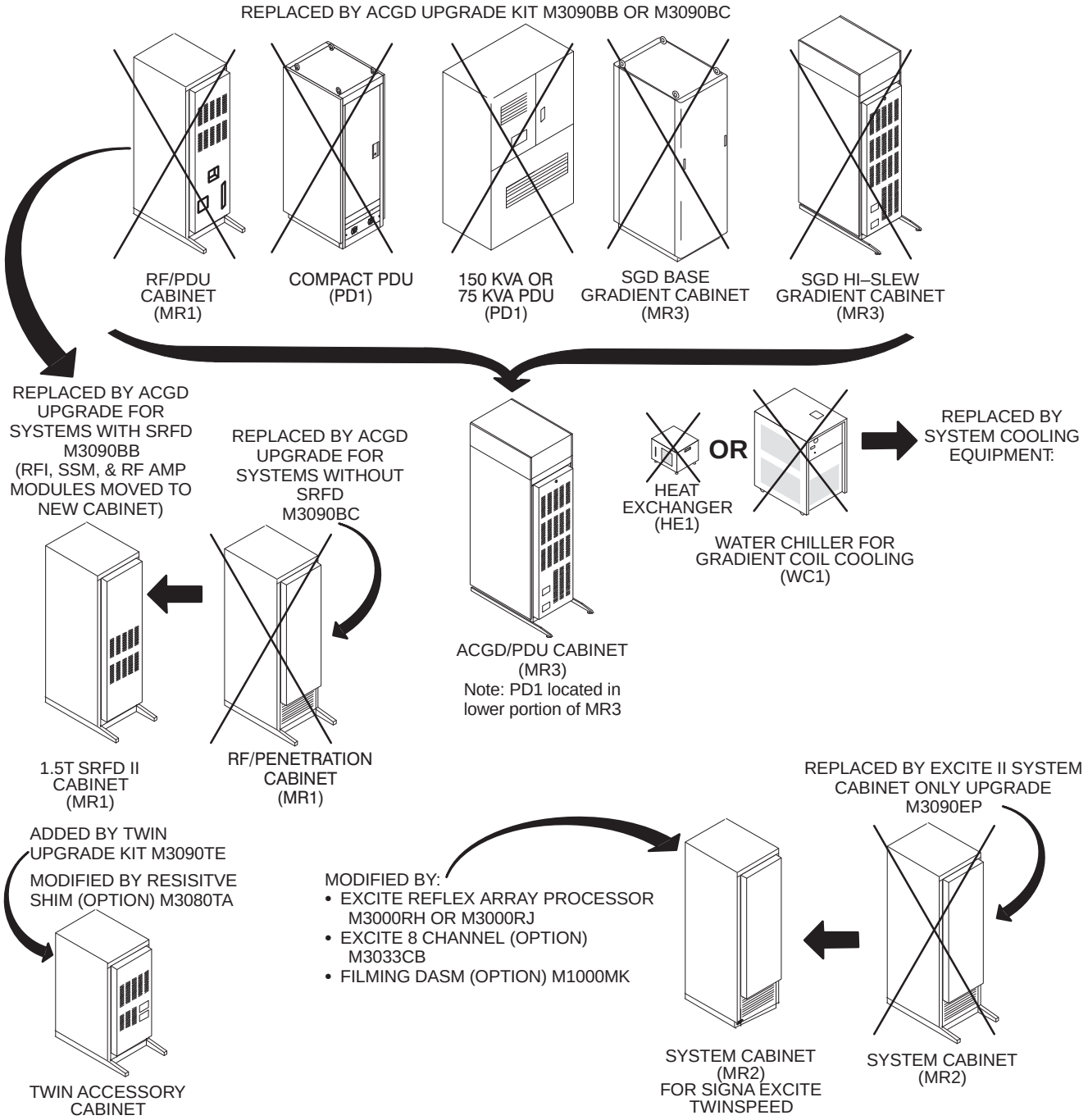
SIGNA LX 1.5T WITH LCC MAGNET INSTALLED UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1–5

1–8–1 Signa LX 1.5T With LCC Magnet Installed (Continued)



SIGNA MR/I & SIGNA LX WITH 1.5T LCC MAGNET EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–6

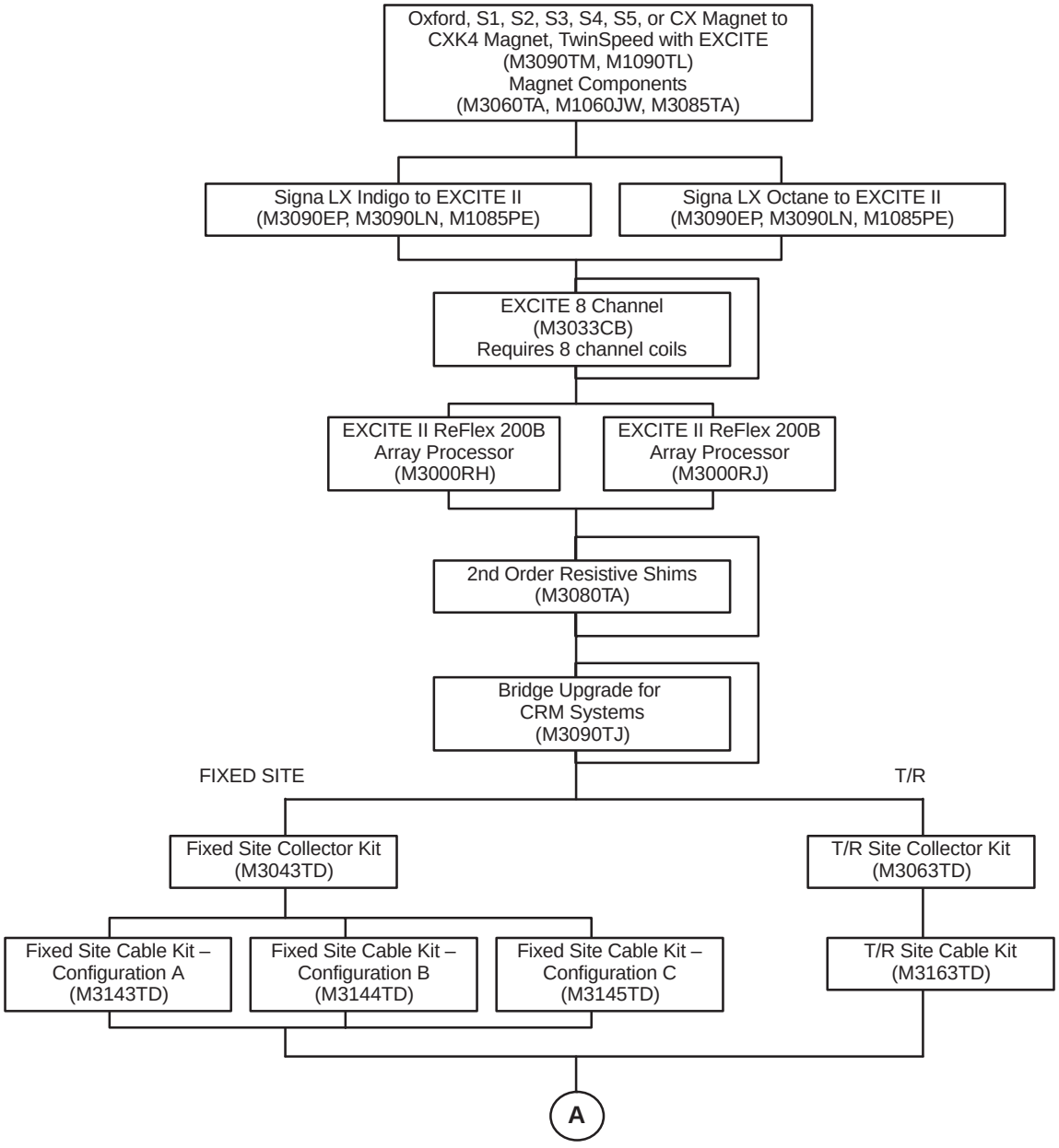
1–8–1 Signa LX 1.5T With LCC Magnet Installed(Continued)



SIGNA MR/I & SIGNA LX WITH 1.5T LCC MAGNET EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–7

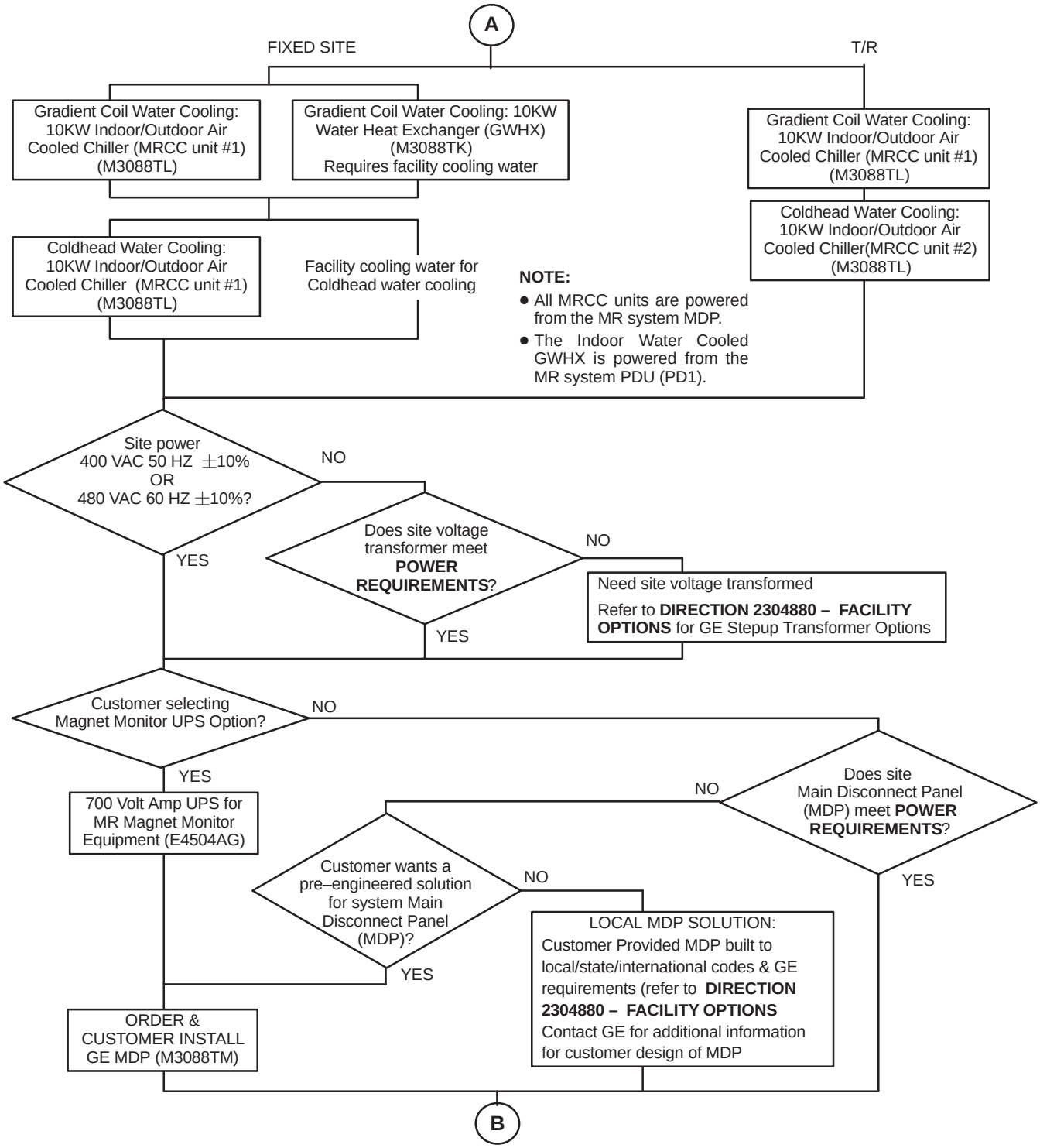
1–8–2 Signa LX 1.5T Without LCC Magnet Installed

Upgrades from Signa LX 1.5T to Signa EXCITE 1.5T TwinSpeed require the system magnet to be upgraded to an LCC Magnet. The flowchart shown in Illustrations 1–8 through 1–10 lists the upgrade catalogs for a Signa LX or CVMR (with ACGD or SGD) and current system installed magnet is NOT an LCC Magnet upgrading to Signa EXCITE 1.5T TwinSpeed. Illustrations 1–11 through 1–12 show the equipment and cabinets replaced and modified by the catalogs listed in the flowchart.



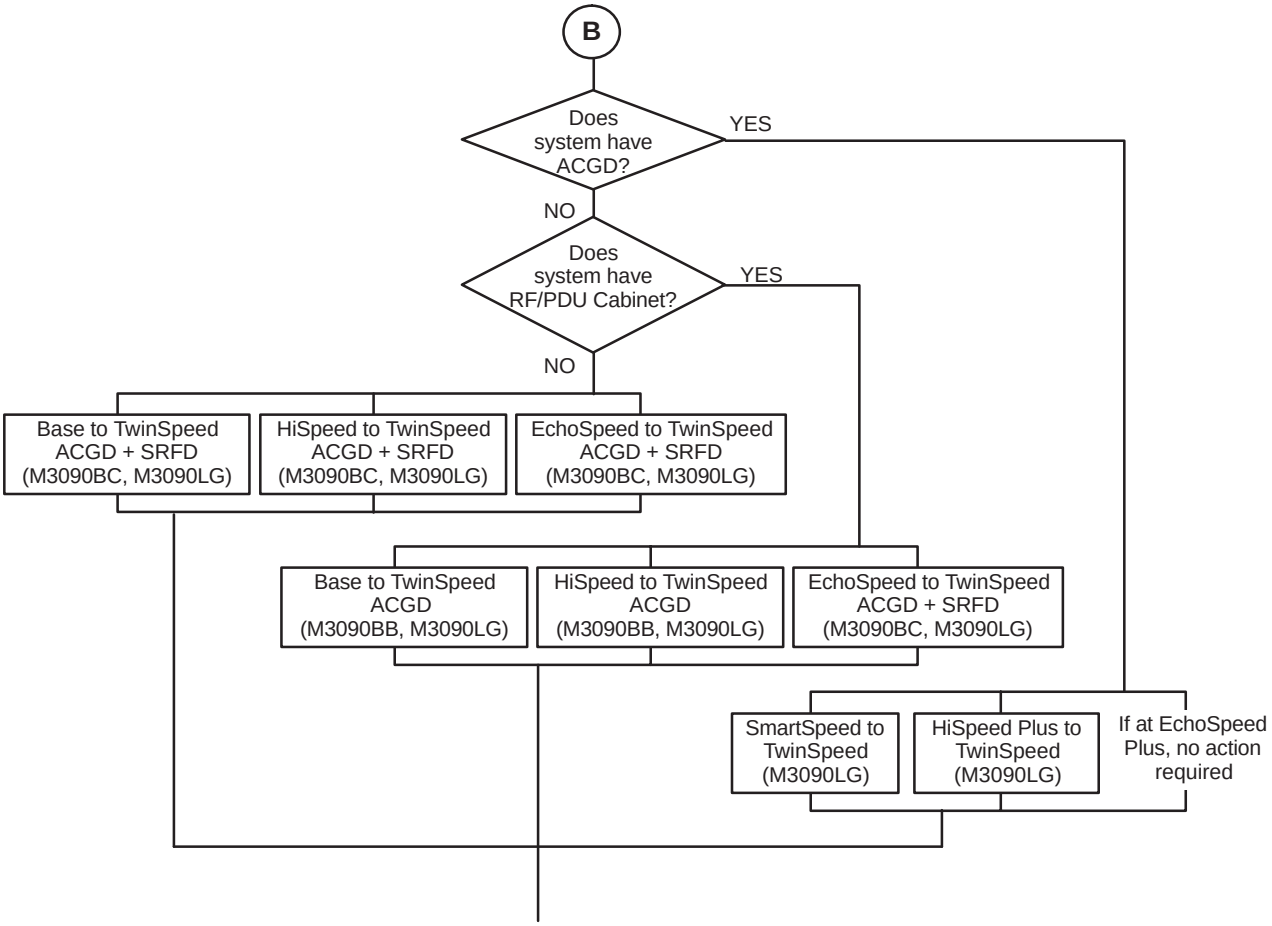
SIGNA LX 1.5T WITHOUT 1.5T LCC MAGNET INSTALLED UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1–8

1–8–2 Signa LX 1.5T Without LCC Magnet Installed (Continued)



SIGNA LX 1.5T WITH LCC MAGNET INSTALLED UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1–9

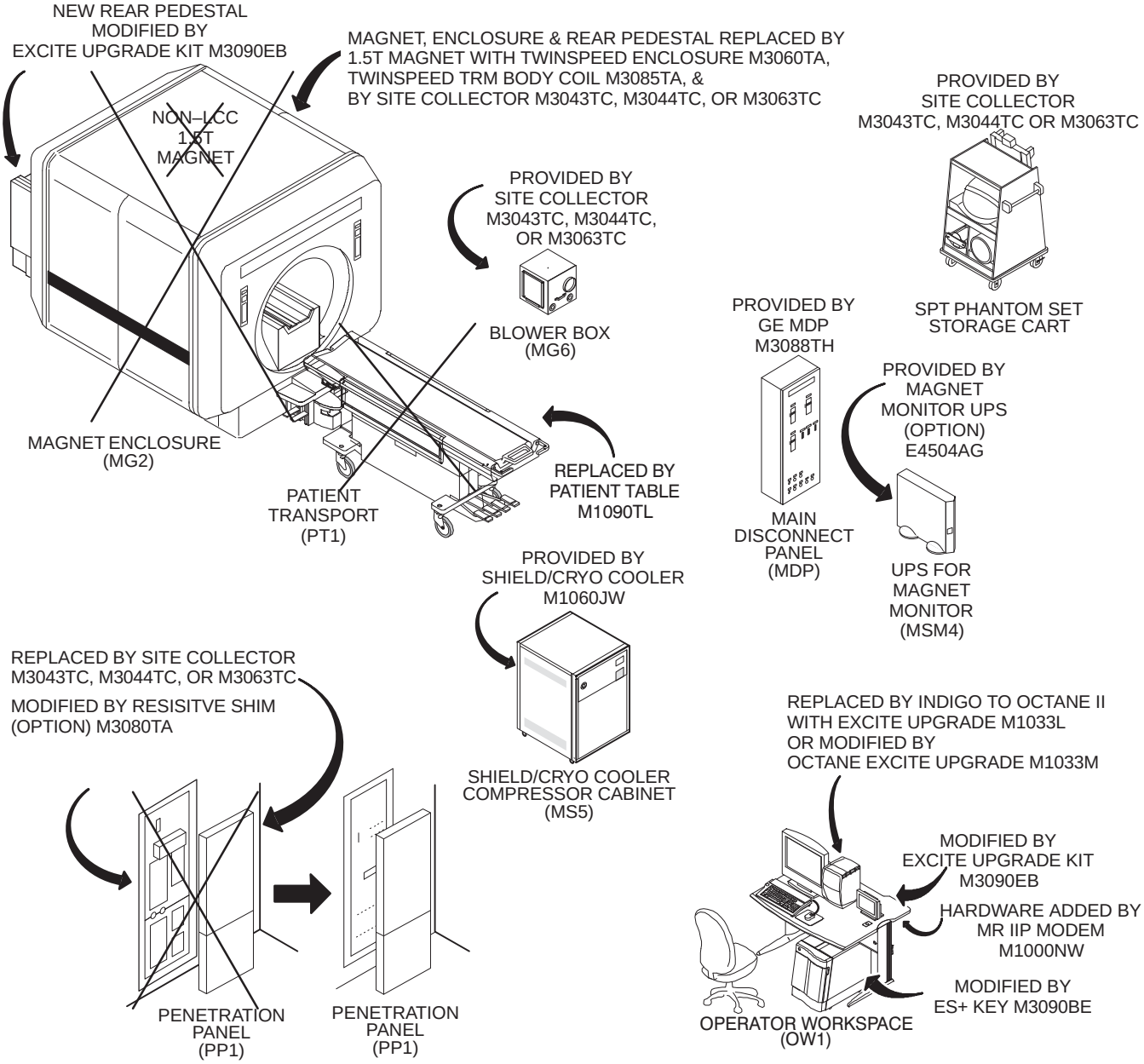
1–8–2 Signa LX 1.5T Without LCC Magnet Installed (Continued)



Go To
Section 1–9 SIGNA EXCITE 1.5T TWINSPEED OPTIONS

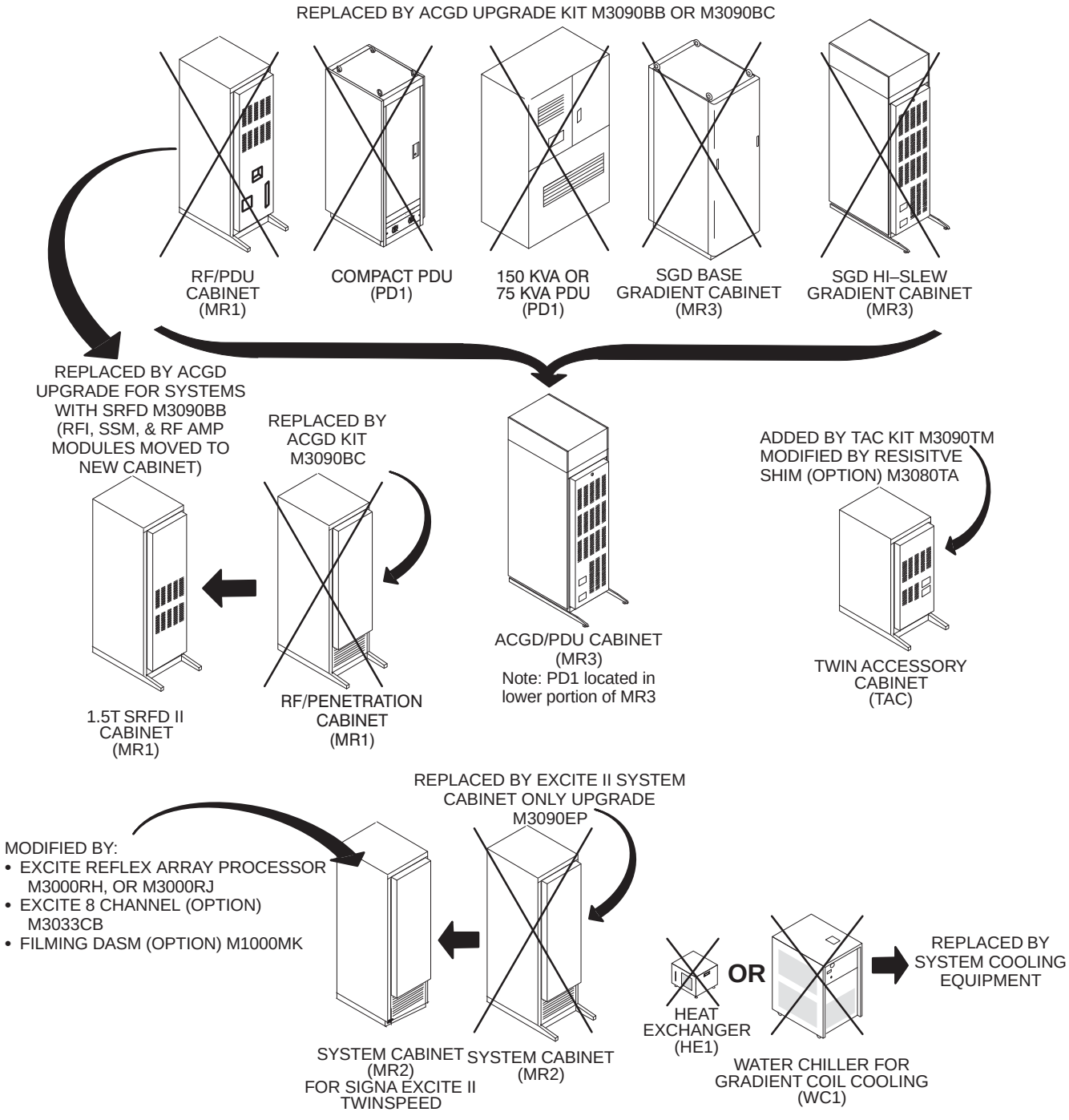
SIGNA LX 1.5T WITHOUT 1.5T LCC MAGNET INSTALLED UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1 – 10

1–8–2 Signa LX 1.5T Without LCC Magnet Installed (Continued)



SIGNA LX WITHOUT 1.5T LCC MAGNET INSTALLED
EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–11

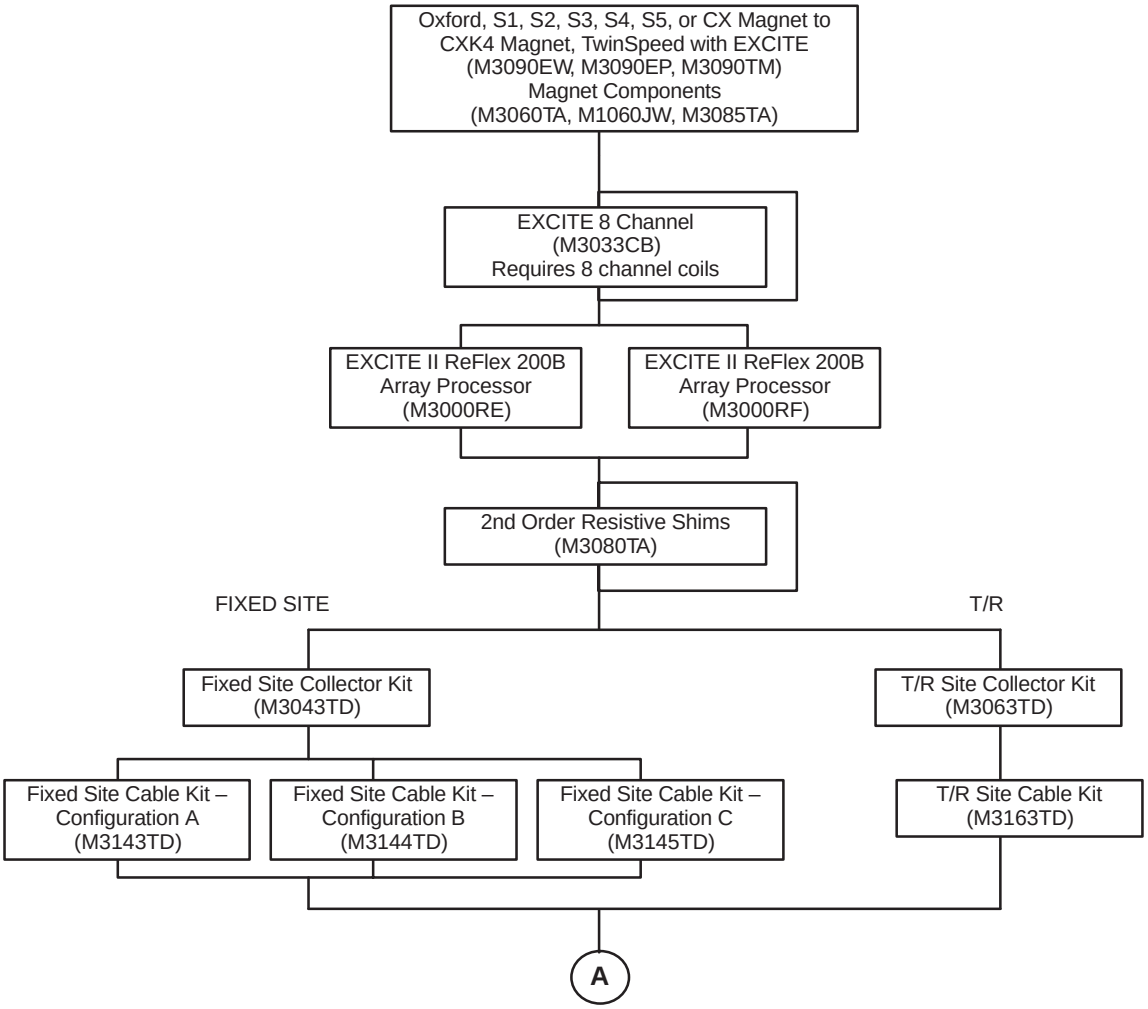
1–8–2 Signa LX 1.5T Without LCC Magnet Installed (Continued)



SIGNA LX WITHOUT 1.5T LCC MAGNET INSTALLED
EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–12

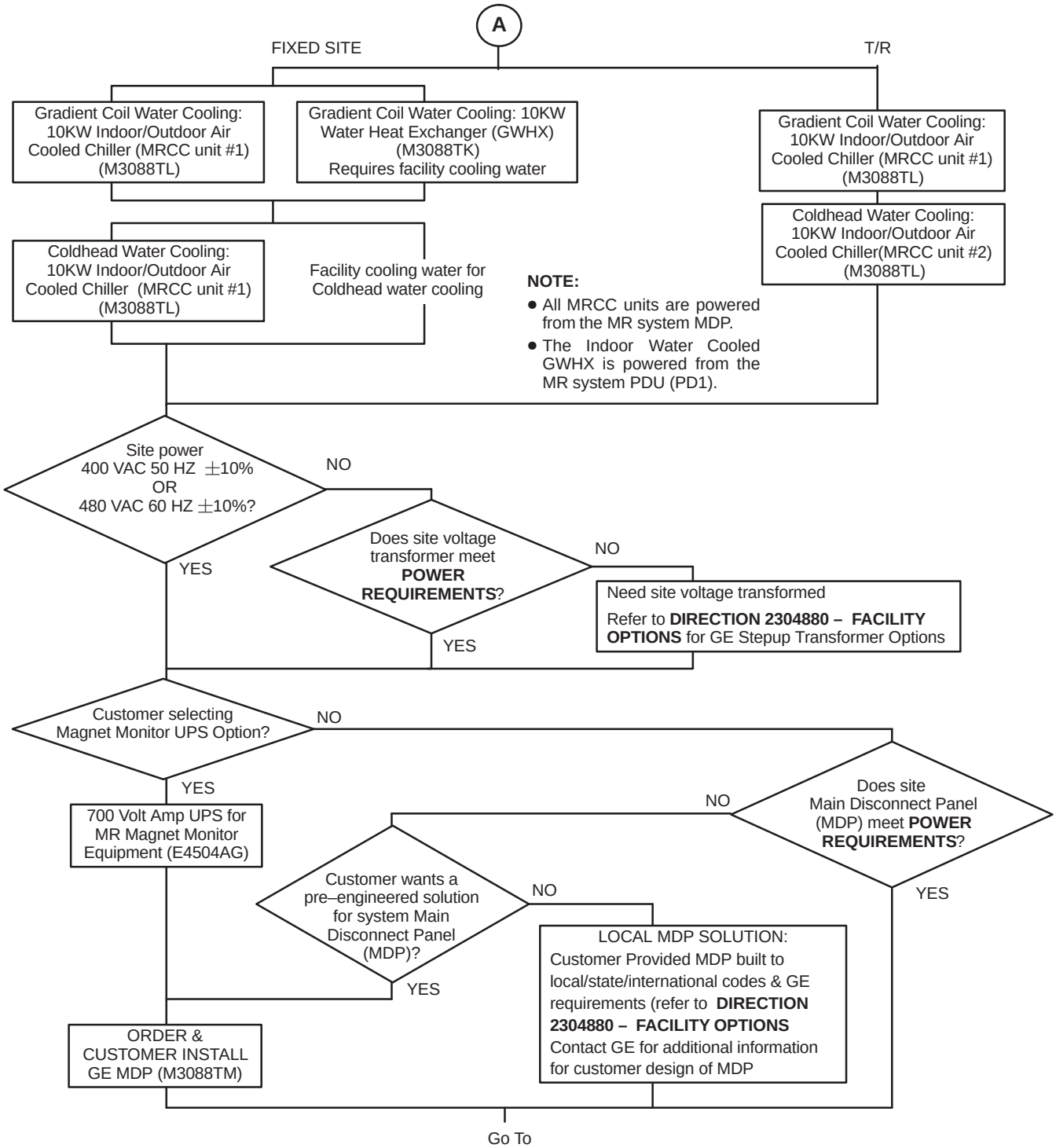
1–8–3 Signa Horizon 1.5T

Upgrades from Signa Horizon 5.X to Signa EXCITE 1.5T TwinSpeed require the system magnet to be upgraded to an LCC Magnet. The flowchart shown in Illustrations 1–13 through 1–14 lists the Signa Horizon 5.X upgrade catalogs. Illustrations 1–15 and 1–16 show the equipment and cabinets replaced and modified by the catalogs listed in the flowchart.



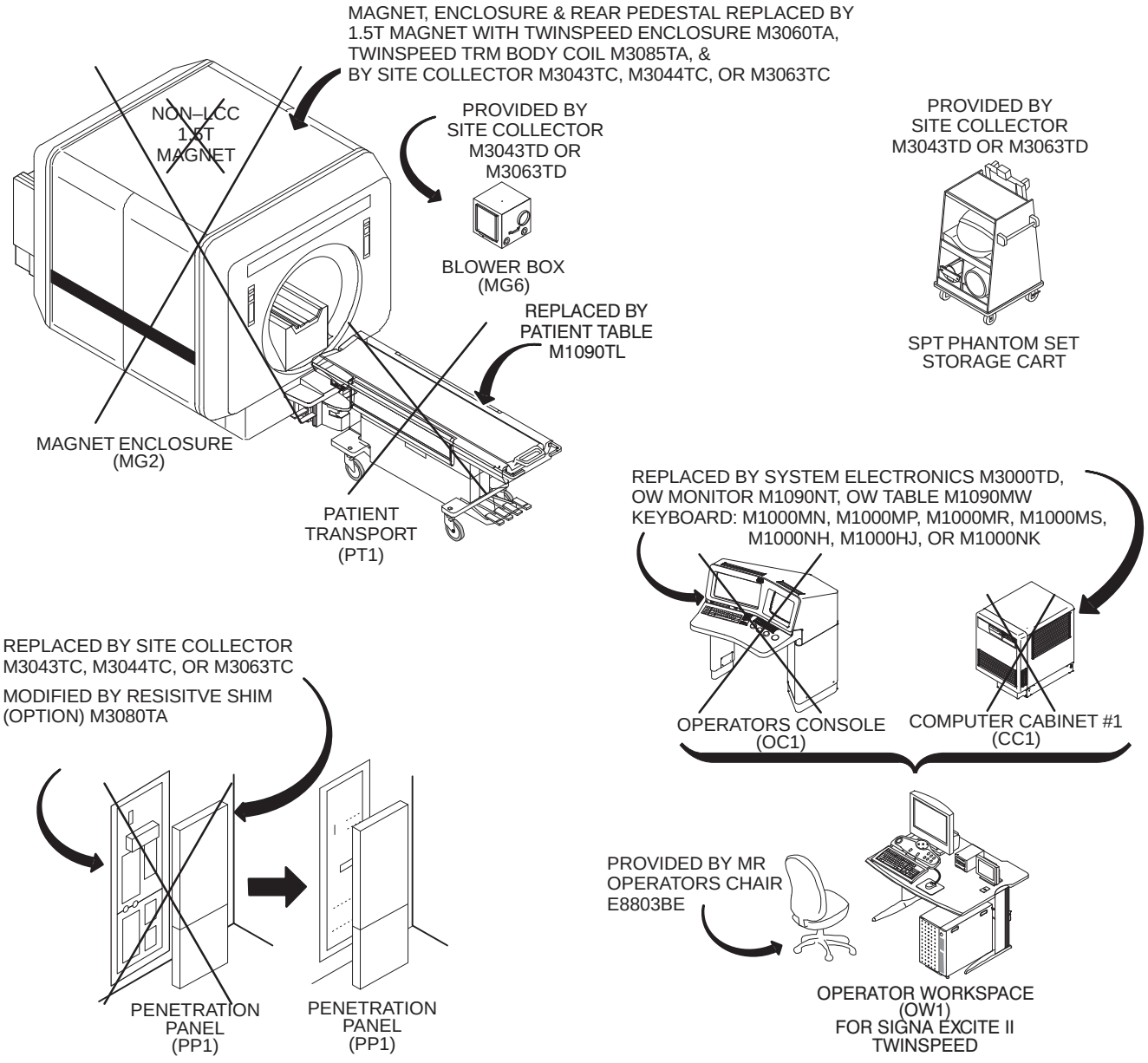
SIGNA HORIZON 1.5T UPGRADE TO SIGNA TWINSPEED WITH EXCITE TECHNOLOGY CATALOGS
ILLUSTRATION 1 – 13

1–8–3 Signa Horizon 1.5T (Continued)



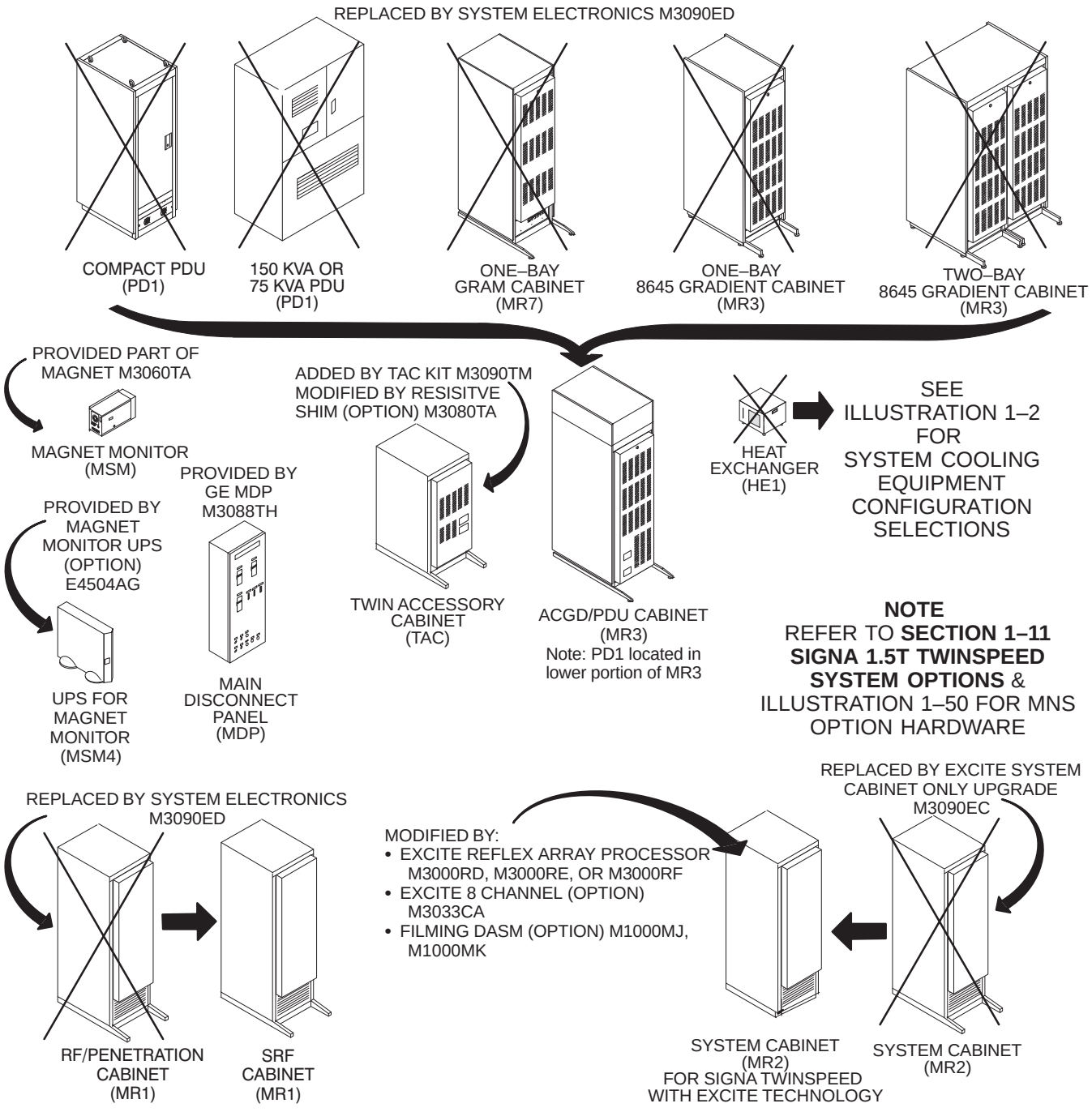
SIGNA HORIZON 1.5T UPGRADE TO SIGNA TWINSPEED WITH EXCITE TECHNOLOGY CATALOGS
ILLUSTRATION 1–14

1–8–3 Signa Horizon1.5T (Continued)



SIGNA HORIZON 1.5T SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–15

1–8–3 Signa Horizon 1.5T (Continued)

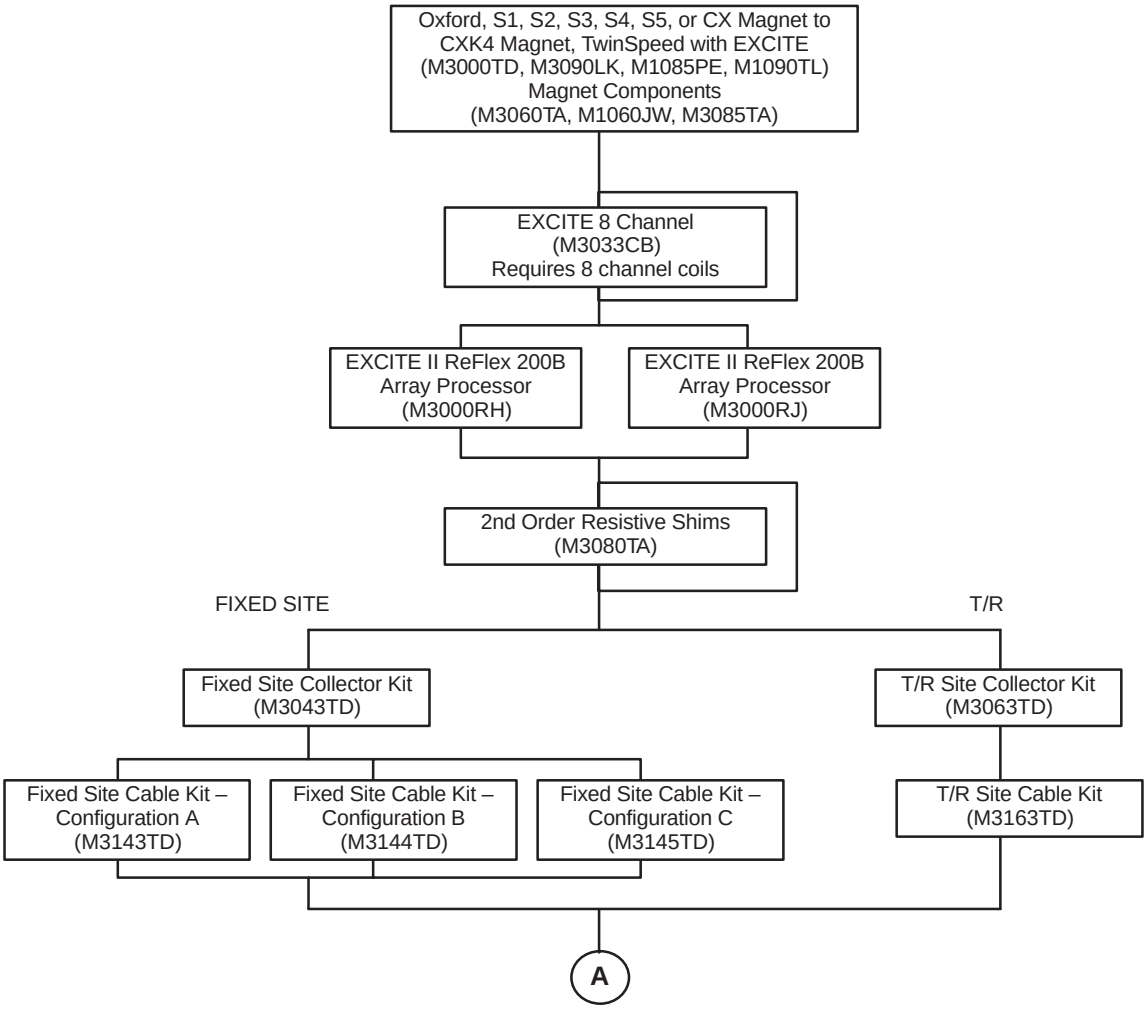


SIGNA HORIZON 1.5T SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–16

1–8–4 Signa 1.5T 5.X & 4.X

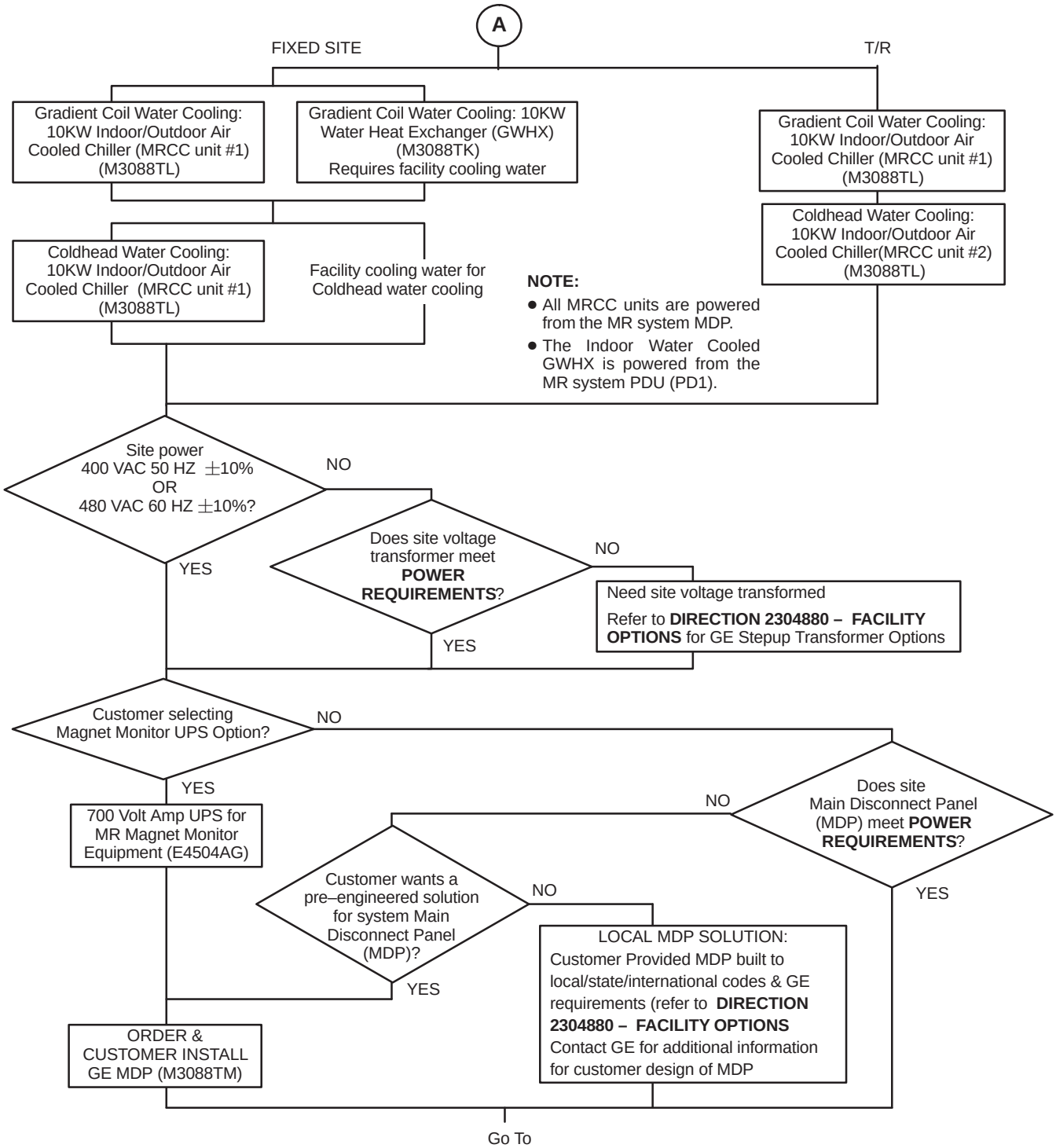
Upgrades from Signa 5.X and 4.X to Signa EXCITE 1.5T TwinSpeed require the system magnet to be upgraded to an LCC Magnet. The flowchart shown in Illustrations1–17 and 1–18 lists the Signa Horizon 5.X Software Only, Advantage 5.X and 4.X to Signa 1.5T TwinSpeed upgrade catalogs. The equipment replaced and modified by the catalogs listed in the flowchart are shown in the illustrations as note below:

- Signa 1.5T 5.X see Illustrations 1–19 and 1–20
- Signa 1.5T 4.X see Illustrations 1–21 and 1–22



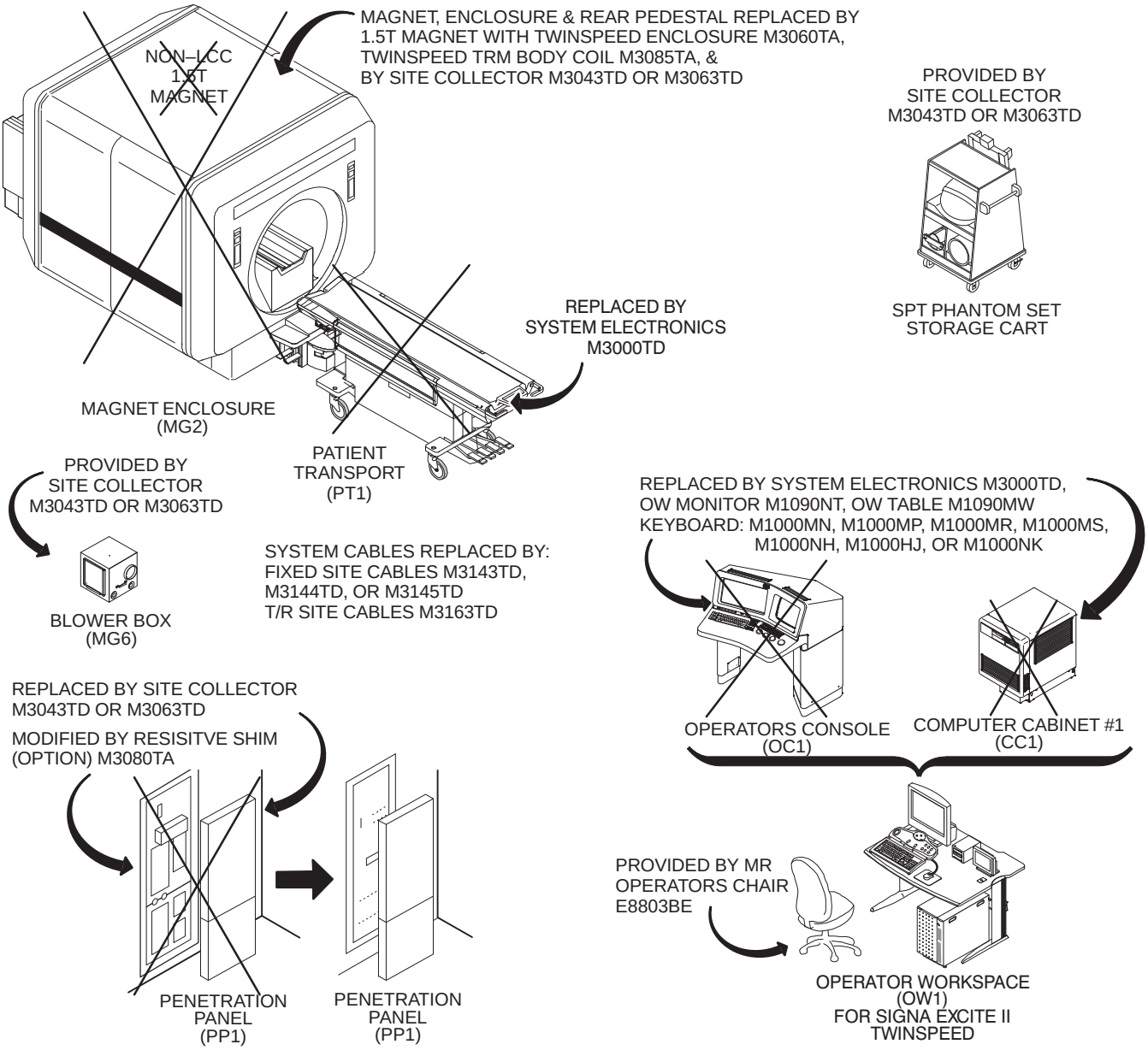
SIGNA 1.5T 5.X & 4.X UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1 – 17

1–8–4 Signa 1.5T 5.X & 4.X (Continued)



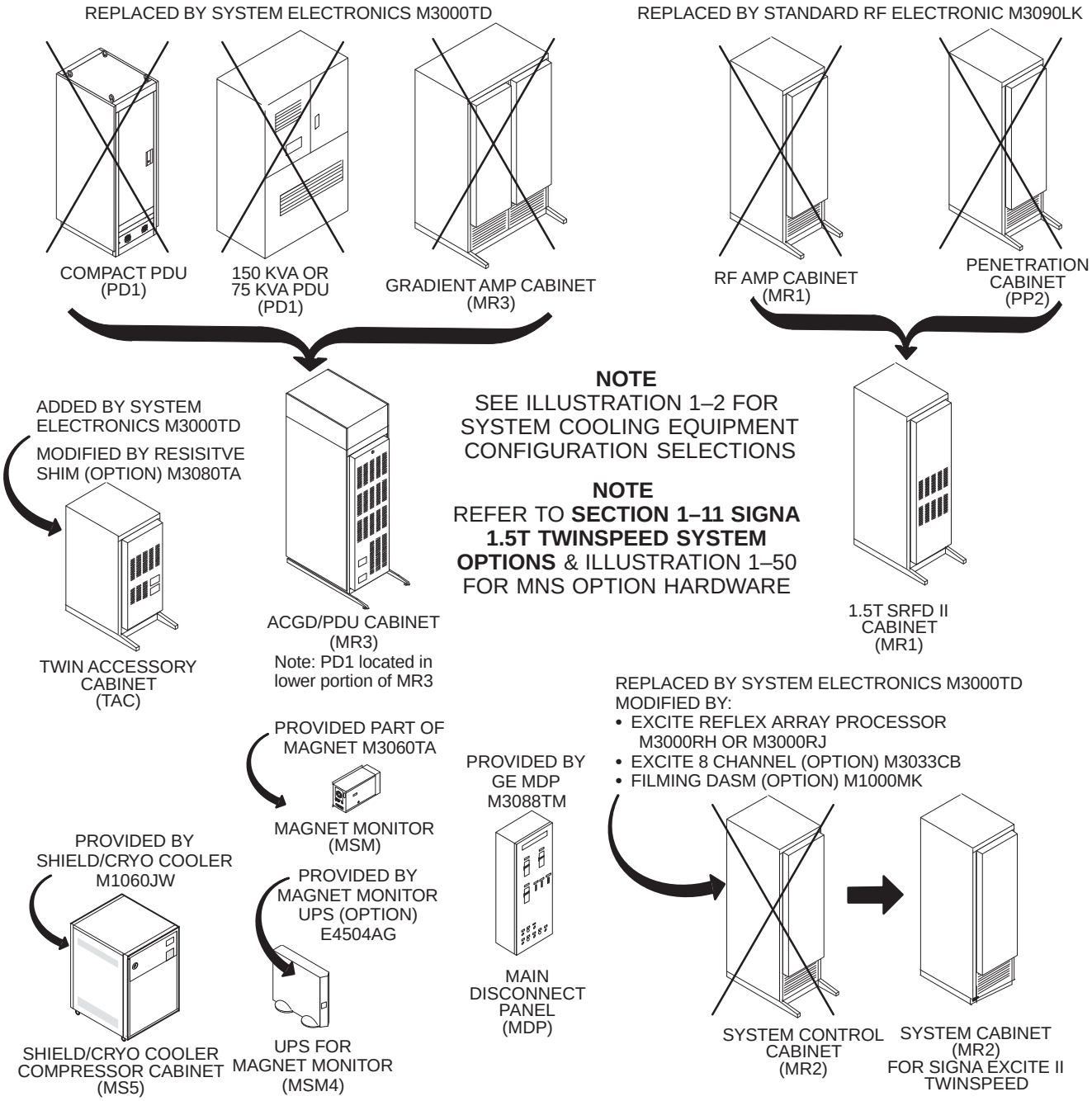
SIGNA 1.5T 5.X & 4.X UPGRADE CATALOGS TO SIGNA EXCITE TWINSPEED
ILLUSTRATION 1–18

1–8–4 Signa 1.5T 5.X & 4.X (Continued)



SIGNA HORIZON 1.5T 5.X SOFTWARE ONLY, SIGNA ADVANTAGE 1.5T 5.X SYSTEM
EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–19

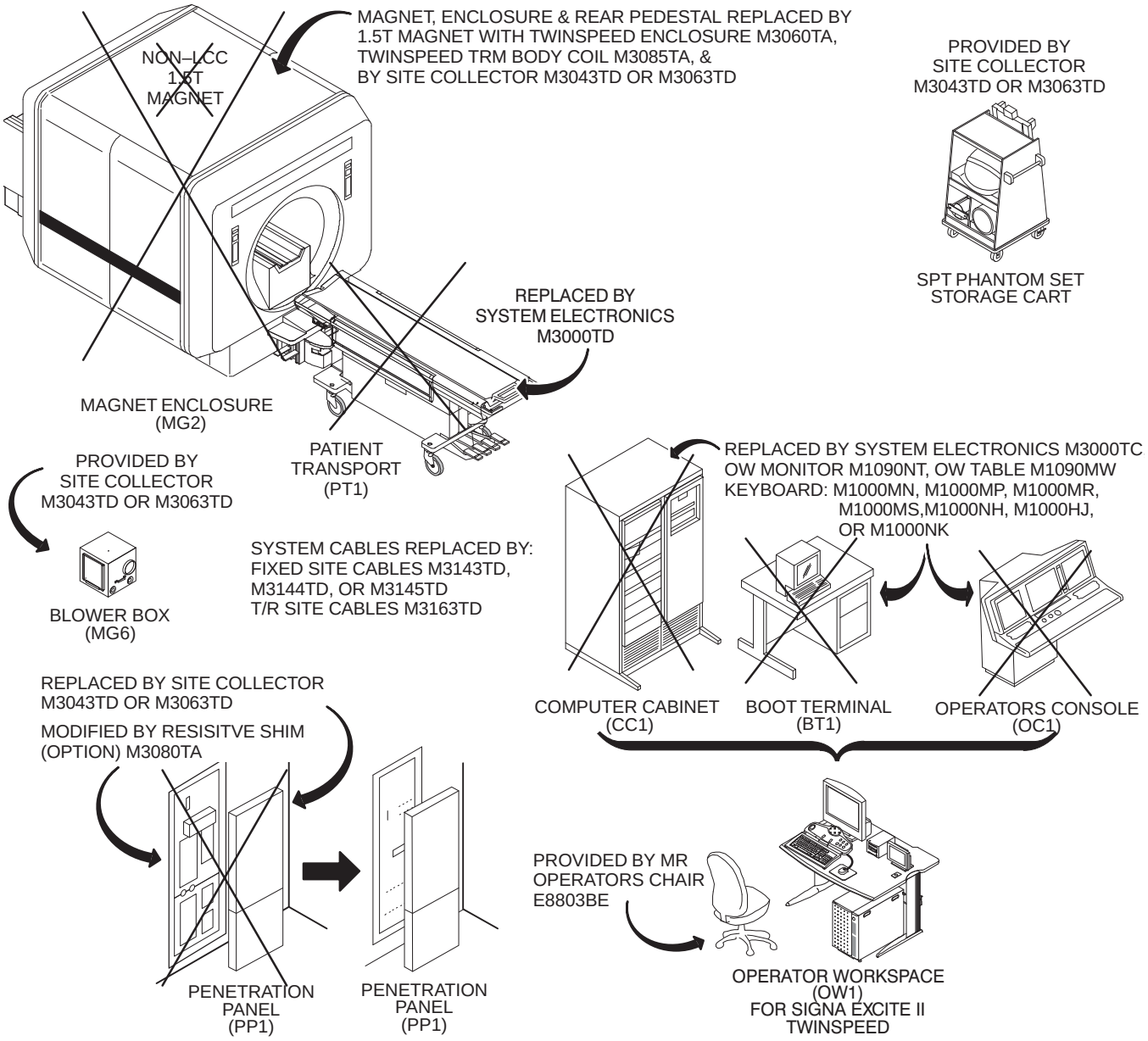
1–8–4 Signa 1.5T 5.X & 4.X (Continued)



SIGNA HORIZON 1.5T 5.X SOFTWARE ONLY, SIGNA ADVANTAGE 1.5T 5.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED

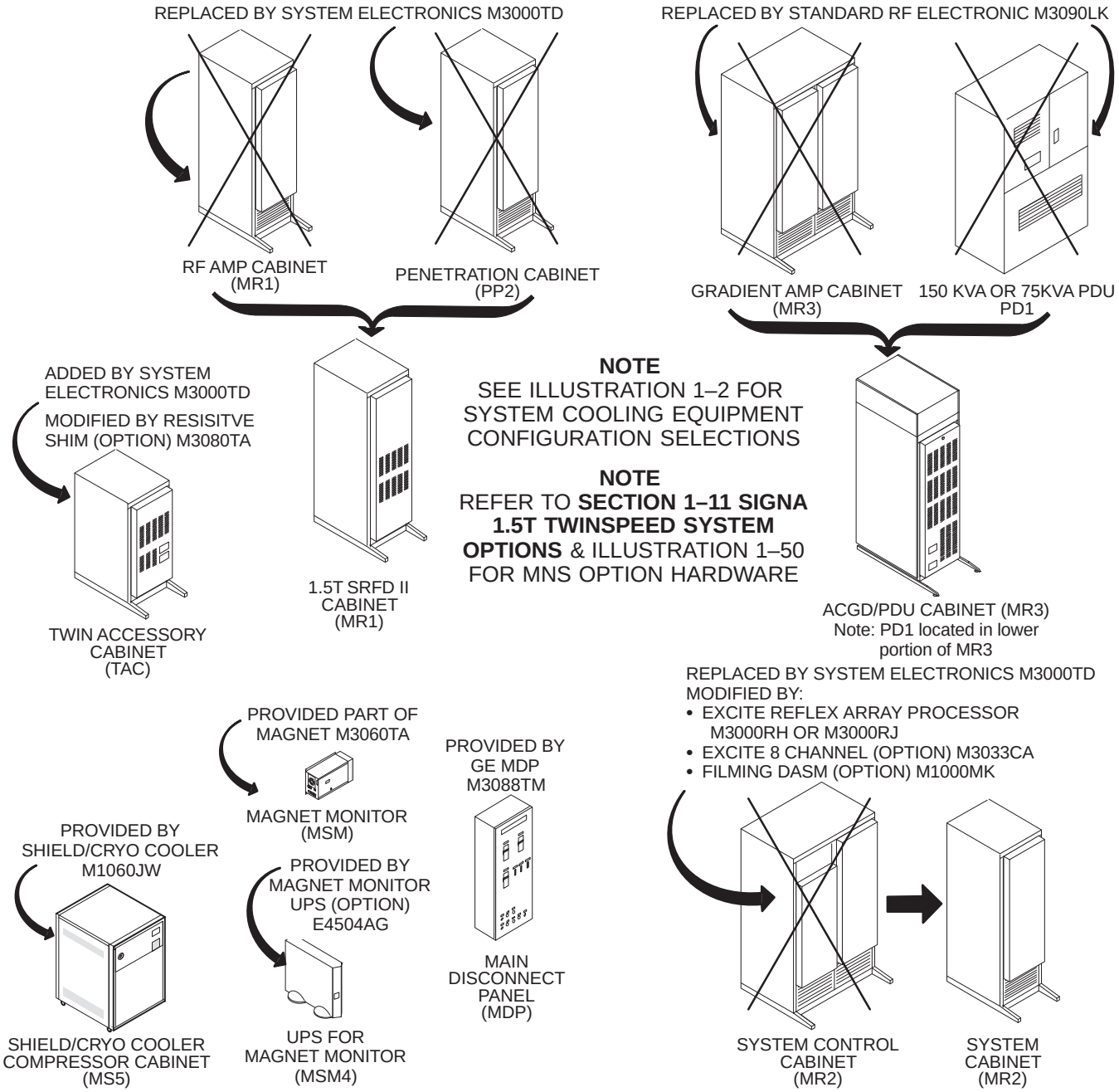
ILLUSTRATION 1–20

1–8–4 Signa Advantage 1.5T 5.X & 4.X (Continued)



SIGNA ADVANTAGE 1.5T 4.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–21

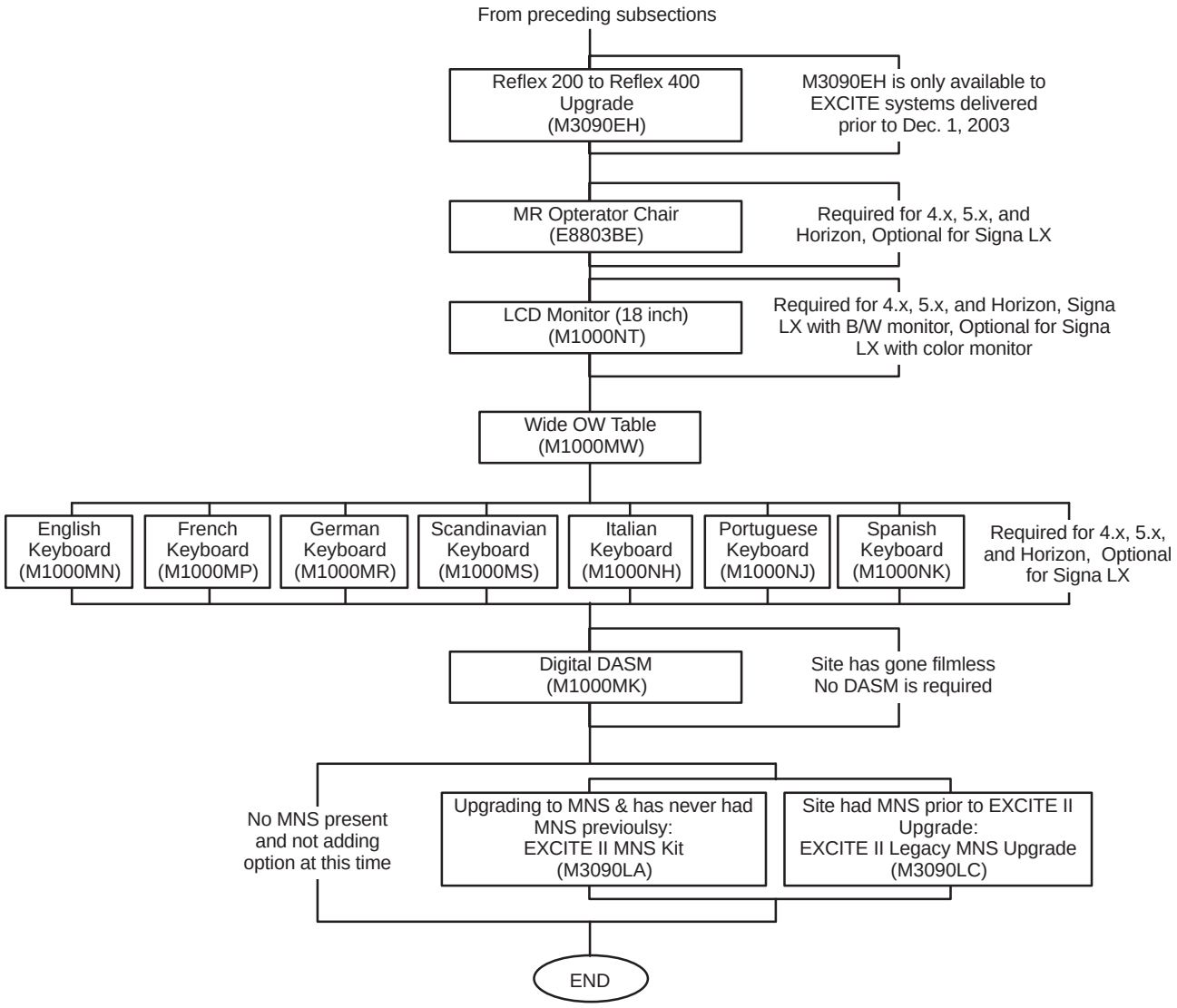
1–8–4 Signa Advantage 1.5T 5.X & 4.X (Continued)



SIGNA ADVANTAGE 1.5T 4.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–22

1–9 SIGNA EXCITE 1.5T TWINSPEED OPTIONS

Signa 1.5T EXCITE TwinSpeed system options which may have site preparation impact are listed in Illustration 1–23. Surface Coils, software, training, and other options that do not provide MR system hardware requiring site preparation are not listed in this section.



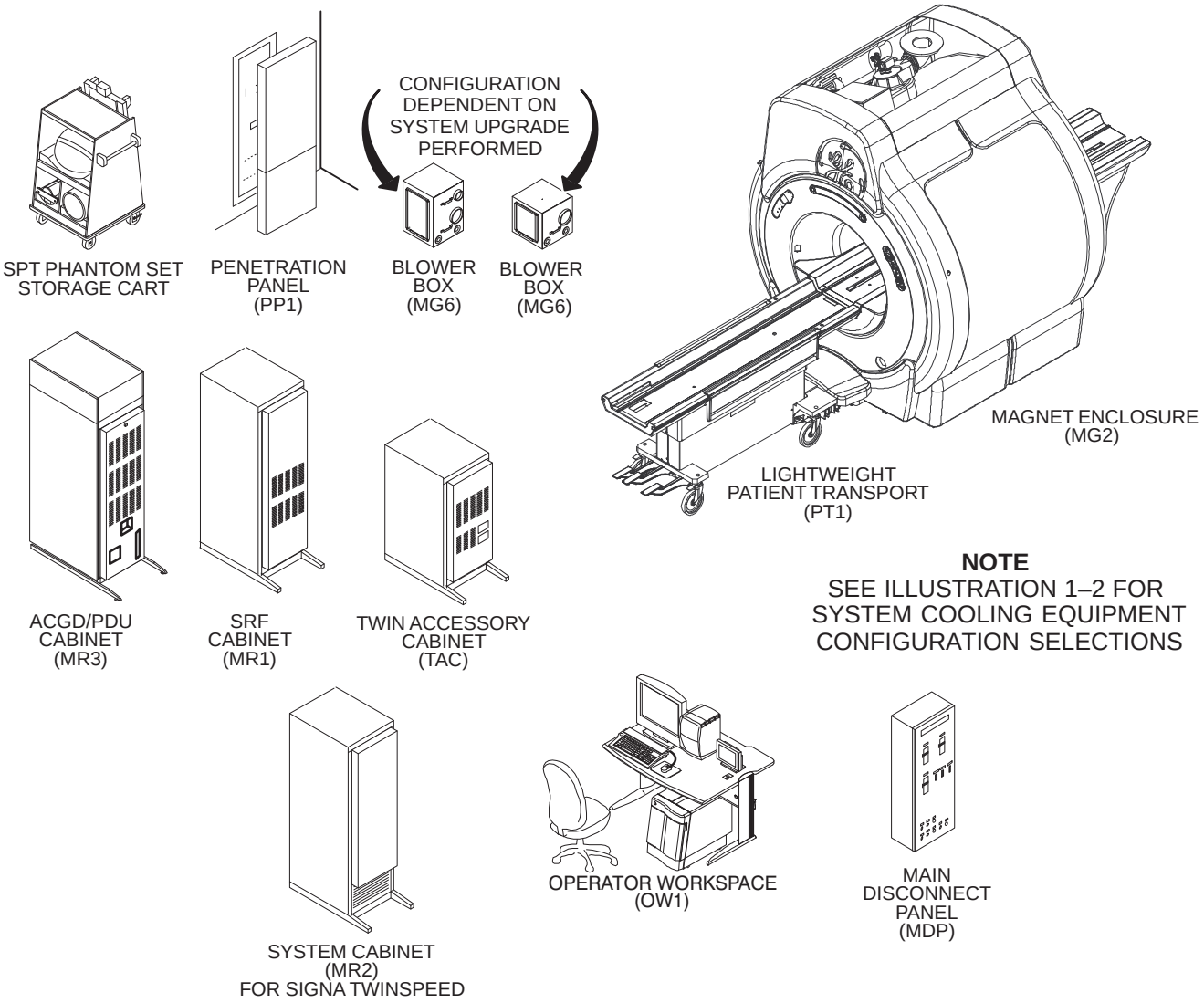
SIGNA EXCITE 1.5T TWINSPEED OPTIONS
ILLUSTRATION 1–23

1–10 SYSTEM UPGRADE TO SIGNA 1.5T Twin*Speed*

Illustrations 1–24 and 1–2 shows the system's major equipment after a Signa 1.5T Twin*Speed* upgrade is complete. The upgrade content is dependent on the configuration of the system being upgraded. The following sub–sections provide an overview of the various Signa 1.5T TwinSpeed upgrade hardware.

- SECTION 1–10–1 **Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet**
- SECTION 1–10–2 **Signa LX & CVMR Without LCC Magnet Installed**
- SECTION 1–10–3 **Signa Horizon**
- SECTION 1–10–4 **Signa Advantage 5.X & 4.X**

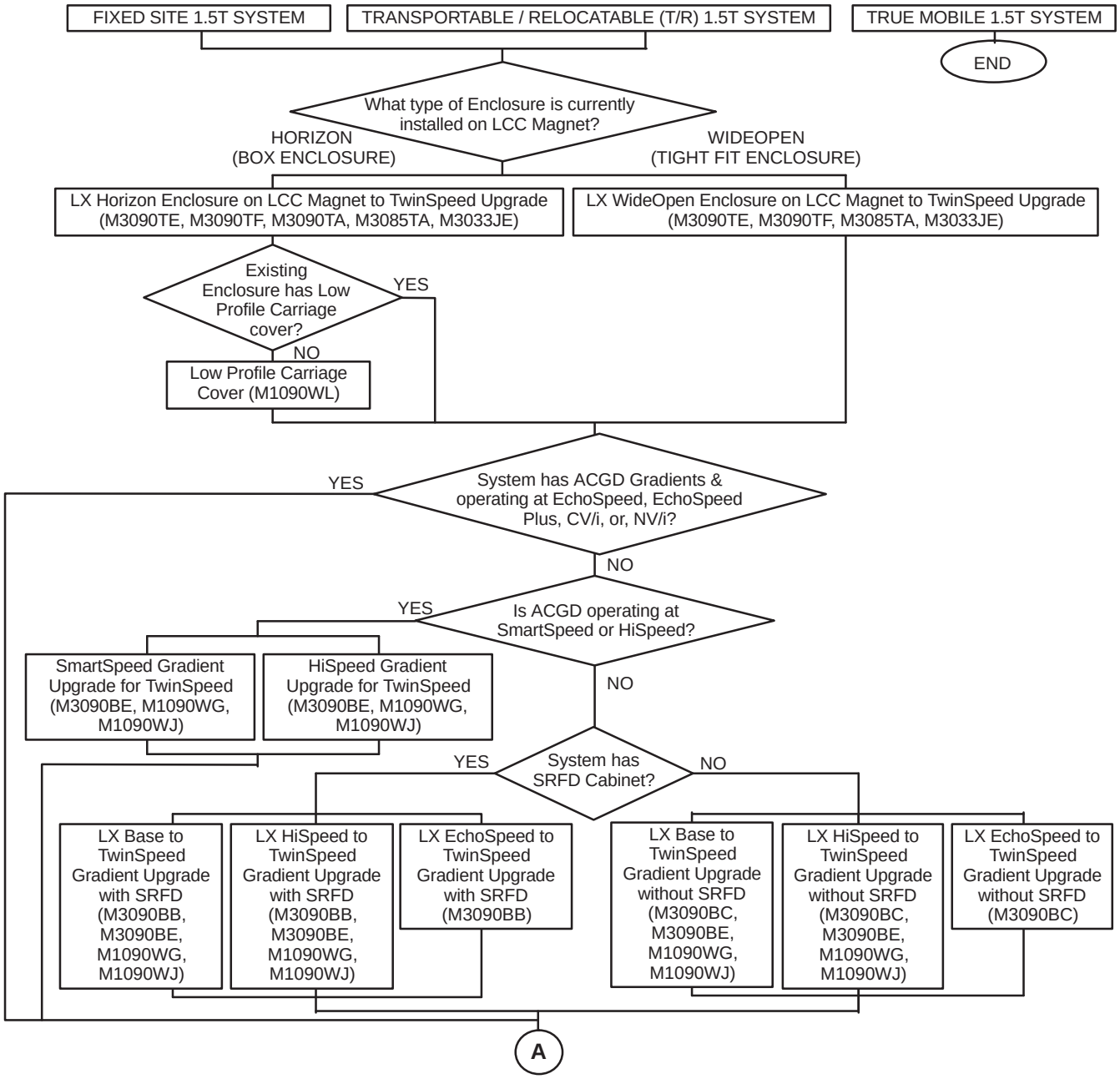
Refer to the appropriate section listed above for overview of the upgrade content, refer to the remainder of this publication for upgrade requirements.



SIGNA 1.5T TWINSPEED SYSTEM MAJOR EQUIPMENT
ILLUSTRATION 1–24

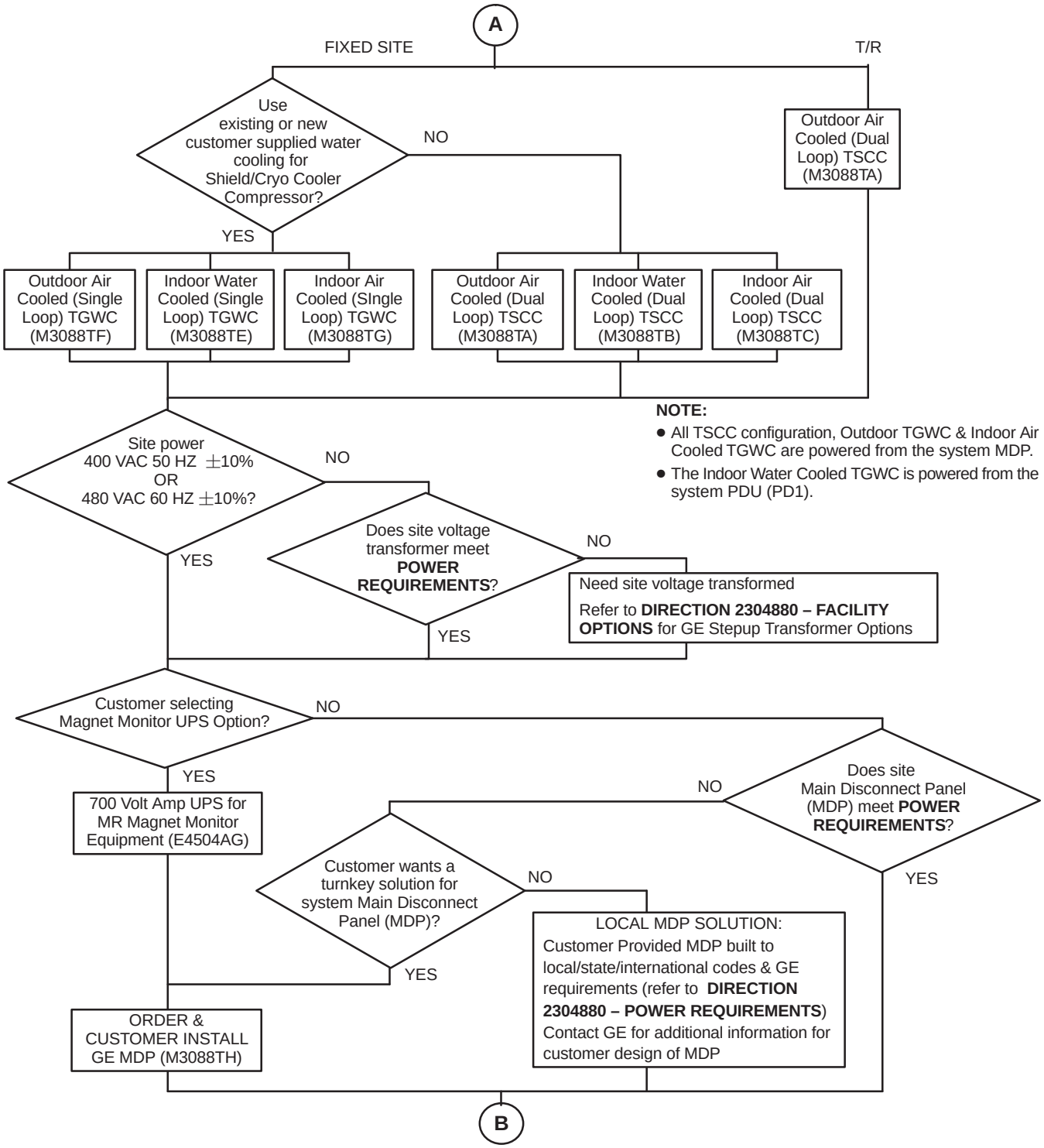
1–10–1 Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet

The flowchart shown in Illustrations 1–26 through 1–29 lists the upgrade catalogs for a Signa MR/i, CV/i, & NV/i or Signa LX (with ACGD or SGD) and current system installed magnet is an LCC Magnet upgrading to Signa 1.5T TwinSpeed. Illustrations 1–25 through 1–31 show the cabinets replaced and modified by the catalogs listed in the flowchart.



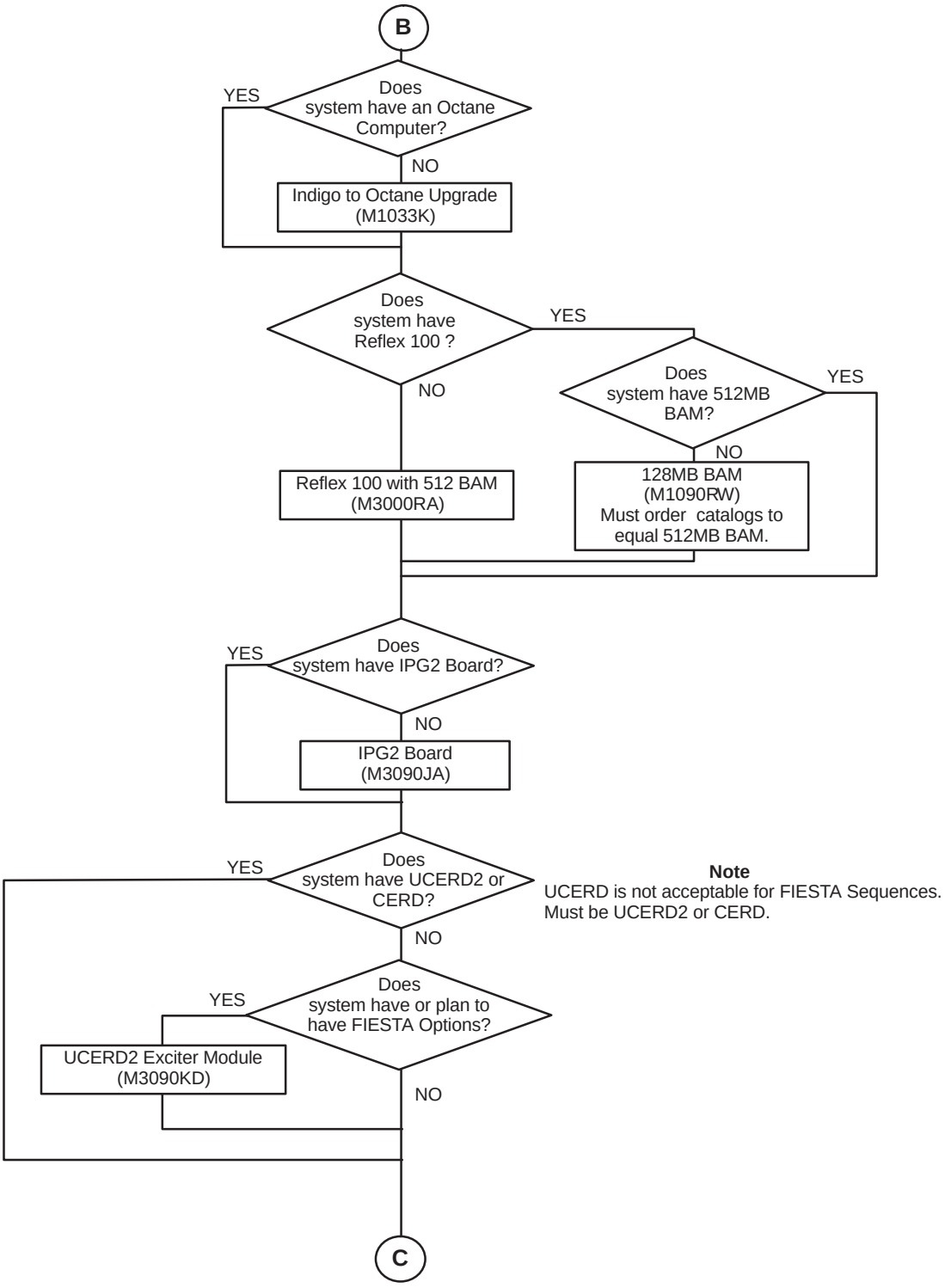
SIGNA MR/i LX UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–26

1–10–1 Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet (Continued)



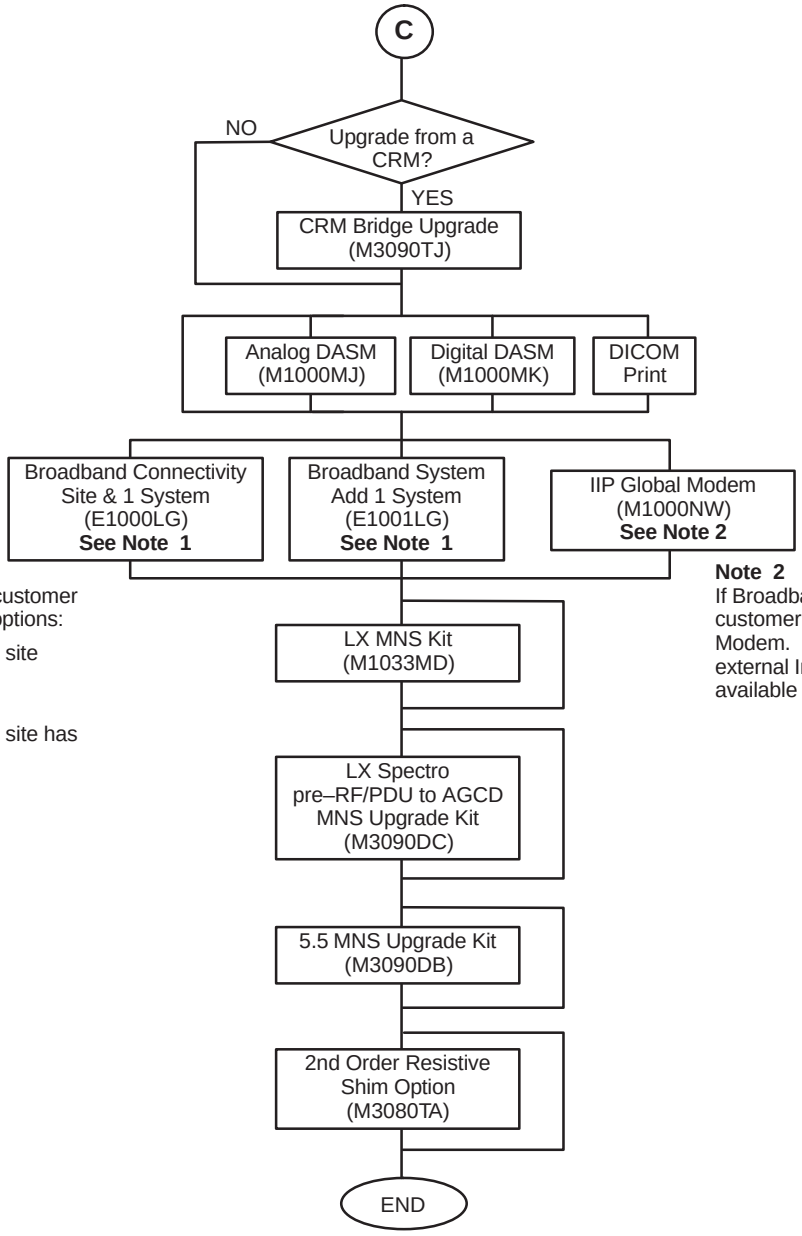
SIGNA MR*i*, CV*i*, NV*i* & SIGNA LX UPGRADE TO SIGNA 1.5T TWINSPEED UPGRADE CATALOGS
ILLUSTRATION 1–27

1–10–1 Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet (Continued)



SIGNA LX UPGRADE TO SIGNA TWINSPEED CATALOGS (CONTINUED)
ILLUSTRATION 1–28

1–10–1 Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet (Continued)



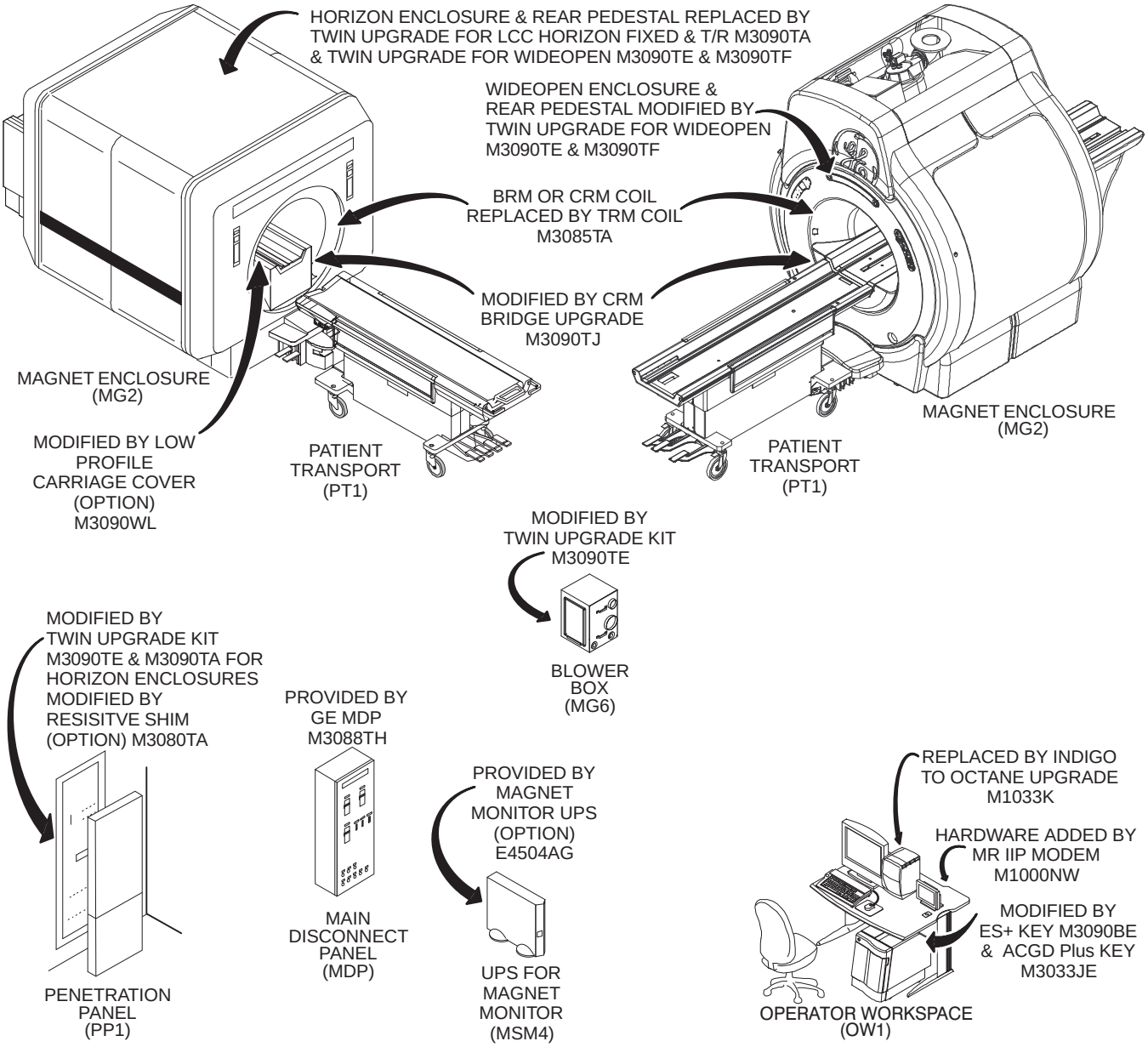
Note 1
If Broadband is available at customer site then choose one of the options:

- Order E1000LG if customer site does not have an existing connection.
- Order E1001LG if customer site has previously ordered E1000LG

Note 2
If Broadband is not available at customer site then must choose Modem. One Global Modem for external InSite modem to be available during system installation.

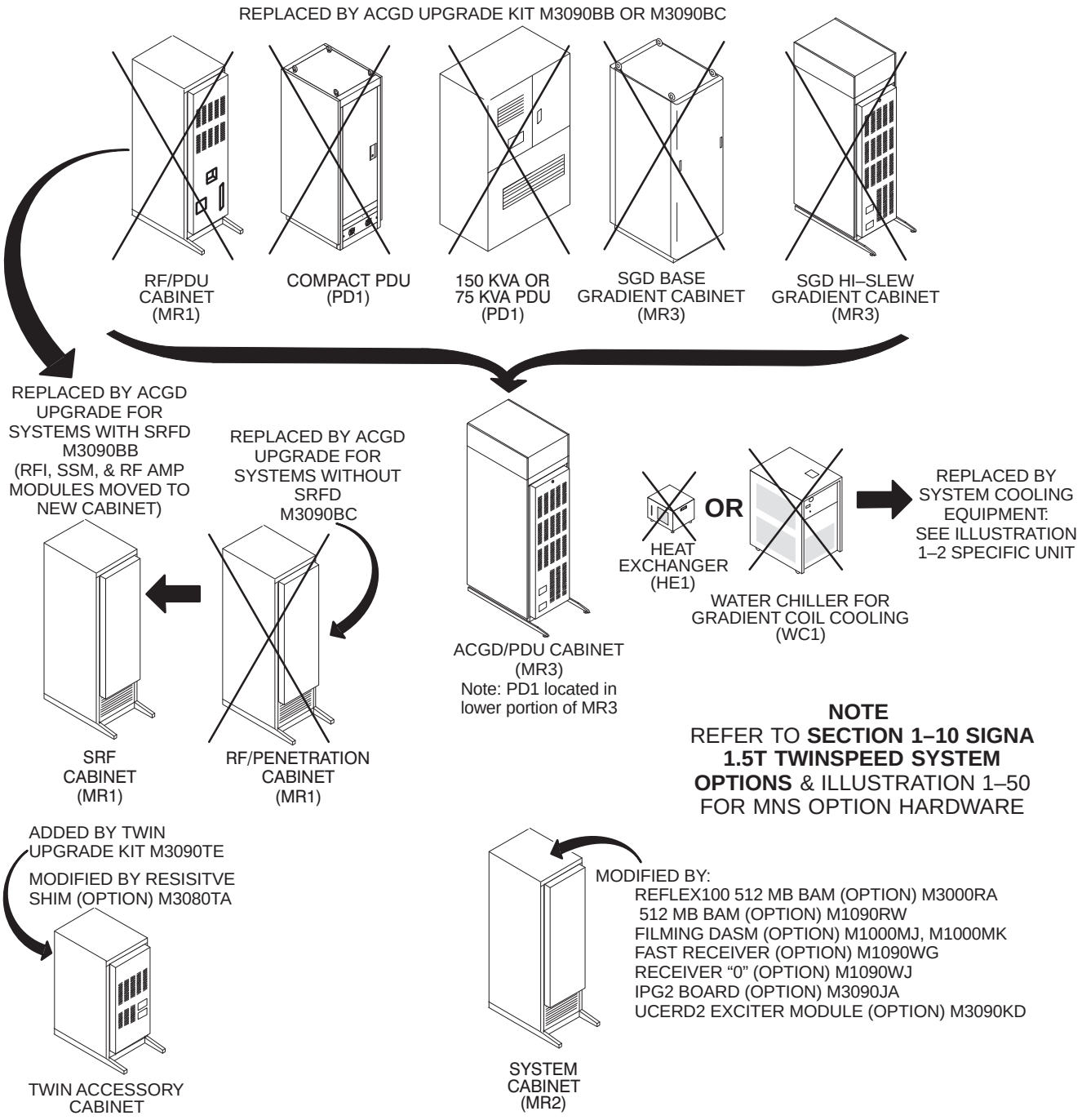
SIGNA HORIZON OR SIGNA LX UPGRADE TO SIGNA TWINSPEED CATALOGS (CONTINUED)
ILLUSTRATION 1–29

1–10–1 Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet (Continued)



SIGNA LX & SIGNA MR*i* SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–30

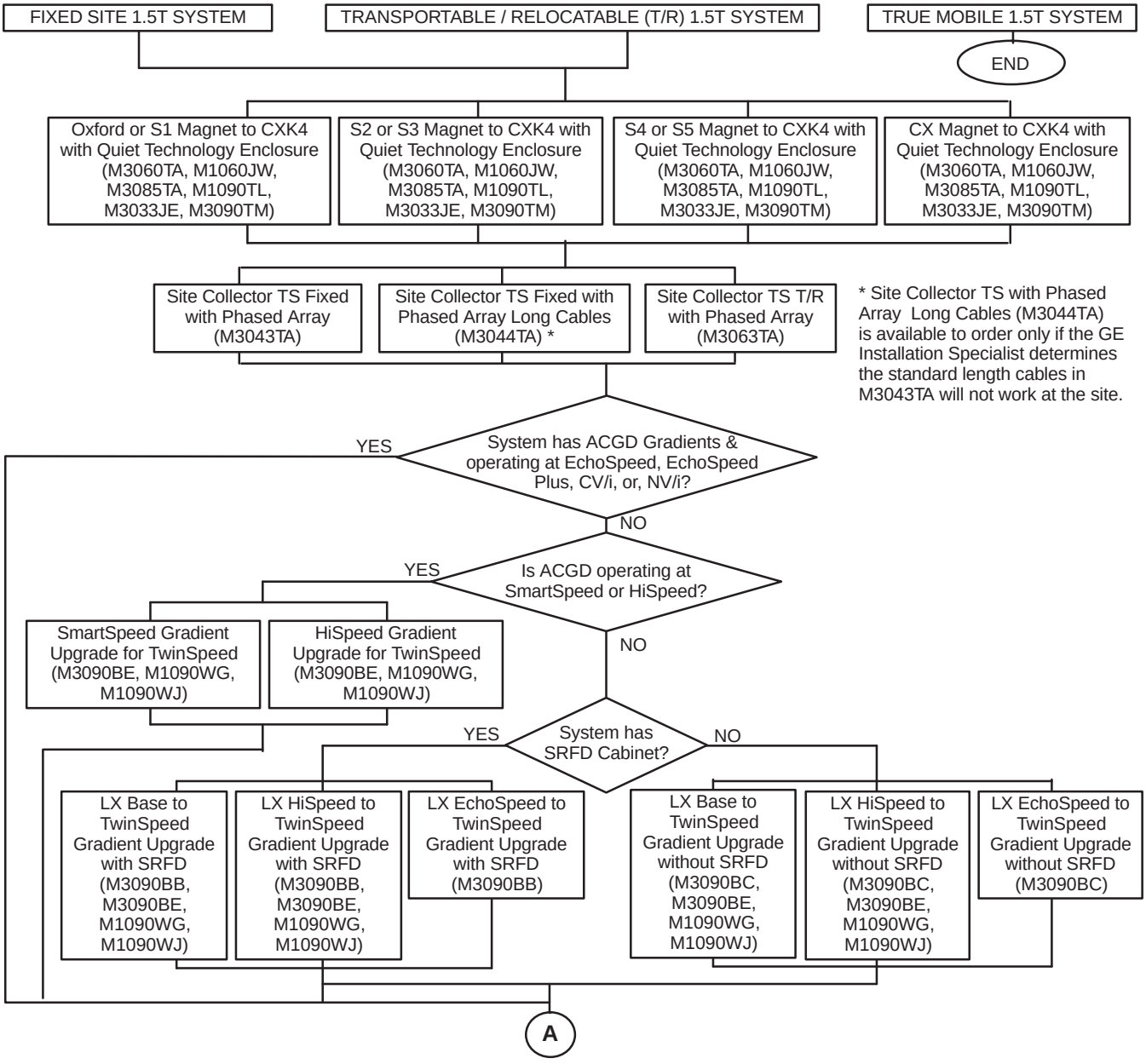
1–10–1 Signa MR/i, CV/i, NV/i & Signa LX, CVMR With LCC Magnet (Continued)



SIGNA LX & SIGNA MR*i* SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–31

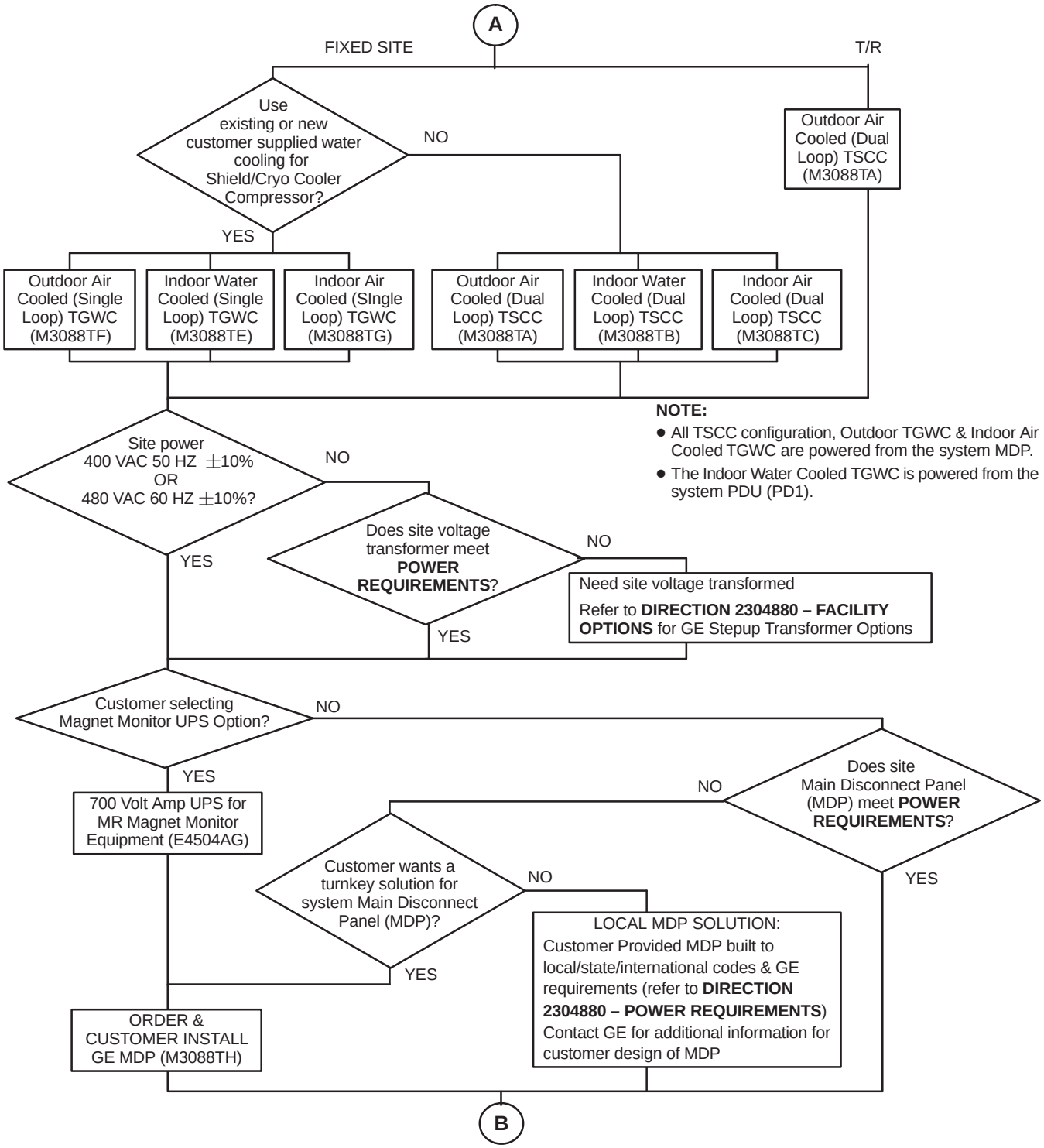
1–10–2 Signa LX & CVMR Without LCC Magnet Installed

The flowchart shown in Illustrations 1–32 through 1–35 lists the upgrade catalogs for a Signa LX or CVMR (with ACGD or SGD) and current system installed magnet is NOT an LCC Magnet upgrading to Signa 1.5T TwinSpeed. Illustrations 1–36 through 1–37 show the equipment and cabinets replaced and modified by the catalogs listed in the flowchart.



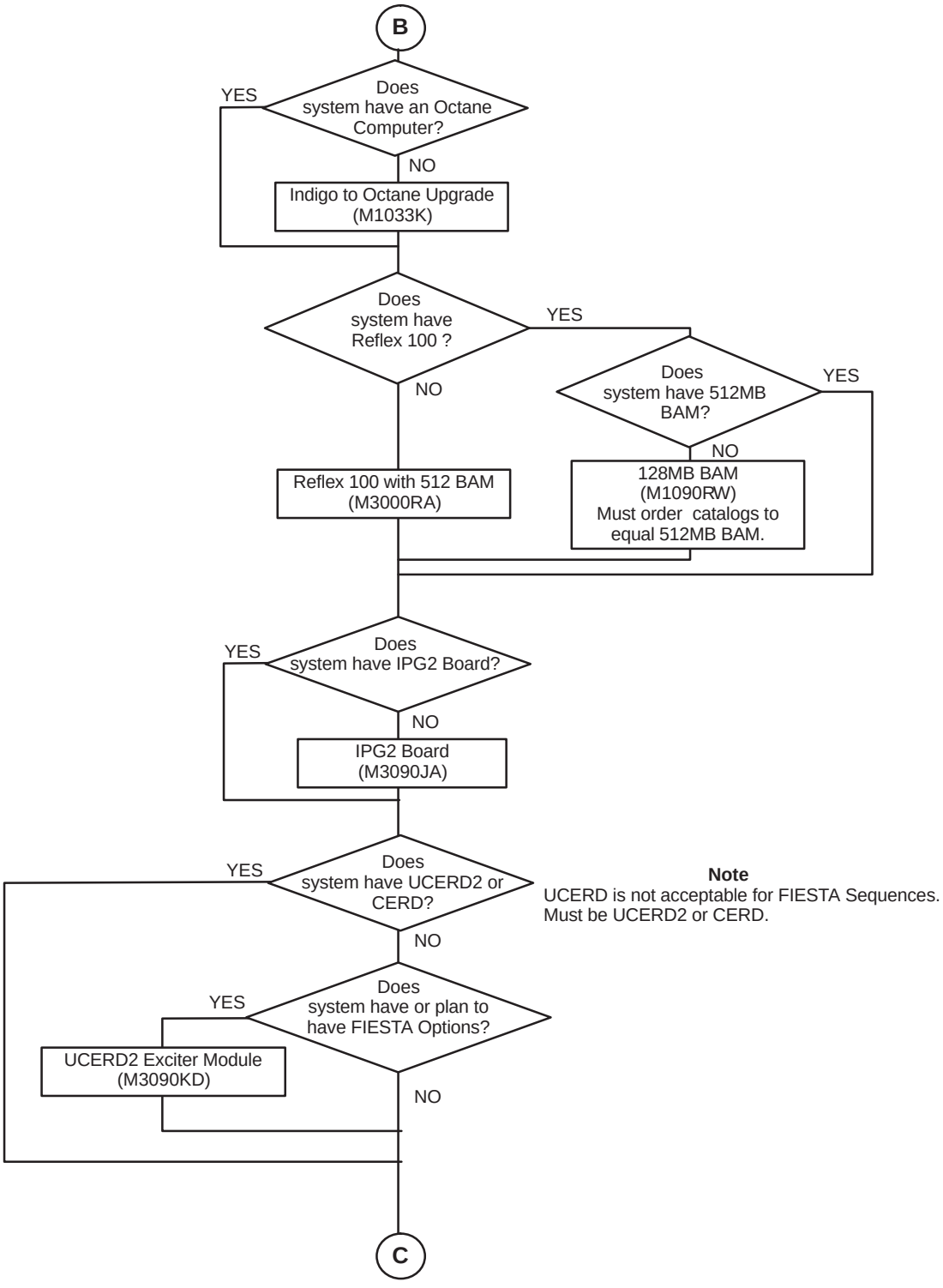
SIGNA LX & CVMR WITHOUT LCC MAGNET INSTALLED UPGRADE TO SIGNA 1.5T TWINSPEED CATALOGS
ILLUSTRATION 1 – 32

1–10–2 Signa LX & CVMR Without LCC Magnet Installed (Continued)



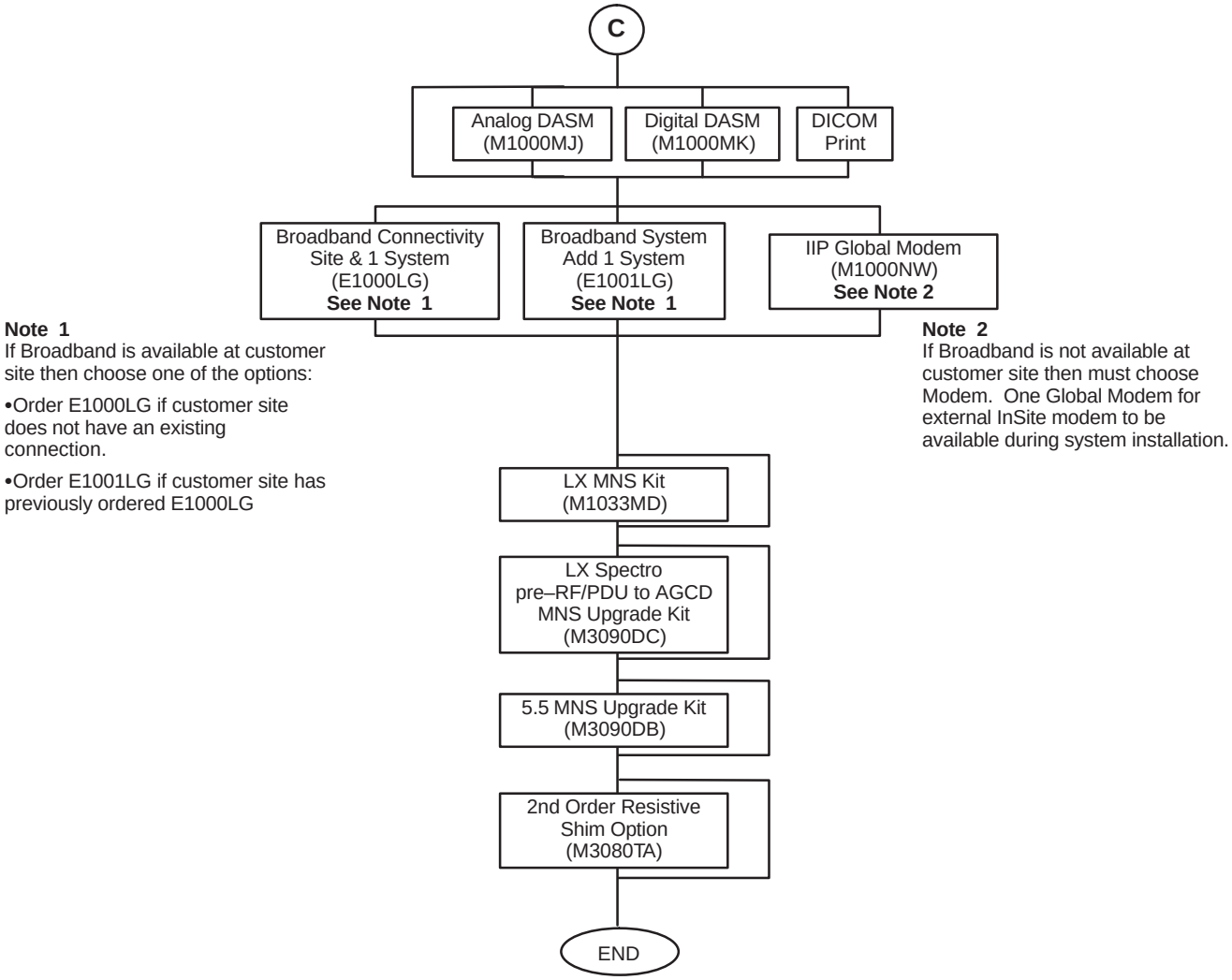
SIGNA LX & CVMR WITHOUT LCC MAGNET INSTALLED UPGRADE TO SIGNA 1.5T TWINSPEED CATALOGS
ILLUSTRATION 1–33

1–10–2 Signa LX & CVMR Without LCC Magnet Installed (Continued)



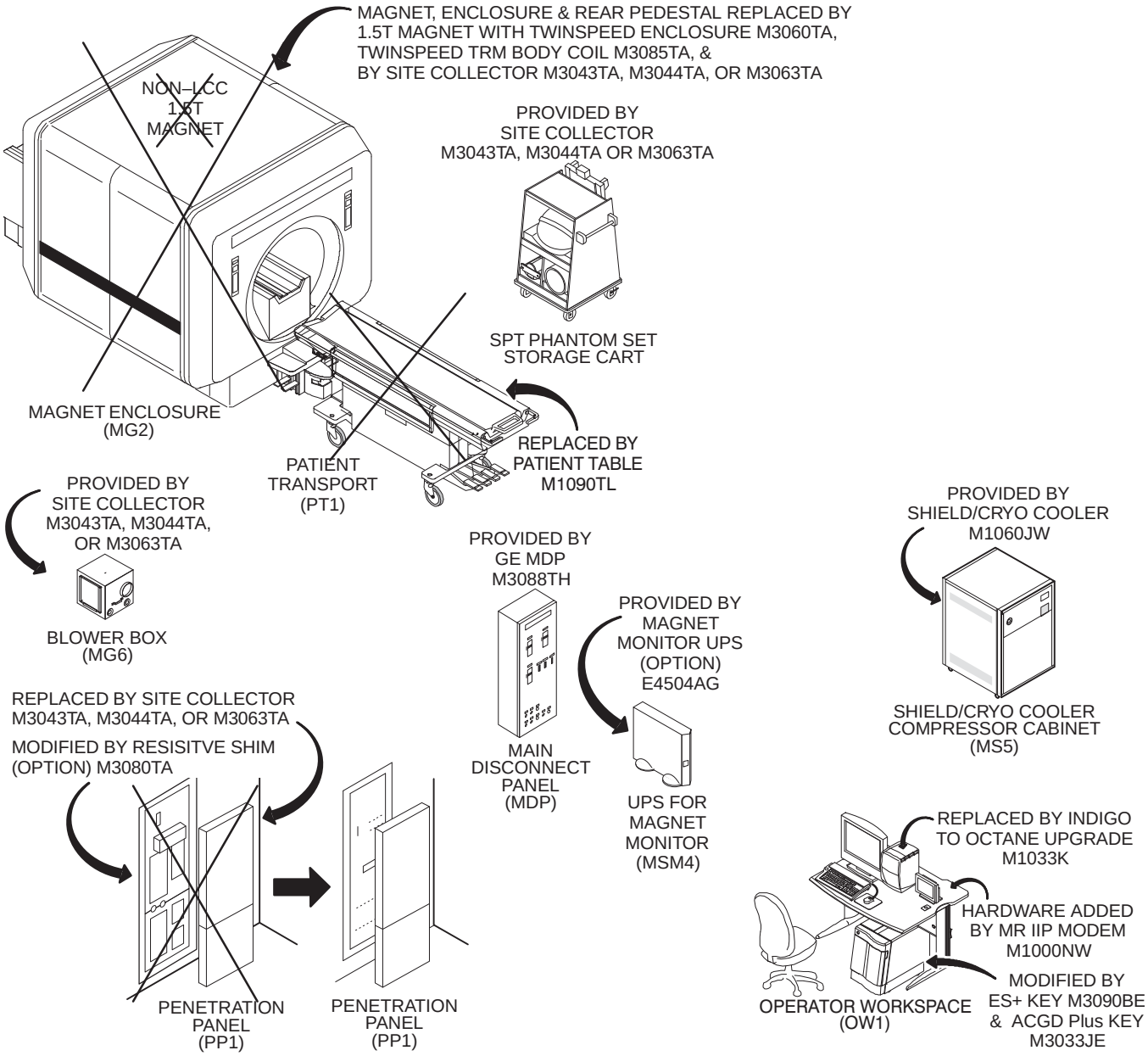
SIGNA LX & CVMR WITHOUT LCC MAGNET INSTALLED UPGRADE TO SIGNA 1.5T TWINSPEED CATALOGS
ILLUSTRATION 1–34

1–10–2 Signa LX & CVMR Without LCC Magnet Installed (Continued)



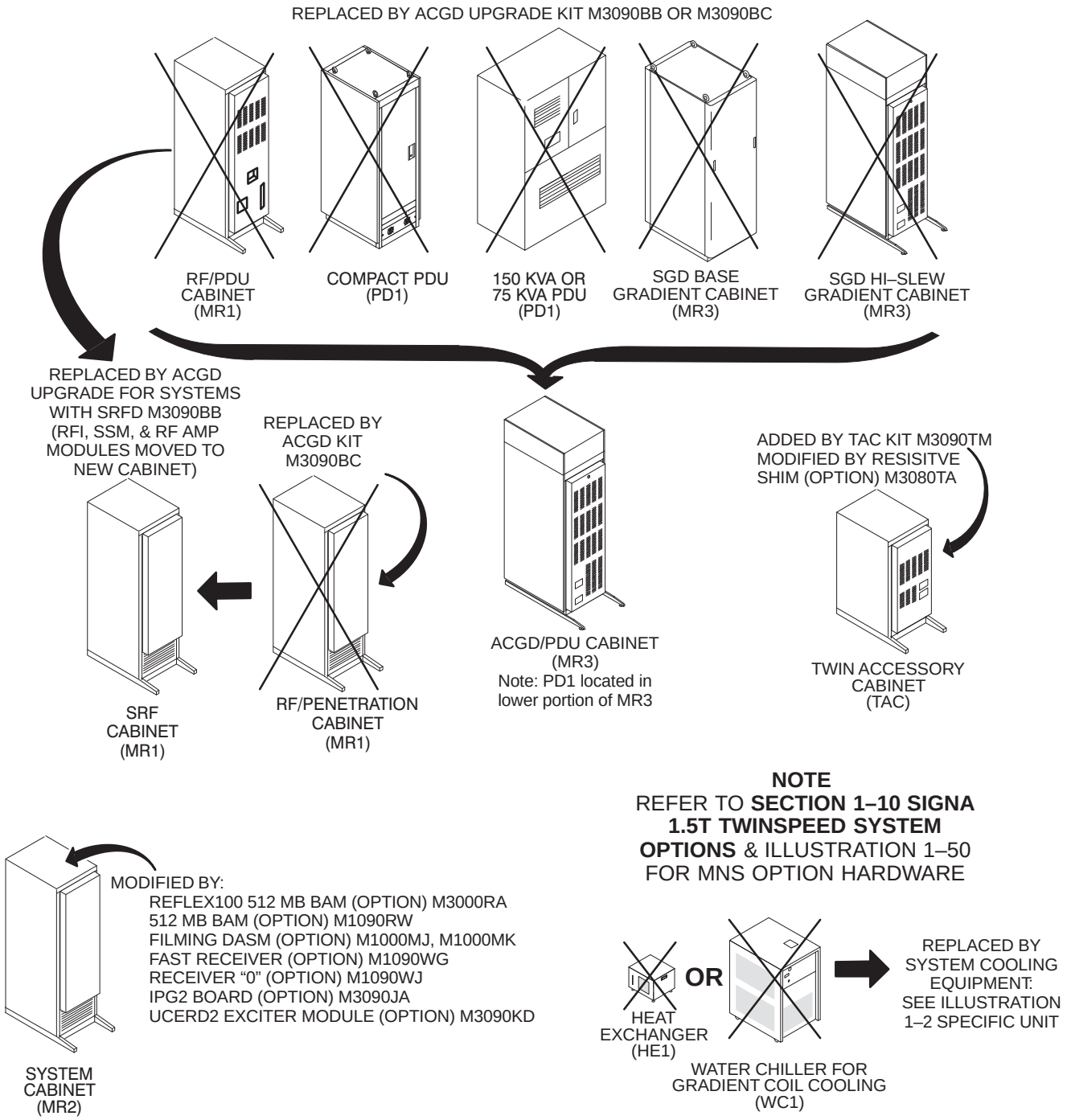
SIGNA LX & CVMR WITHOUT LCC MAGNET INSTALLED UPGRADE TO SIGNA 1.5T TWINSPEED CATALOGS
ILLUSTRATION 1–35

1–10–2 Signa LX & CVMR Without LCC Magnet Installed (Continued)



SIGNA LX & CVMR WITHOUT LCC MAGNET INSTALLED
EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–36

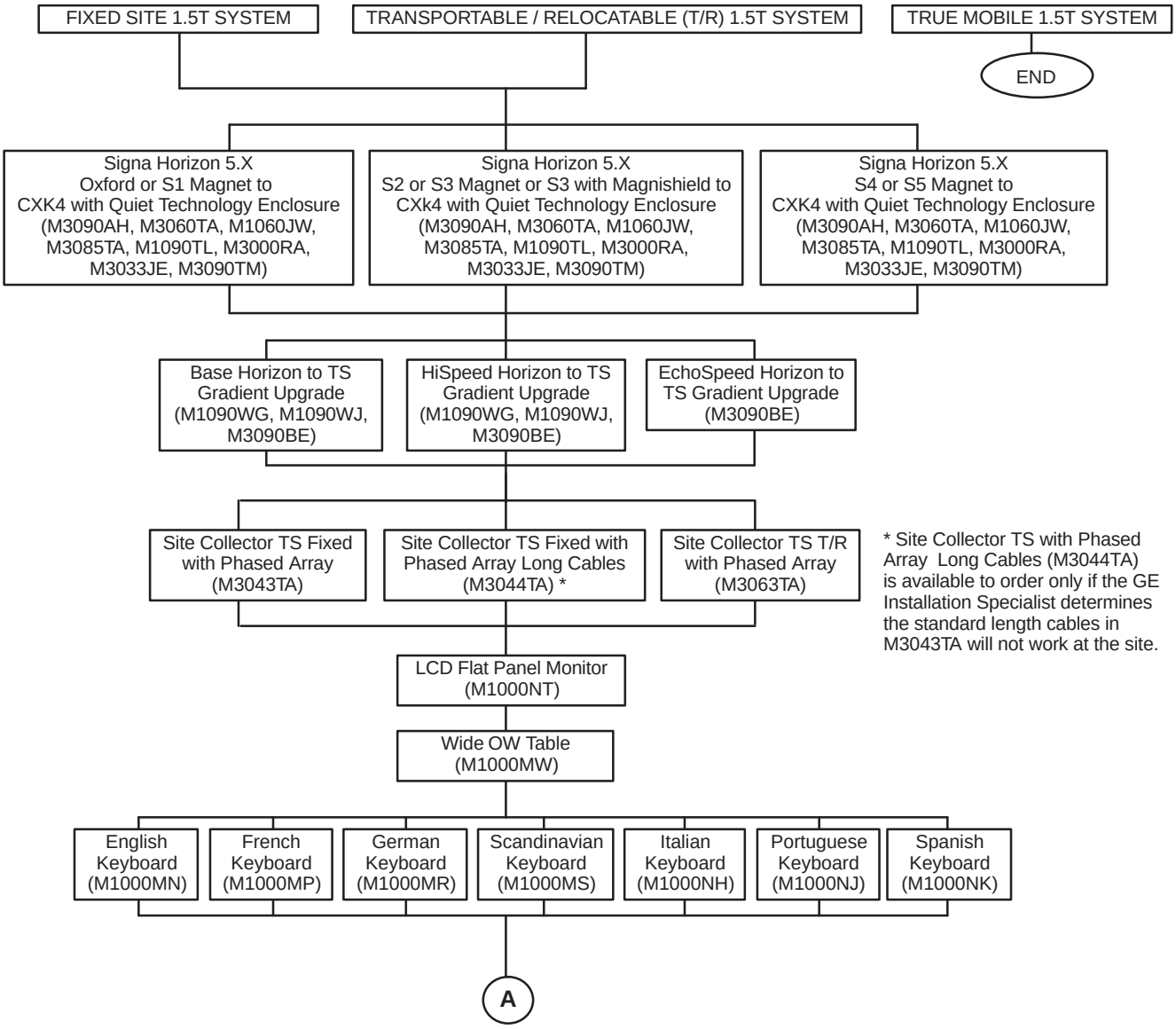
1–10–2 Signa LX & CVMR Without LCC Magnet Installed (Continued)



SIGNA LX & CVMR WITHOUT LCC MAGNET INSTALLED
EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–37

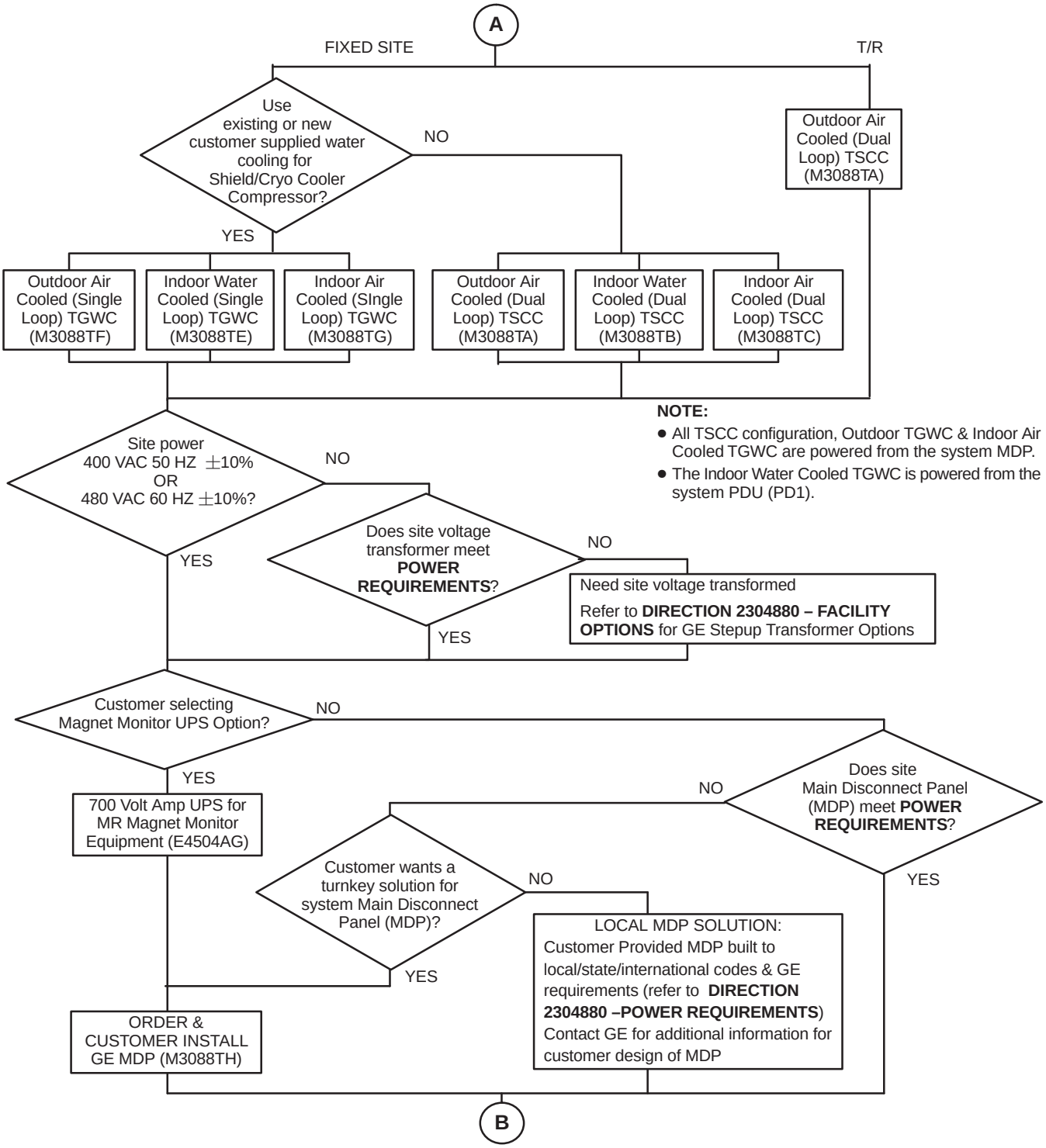
1–10–3 Signa Horizon

Upgrades from Signa Horizon 5.X to Signa 1.5T TwinSpeed require the system magnet to be upgraded to an LCC Magnet. The flowchart shown in Illustrations 1–38 through 1–40 lists the Signa Horizon 5.X upgrade catalogs. Illustrations 1–41 and 1–42 show the equipment and cabinets replaced and modified by the catalogs listed in the flowchart.



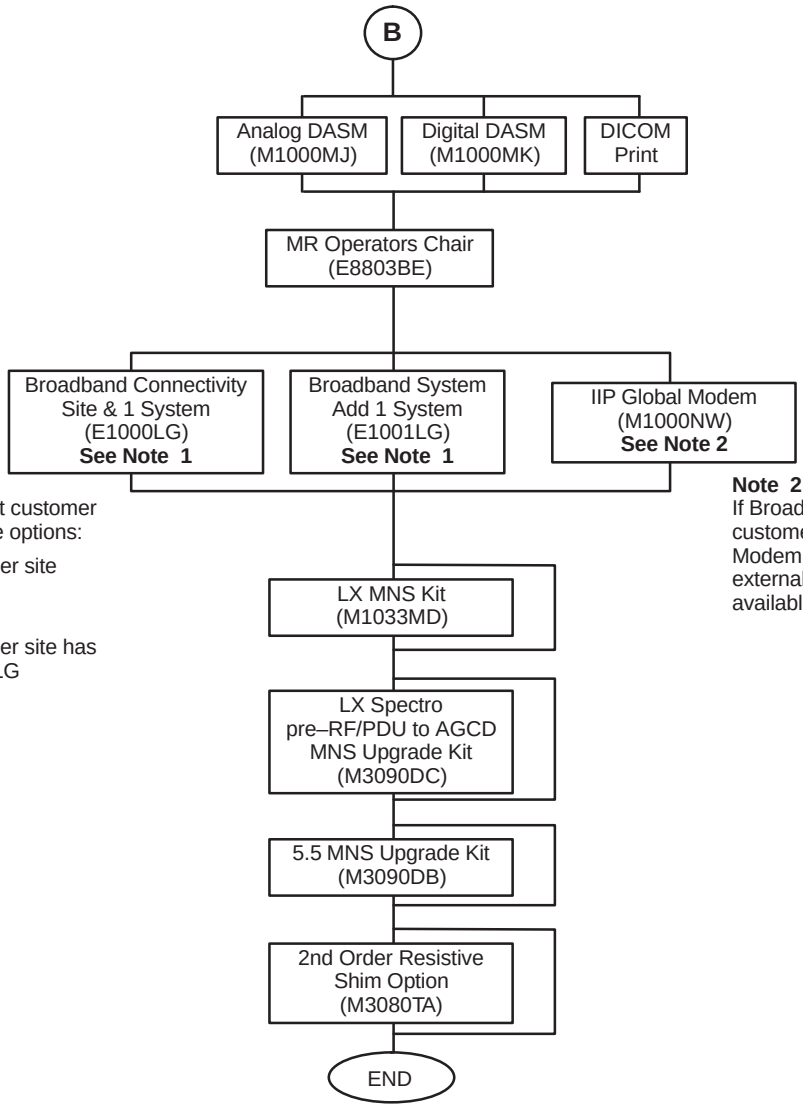
SIGNA HORIZON UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–38

1–10–3 Signa Horizon (Continued)



SIGNA HORIZON UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–39

1–10–3 Signa Horizon (Continued)



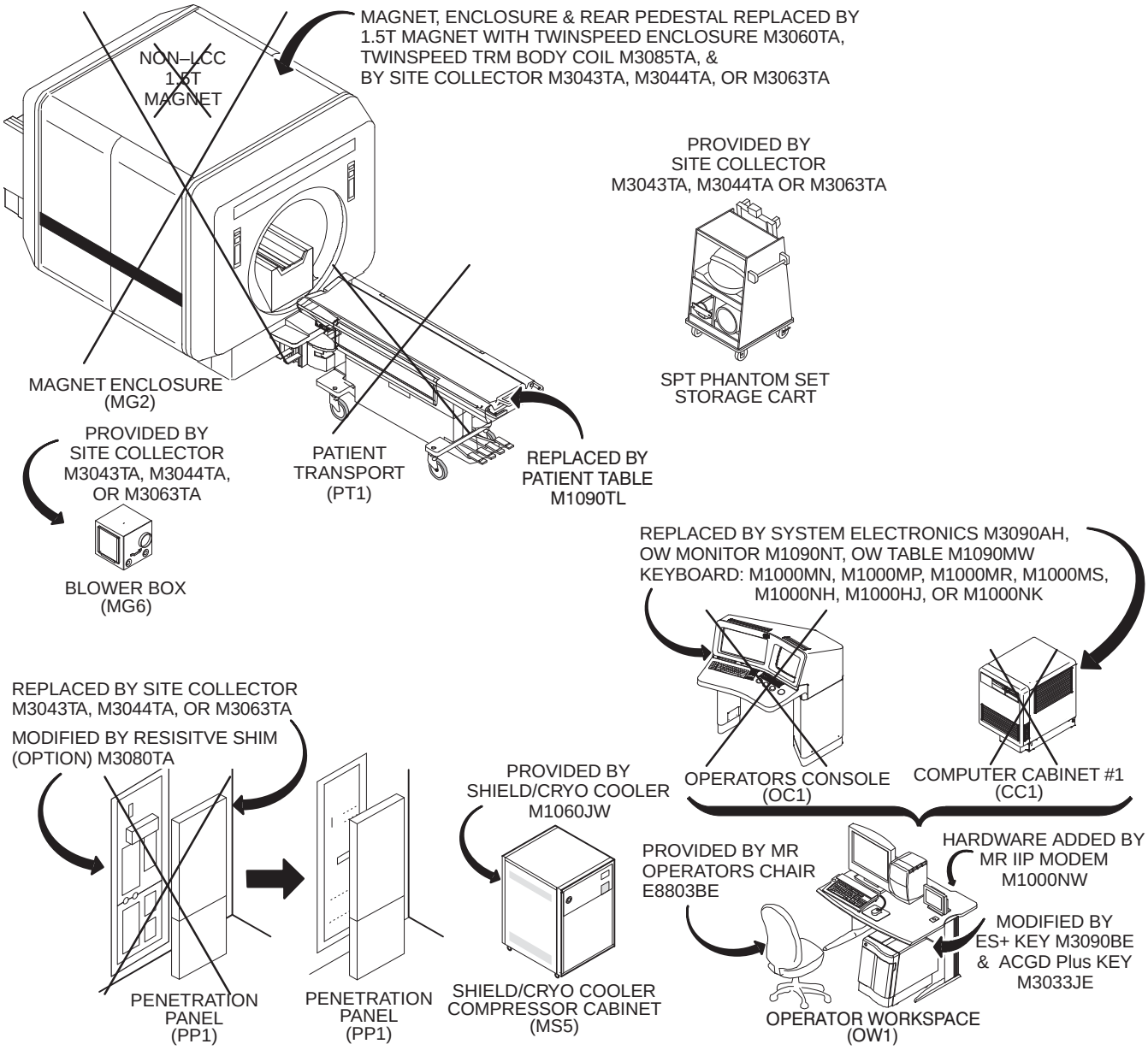
Note 1
If Broadband is available at customer site then choose one of the options:

- Order E1000LG if customer site does not have an existing connection.
- Order E1001LG if customer site has previously ordered E1000LG

Note 2
If Broadband is not available at customer site then must choose Modem. One Global Modem for external InSite modem to be available during system installation.

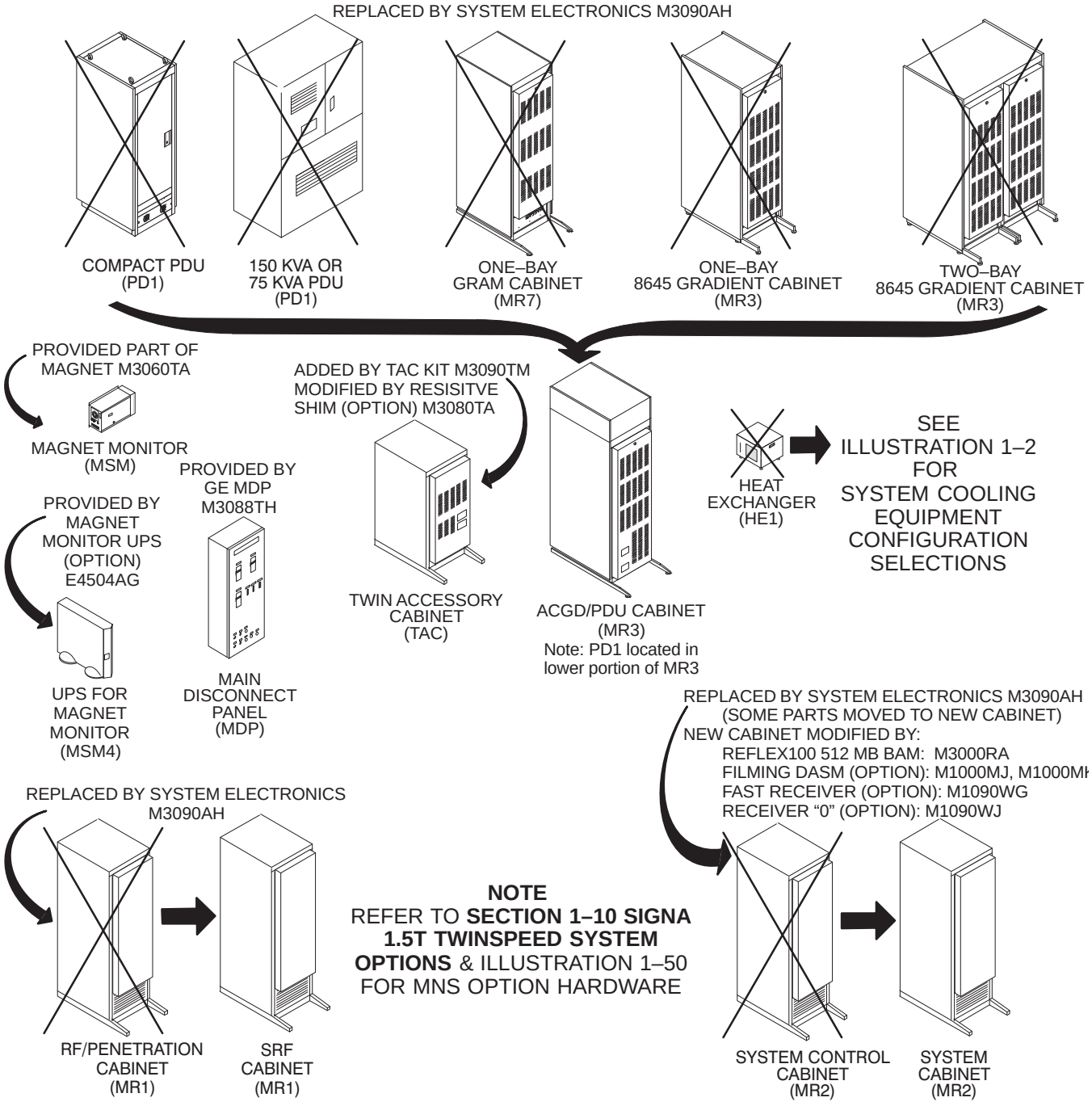
SIGNA HORIZON UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–40

1–10–3 Signa Horizon (Continued)



SIGNA HORIZON 5.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–41

1–10–3 Signa Horizon (Continued)

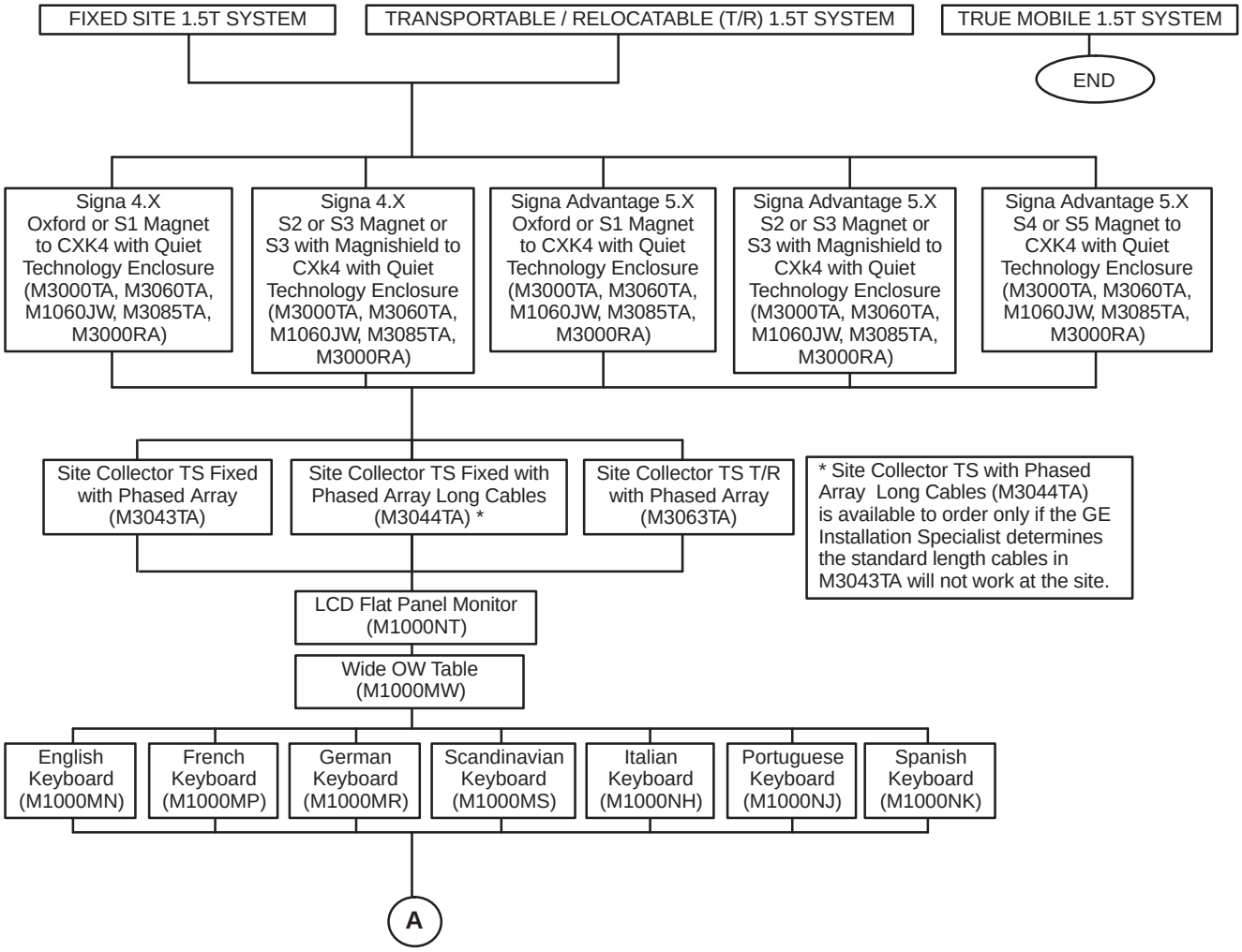


SIGNA HORIZON 5.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–42

1–10–4 Signa Advantage 5.X & 4.X

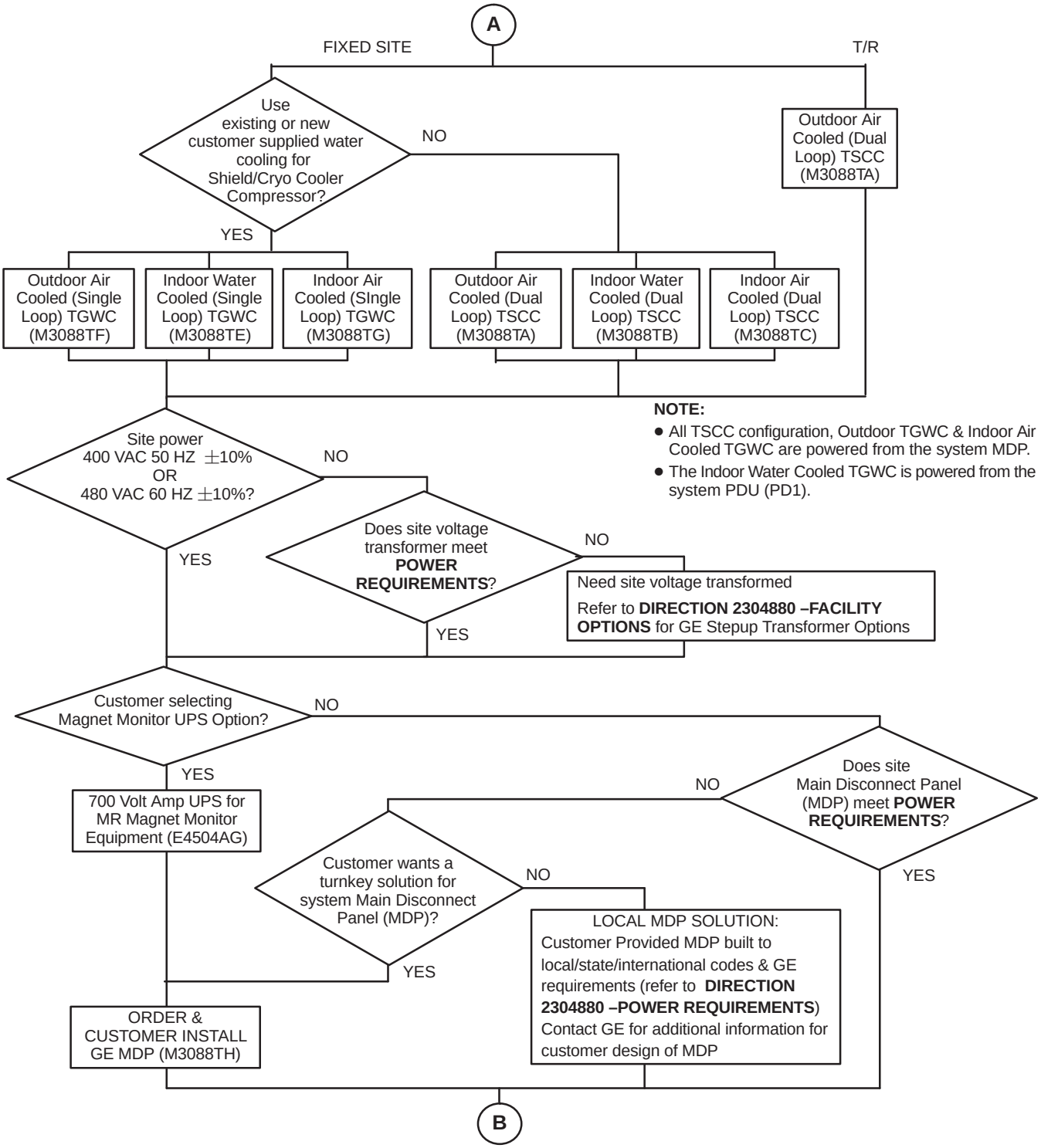
Upgrades from Signa Horizon 5.X Software Only, Advantage 5.X and 4.X to Signa 1.5T TwinSpeed require the system magnet to be upgraded to an LCC Magnet. The flowchart shown in Illustrations 1–43 through 1–45 lists the Signa Horizon 5.X Software Only, Advantage 5.X and 4.X to Signa 1.5T TwinSpeed upgrade catalogs. The equipment replaced and modified by the catalogs listed in the flowchart are shown in the illustrations as note below:

- Signa Horizon 5.X Software Only & Signa Advantage 5.X see Illustrations 1–46 and 1–47
- Signa Advantage 4.x see Illustrations 1–48 and 1–49



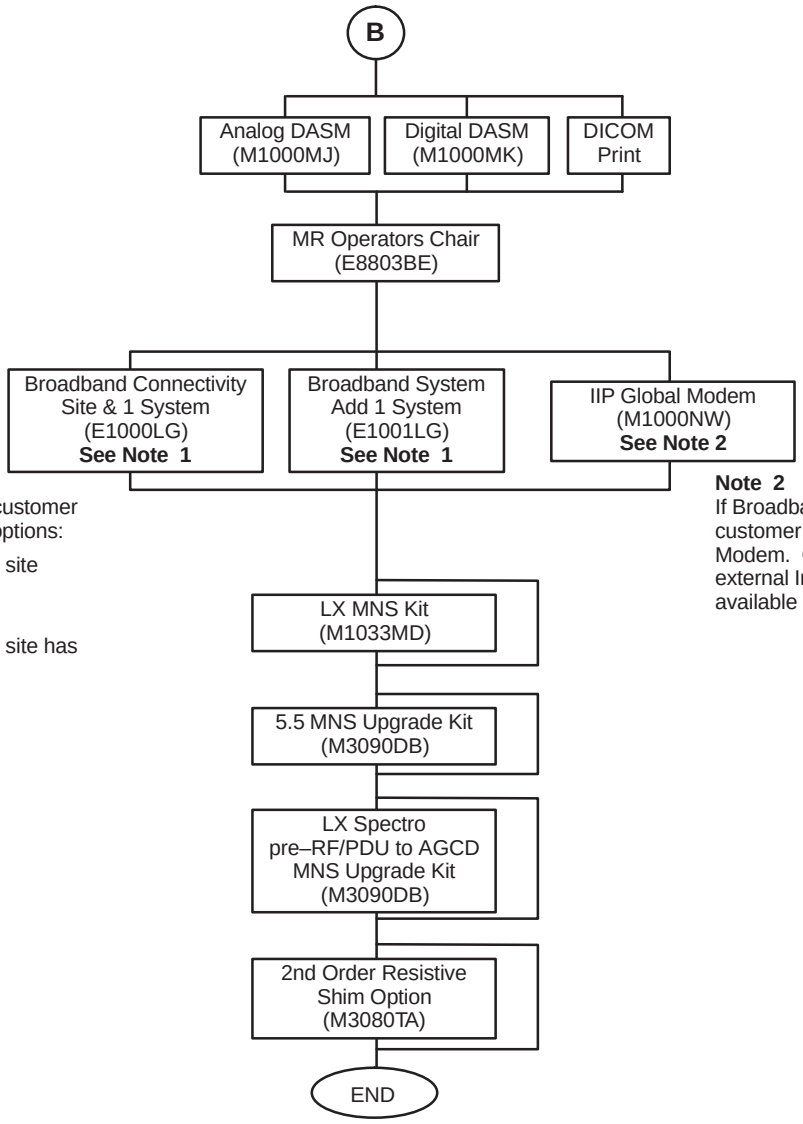
SIGNA HORIZON 5.X SOFTWARE ONLY, ADVANTAGE 5.X & 4.X UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–43

1–10–4 Signa Advantage 5.X & 4.X (Continued)



SIGNA HORIZON 5.X SOFTWARE ONLY, ADVANTAGE 5.X & 4.X UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–44

1–10–4 Signa Advantage 5.X & 4.X (Continued)



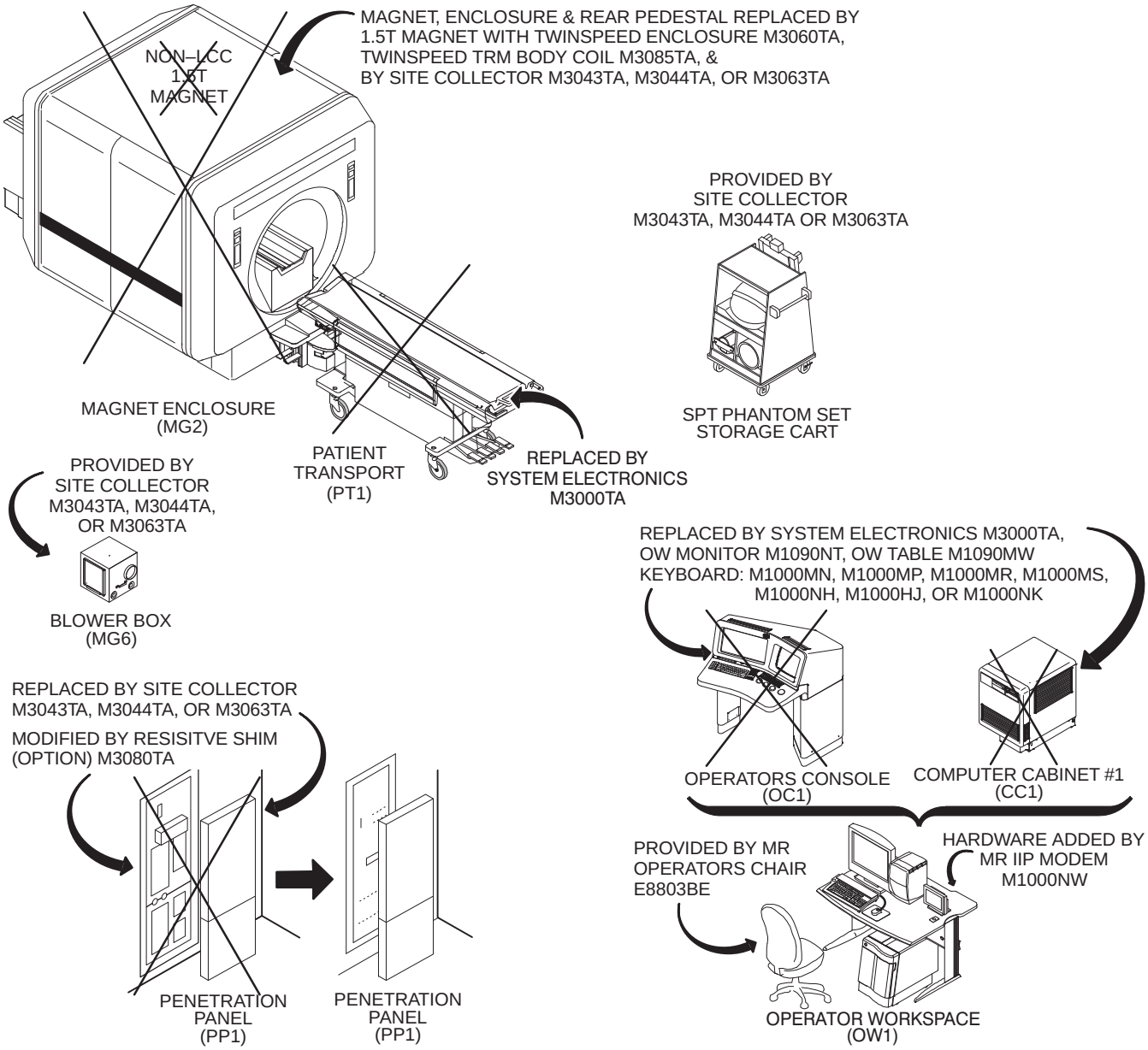
Note 1
If Broadband is available at customer site then choose one of the options:

- Order E1000LG if customer site does not have an existing connection.
- Order E1001LG if customer site has previously ordered E1000LG

Note 2
If Broadband is not available at customer site then must choose Modem. One Global Modem for external InSite modem to be available during system installation.

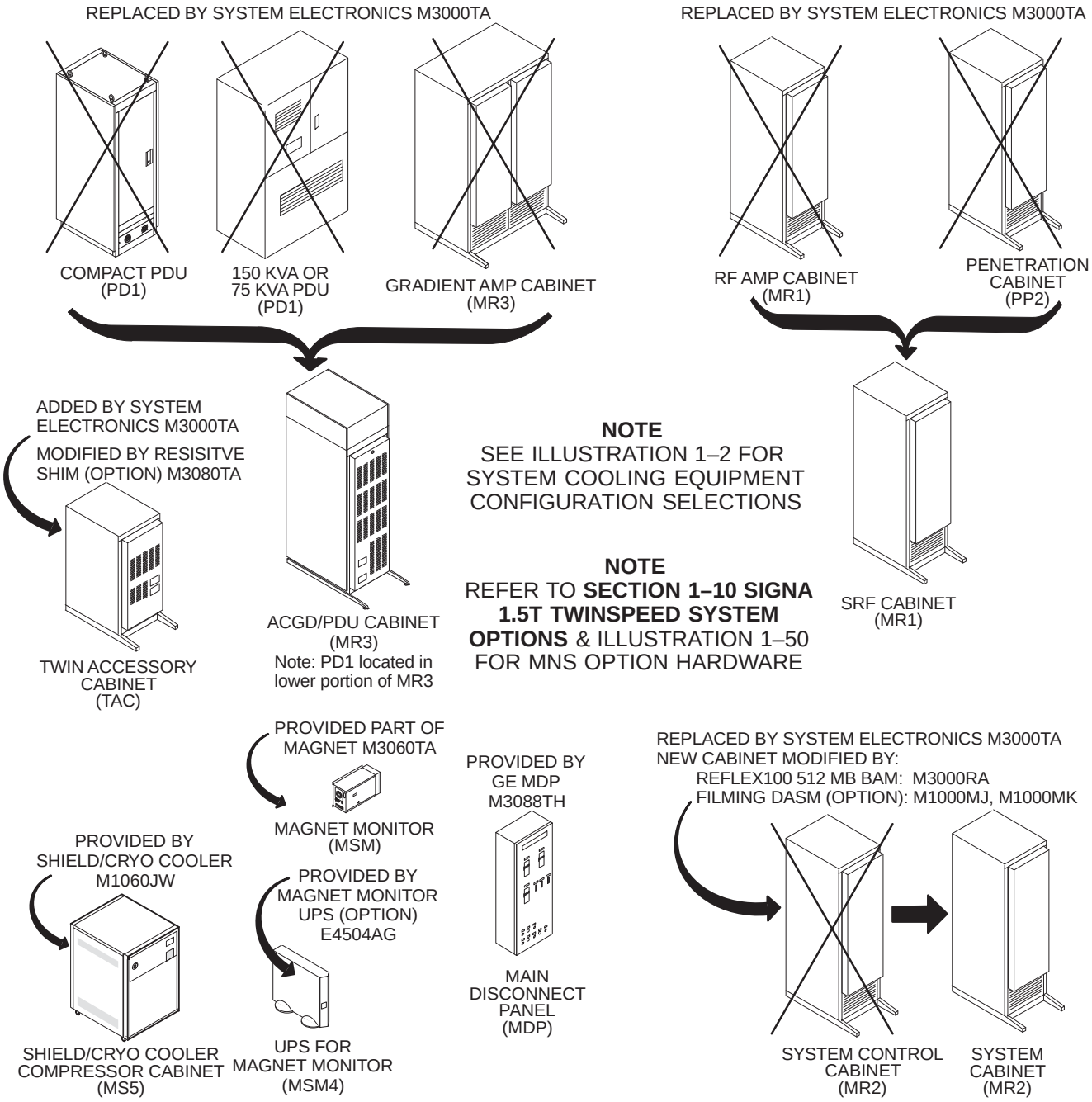
SIGNA HORIZON 5.X SOFTWARE ONLY, ADVANTAGE 5.X & 4.X UPGRADE TO SIGNA TWINSPEED CATALOGS
ILLUSTRATION 1–45

1–10–4 Signa Advantage 5.X & 4.X (Continued)



SIGNA HORIZON 5.X SOFTWARE ONLY & ADVANTAGE 5.X SYSTEM
EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–46

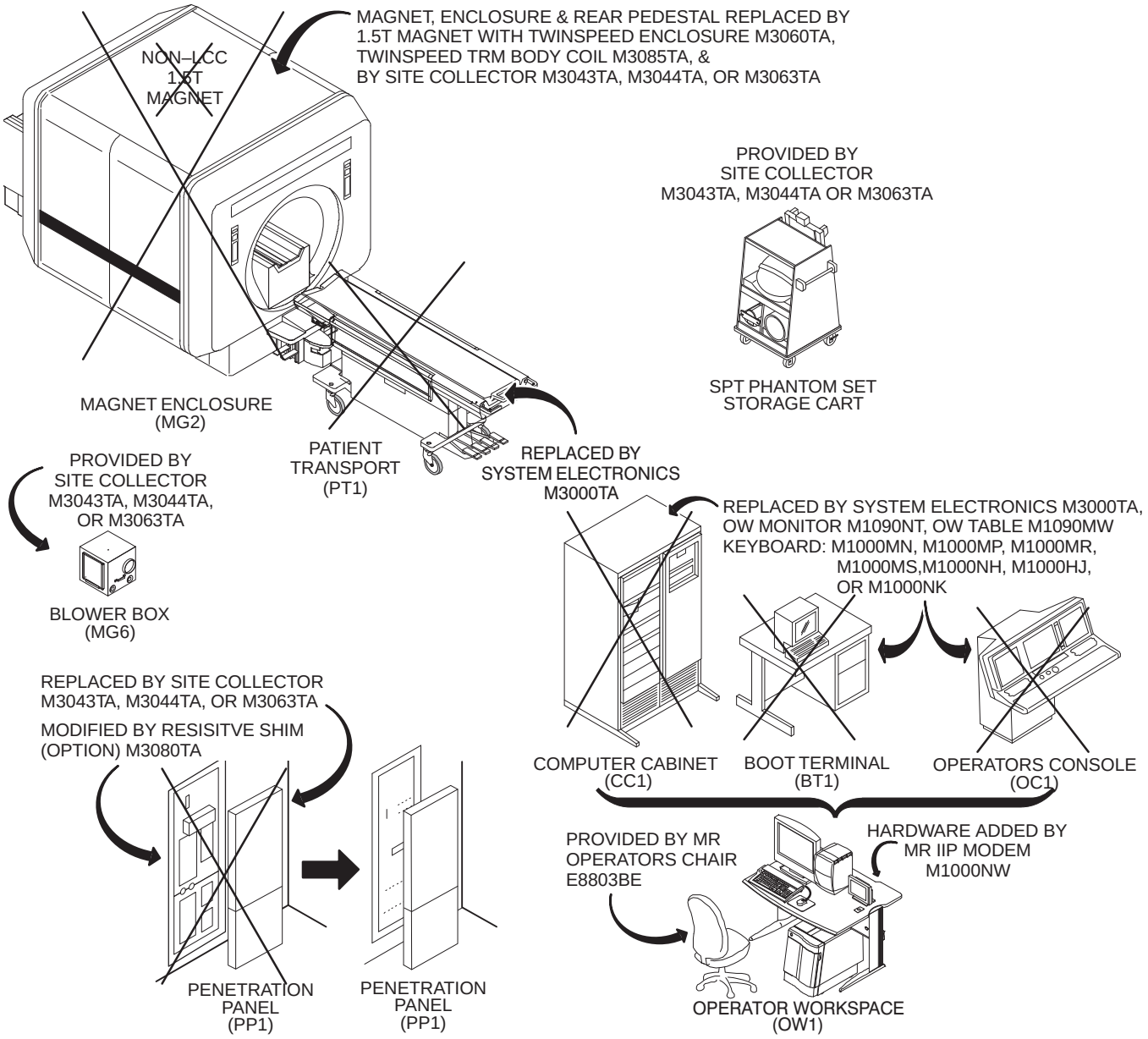
1–10–4 Signa Advantage 5.X & 4.X (Continued)



SIGNA HORIZON 5.X SOFTWARE ONLY & SIGNA ADVANTAGE 5.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED

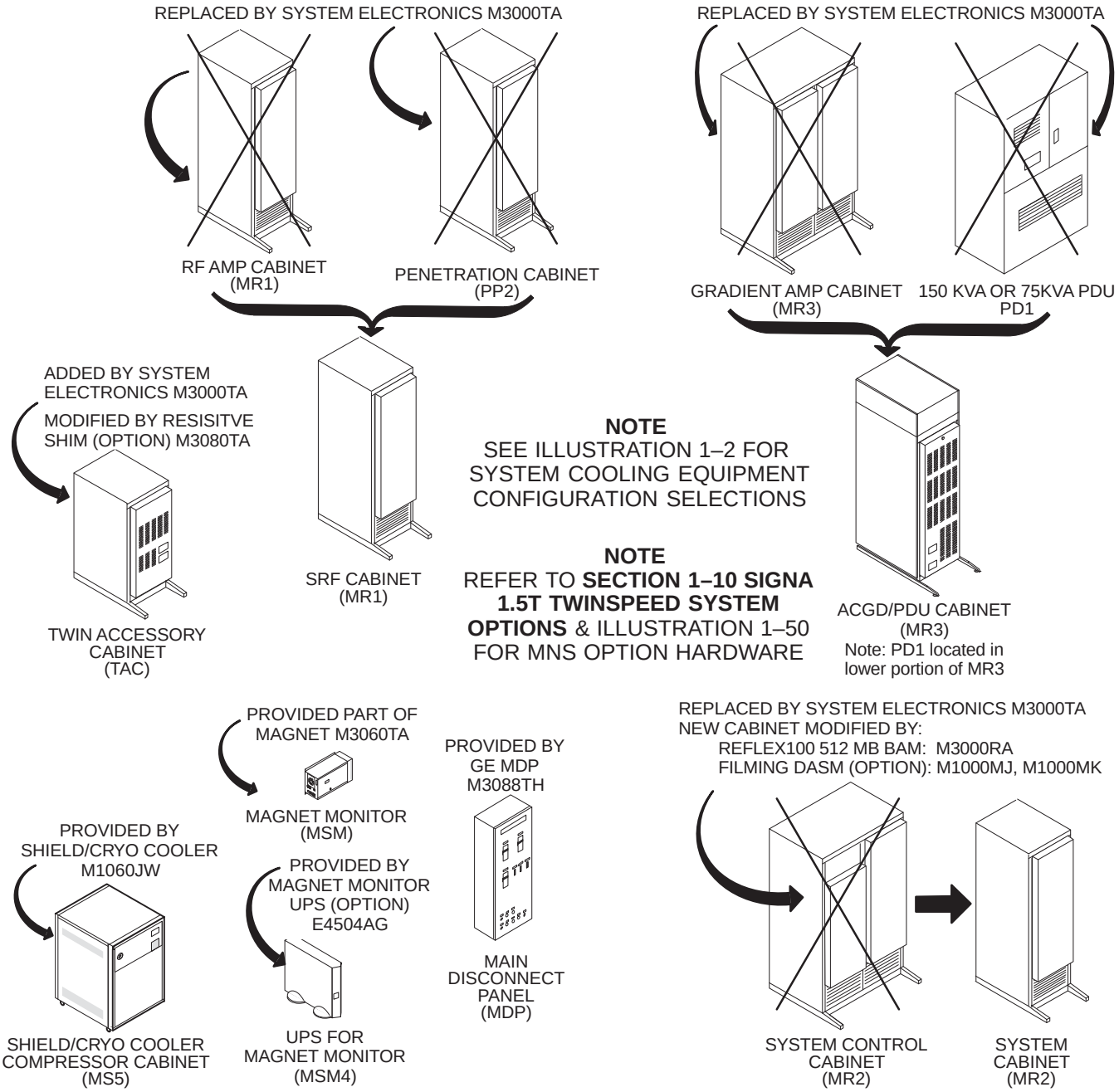
ILLUSTRATION 1–47

1–10–4 Signa Advantage 5.X & 4.X (Continued)



SIGNA ADVANTAGE 4.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–48

1–10–4 Signa Advantage 5.X & 4.X (Continued)



SIGNA ADVANTAGE 4.X SYSTEM EXISTING HARDWARE REPLACED OR MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–49

1–11 SIGNA 1.5T Twin*Speed* SYSTEM OPTIONS

There are no system options specific to the Signa 1.5T Twin*Speed* Upgrade. The list below identifies options that are available for the Signa 1.5T Twin*Speed* system.

Purchased options may also be installed concurrently with the system upgrade. Flow charts provide steering to the Option Installation Direction that is delivered with the system.

Refer to installation manual shipped with the option for the following:

- M1060KM – Oxygen Monitor: *Direction 15336, Oxygen Monitor Subsystem*
- M1090TL – Second Patient Transport: *Direction 15477, Second Patient Transport Option Installation*

PERFORMANCE UPGRADE OPTIONS

- M1090RW – Acquisition Memory – 128MB for Medcam
- M1090RY – Host Memory Kit – 128MB

HARDWARE OPTIONS

- M1090SY – Video Conferencing
- M1090TZ – VCR Interface Kit
- M3000JB – 18 Gb Disk Drive for Octane
- M3080TA – Resistive Shim for TwinSpeed
- E4504AG UPS for Manget Monitor

SOFTWARE OPTIONS

- M1033JA – *i*Drive Pro
- M1033JB – SmartPrep 2000 (Includes SmartStep)
- M1033JD – Probe2000
- M1033JE – EchoPlus Base
- M1033JF – ScanTools 2000
- M1033JH – SmartPrep 2000 Update
- M1033JJ – Probe2000 Update (for customers that have Probe software)
- M1033JK – LX FuncToll 2000
- M1033JL – LX Tools
- M1033JZ – FuncTool 2000 for AW
- M1033MG – SAGE 7
- M1033PA – Performed Procedure Step
- M1033PL – ConnectPro
- M1090CR – Cardiac
- M1090LP – EchoPlus Diffusion Weighted Imaging Software
- M1090LR – Single Shot – FSE
- M1090LT – SmartPrep IA
- M1090MW – 8.x Software Non–Z with Multi–slice
- M1090MZ – Clariview
- M1090NN – Functool
- M1090PM – Bar Code Reader
- M1090PR – Flow Analysis
- M3033JA – Probe 3D Bain
- M3033JB – Functool CSI

1–11 SIGNA 1.5T Twin*Speed* SYSTEM OPTIONS (Continued)

- M3033JC – Ultra–Short TR for 3D Fast GRE
- M3033JD – BodyPak
- M3033JE – ACGD Plus
- M3033JG – Phase Sensitive IR
- M3033JF – Flouro Triggered MRA
- M3033JP – FGRET
- M3033JM – Spiral Hi Resolution
- M3033JN – Spiral Real–Time
- M3033JR – FGRET Real–Time
- M3033JJ – Prose Rulse Sequence
- M3033JH – SSFSE–XL
- M3033JL – 3D FSE Variable R1
- M3033LR – HiSpeed Plus

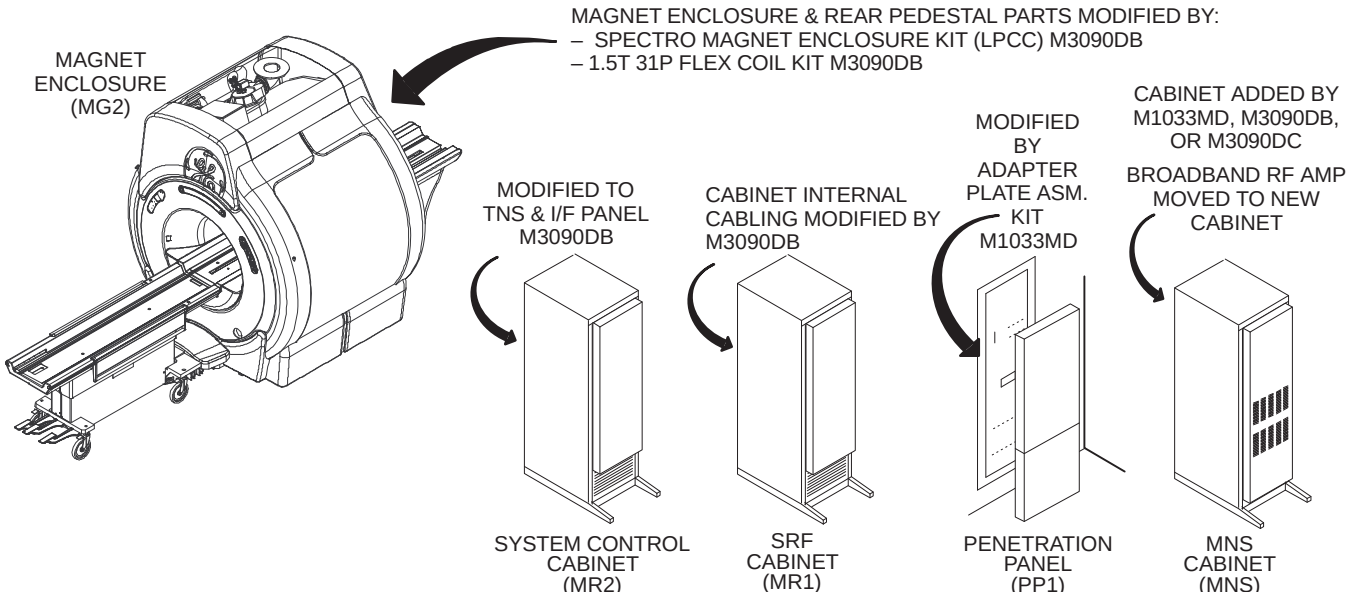
Refer to manual shipped with the option for installation of Surface Coil Options, Advantage Window options, and Camera Options.

- The following Multi–Nuclear Spectroscopy (MNS) options are available (refer to Illustration 1–50):

  –If system never had Multi–Nuclear Spectroscopy or did not retain all parts from the MNS Kit then need to install MNS Kit For Signa LX Systems that have RF/PDU Cabinet or ACGD Cabinet (M1033MD). Kit requires UCERD (can be ordered M1033MF) and ACGD Cabinet. M1033MD provides MNS software and hardware. The hardware includes MNS Cabinet containing RF Broadband Amplifier, system interconnect cables, modification hardware for the basic 1.5T system, P31 Flexible Coil, and MR Spectroscopy Head Phantom.

  –For Signa Horizon 5.5 or later system upgrading to Signa LX:
  If system already has Multi–Nuclear Spectroscopy and have all the parts on site then can install 8.X MNS Upgrade For Signa Horizon 5.5 And Later (M3090DB).

  –Signa LX with Spectroscopy pre–RF/PDU Cabinet to ACGD Upgrade (M3090DC).



1.5T SYSTEM WITH ACGD/PDU CABINET: MNS OPTIONS EXISTING HARDWARE MODIFIED & NEW EQUIPMENT ADDED
ILLUSTRATION 1–50

1–12 TRANSPORTABLE/RELOCATABLE UPGRADE

Transportable and Relocatable MR system upgrade catalogs are listed in the previous upgrade sections. Note, the cable kits for Transportable/Relocatable include a complete set of system interconnect excluding magnet and option related cables.

In addition to the system, the van must also be upgraded to accommodate the MR system upgrade. The van/system upgrades can be preformed at the Van Manufacturer facility (preferred location) or at customer site. It is customer responsibility to arrange with the appropriate Van Manufacturer for any upgrade to be performed at site.

- Customer must contact Van Manufacturer to arrange for van/system upgrade at Van Manufacturer facility or customer site.
- **Customer is responsible for van upgrade costs with Van Manufacturer.** Contact the Van Manufacturer for Van upgrade cost estimate and Van upgrade timing.

Note

The Van upgrade cost is **NOT** included in the price of the MR System Upgrade.

- Customer is responsible for van transportation to and from Van Manufacturer facility for upgrades to be performed there.
- MR system check and calibration performance:
  - –For van/system upgrades performed at Van Manufacturer facility, the installation will be checked by MR Manufacturing. Final calibrations will be performed by GE Field Service.
  - –For van/system upgrades performed at customer site, the installation will be check and final calibrations will be performed by GE Field Service.

1–13 TRUE MOBILE UPGRADE

MR system 1.5T Twin*Speed* upgrade catalogs for True Mobiles at not available at this time.

SECTION 2 – UPGRADE INSTALLATION FLOWCHART

2–1 UPGRADE PROCEDURE

The following upgrade flow charts contain information for upgrading to 1.5T Twin*Speed* or EXCITE 1.5T Twin*Speed*. Follow the path of the flow chart that is approriate for the upgrade you are installing.

2–1–1 Upgrade Flow

The following flowcharts contain information for EXCITE and non–EXCITE systems.

Note

All on–site construction must be completed before equipment is delivered and installation starts. Attempting to install the system while construction is being completed will impact installation efficiency and further delay site completion. Making sure that all preinstallation and construction work is completed before equipment is delivered will usually result in an earlier turnover date.

The applicable flow chart should be followed for an orderly and efficient installation of the Signa 1.5T Twin*Speed* system. Note that many procedures may be performed in parallel and may be performed in any order according to the specific situation of each site.

Note

The flow chart references the Tab number and the PIP (Pictorial Installation Procedure) Direction number for the procedure. PIP Directions are similar to cable maps in that they are to be removed from this binder and used at the location where hardware installation is being performed. The PIP Direction may be returned to the binder for future reference upon completion of the installation. Other Directions and installation drawings delivered with kits are also referenced by the flowchart.

This installation flowchart has been developed assuming that all Signa 1.5T Twin*Speed* equipment has been delivered together. Ensure that every part required is available before starting.

The general installation flow is as follows:

- Hardware installation per applicable Pictorial Installation Procedure (PIP) Direction
- Power–up and other pre–software load checks
- Software reconfiguration
- Functional checks, Set–up and Calibration, System calibrations, System performance checks
- Final sign–off and records
- Customer turn over

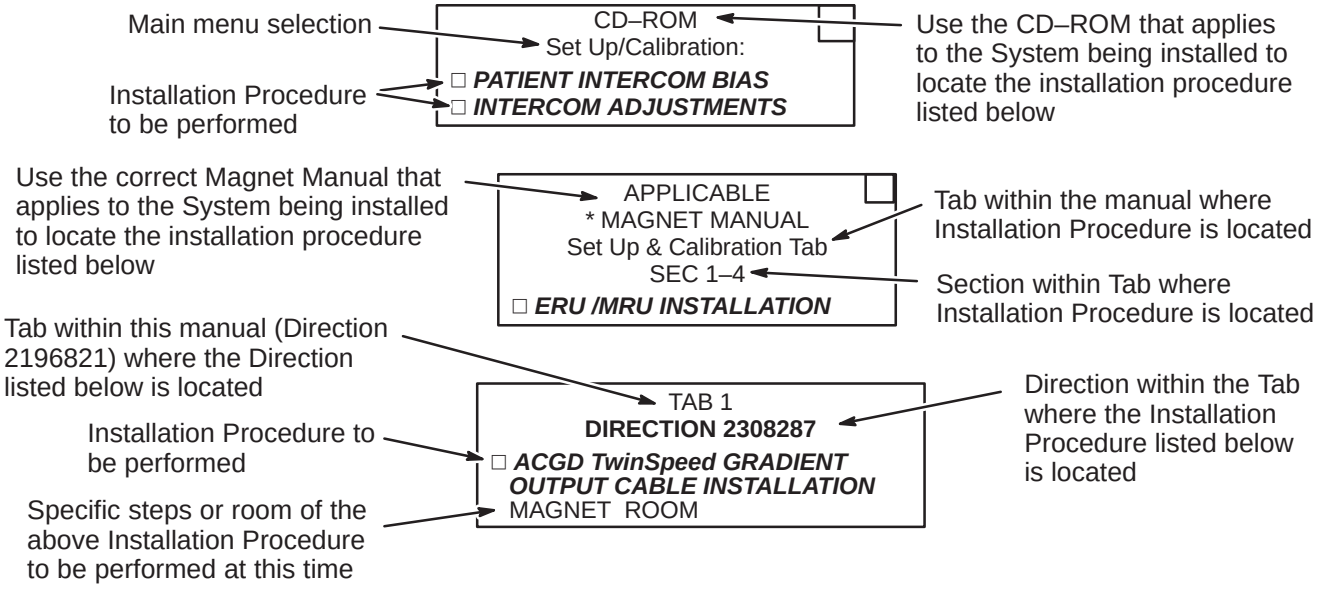
2–1–2 Upgrade Flow Charts

The following flow charts are included in this section:

- System with LCC Magnet to Twin*Speed* Upgrade Installation Flow Chart . . . . . Page 2–3
- Pre–LCC Magnet to Twin*Speed* Upgrade Installation Flow Chart . . . . . Page 2–17

2–2 INSTALLATION FLOWCHART EXPLANATION

Shown below are three examples of the flow chart Installation Procedures and an explanation of the areas within the procedures.



LEGEND FOR FOLLOWING INSTALLATION FLOWCHART

MX — INDICATES MILESTONE COMPLETION GOAL IN DAYS

OR — INDICATES AN OPTIONAL PATH DEPENDING ON SYSTEM CONFIGURATION

INDICATES GE PROPRIETARY PROCEDURE

1 — INDICATES AN ADDITIONAL PROPRIETARY TEST OR ALTERNATIVE PROPRIETARY CALIBRATION PROCEDURE AVAILABLE FOR GE USE OR TO CUSTOMERS WITH AN ADVANCED SERVICE PACKAGE LIMITED LICENSE.

2 — AFTER GRADIENT SHIM (OR LV SHIM) IT MAY BE NECESSARY TO REPARK THE MAGNET.

3 — MAY ALREADY BE INSTALLED. CHECK TO MAKE SURE ALL CONNECTIONS ARE MADE AND INSTALLED COMPLETE.

NOTE 1: STANDARD CORRELATED NOISE CHECK NOT REQUIRED IF PROPRIETARY SPT FULL TEST MODE PROCEDURE PERFORMED EARLIER DURING INSTALLATION (HOWEVER, MULTICOIL AND FAST RECEIVER OPTION CORRELATED NOISE CHECKS IN PROCEDURE STILL REQUIRED).

NOTE 2: IF TROUBLESHOOTING NECESSARY.

NOTE 3: SRF PROCEDURES ARE TO BE USED IF SITE HAS SRFD2 CABINET INSTALLED.

NOTE 4: A “saveINFO” SHOULD BE DONE BEFORE SPT IS RUN. IF YOU HAVE THE EPI OPTION, IT IS NECESSARY TO “saveINFO” AGAIN. IN THIS WAY, ANY DATA COLLECTED FOR CALIBRATION WILL NOT BE LOST IF A PROBLEM OCCURS.

NOTE 5: VALUES OF LVSHIM ARE DEPENDENT UPON EDDY CURRENT COMPENSATION.

NOTE 6: VALUES OF EDDY CURRENT COMPENSATION ARE INDEPENDENT OF MAGNET SHIM.

NOTE 7: OVERNIGHT DIAGS MAY BE RUN AT END OF ANY DAY TO DETECT POSSIBLE ERRORS.

MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

PRE–INSTALLATION (PERFORMED BY CUSTOMER'S CONTRACTOR)

MAGNET MECHANICAL INSTALLATION

SYSTEM MECHANICAL INSTALLATION

UPDPATE SSA WITH BELOW INFORMATION
- ☐ *SITE NAME:* _____
- ☐ *ADDRESS:* _____
- ☐ *FDO # :* _____
- ☐ *SYSTEM ID:* _____
- ☐ *CRYO ID:* _____
- ☐ *MAGNET TYPE:* _____
- ☐ *SERIAL #:* _____
- ☐ *COLDHEAD TYPE:* _____

(Pink booklet)
DIR 2147446
SIGNA HORIZON 1.5T & 1.0T UFI–COMPATIBLE SURFACE COILS INSTRUCTIONS
SECTIONS 1–1 to 1–5
(SURFACE COILS INVENTORY, FDO ORDERING AND FMI VERIFICATION)

MAGNET ROOM EXHAUST FAN INSTALLED & OPERATIONAL

START

VENDOR DOCUMENT
TwinSpeed SYSTEM COOLING CABINET INSTALLATION

DIR 2304880
DIR 2294003
SIGNA *TwinSpeed*
PRE–INSTALLATION
SITE READY
TOOLS READY

MDP (MAIN DISCONNECT PANEL) INSTALLED

COMPLETE SITE ELECTRICAL WIRING AND HVAC

CD–ROM
Functional Checks: System
☐ ***RF SHIELDED ROOM TESTING***
DATA SHEET

DIRECTION 2230681
MAGNET MONITORING KIT HARDWARE INSTALLATION

ORDER MODEM KIT

☐ ***DELIVERY AND UNLOADING OF MAGNET AND EQUIPMENT ROOM MATERIALS***

M0

CD–ROM
Setup & Calibration:
☐ ***LINE VOLTAGE CHECKS***

OPTION
DIR 15336
☐ ***O_2 MONITOR INSTALLATION***

TAB 11
DIRECTION 2231762
☐ ***WIDE-OPEN PNEUMATIC PATIENT ALERT***
Step A1
PRE–INSTALLATION
Step A5
DETERMINING NEED FOR EXTENDER BOX

APPLICABLE
* MAGNET MANUAL
Set Up & Calibration Tab
☐ ***SHIELD COOLER INSTALLATION***
☐ ***SHIELD COOLER GAS LINE PLASTIC COVER INSTALLATION***

OVERVIEW TAB
☐ SEC 3–4
LOCKOUT & TAGOUT MAIN DISCONNECT

EQUIPMENT ROOM

OR
☐ ***DEINSTALL RF/PEN CABINET***
☐ ***DEINSTALL FULL–SIZE OR COMPACT PDU CABINET***
☐ ***DEINSTALL RF/PDU CABINET***
OR
FOR SRF CAB INSTALLATION
M3090BB
DIRECTION 2289435
☐ ***TRANSFER RF MODULES TO SRF CABINET***
SEC. 3–1
FOR SRFD2 CAB INSTALLATION
☐ ***DEINSTALL SGD OR GRADIENT/ GRAM CABINET***

OR
3 ***IF ACGD/PDU & SRF CABINETS ARE ALREADY INSTALLED, CONTINUE WITH INSTALL***

OR
9.x NON–EXCITE SYSTEM CABINET

EXCITE
M3090EB
DIRECTION 2402879
☐ ***DEINSTALL SYSTEM CABINET***

MAGNET ROOM

OR
TAB 2
DIRECTION 2309133
☐ ***WideOpen TO TwinSpeed MAGNET ENCLOSURE UPGRAD***
REMOVE OLD COVERS, FRAMES AND CABLES, PROCEDURES **A1** THRU **G4**

TAB 2
DIRECTION 2319224
☐ ***HORIZON BOX ENCLOSURE TO TwinSpeed MAGNET ENCLOSURE UPGRADE***
REMOVE OLD COVERS, FRAMES AND CABLES, PROCEDURES **A1** THRU **F4**

CD–ROM
TRMREA1.DOC
☐ ***REMOVE EXISTING BRM/CRM COIL***

OVERVIEW TAB
☐ SEC 4–5
SEC 4–6
LOCATING AND UNPACKINGCABLES
☐ SEC 4–10
SEC 4–13
SORTING AND ROUTING CABLES
(MAGNET AND MAGNET ROOM CABLES)

TAB 4
DIRECTION 2318792
☐ ***PENETRATION PANEL UPGRADE INSTALLATION***

OR
9.x
EXCITE
TAB 4
DIRECTION 2403003
☐ ***PENETRATION PANEL EXCITE ADPTER PLATE UPGRADE***

A TO SHEET 2

B TO SHEET 2

C TO SHEET 2

* **MAGNET MANUAL USED**:
DIR 2192625 – GE 1.5T & 1.0T LCC Active Shield Magnet & Cryogens Subsystem
DIR 2226318 – GE 1.5T & 1.0T LCC Magnet Signa MR/*i* & CV/i Delivery & Installation

SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 1 OF 7)

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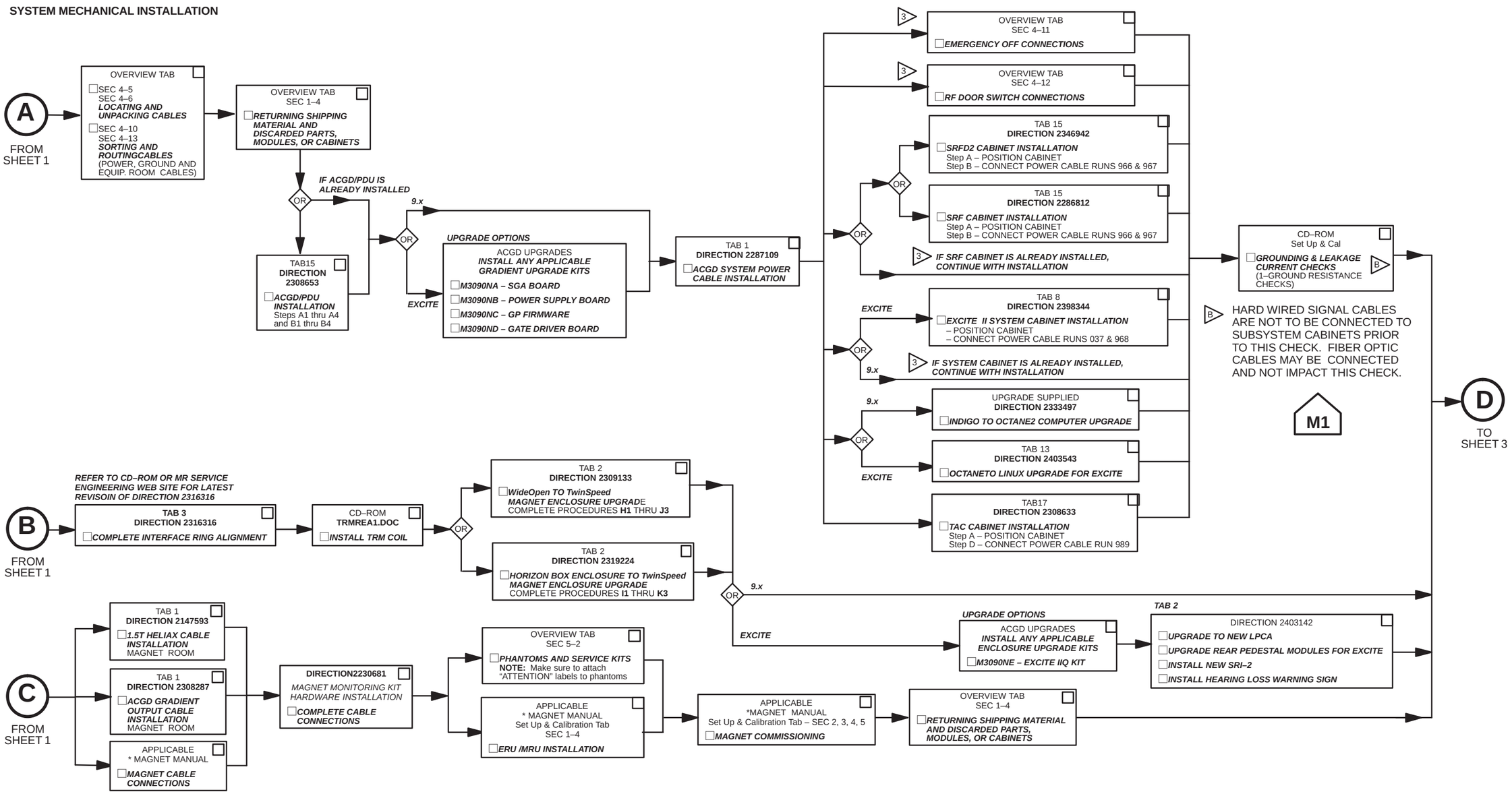
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM MECHANICAL INSTALLATION



SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 2 OF 7)

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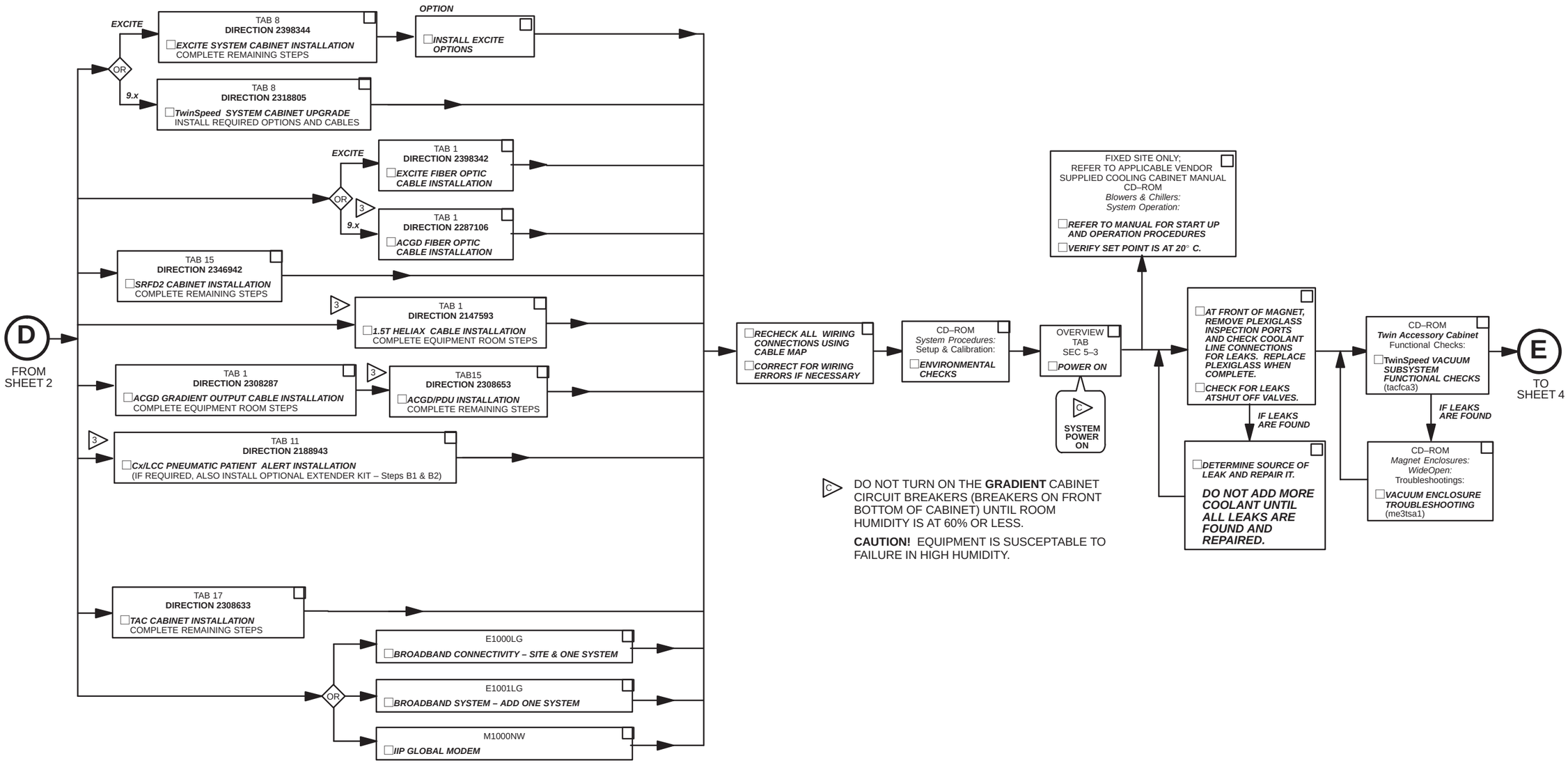
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM MECHANICAL INSTALLATION



C DO NOT TURN ON THE **GRADIENT** CABINET CIRCUIT BREAKERS (BREAKERS ON FRONT BOTTOM OF CABINET) UNTIL ROOM HUMIDITY IS AT 60% OR LESS.

CAUTION! EQUIPMENT IS SUSCEPTABLE TO FAILURE IN HIGH HUMIDITY.

SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 3 OF 7)

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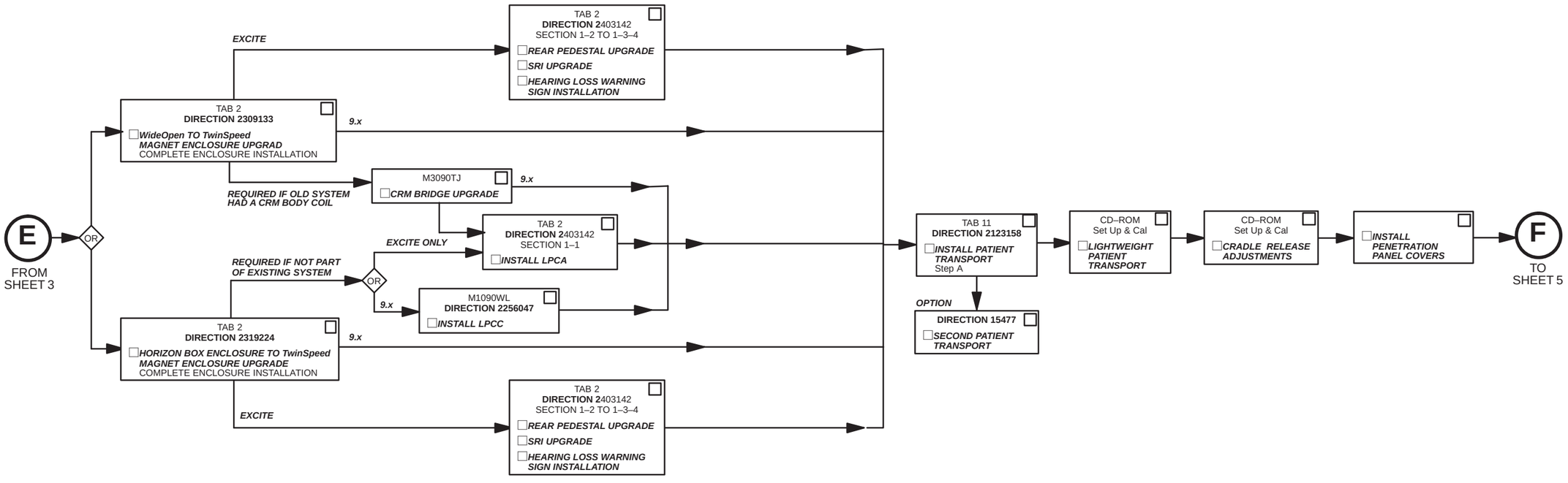
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM MECHANICAL INSTALLATION



SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 4 OF 7)

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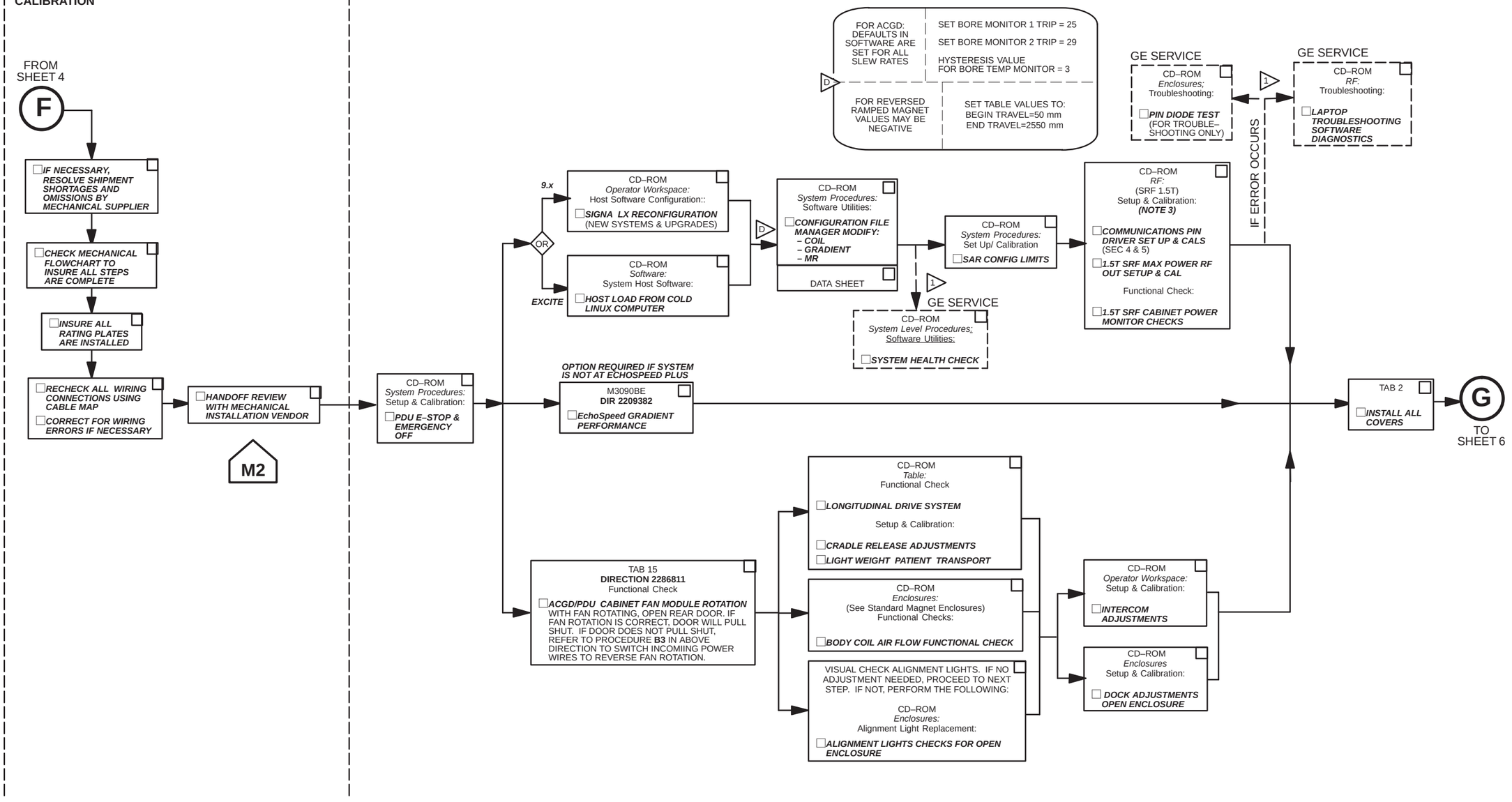
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM PREPARATION FOR CALIBRATION

SYSTEM CALIBRATION



SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 5 OF 7)

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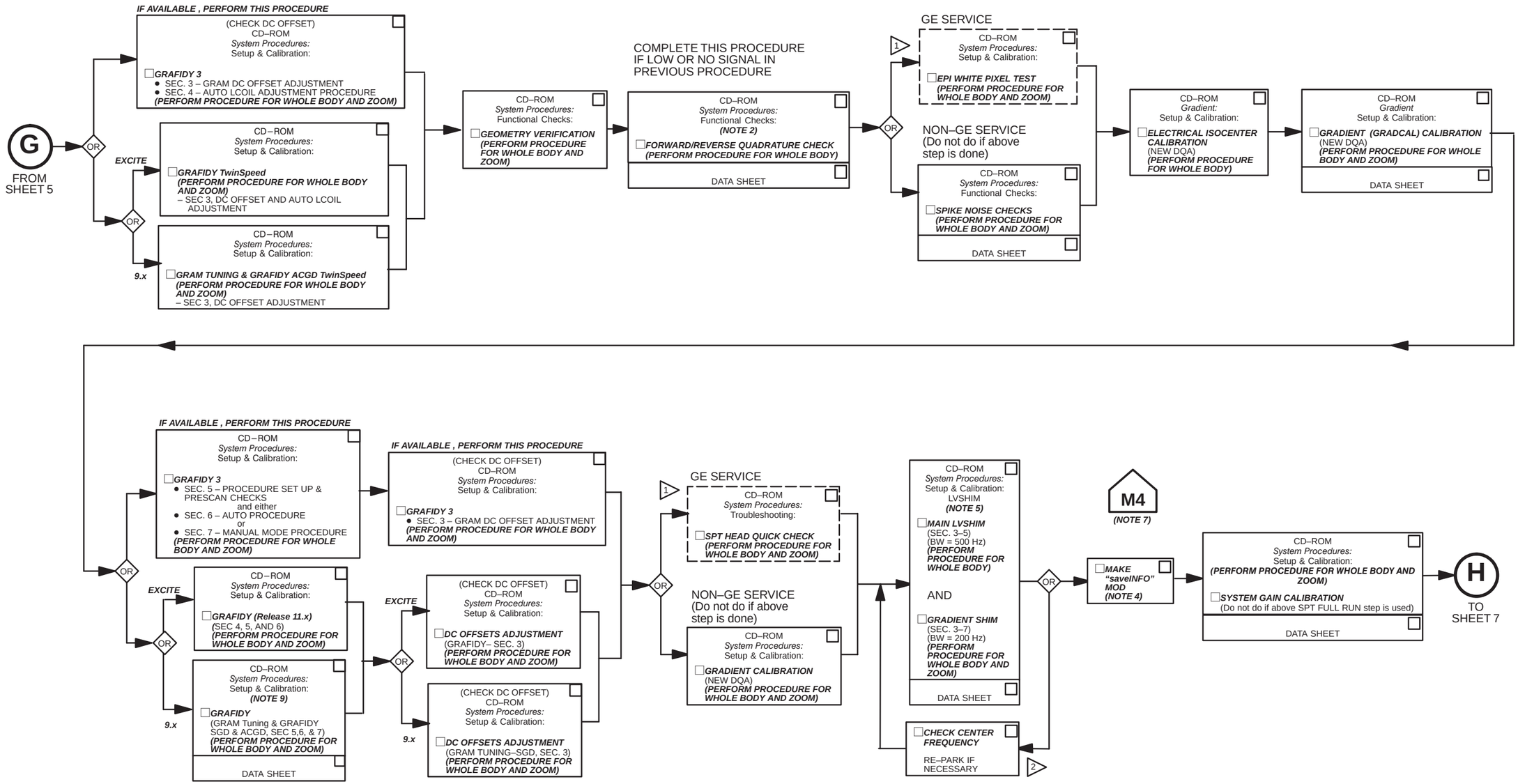
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM CALIBRATION



SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 6 OF 7)

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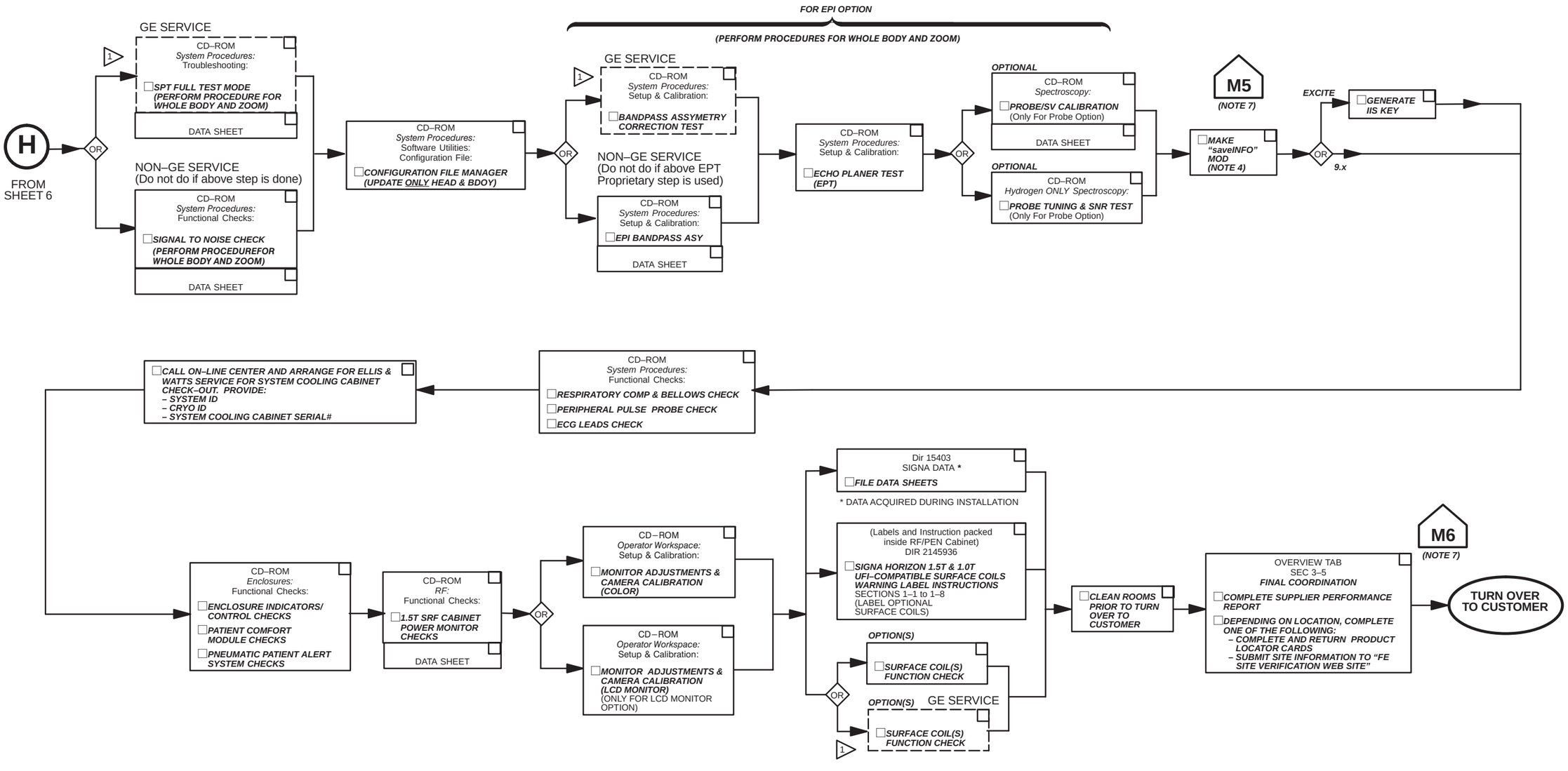
MARK OFF PERFORMED ITEMS

IMPORTANT : PER ISO 9001 REQUIREMENTS

SYSTEM CALIBRATION



SYSTEM WITH LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–1 (SHEET 7 OF 7)

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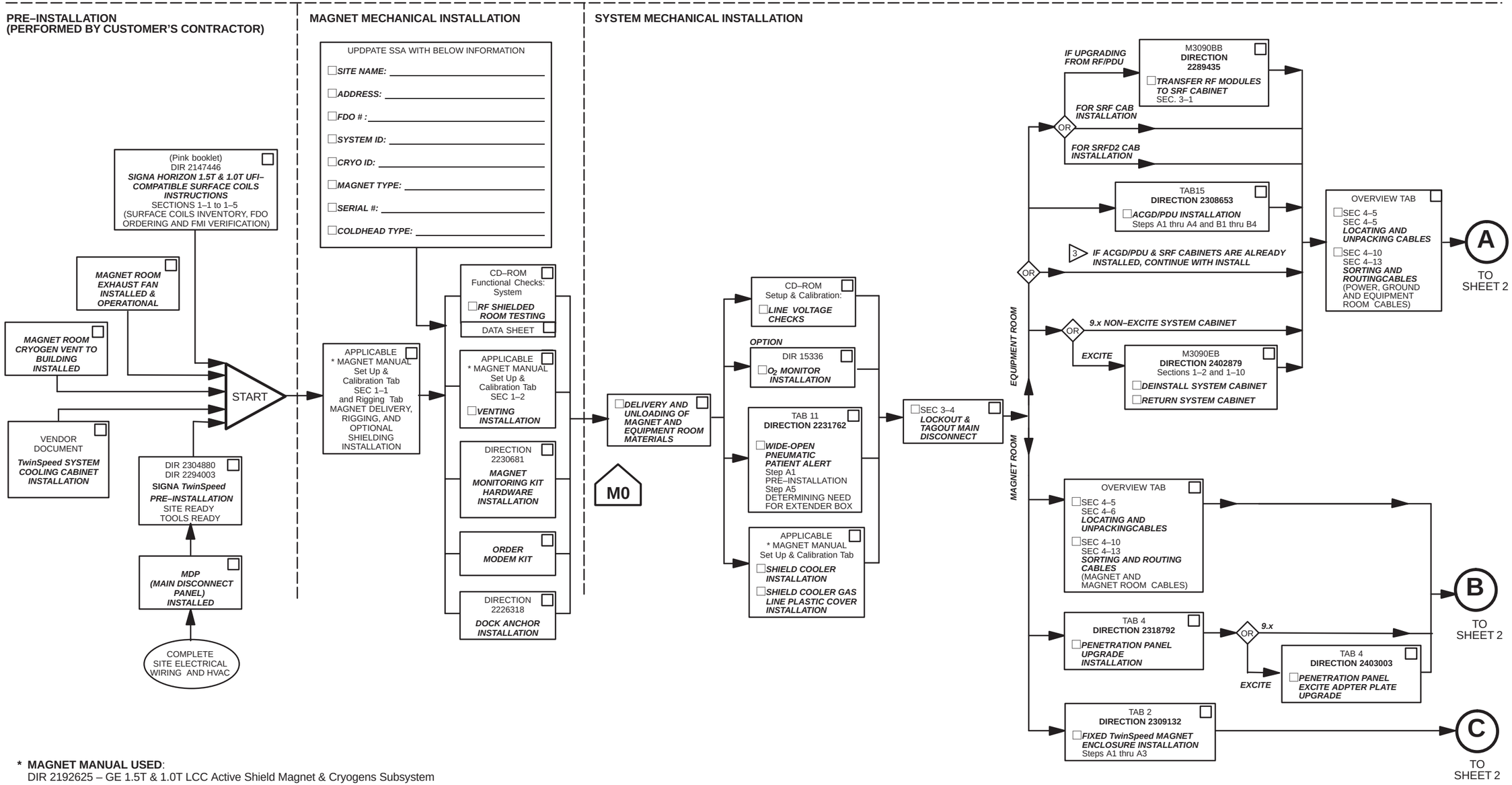
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS



* **MAGNET MANUAL USED**:
DIR 2192625 – GE 1.5T & 1.0T LCC Active Shield Magnet & Cryogens Subsystem
DIR 2226318 – GE 1.5T & 1.0T LCC Magnet Signa MR/*i* & CV/i Delivery & Installation

PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 1 OF 7)

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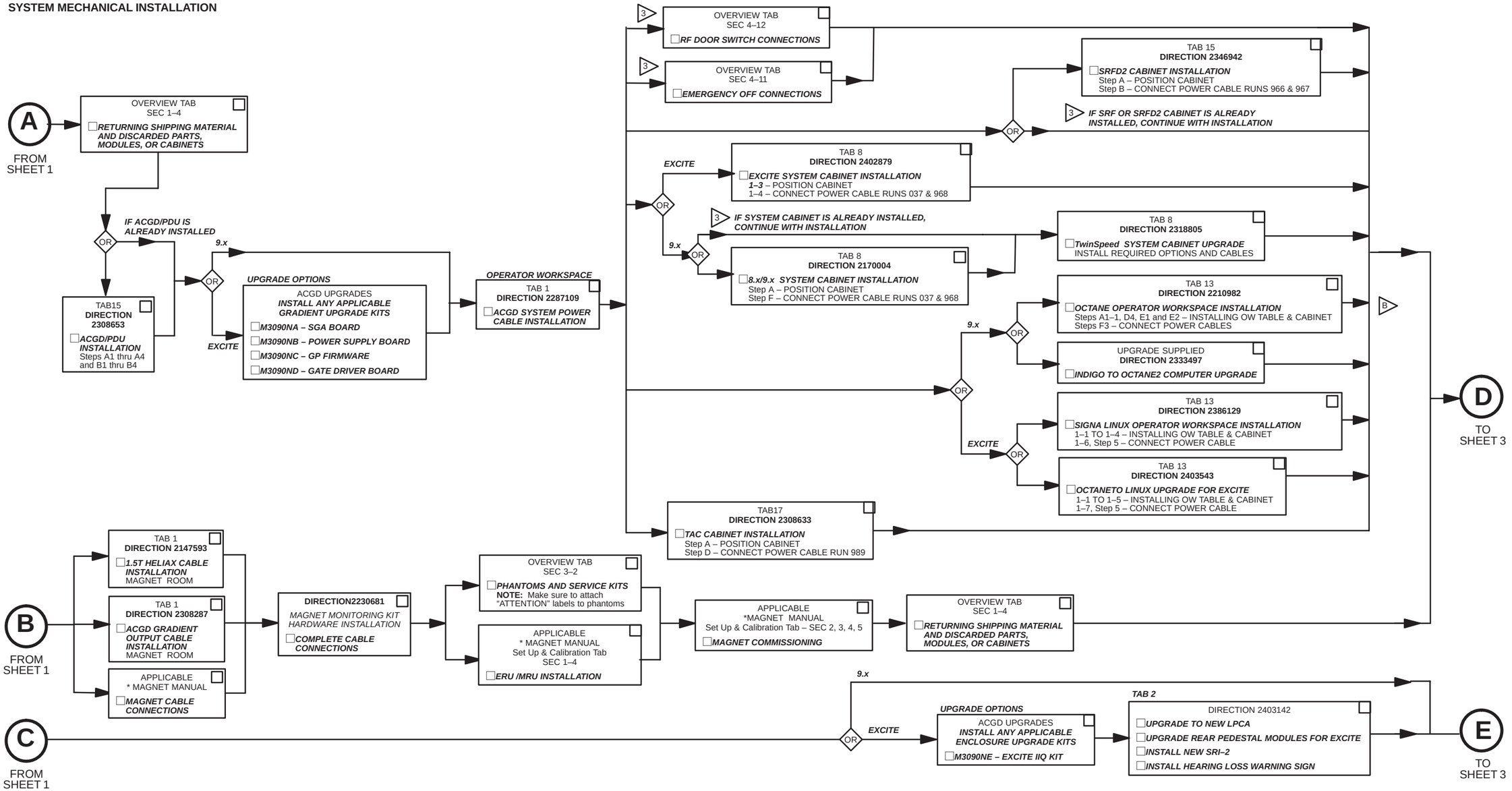
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM MECHANICAL INSTALLATION



PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 2 OF 7)

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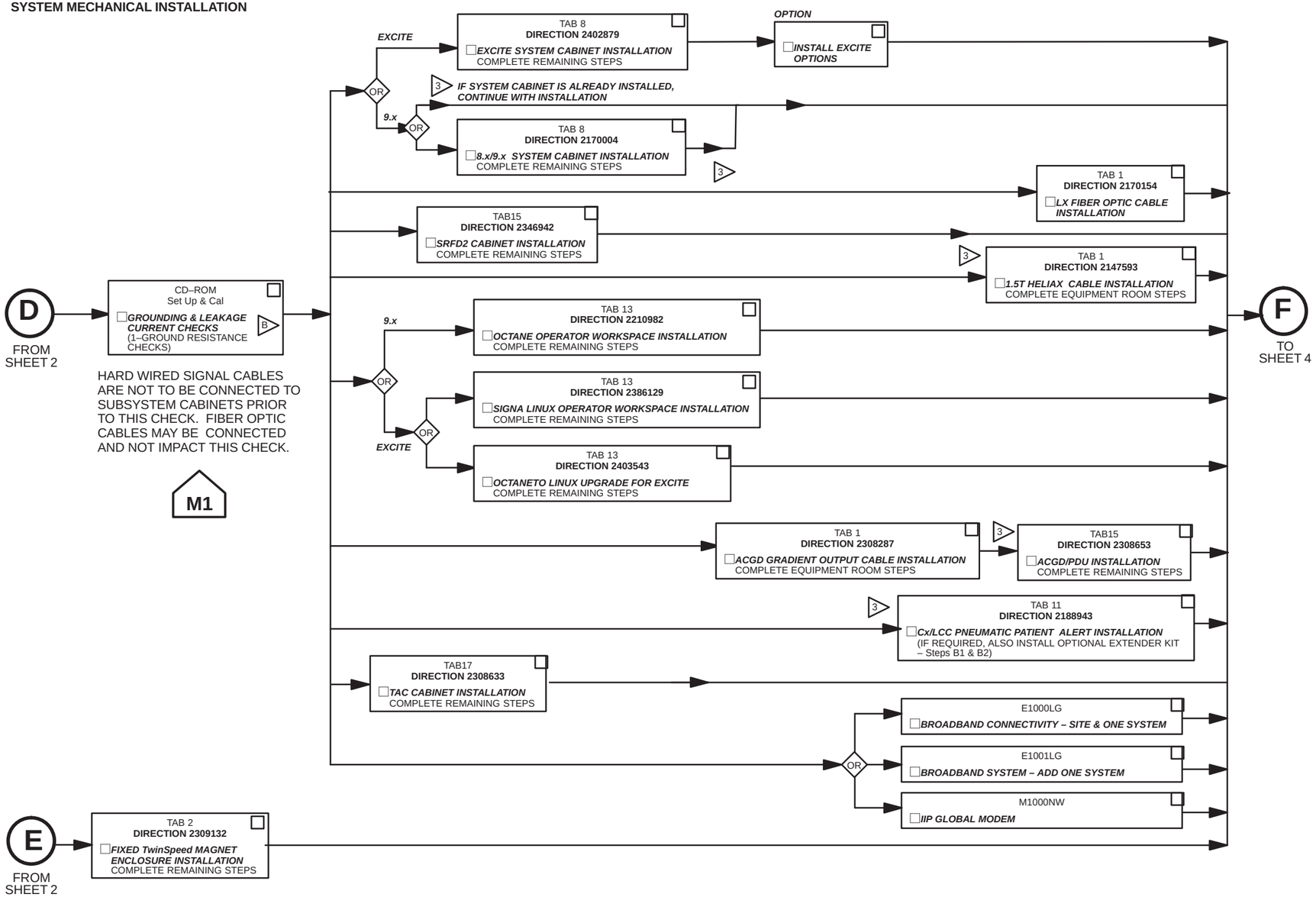
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM MECHANICAL INSTALLATION



PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 3 OF 7)

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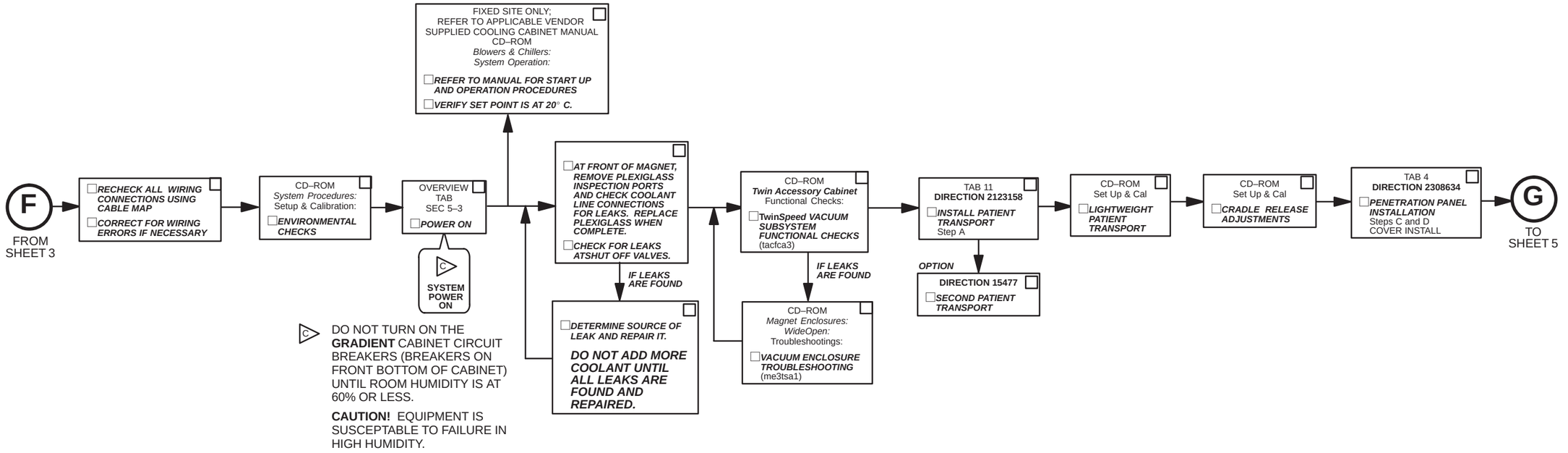
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM MECHANICAL INSTALLATION



C DO NOT TURN ON THE **GRADIENT** CABINET CIRCUIT BREAKERS (BREAKERS ON FRONT BOTTOM OF CABINET) UNTIL ROOM HUMIDITY IS AT 60% OR LESS.

CAUTION! EQUIPMENT IS SUSCEPTABLE TO FAILURE IN HIGH HUMIDITY.

PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 4 OF 7)

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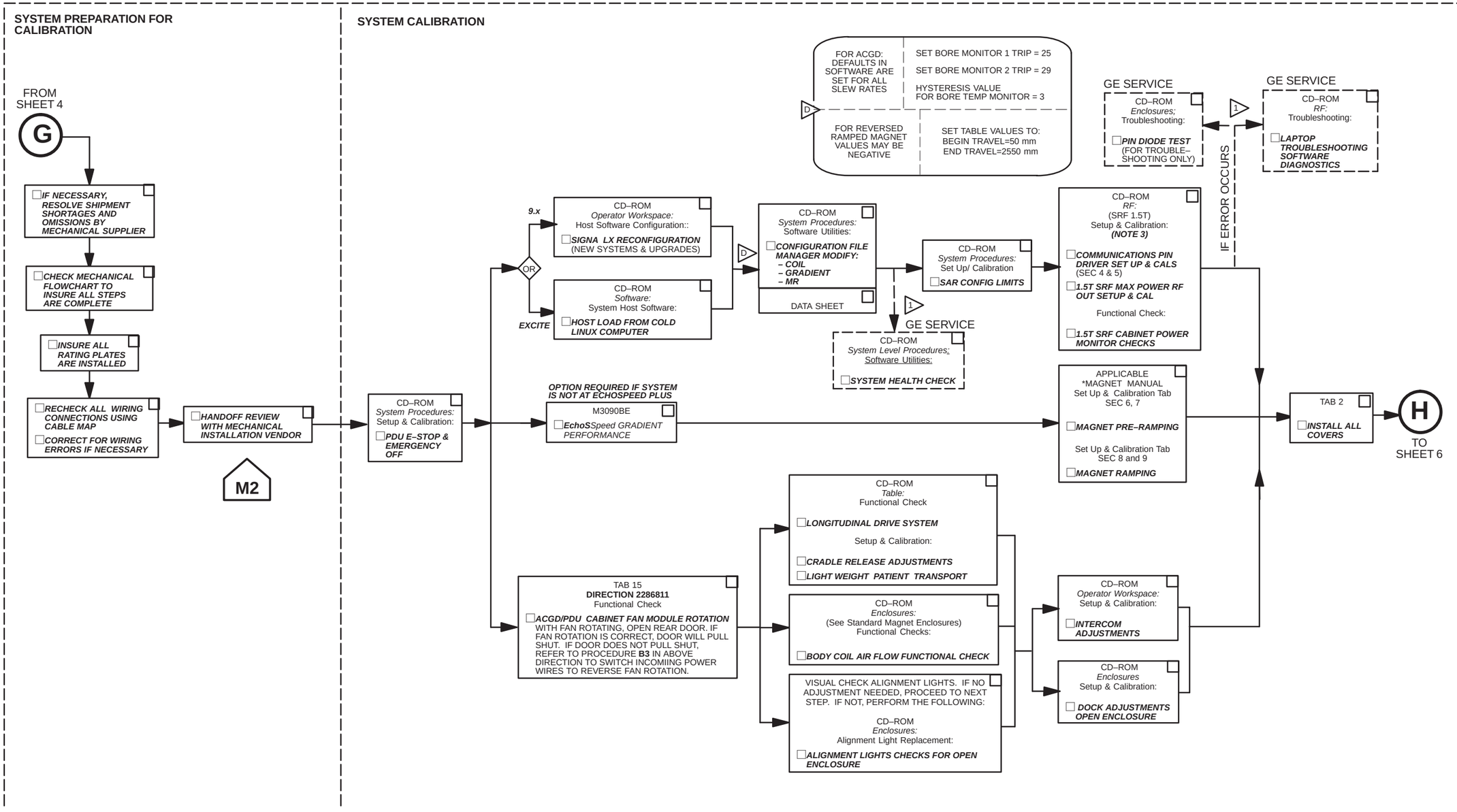
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS



PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 5 OF 7)

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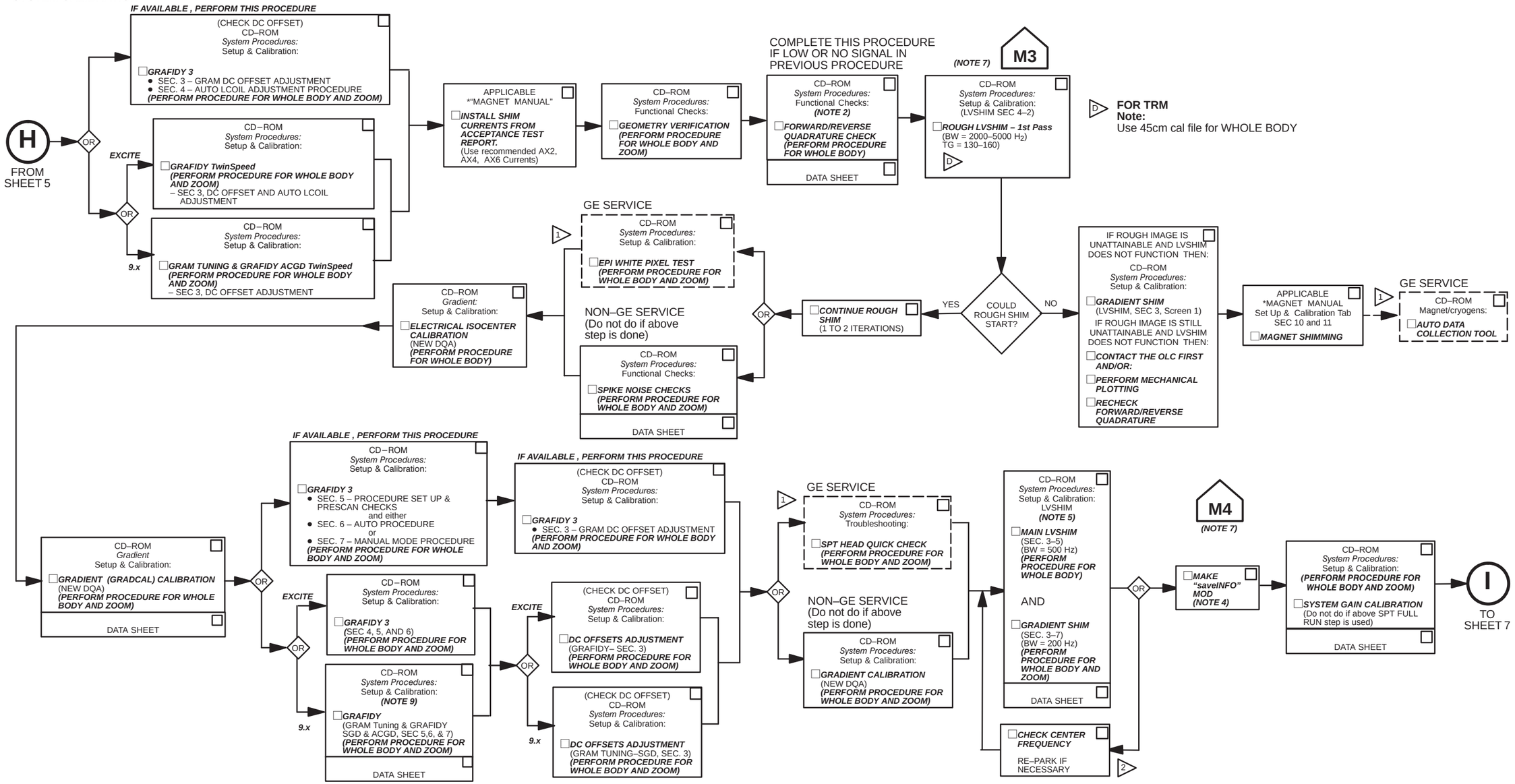
MARK OFF PERFORMED ITEMS

IMPORTANT: PER ISO 9001 REQUIREMENTS

SYSTEM CALIBRATION



PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 6 OF 7)

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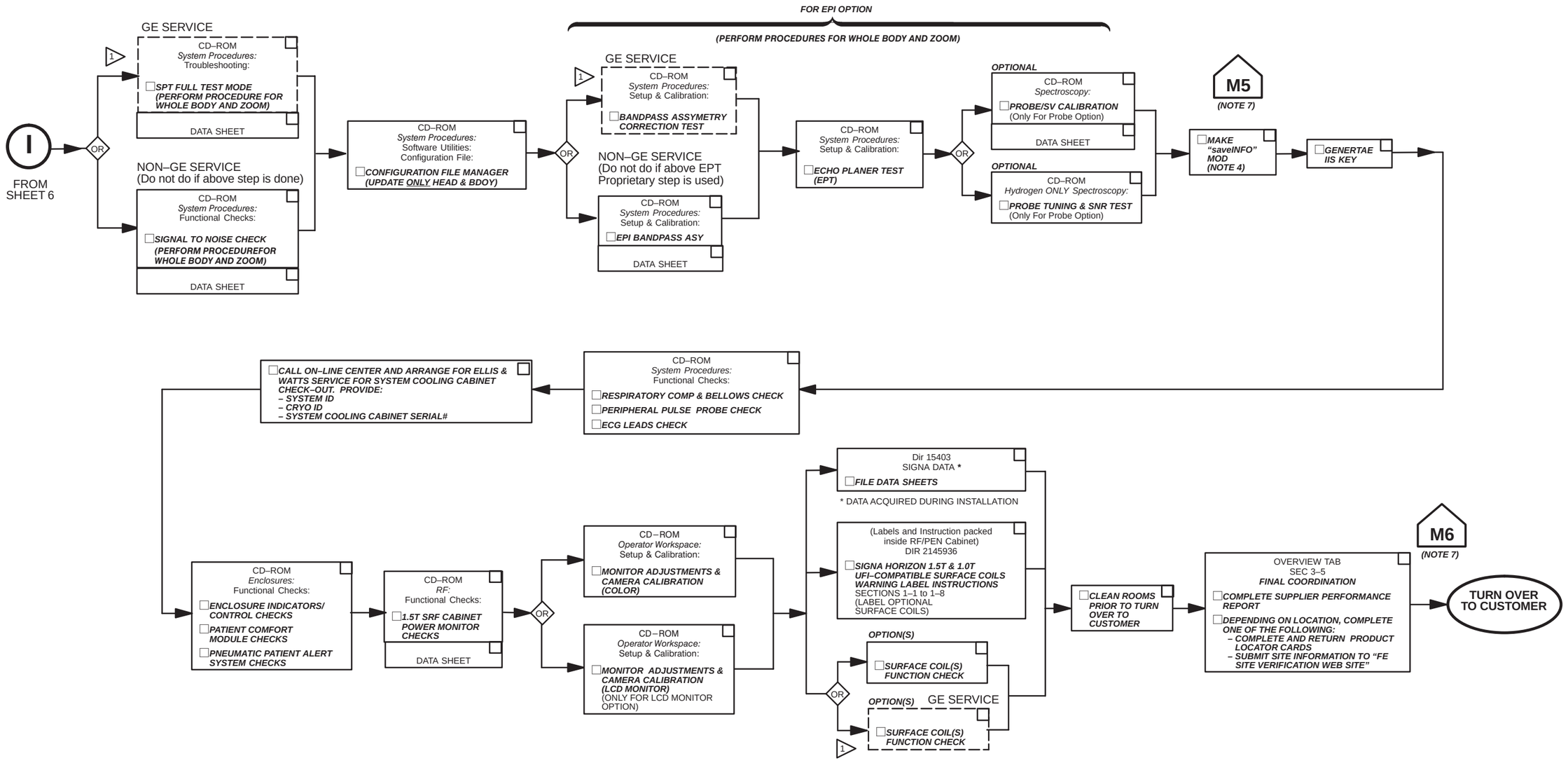
MARK OFF PERFORMED ITEMS

IMPORTANT : PER ISO 9001 REQUIREMENTS

SYSTEM CALIBRATION



PRE–LCC MAGNET TO Twin*Speed* UPGRADE INSTALLATION FLOW CHART
ILLUSTRATION 2–2 (SHEET 7 OF 7)

SECTION 3 – DE-INSTALLATION PROCESS

3–1 DE–INSTALLATION GUIDELINES

The following are basic guidelines for all deinstallations:

1. **DO NOT CUT CABLES.** Cables are to be disconnected and returned intact.
2. Deinstalled cabinets, penetration panel, console, and any other modules or assemblies are to be returned intact.
3. All fastening hardware needs to be returned for reuse. In all cases, after disassembly, loosely re–install all fastening hardware in mounting holes or threaded holes where they were originally located.
4. Retain on site the Head Coil, all Surface Coils, and pads for reuse on new Twin*Speed* system.
5. Refer to Section 3, UPGRADE INSTALLATION FLOWCHART, for de–installation procedures and Section 4, SYSTEM CABLES, for information on cable removal.
6. Refer to Section 1–4 for information on returning removed and discarded materials.

3–2 DE–INSTALLATION FEEDBACK FORM

Located on the last page of this section is the Deinstallation Feedback Data Sheet. Fill out this form and send it to the address located on the bottom of the sheet. Any and all information provided will help improve the deinstallation process.

3–3 RETURN MATERIAL INFORMATION FORMS

Fill in the information on “Attention: GEMS Recycling Center” form for any deinstalled Cabinets (page 3–7) and attach the appropriate sheet to each item.

3–4 SYSTEM POWER SHUTDOWN

DANGER!!

FATAL ELECTRIC SHOCK HAZARD!! LETHAL VOLTAGES ARE PRESENT WITHIN THE PDU EVEN IF ALL PDU BREAKERS ARE OFF. TO PREVENT POSSIBLE FATAL ELECTRIC SHOCK VERIFY THAT FACILITY DISCONNECT IS OFF, LOCKED OUT, AND TAGGED BEFORE PROCEEDING. SERIOUS INJURY OR DEATH BY ELECTROCUTION MAY OTHERWISE RESULT.

1. Verify that System performance baseline measurements have been obtained. and center frequency should be recorded before system is shut down.
2. Verify with the customer that all images / protocols / data has been archived.
3. Ensure that Patient Transport is undocked with cradle in place and Head Coil carriage is at rear of travel.
4. Press the FULL OFF button on the PDU front control panel.

DANGER!!

ELECTRIC SHOCK HAZARD!! HIGH VOLTAGES ARE PRESENT ON INTERCONNECTING CABLES USED WITH SPECIAL FIELD INSTALLED ION–PUMPS USED WITH OXFORD MAGNETS. THE ION PUMP POWER SUPPLY IS USUALLY CONNECTED TO A POWER SOURCE THAT IS NOT CONTROLLED BY THE PDU AND HIGH VOLTAGE WILL BE PRESENT EVEN IF ALL PDU BREAKERS ARE OFF. TO PREVENT POSSIBLE FATAL ELECTRIC SHOCK, DISCONNECT POWER TO THE ION PUMP POWER SUPPLY, LOCK OUT, AND TAG BEFORE PERFORMING PROCEDURES IN THE FOLLOWING SECTIONS. ALSO CHECK FOR OTHER INTERCONNECTING EQUIPMENT WHICH WAS FIELD INSTALLED AND DISCONNECT POWER, LOCK OUT, AND TAG.

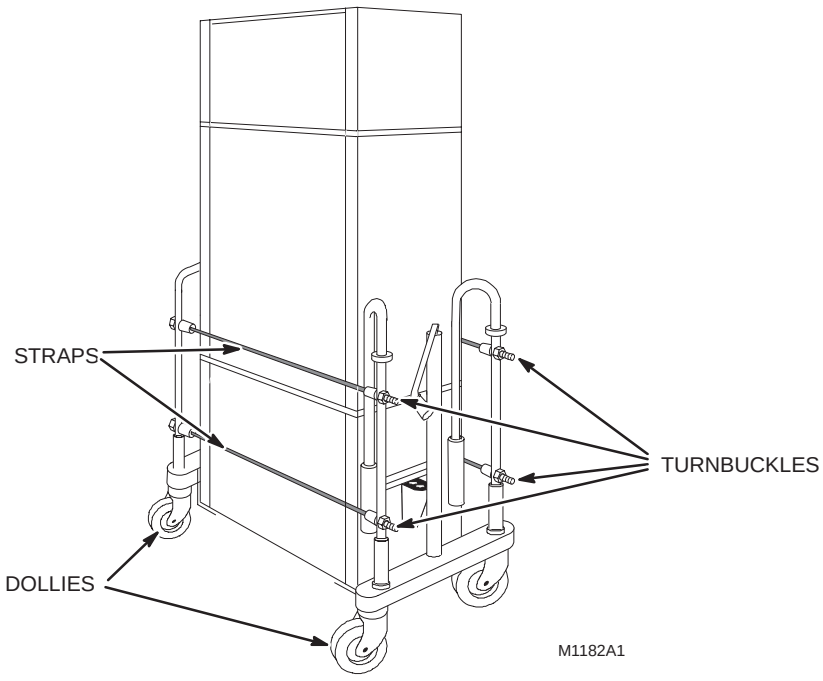
5. Notify field service and other installation personnel that are working at the site that the PDU main disconnect is to be shut off, locked out, and tagged.
6. Locate and shut off main disconnect supplying power to the PDU.
7. Perform lock out and tag out procedures at main disconnect to prevent inadvertent power restoration.
8. Verify absence of power in the PDU by checking for 0 volts on incoming power wiring.

3–5 REMOVING FULL–SIZE PDU

Sites that are upgrading to ACGD require that the full–size PDU or Compact PDU be de–installed. The Compact PDU has built–in casters for ease of movement. The full–size PDU does not have casters and will have to be moved with two shipping dollies placed on each side of the PDU and clamped in place using straps with turnbuckles as shown in illustration below. If dollies are not provided, the Full–size PDU will have to removed by riggers or other locally supplied equipment moving personnel.

CAUTION

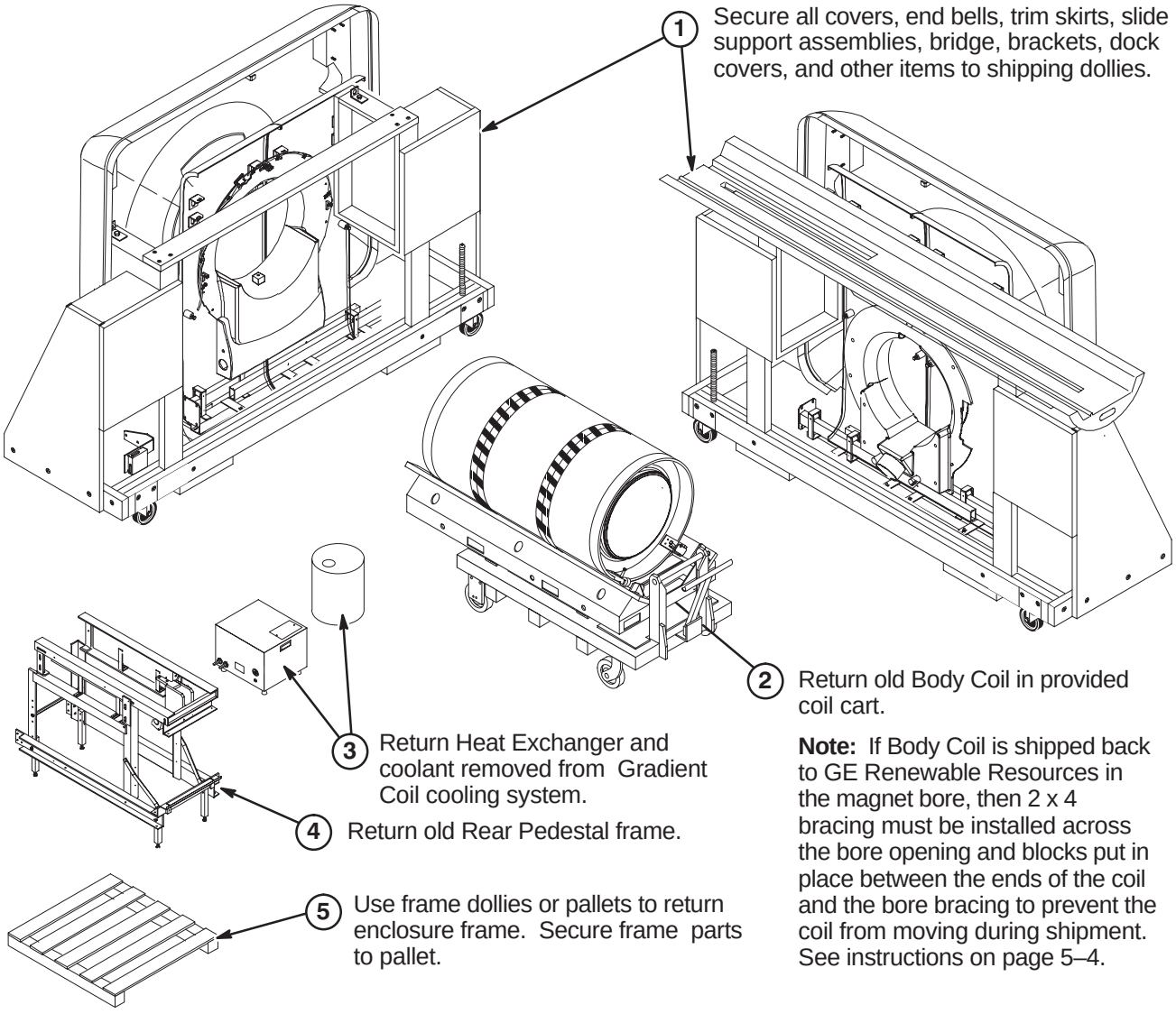
PDU weight is about 1000 pounds (455 kilograms). Plywood or steel plates may be used to distribute weight and protect floor surface from overload damage.



3–6 RETURN OF DEINSTALLED MATERIAL

❑ ITEMS TO BE RETURNED FOR RECYCLING

Note: All items de–installed during this upgrade are to be returned for recycling. Secure as many of the items as possible to the two shipping dollies provided for this purpose. Shown below is an example of how the dollies, provided for Horizon enclosure deinstallation, might look when loaded. (not all items are shown)



1. Secure all covers, end bells, trim skirts, slide support assemblies, bridge, brackets, dock covers, and other items to shipping dollies.
2. Return old Body Coil in provided coil cart.

Note: If Body Coil is shipped back to GE Renewable Resources in the magnet bore, then 2 x 4 bracing must be installed across the bore opening and blocks put in place between the ends of the coil and the bore bracing to prevent the coil from moving during shipment. See instructions on page 5–4.

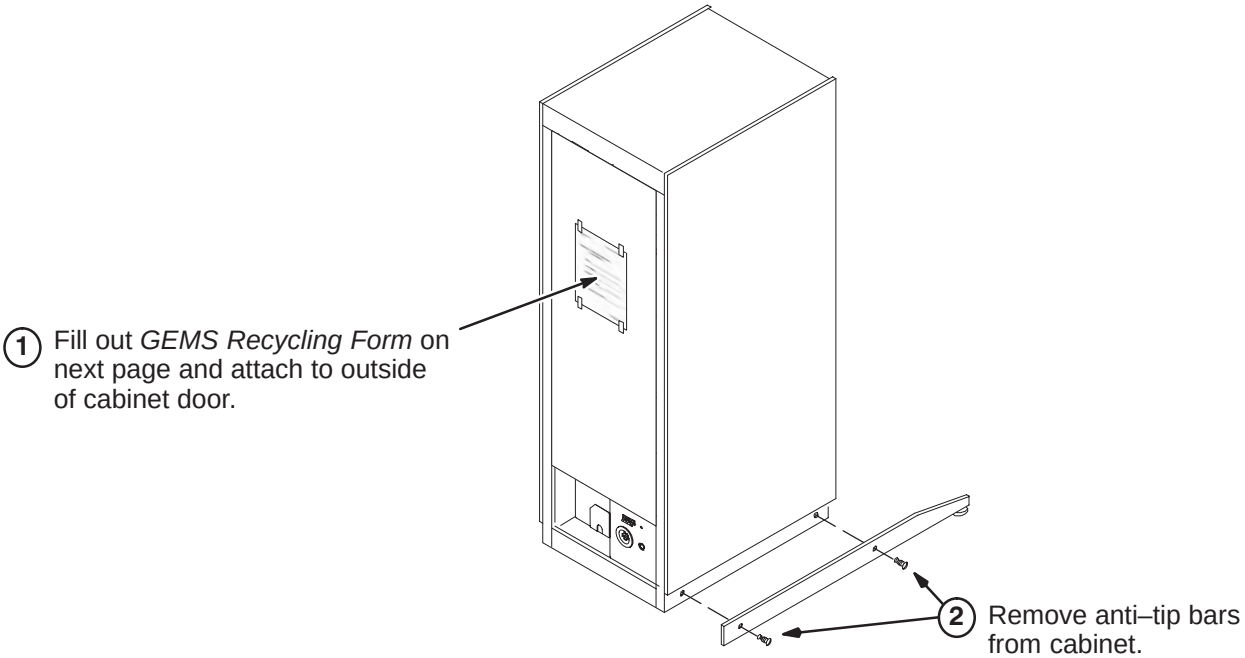
3. Return Heat Exchanger and coolant removed from Gradient Coil cooling system.
4. Return old Rear Pedestal frame.
5. Use frame dollies or pallets to return enclosure frame. Secure frame parts to pallet.

3–7 CABINET RETURN PROCEDURE

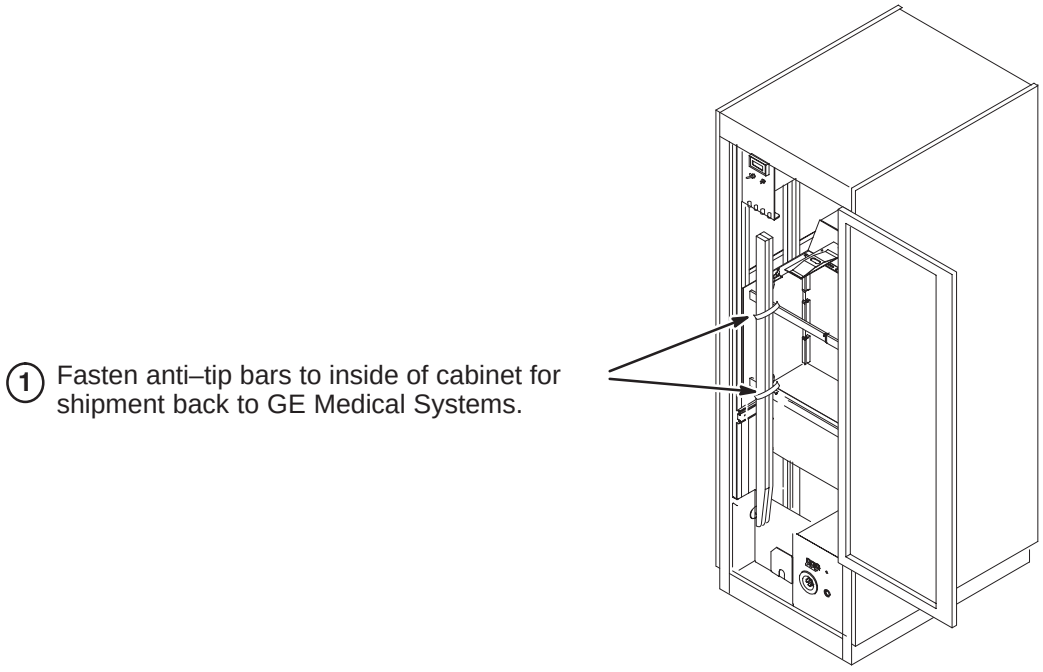
Confirm that all cables are disconnected from applicable Cabinet. The System Cabinet is shown below. The following procedure should be used for return of any cabinet with anti–tip bars.

Refer to following deinstallation for cabinets being removed

❑ REMOVING ANTI–TIP BARS



❑ ATTACHING ANTI–TIP BARS AND FORM FOR RETURN SHIPMENT



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NOTE: Copy this sheet as needed.

FDO: _____

Site Name: _____

Removal Date: _____

Field Engineer: _____

Cabinet Type: _____

Cabinet Serial Number: _____

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3–8 DEINSTALLATION FEEDBACK DATA SHEET

Use this form to list the problems you had with the Deinstallation at this site.

Site Name: _____

Location: _____

Magnet Type: _____ (S2, S3, S4, Cx, LCC, etc...)

System Type: _____ (4x, 5x, 8.x, other)

Problems encountered with desinstall procedures and Flowcharts

Site related problems

List any cables that were cut or damaged during deinstall. List any hardware that sustained any major damage during deinstall:

Send this completed form to:

Magnet Deinstall Feedback
MR Service Engineering, W808
GE Medical Systems
P.O. Box 414
Milwaukee, Wisconsin 53201–9824

SECTION 4 – SYSTEM CABLES

This section provides information on removing, relabeling and installing system cables for a Signa LX or LX with EXCITE 1.5T Twin*Speed* upgrade.

4–1 CABLE REMOVAL FOR UPGRADING SITE WITH LCC MAGNET TO SIGNA 1.5T Twin*Speed*

Signa Advantage 4.x/5.x, Horizon systems, and Signa LX systems that use a magnet other than LCC must have the existing magnet removed and replaced with a 1.5T Twin*Speed* magnet and enclosure. The instructions for deinstallation any of these systems and cables are contained in Direction 2316677, *Magnet and System Deinstallation for Upgrade to 1.5T TwinSpeed*. The deinstallation includes magnet & enclosure, and all affected cables, cabinets, or modules. This must be completed before the upgrade process outlined in this manual can start.

Table 4–1 lists all cables to be removed from various WideOpen and Horizon Box enclosures (on LCC magnet) system configurations when upgrading to 1.5T Twin*Speed* or 1.5T Twin*Speed* with EXCITE Technolgy. The letters on the right side of the table are defined by the following cable removal explanations:

A – Existing system is Signa WideOpen enclosure with ACGD/PDU

B – Existing system is Signa Horizon Box enclosure with ACGD/PDU

C – Existing system is Signa WideOpen enclosure with RF/PDU and SGD

D – Existing system is Signa Horizon Box enclosure with RF/PDU and SGD

E – Existing system is Signa WideOpen enclosure with pre–RF/PDU and SGD

F – Existing system is Signa WideOpen enclosure with pre–RF/PDU and Gradient/GRAM

If upgrading to 1.5T Twin*Speed* with EXCITE Technology:

G – Additional cables to be removed if upgrading from Indigo Computer to 1.5T Twin*Speed* with EXCITE

H – Additional cables to be removed if upgrading from Octane Computer to 1.5T Twin*Speed* with EXCITE

The upgrades in this manual will have many new cables delivered to the site. In some cases the new cables are the same as the old cables being removed. These are indicated in the table by the letters **E** and **M** and are defined by the following explanations:

E= Equipment Room Cable. A new cable with the same Run number will be shipped to site for upgade to Twin*Speed.* Site FE must determine whether to keep existing cable or remove it and install new cable.

M = Magnet Room Cable. A new cable with the same Run number will be shipped to site for upgading to Twin*Speed.* Site FE must determine whether to keep existing cable or remove it and install new cable.

X = Cable to be removed and returned for recycling. **DO NOT CUT CABLES.**

Note

Discard means to remove and return to GE for recycling

4–1 CABLE REMOVAL FOR UPGRADING SITE W/LCC MAGNET TO SIGNA 1.5T Twin*Speed* (cont'd)

TABLE 4–1
CABLES TO BE REMOVED AND DISCARDED FOR UPGRADING TO Twin*Speed* FROM VARIOUS LX CONFIGURATIONS

RUN#	FROM	TO	A	B	C	D	E	F	G	H
009	PD1–A2–TS1–10,11,12/NEUT/GND	MR1–A7–J1					X	X		
030	PDI–A2–TS1–16,17,18,NEUT,GND	MR2–A12–J1 AC IN			X	X	X	X		
038	PD1–TS1–10,11,12,GND	MR1–A7–GND					X	X		
041	PD1–TS1–1,2,3,GND	MR3–CABI/FJ6			X	X	X	X		
042	PD1–TS1–4,5,6,GND	MR3–CABI/FJ7			X	X	X	X		
043*	MR7–A4–J7	PD1–A2						X		
046	PD1–TS1–20,NEUT,GND	HE1				X				
047	PD1–TS1–X,X,NEUT,GND	OW1–A2–A5–J1			X	X	X	X		
065	WC1	PD1			X		X	X		
300	PP1–J15	MG2–A15		X		X	M	M		
385	PP1–J20	MG2–A30	M	X	M	X	M	M		
404	MG3 A17 J1	MG2 A16 A5 J6							X	X
414	MG3–A25	MG3–A2–J9	M	X	M	X	M	M		
421	MG2–A33–J3	MG3–A31–J1		X		X				
485	MG3 A17 J2	MG2 A16 A3 OUT							X	X
486	PP1–A14–J85	MR1–A7–J22							X	X
487	PP1–A15–J78	MR1–A7–J20							X	X
488	PP1–J80	MR2–A11–J8							X	X
489	PP1–J81	MR2–A11–J9							X	X
490	PP1–J82	MR2–A11–J10							X	X
491	PP1–J80	MG3–A36–J7							X	X
492	PP1–J81	MG3–A36–J8							X	X
493	PP1–J82	MG3–A36–J9							X	X
494	PP1–A14–J87	MG3–A36–J6							X	X
495	PP1–A15–J78	MG3–A36–J10							X	X
499	PP1–A14–J84	MR2–A11–J5							X	X
536	WC1 (Coolant Line)	MG2–A12–A1	X	X	X	X	X	X		
537	WC1 (Coolant Line)	MG2–A12–A1	X	X	X	X	X	X		
605**	MR2–A11–J5	PP1–J10				X	X	X	X	X
605**	MS1–A3–A1	PP1–J10				X	X	X	X	X
700	PP1 A14 J86	MG2/MG3 A17 J2							X	X
706	MR2 A11 J14	PD1 A14 A1 J3 / MR1 PD1 J3							X	X
710	MR2 A11 J17	MR3 A11 J1							X	X
726	PP1–A16–J77	MR1–A7–J18							X	X
727	PP1–A16–J77	MG3–A36–J5							X	X
728	MG3 A36 J11	MG2 A16 OUT J1							X	X
729	MG3 A36 J12	MG2 A16 OUT J2							X	X
730	MG3 A36 J13	MG2 A16 OUT J3							X	X
731	MG3 A36 J14	MG2 A16 OUT J4							X	X
732	MG3 A36 J15	MG2 A16 OUT J5							X	X
733	MG3 A36 J16	MG2 A16 OUT J6							X	X

4–1 CABLE REMOVAL FOR UPGRADING SITE W/LCC MAGNET TO SIGNA 1.5T Twin*Speed* (cont'd)

TABLE 4–1 (CONT'D)
CABLES TO BE REMOVED AND DISCARDED FOR UPGRADING TO Twin*Speed* FROM VARIOUS LX CONFIGURATIONS

RUN#	FROM	TO	A	B	C	D	E	F	G	H
734	MG3 A36 J17	MG2 A16 OUT J7							X	X
735	MG3 A36 J18	MG2 A16 OUT J8							X	X
736	MG3 A36 J19	MG2 A16 A8–J9							X	X
743	MG2–A12–A1–J1	MG3–A3–J4	M	M	M	M	M	M		
744	MG2–A12–A1–J2	MG3–A3–J3	M	M	M	M	M	M		
749	MG2–A33–J10	MG2–A36	X	X	X	X	X	X		
753*	MR7–A4–J1	MG3–A11–J5						X		
754*	MR7–A4–J2	MG3–A11–J4						X		
755*	MR7–A4–J3	MG3–A11–J3						X		
756*	MR7–A4–J4	MG3–A11–J8						X		
757*	MR7–A4–J5	MG3–A11–J7						X		
758*	MR7–A4–J6	MG3–A11–J6						X		
759*	MR3–11–J12	MR7–A4–J8						X		
760*	MR3–11–J11	MR7–A4–J9						X		
761*	MR3–11–J10	MR7–A4–J10						X		
762	MR3CABI/FJ3	PP1–A7–1/2	X	X	X	X	X	X		
762	MG2–A12–A1–1/2	PP1–A7–1/2	X	X	X	X	X	X		
763	MR3CABI/FJ4	PP1–A7–3/4	X	X	X	X	X	X		
763	MG2–A12–A1–3/4	PP1–A7–3/4	X	X	X	X	X	X		
764	MR3CABI/FJ5	PP1–A7–5/6	X	X	X	X	X	X		
764	MG2–A12–A1–5/6	PP1–A7–5/6	X	X	X	X	X	X		
785	MR1–A7–J18	PP1–F7/F8	X	X	X	X	X	X		
786	MG6–J2 (FAN)	PP1–F7/F8	X	X	X	X	X	X		
790	OW1–A2–A6–XO,RO,X1,R1	MR2–A11–J21							X	X
791	MR2–A11–J30	OW1–A2–A4–EXP1							X	X
792**	OW1–A1–A4–J11,13	OW1–A15–MIC,AUDIO	X	X	X	X	X	X	X	X
793	OW1–A2–A1–COM 1	OW1–A1–A4–J9							X	
794	OW1–A2–A3–MIC/AUDIO	OW1–A1–A4–J12,J14							X	
795	OW1–A2–A3–PWR	OW1–A1–A4–J17							X	
796	OW1–A2–A3–KBD/MS	OW1–A1–A4–J8							X	
797	OW1 A2 A1 PC	OW1 A3 LCD							X	
799	OW1–A15–MONITOR (OR 820)	OW1–A4 (B/W) (OR 820)							X	
805	OW1–A1–A4–J6	OW1–A7 (NON–SCIM KYBRD)							X	X
806	OW1–A2–A3–SER 1	OW1–A13 (MODEM)							X	
807	OW1–A16	OW1–A5 (DASM)							X	X
809**	OW1–A1–A2–J12,14	OW1–A15–MIC,AUDIO	X	X	X	X	X	X		X
810	OW1–A15–MD,KYBD	OW1–A1–A4–J8								X
811	OW1–A2–A4–PORT2	OW1–A15–ETHERNET								X
813	OW1–A2–A1–COM2	OW1–A15–COM2								X
814	OW1–A1–A4–J9	OW1–A2–A1–KBD,MOUSE								X
815	OW1–A16–SCSI	OW1–A15–SCSI (PCI)								X
816	OW1–A2–A6–J1	OW1–A15–BIT3							X	X

4–1 CABLE REMOVAL FOR UPGRADING SITE W/LCC MAGNET TO SIGNA 1.5T Twin*Speed* (cont'd)

TABLE 4–1 (CONT'D)
CABLES TO BE REMOVED AND DISCARDED FOR UPGRADING TO Twin*Speed* FROM VARIOUS LX CONFIGURATIONS

RUN#	FROM	TO	A	B	C	D	E	F	G	H
817	OW1–A1–A2–J17	OW1–A2–A5–J3								X
818	MR2–A11–J31	OW1–A16–PORT6,7,8								X
819	OW1–A2–A7–SCSI	OW1–A15–SCSI								X
820	OW1–A15–MONITOR	OW1–A4 (B/W)							X	X
836	MR2–A11–J21	OW1–A15–BIT3							X	X
848	MG2–A11–J4	MG2–A4–J5		X						
861	MG2–A4–J4	MG2–A33–J5,J6,J7,J8,J9		X		X			X	X
862	MG2–A4–J1	MG2–A6–J1		X		X				
863	MG2–A4–J2	MG2–A6–J2		X		X				
897	MG2–A4–J3	MG2–A33–J4		X		X				
970	WC1	MR3–PD1	X	X						
972	MR2–A11–J14	MR3–PD1–J3							X	X

Notes:

* These Runs are removed only if GRAM Cabinet is part of existing site being deinstalled.

** If installed, remove and discard.

4–2 RE–LABELING & RE–ROUTING EXISTING HORIZON 8.x CABLES TO SIGNA 8.x w/ACGD

Several existing Horizon 8.x cables need to be re–labeled per the new labels as part of M3090BB. Refer to Table 4–2.

TABLE 4–2
HORIZON 5.x & 8.x CABLES RE–LABELED AND RE–LOCATED FOR UPGRADE TO ACGD

RUN	SYSTEM TYPE	ONE END		OTHER END	
		OLD LABEL	NEW LABEL	OLD LABEL	NEW LABEL
065	Octane with RF/PDU	RUN 065 PD1–26,27,GND 2223355	RUN 970 MR3–PDI–16,17,GND 2280289	RUN 065 WC1 2223355	RUN 970 WC1 2280289
969	Octane	RUN 969 OW1–A2–A5–J1 2280288	RUN 1081 OW1–A19–J1 2371515	RUN 969 MR3–PD1–18,19,GND,N 2280288	RUN 1081 MR3–PD1–18,19,GND,N 2371515
703	Indigo	RUN #703 PD1–A1–A2–J2 PD1–A14–A1–J2 46–258431G809	RUN #703/971 PD1–A1–A2–J2 PD1–A14–A1–J2 MR3–PD1–J2	RUN #703 MR2–A11–J23 46–228431G809	RUN #703/971 MR2–A11–J23 46–258431G941
706	Indigo	RUN #706 MR1–PD1–J3 PD1–A14–A1–J3 46–258431G808	RUN #706/972 PD1–A1–A3–J2 PD1–A14–A1–J3 MR3–PD1–J3	RUN #706 MR2–A11–J14 46–258431G808	RUN #706/972 MR2–A11–J14 46–258431G940
788	Indigo Octane	RUN 788 PP1–J12 46–328000G937	RUN 1085 PP1–J12 2363001–5	RUN 788 OW1–A1–A4–J7 46–328000G937	RUN 1085 OW1–A21–J7 2363001–5
789	Indigo Octane	RUN 789 MR2–A11–J26 46–328000G938	RUN 1084 MR2–A11–J26 2354601–5	RUN 789 OW1–A1–A4–J18 46–328000G938	RUN 1084 OW1–A21 (CONNECT TO RUN 1062) 2354601–5

4–3 RE–LABELING & RE–ROUTING EXISTING FIBER OPTIC CABLES TO SIGNA LX with EXCITE

Several existing LX fiber optic cables need to be re–labeled and some of them re–routed per the new labels. Blank write–on labels for marking cables (46–208781P3) are provided. Refer to Table 4–3 for information to write on the labels. Apply labels over existing labels at the appropriate ends of affected cables. Refer to cable maps for routing and connection of cables.

- Run 708 is re–labeled for Horizon 5.x or LX systems upgraded to Signa LX with EXCITE. The fiber optic connections to the 5.x and LX TYME board are different than the MGD STIF board. Refer to table 4–3. All pre–5.x system upgrades are provided a new cables for Run 708
- A new Run 1034 is provided which will replace Run 710. If existing Run 710 is retained, it will need to be re–labeled. Refer to table 4–3. The conduit may also need to be shortened to provide longer fiber optic wires required for routing and connecting within the System Cabinet. Refer to EXCITE System Cabinet Upgrade instructions in Tab 8.
- A new Run 1045 is provided which will replace Run 711/712 in the Equipment Room. If existing Run 711/712 is retained, it will need to be re–labeled. The fiber optic connections to the 5.x and LX TYME board are different than the MGD STIF board. Refer to table 4–3.

TABLE 4–3
HORIZON LX FIBER OPTIC CABLES RE–LABELED AND RE–LOCATED FOR UPGRADE TO LX with EXCITE

RUN	SYSTEM TYPE	ONE END		OTHER END	
		OLD LABEL	NEW LABEL	OLD LABEL	NEW LABEL
708	Indigo Octane	RUN #708 MR2–A11–J16 (TR1/TX)	RUN 1033 MR2–A11–J16 2330480 (TR1/TX)	RUN #708 MR1–A7–TX (J19)	RUN 1033 MR1–A7–T 2330480X (MGD SLOT 13R–J21)
710	Indigo Octane	RUN #710 MR2–A11–J17 46–317085G603 –1 (J12) –2 (J13) –3 (J15) –4 (J17) –5 (J18)	RUN 1034 MR2–A11–J17 2331897 –1 (J14) –2 (J13) –3 (J12) –4 (J11) –5 (J20)	RUN #710 MR3–A11–J2 46–317085G603 –1 (J2) –2 (J3) –3 (J4) –4 (J1) –5 (J5)	RUN 1034 MR3–PD1–J2 2331897 –1 (J2) –2 (J3) –3 (J4) –4 (J1) –5 (J5)
711/712 Equip. Room	Indigo Octane	RUN #711/712 MR2–A11–J13 (J25,J27) (J23) (J20,J21)	RUN 1045 MR2–A11–J13 2331897 (MGD SLOT 13R–J15,J16) (MGD SLOT 13R–J17) (MGD SLOT 13R–J18,J19)	RUN #711/712 PP1–A17–A1	RUN 1045 PP1–A17–A1

4–4 AFFECTED CABLES AND EQUIPMENT FOR UPGRADE TO 1.5T Twin*Speed*

Cables that are removed, relocated, and/or disconnected and reused when upgrading an existing LX system with an LCC magnet that has a WideOpen or Horizon Box enclosure are indentified on the following “Affected Cables for Upgrading to Signa1.5T Twin*Speed*” interconnect maps.

If the site is being upgraded to EXCITE, the computer will be upgraded to Linux PC. Select one of the following for upgrading the Operator Workspace area.

Description **Page**

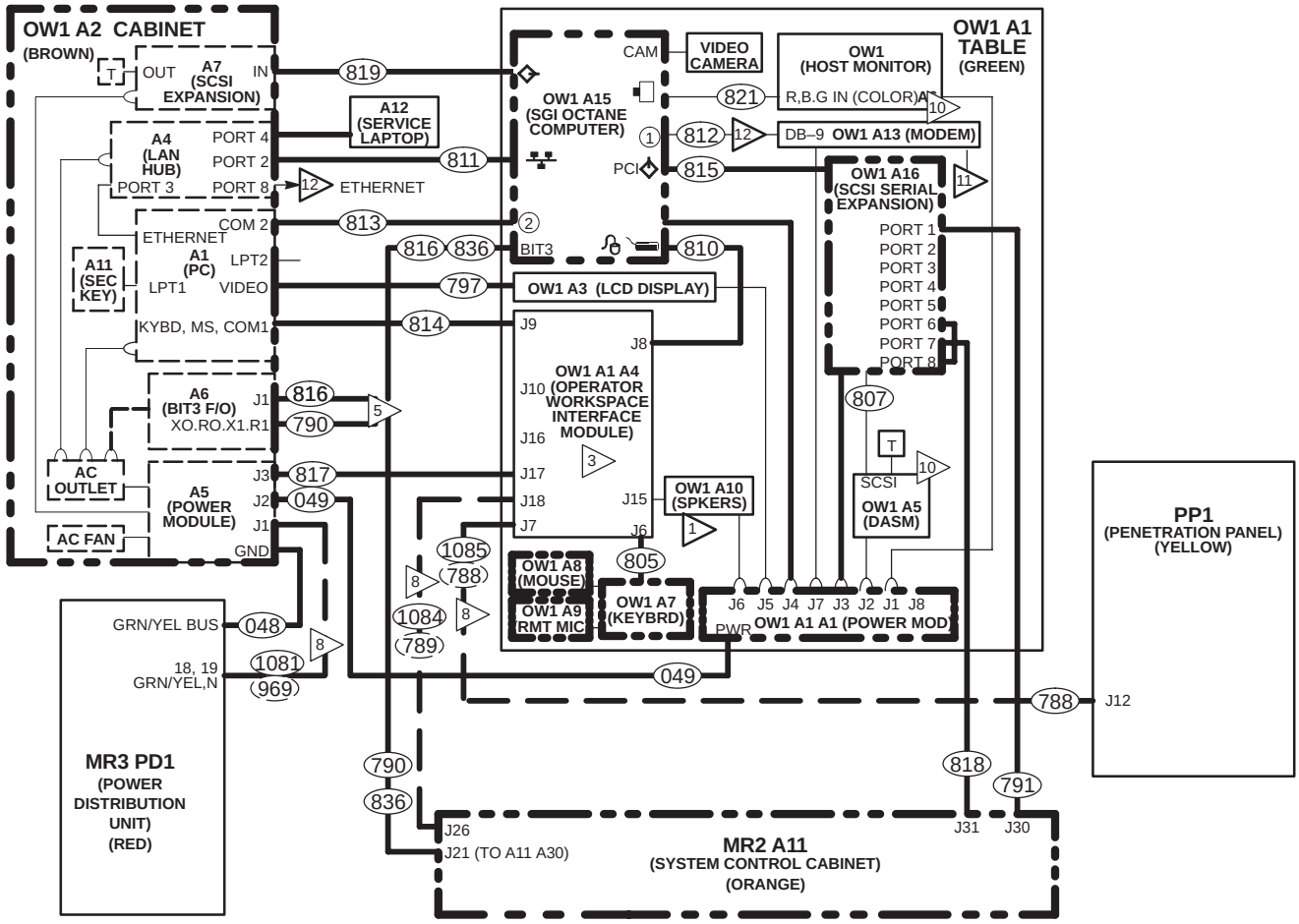
- Signa LX with Octane Computer to 11.x TwinSpeed EXCITE 4–7
- Signa LX with Indigo Computer to 11.x TwinSpeed EXCITE 4–8

For the remainder of the cables, cabinets, and modules being upgraded, select one of the following cable removal maps.

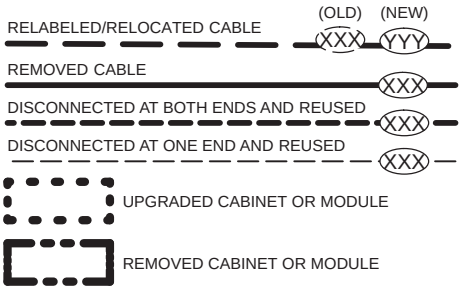
Description **Page**

- Signa WideOpen enclosure with ACGD/PDU to Signa 9.x Twin*Speed* 4–9
- Signa WideOpen enclosure with ACGD/PDU to Signa 11.x Twin*Speed* EXCITE 4–10
- Signa Horizon Box enclosure with ACGD/PDU to Signa 9.x Twin*Speed* 4–11
- Signa Horizon Box enclosure with ACGD/PDU to Signa 11.x Twin*Speed* EXCITE 4–12
- Signa WideOpen enclosure with RF/PDU and SGD to Signa 9.x Twin*Speed* 4–13
- Signa WideOpen enclosure with RF/PDU and SGD to Signa 11.x Twin*Speed* EXCITE 4–14
- Signa Horizon Box enclosure with RF/PDU and SGD to Signa 9.x Twin*Speed* 4–15
- Signa Horizon Box enclosure with RF/PDU and SGD to Signa 11.x Twin*Speed* EXCITE 4–16
- Signa WideOpen enclosure with pre–RF/PDU and SGD (or Gradient/GRAM) to 9.x Twin*Speed* 4–17
- Signa WideOpen enclosure with pre–RF/PDU and SGD (or Gradient/GRAM) to 11.x Twin*Speed* 4–18

AFFECTED CABLES FOR UPGRADING A SIGNA LX SYSTEM with Octane Computer to TwinSpeed EXCITE



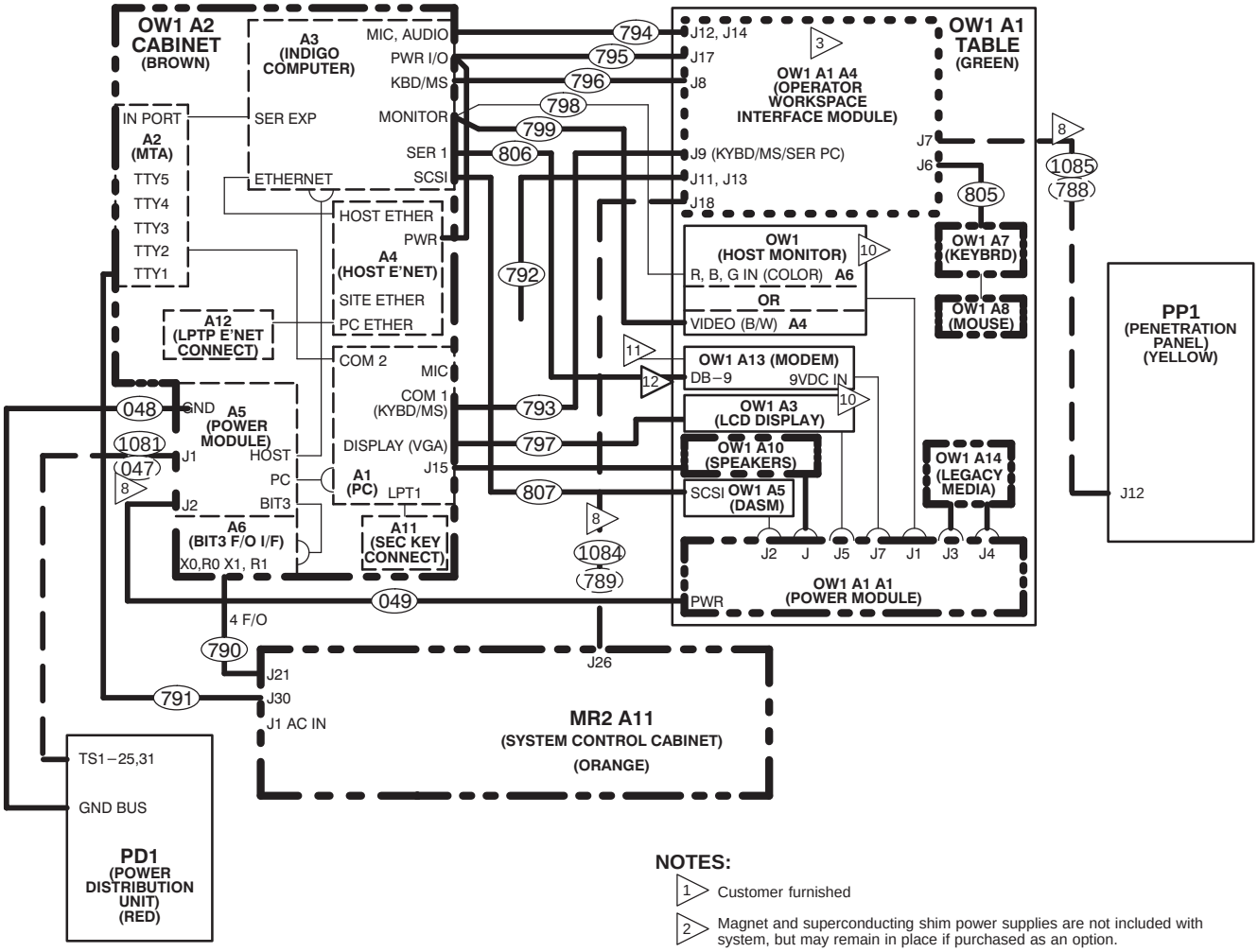
LEGEND:



NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. For most LX upgrades, the WIM will be transferred to the new GOC Cabinet. Refer to Tab 13..
4. Typical connection for normally closed emergency off switch
5. Prior to Run 836, sites were installed with Runs 790 & 816 routed to Bit3 located at bottom of Computer Cabinet. If so for this site, remove Runs 790 & 816 and disconnect Bit3 power cable from AC Outlet in Computer Cabient.
6. Magnet ramping cables pass through ramp port on pp1 plate.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
8. Refer to Section 4–2 for instructions on relabeling cables.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. DASM, Modem, LCD DIsplay, and Color Monitor may be used with EXCITE. Refer to Site plans for verification.
11. Customer supplied telephone line for Insite Modem.
12. Ethernet cable is customer supplied. RUN 812 and modem may not be required if connection to InSite is provided thru site ethermet connection.

AFFECTED CABLES FOR UPGRADING A SIGNA LX SYSTEM with Indigo Computer to TwinSpeed EXCITE



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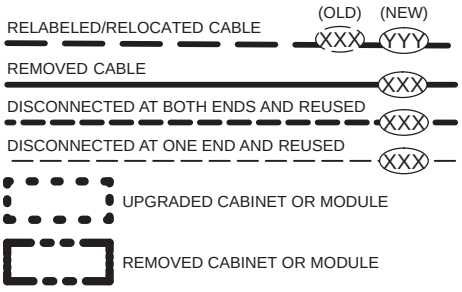
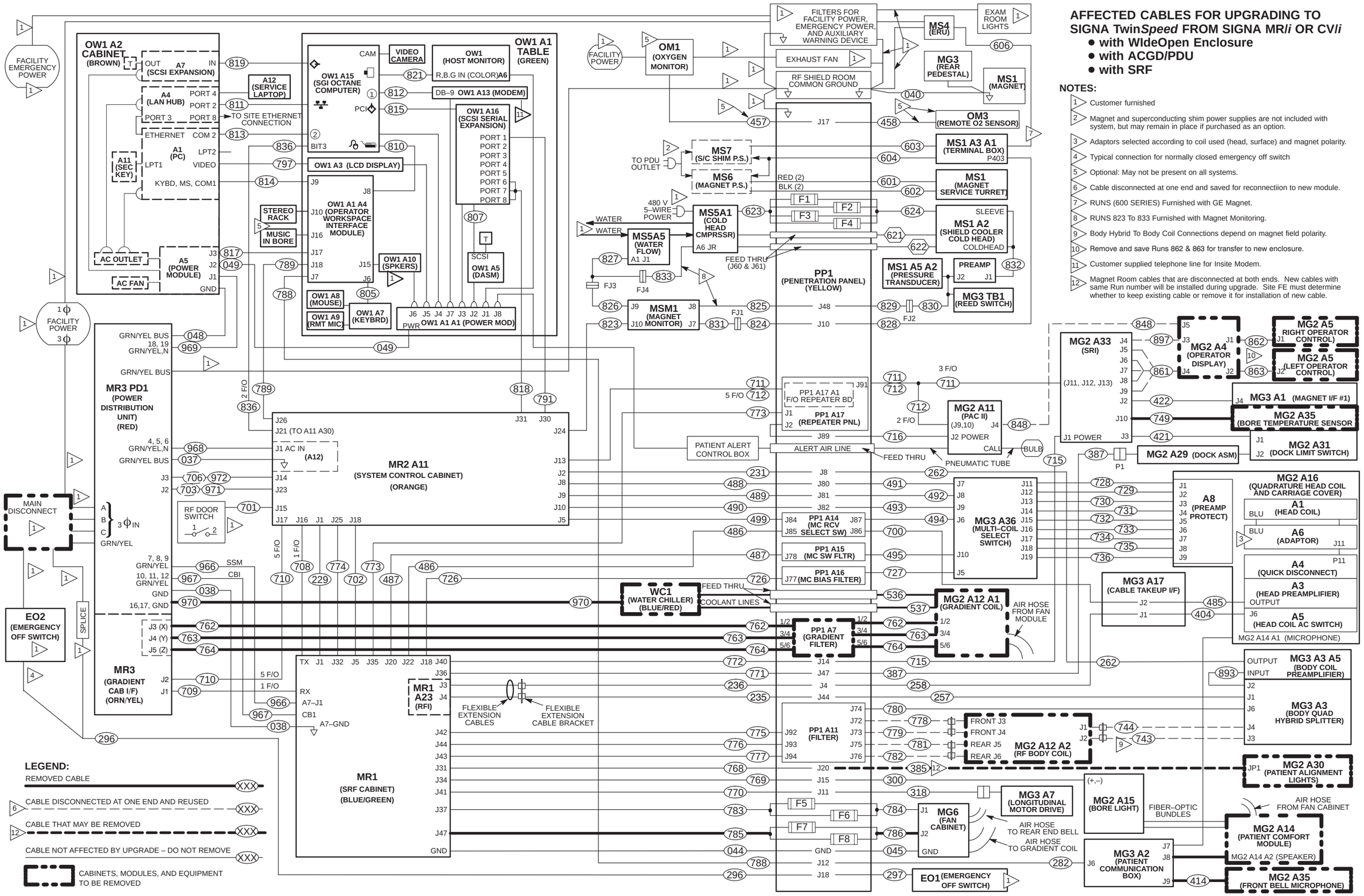


NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. For most LX upgrades, the WIM will be transferred to the new GOC Cabinet. Refer to Tab 13..
4. Typical connection for normally closed emergency off switch
5. Prior to Run 836, sites were installed with Runs 790 & 816 routed to Bit3 located at bottom of Computer Cabinet. If so for this site, remove Runs 790 & 816 and disconnect Bit3 power cable from AC Outlet in Computer Cabient.
6. Magnet ramping cables pass through ramp port on pp1 plate.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
8. Refer to Section 4–2 for instructions on relabeling cables.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. DASM, Modem, LCD DIsplay, and Color Monitor may be used with EXCITE. Refer to Site plans for verification.
11. Customer supplied telephone line for Insite Modem.
12. Ethernet cable is customer supplied. RUN 812 and modem may not be required if connection to InSite is provided thru site ethermet connection.

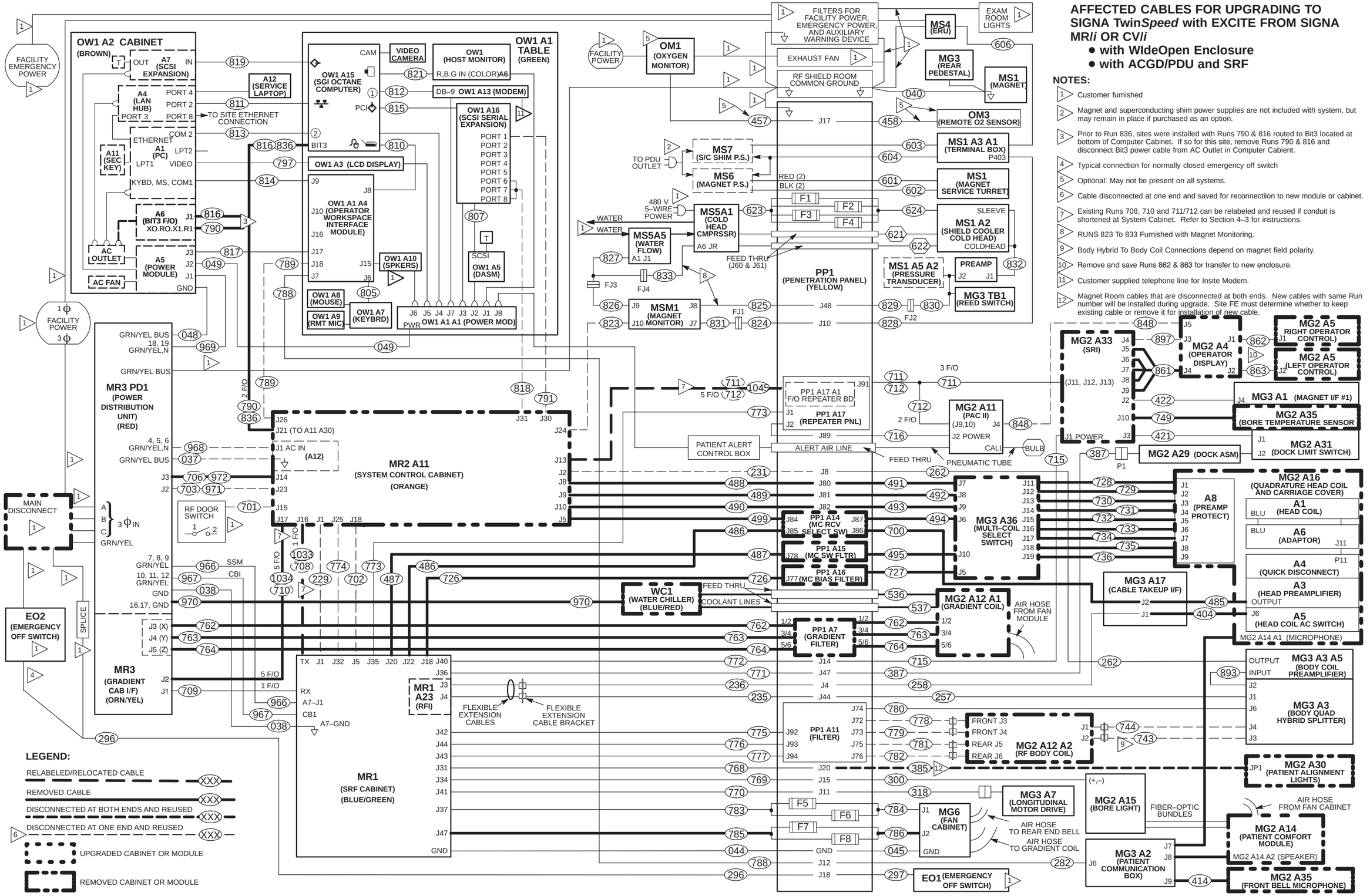

AFFECTED CABLES FOR UPGRADING TO SIGNA TwinSpeed FROM SIGNA MRi OR CVi
with WIdeOpen Enclosure
with ACGD/PDU
with SRF
NOTES:
1 Customer furnished
2 Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3 Adaptors selected according to coil used (head, surface) and magnet polarity.
4 Typical connection for normally closed emergency off switch
5 Optional: May not be present on all systems.
6 Cable disconnected at one end and saved for reconnectiion to new module.
7 RUNS (600 SERIES) Furnished with GE Magnet.
8 RUNS 823 To 833 Furnished with Magnet Monitoring.
9 Body Hybrid To Body Coil Connections depend on magnet field polarity.
10 Remove and save Runs 862 & 863 for transfer to new enclosure.
11 Customer supplied telephone line for Insite Modem.
12 Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.
FACILITY EMERGENCY POWER
OW1 A2 CABINET (BROWN)
A7 (SCSI EXPANSION)
A4 (LAN HUB)
A1 (PC)
A11 (SEC KEY)
A12 (SERVICE LAPTOP)
TO SITE ETHERNET CONNECTION
AC OUTLET
AC FAN
A5 (POWER MODULE)
OW1 A1 TABLE (GREEN)
OW1 A15 (SGI OCTANE COMPUTER)
VIDEO CAMERA
OW1 (HOST MONITOR)
OW1 A16 (SCSI SERIAL EXPANSION)
OW1 A3 (LCD DISPLAY)
OW1 A1 A4 (OPERATOR WORKSPACE INTERFACE MODULE)
STEREO RACK
MUSIC IN BORE
OW1 A10 (SPKERS)
SCSI
OW1 A5 (DASM)
OW1 A8 (MOUSE)
OW1 A9 (RMT MIC)
OW1 A7 (KEYBRD)
OW1 A1 A1 (POWER MOD)
FACILITY POWER 1 Φ 3 Φ
MR3 PD1 (POWER DISTRIBUTION UNIT) (RED)
MAIN DISCONNECT
EO2 (EMERGENCY OFF SWITCH)
SPLICE
MR3 (GRADIENT CAB I/F) (ORN/YEL)
RF DOOR SWITCH
MR2 A11 (SYSTEM CONTROL CABINET) (ORANGE)
MR1 (SRF CABINET) (BLUE/GREEN)
MR1 A23 (RFI)
FLEXIBLE EXTENSION CABLES
FLEXIBLE EXTENSION CABLE BRACKET
FACILITY POWER
OM1 (OXYGEN MONITOR)
FILTERS FOR FACILITY POWER, EMERGENCY POWER, AND AUXILIARY WARNING DEVICE
EXHAUST FAN
RF SHIELD ROOM COMMON GROUND
EXAM ROOM LIGHTS
MS4 (ERU)
MG3 (REAR PEDESTAL)
MS1 (MAGNET)
OM3 (REMOTE O2 SENSOR)
MS7 (S/C SHIM P.S.)
MS6 (MAGNET P.S.)
TO PDU OUTLET
480 V 5–WIRE POWER
MS5A1 (COLD HEAD CMPRSSR)
MS5A5 (WATER FLOW)
WATER
FEED THRU (J60 & J61)
MS1 A3 A1 (TERMINAL BOX)
MS1 (MAGNET SERVICE TURRET)
MS1 A2 (SHIELD COOLER COLD HEAD)
MS1 A5 A2 (PRESSURE TRANSDUCER)
PREAMP
MG3 TB1 (REED SWITCH)
PP1 (PENETRATION PANEL) (YELLOW)
MSM1 (MAGNET MONITOR)
PP1 A17 A1 F/O REPEATER BD
PP1 A17 (REPEATER PNL)
PP1 A14 (MC RCV SELECT SW)
PP1 A15 (MC SW FLTR)
PP1 A16 (MC BIAS FILTER)
PATIENT ALERT CONTROL BOX
ALERT AIR LINE
WC1 (WATER CHILLER) (BLUE/RED)
COOLANT LINES
PP1 A7 (GRADIENT FILTER)
PP1 A11 (FILTER)
MG2 A12 A1 (GRADIENT COIL)
MG2 A12 A2 (RF BODY COIL)
AIR HOSE FROM FAN MODULE
MG2 A11 (PAC II)
PNEUMATIC TUBE
BULB
MG3 A36 (MULTI–COIL SELECT SWITCH)
MG3 A17 (CABLE TAKEUP I/F)
MG2 A33 (SRI)
MG2 A4 (OPERATOR DISPLAY)
MG2 A5 (RIGHT OPERATOR CONTROL)
MG2 A5 (LEFT OPERATOR CONTROL)
MG3 A1 (MAGNET I/F #1)
MG2 A35 (BORE TEMPERATURE SENSOR)
MG2 A31 (DOCK LIMIT SWITCH)
MG2 A29 (DOCK ASM)
MG2 A16 (QUADRATURE HEAD COIL AND CARRIAGE COVER)
A8 (PREAMP PROTECT)
A1 (HEAD COIL)
A6 (ADAPTOR)
A4 (QUICK DISCONNECT)
A3 (HEAD PREAMPLIFIER)
A5 (HEAD COIL AC SWITCH)
MG2 A14 A1 (MICROPHONE)
MG3 A3 A5 (BODY COIL PREAMPLIFIER)
MG3 A3 (BODY QUAD HYBRID SPLITTER)
MG2 A30 (PATIENT ALIGNMENT LIGHTS)
MG2 A15 (BORE LIGHT)
FIBER–OPTIC BUNDLES
AIR HOSE FROM FAN CABINET
MG2 A14 (PATIENT COMFORT MODULE)
MG2 A14 A2 (SPEAKER)
MG2 A35 (FRONT BELL MICROPHONE)
MG3 A7 (LONGITUDINAL MOTOR DRIVE)
MG6 (FAN CABINET)
AIR HOSE TO REAR END BELL
AIR HOSE TO GRADIENT COIL
MG3 A2 (PATIENT COMMUNICATION BOX)
EO1 (EMERGENCY OFF SWITCH)
LEGEND:
REMOVED CABLE
CABLE DISCONNECTED AT ONE END AND REUSED
CABLE THAT MAY BE REMOVED
CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE
CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED

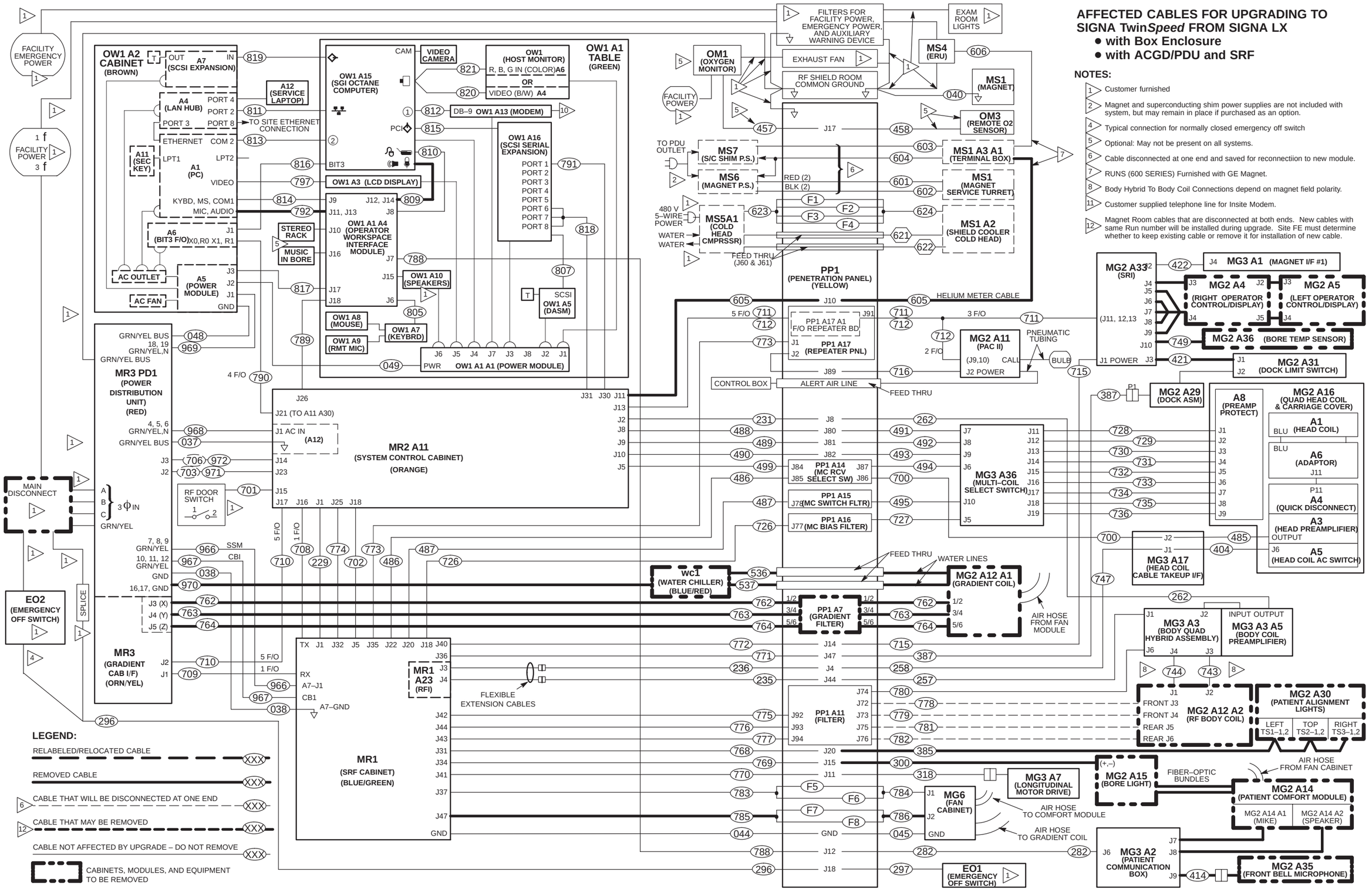
AFFECTED CABLES FOR UPGRADING TO SIGNA Twin*Speed* with EXCITE FROM SIGNA MR*i* OR CV*i*

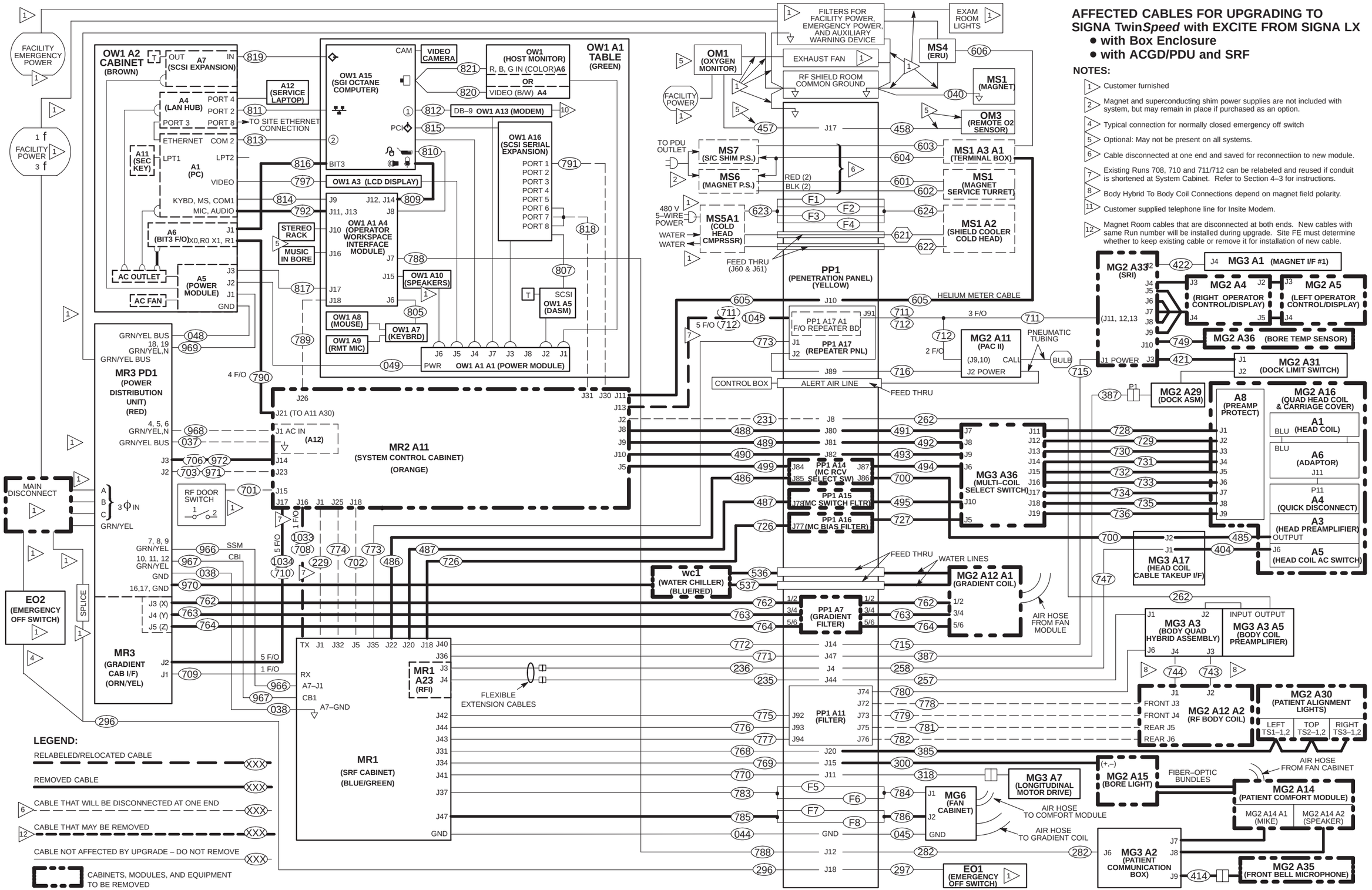
- with WIdeOpen Enclosure
- with ACGD/PDU and SRF

NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Prior to Run 836, sites were installed with Runs 790 & 816 routed to Bit3 located at bottom of Computer Cabinet. If so for this site, remove Runs 790 & 816 and disconnect Bit3 power cable from AC Outlet in Computer Cabient.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Cable disconnected at one end and saved for reconnectiion to new module or cabinet.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
8. RUNS 823 To 833 Furnished with Magnet Monitoring.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Remove and save Runs 862 & 863 for transfer to new enclosure.
11. Customer supplied telephone line for Insite Modem.
12. Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.




AFFECTED CABLES FOR UPGRADING TO SIGNA TwinSpeed FROM SIGNA LX
with Box Enclosure
with ACGD/PDU and SRF
NOTES:
1 Customer furnished
2 Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
4 Typical connection for normally closed emergency off switch
5 Optional: May not be present on all systems.
6 Cable disconnected at one end and saved for reconnectiion to new module.
7 RUNS (600 SERIES) Furnished with GE Magnet.
8 Body Hybrid To Body Coil Connections depend on magnet field polarity.
11 Customer supplied telephone line for Insite Modem.
12 Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.
FACILITY EMERGENCY POWER
OW1 A2 CABINET (BROWN)
A7 (SCSI EXPANSION)
A4 (LAN HUB)
A12 (SERVICE LAPTOP)
TO SITE ETHERNET CONNECTION
A11 (SEC KEY)
A1 (PC)
A6 (BIT3 F/O)
AC OUTLET
AC FAN
A5 (POWER MODULE)
STEREO RACK
MUSIC IN BORE
OW1 A15 (SGI OCTANE COMPUTER)
VIDEO CAMERA
OW1 (HOST MONITOR)
R, B, G IN (COLOR) A6
OR
VIDEO (B/W) A4
DB–9 OW1 A13 (MODEM)
OW1 A16 (SCSI SERIAL EXPANSION)
OW1 A3 (LCD DISPLAY)
OW1 A4 (OPERATOR WORKSPACE INTERFACE MODULE)
OW1 A10 (SPEAKERS)
OW1 A8 (MOUSE)
OW1 A7 (KEYBRD)
OW1 A9 (RMT MIC)
OW1 A5 (DASM)
OW1 A1 TABLE (GREEN)
OW1 A1 A1 (POWER MODULE)
FILTERS FOR FACILITY POWER, EMERGENCY POWER, AND AUXILIARY WARNING DEVICE
EXAM ROOM LIGHTS
OM1 (OXYGEN MONITOR)
EXHAUST FAN
RF SHIELD ROOM COMMON GROUND
MS4 (ERU)
MS1 (MAGNET)
OM3 (REMOTE O2 SENSOR)
MS7 (S/C SHIM P.S.)
MS6 (MAGNET P.S.)
MS5A1 (COLD HEAD CMPRSSR)
MS1 A3 A1 (TERMINAL BOX)
MS1 (MAGNET SERVICE TURRET)
MS1 A2 (SHIELD COOLER COLD HEAD)
PP1 (PENETRATION PANEL) (YELLOW)
PP1 A17 A1 F/O REPEATER BD
PP1 A17 (REPEATER PNL)
PP1 A14 (MC RCV SELECT SW)
PP1 A15 (MC SWITCH FLTR)
PP1 A16 (MC BIAS FILTER)
PP1 A7 (GRADIENT FILTER)
PP1 A11 (FILTER)
HELIUM METER CABLE
MG2 A11 (PAC II)
PNEUMATIC TUBING
MG3 A36 (MULTI–COIL SELECT SWITCH)
MG2 A33 (SRI)
MG3 A1 (MAGNET I/F #1)
MG2 A4 (RIGHT OPERATOR CONTROL/DISPLAY)
MG2 A5 (LEFT OPERATOR CONTROL/DISPLAY)
MG2 A36 (BORE TEMP SENSOR)
MG2 A31 (DOCK LIMIT SWITCH)
MG2 A29 (DOCK ASM)
A8 (PREAMP PROTECT)
MG2 A16 (QUAD HEAD COIL & CARRIAGE COVER)
A1 (HEAD COIL)
A6 (ADAPTOR)
A4 (QUICK DISCONNECT)
A3 (HEAD PREAMPLIFIER)
A5 (HEAD COIL AC SWITCH)
MG3 A17 (HEAD COIL CABLE TAKEUP I/F)
MG3 A3 (BODY QUAD HYBRID ASSEMBLY)
MG3 A3 A5 (BODY COIL PREAMPLIFIER)
MG2 A12 A2 (RF BODY COIL)
MG2 A30 (PATIENT ALIGNMENT LIGHTS)
MG2 A12 A1 (GRADIENT COIL)
WC1 (WATER CHILLER) (BLUE/RED)
FEED THRU
WATER LINES
AIR HOSE FROM FAN MODULE
MG3 A7 (LONGITUDINAL MOTOR DRIVE)
MG2 A15 (BORE LIGHT)
FIBER–OPTIC BUNDLES
MG2 A14 (PATIENT COMFORT MODULE)
AIR HOSE FROM FAN CABINET
AIR HOSE TO COMFORT MODULE
AIR HOSE TO GRADIENT COIL
MG6 (FAN CABINET)
MG2 A35 (FRONT BELL MICROPHONE)
EO1 (EMERGENCY OFF SWITCH)
EO2 (EMERGENCY OFF SWITCH)
MR3 PD1 (POWER DISTRIBUTION UNIT) (RED)
MR3 (GRADIENT CAB I/F) (ORN/YEL)
MR2 A11 (SYSTEM CONTROL CABINET) (ORANGE)
MR1 (SRF CABINET) (BLUE/GREEN)
MR1 A23 (RFI)
FLEXIBLE EXTENSION CABLES
MAIN DISCONNECT
RF DOOR SWITCH
SPLICE
LEGEND:
RELABELED/RELOCATED CABLE
REMOVED CABLE
CABLE THAT WILL BE DISCONNECTED AT ONE END
CABLE THAT MAY BE REMOVED
CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE
CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED

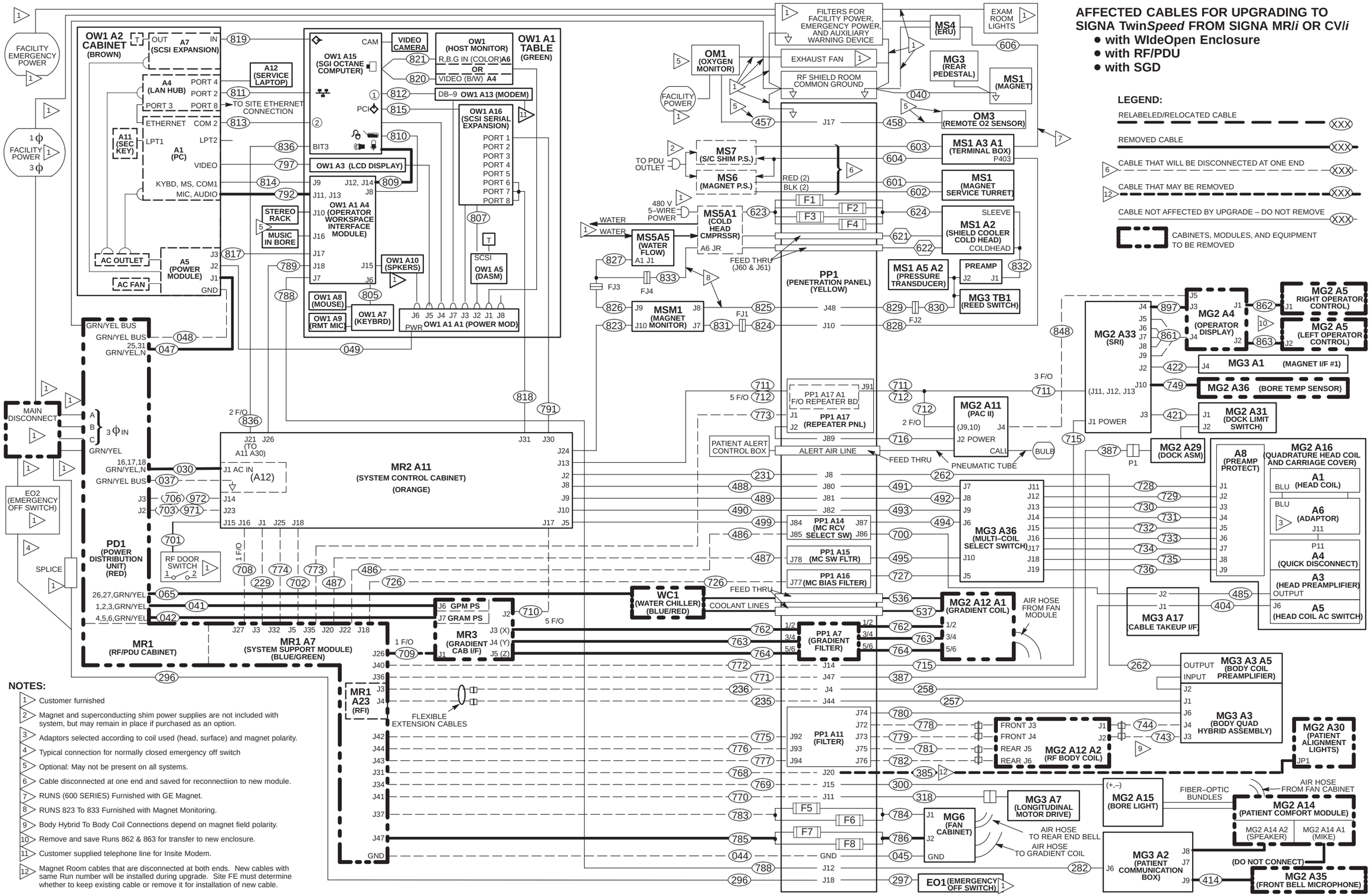


AFFECTED CABLES FOR UPGRADING TO SIGNA Twin*Speed* with EXCITE FROM SIGNA LX

- with Box Enclosure
- with ACGD/PDU and SRF

NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Cable disconnected at one end and saved for reconnectiion to new module.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
8. Body Hybrid To Body Coil Connections depend on magnet field polarity.
11. Customer supplied telephone line for Insite Modem.
12. Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.


AFFECTED CABLES FOR UPGRADING TO SIGNA TwinSpeed FROM SIGNA MRi OR CVi
with WIdeOpen Enclosure
with RF/PDU
with SGD
LEGEND:
RELABELED/RELOCATED CABLE
REMOVED CABLE
CABLE THAT WILL BE DISCONNECTED AT ONE END
CABLE THAT MAY BE REMOVED
CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE
CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED
OW1 A2 CABINET (BROWN)
OW1 A1 TABLE (GREEN)
A7 (SCSI EXPANSION)
A12 (SERVICE LAPTOP)
A4 (LAN HUB)
A11 (SEC KEY)
A1 (PC)
A5 (POWER MODULE)
AC OUTLET
AC FAN
OW1 A15 (SGI OCTANE COMPUTER)
VIDEO CAMERA
OW1 (HOST MONITOR)
OR
DB–9 OW1 A13 (MODEM)
OW1 A16 (SCSI SERIAL EXPANSION)
OW1 A3 (LCD DISPLAY)
OW1 A1 A4 (OPERATOR WORKSPACE INTERFACE MODULE)
STEREO RACK
MUSIC IN BORE
OW1 A10 (SPKERS)
SCSI
OW1 A5 (DASM)
OW1 A8 (MOUSE)
OW1 A9 (RMT MIC)
OW1 A7 (KEYBRD)
OW1 A1 A1 (POWER MOD)
FACILITY EMERGENCY POWER
FACILITY POWER
FILTERS FOR FACILITY POWER, EMERGENCY POWER, AND AUXILIARY WARNING DEVICE
EXAM ROOM LIGHTS
MS4 (ERU)
MG3 (REAR PEDESTAL)
MS1 (MAGNET)
OM1 (OXYGEN MONITOR)
EXHAUST FAN
RF SHIELD ROOM COMMON GROUND
OM3 (REMOTE O2 SENSOR)
MS7 (S/C SHIM P.S.)
MS6 (MAGNET P.S.)
MS1 A3 A1 (TERMINAL BOX)
MS1 (MAGNET SERVICE TURRET)
MS5A1 (COLD HEAD CMPRSSR)
MS1 A2 (SHIELD COOLER COLD HEAD)
MS5A5 (WATER FLOW)
MS1 A5 A2 (PRESSURE TRANSDUCER)
PREAMP
MG3 TB1 (REED SWITCH)
MSM1 (MAGNET MONITOR)
PP1 (PENETRATION PANEL) (YELLOW)
MAIN DISCONNECT
EO2 (EMERGENCY OFF SWITCH)
PD1 (POWER DISTRIBUTION UNIT) (RED)
RF DOOR SWITCH
SPLICE
MR1 (RF/PDU CABINET)
MR1 A7 (SYSTEM SUPPORT MODULE) (BLUE/GREEN)
MR2 A11 (SYSTEM CONTROL CABINET) (ORANGE)
MR3 (GRADIENT CAB I/F)
MR1 A23 (RFI)
FLEXIBLE EXTENSION CABLES
WC1 (WATER CHILLER) (BLUE/RED)
PP1 A17 A1 F/O REPEATER BD
PP1 A17 (REPEATER PNL)
PP1 A14 (MC RCV SELECT SW)
PP1 A15 (MC SW FLTR)
PP1 A16 (MC BIAS FILTER)
PP1 A7 (GRADIENT FILTER)
PP1 A11 (FILTER)
PATIENT ALERT CONTROL BOX
ALERT AIR LINE
FEED THRU
PNEUMATIC TUBE
MG2 A11 (PAC II)
MG3 A36 (MULTI–COIL SELECT SWITCH)
MG2 A12 A1 (GRADIENT COIL)
MG2 A12 A2 (RF BODY COIL)
MG6 (FAN CABINET)
MG3 A7 (LONGITUDINAL MOTOR DRIVE)
EO1 (EMERGENCY OFF SWITCH)
AIR HOSE FROM FAN MODULE
AIR HOSE TO REAR END BELL
AIR HOSE TO GRADIENT COIL
MG2 A33 (SRI)
MG2 A4 (OPERATOR DISPLAY)
MG2 A5 (RIGHT OPERATOR CONTROL)
MG2 A5 (LEFT OPERATOR CONTROL)
MG3 A1 (MAGNET I/F #1)
MG2 A36 (BORE TEMP SENSOR)
MG2 A31 (DOCK LIMIT SWITCH)
MG2 A29 (DOCK ASM)
MG2 A16 (QUADRATURE HEAD COIL AND CARRIAGE COVER)
A8 (PREAMP PROTECT)
A1 (HEAD COIL)
A6 (ADAPTOR)
A4 (QUICK DISCONNECT)
A3 (HEAD PREAMPLIFIER)
A5 (HEAD COIL AC SWITCH)
MG3 A17 CABLE TAKEUP I/F
MG3 A3 A5 (BODY COIL PREAMPLIFIER)
MG3 A3 (BODY QUAD HYBRID ASSEMBLY)
MG2 A30 (PATIENT ALIGNMENT LIGHTS)
MG2 A15 (BORE LIGHT)
FIBER–OPTIC BUNDLES
MG2 A14 (PATIENT COMFORT MODULE)
MG2 A14 A2 (SPEAKER)
MG2 A14 A1 (MIKE)
(DO NOT CONNECT)
MG2 A35 (FRONT BELL MICROPHONE)
MG3 A2 (PATIENT COMMUNICATION BOX)
NOTES:
1 Customer furnished
2 Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3 Adaptors selected according to coil used (head, surface) and magnet polarity.
4 Typical connection for normally closed emergency off switch
5 Optional: May not be present on all systems.
6 Cable disconnected at one end and saved for reconnectiion to new module.
7 RUNS (600 SERIES) Furnished with GE Magnet.
8 RUNS 823 To 833 Furnished with Magnet Monitoring.
9 Body Hybrid To Body Coil Connections depend on magnet field polarity.
10 Remove and save Runs 862 & 863 for transfer to new enclosure.
11 Customer supplied telephone line for Insite Modem.
12 Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.

AFFECTED CABLES FOR UPGRADING TO SIGNA Twin*Speed* with EXCITE FROM SIGNA MR*i* OR CV*i*

- with WIdeOpen Enclosure
- with RF/PDU
- with SGD

LEGEND:

- RELABELED/RELOCATED CABLE — XXX
- REMOVED CABLE — XXX
- 6 CABLE THAT WILL BE DISCONNECTED AT ONE END — XXX
- 12 CABLE THAT MAY BE REMOVED — XXX
- CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE — XXX
- CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED

NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Prior to Run 836, sites were installed with Runs 790 & 816 routed to Bit3 located at bottom of Computer Cabinet. If so for this site, remove Runs 790 & 816 and disconnect Bit3 power cable from AC Outlet in Computer Cabient.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Cable disconnected at one end and saved for reconnectiion to new module.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
8. RUNS 823 To 833 Furnished with Magnet Monitoring.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Remove and save Runs 862 & 863 for transfer to new enclosure.
11. Customer supplied telephone line for Insite Modem.
12. Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.

AFFECTED CABLES FOR UPGRADING TO SIGNA TwinSpeed FROM SIGNA LX

- with Box Enclosure (LCC Magnet)
- with RF/PDU
- with SGD

LEGEND:

- RELABELED/RELOCATED CABLE — XXX
- REMOVED CABLE — XXX
- CABLE THAT WILL BE DISCONNECTED AT ONE END — XXX
- CABLE THAT MAY BE REMOVED — XXX
- CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE — XXX
- CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED

NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Cable disconnected at one end and saved for reconnectiion to new module.
7. RUNS (600 SERIES) Furnished with GE Magnet.
8. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Customer supplied telephone line for Insite Modem.
12. Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.

M4489B (9–9–96)

AFFECTED CABLES FOR UPGRADING TO SIGNA Twin*Speed* with EXCITE FROM SIGNA LX

- with Box Enclosure (LCC Magnet)
- with RF/PDU
- with SGD

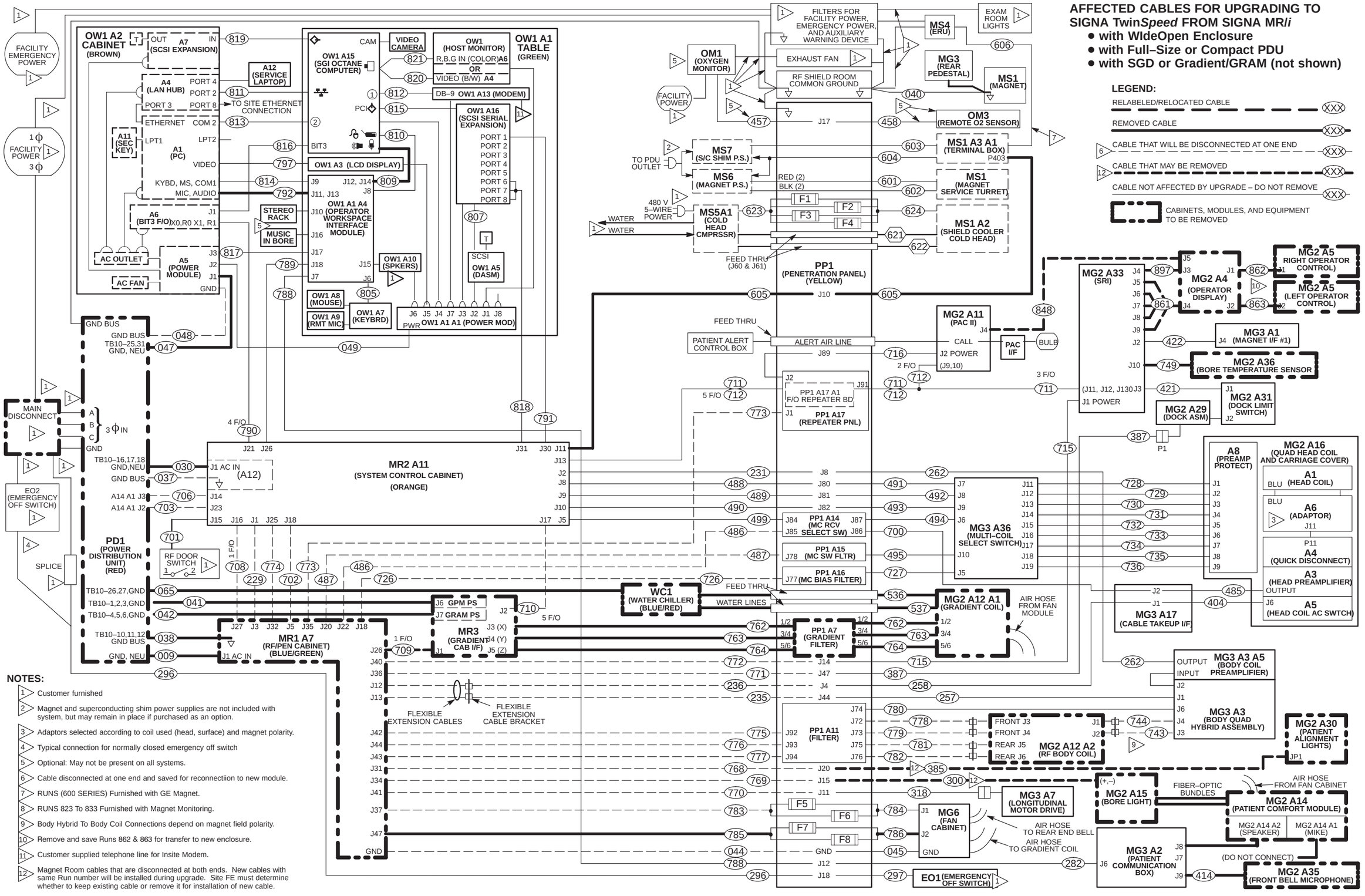
LEGEND:

- RELABELED/RELOCATED CABLE — XXX
- REMOVED CABLE — XXX
- 6 CABLE THAT WILL BE DISCONNECTED AT ONE END — XXX
- 12 CABLE THAT MAY BE REMOVED — XXX
- CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE — XXX
- CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED

NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Prior to Run 836, sites were installed with Runs 790 & 816 routed to Bit3 located at bottom of Computer Cabinet. If so for this site, remove Runs 790 & 816 and disconnect Bit3 power cable from AC Outlet in Computer Cabient.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Cable disconnected at one end and saved for reconnectiion to new module.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
8. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Customer supplied telephone line for Insite Modem.
12. Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.

M4489B (9–9–96)


AFFECTED CABLES FOR UPGRADING TO SIGNA TwinSpeed FROM SIGNA MRi
with WIdeOpen Enclosure
with Full–Size or Compact PDU
with SGD or Gradient/GRAM (not shown)
LEGEND:
RELABELED/RELOCATED CABLE
REMOVED CABLE
CABLE THAT WILL BE DISCONNECTED AT ONE END
CABLE THAT MAY BE REMOVED
CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE
CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED
OW1 A2 CABINET (BROWN)
OW1 A1 TABLE (GREEN)
MR2 A11 (SYSTEM CONTROL CABINET) (ORANGE)
PD1 (POWER DISTRIBUTION UNIT) (RED)
MR1 A7 (RF/PEN CABINET) (BLUE/GREEN)
PP1 (PENETRATION PANEL) (YELLOW)
WC1 (WATER CHILLER) (BLUE/RED)
NOTES:
1 Customer furnished
2 Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3 Adaptors selected according to coil used (head, surface) and magnet polarity.
4 Typical connection for normally closed emergency off switch
5 Optional: May not be present on all systems.
6 Cable disconnected at one end and saved for reconnectiion to new module.
7 RUNS (600 SERIES) Furnished with GE Magnet.
8 RUNS 823 To 833 Furnished with Magnet Monitoring.
9 Body Hybrid To Body Coil Connections depend on magnet field polarity.
10 Remove and save Runs 862 & 863 for transfer to new enclosure.
11 Customer supplied telephone line for Insite Modem.
12 Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.

AFFECTED CABLES FOR UPGRADING TO SIGNA Twin*Speed* with EXCITE FROM SIGNA MR/*i*

- with WIdeOpen Enclosure
- with Full–Size or Compact PDU
- with SGD or Gradient/GRAM (not shown)

LEGEND:

- RELABELED/RELOCATED CABLE — XXX
- REMOVED CABLE — XXX
- 6 CABLE THAT WILL BE DISCONNECTED AT ONE END — XXX
- 12 CABLE THAT MAY BE REMOVED — XXX
- CABLE NOT AFFECTED BY UPGRADE – DO NOT REMOVE — XXX
- CABINETS, MODULES, AND EQUIPMENT TO BE REMOVED

NOTES:

1. Customer furnished
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Prior to Run 836, sites were installed with Runs 790 & 816 routed to Bit3 located at bottom of Computer Cabinet. If so for this site, remove Runs 790 & 816 and disconnect Bit3 power cable from AC Outlet in Computer Cabinet.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Cable disconnected at one end and saved for reconnectiion to new module.
7. Existing Runs 708, 710 and 711/712 can be relabeled and reused if conduit is shortened at System Cabinet. Refer to Section 4–3 for instructions.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Remove and save Runs 862 & 863 for transfer to new enclosure.
11. Customer supplied telephone line for Insite Modem.
12. Magnet Room cables that are disconnected at both ends. New cables with same Run number will be installed during upgrade. Site FE must determine whether to keep existing cable or remove it for installation of new cable.

4–5 INSTALLATION OF UPGRADED CABLES

The information in this section assumes that Signa 1.5T Twin*Speed* upgrade componenets, appropriate Site Kit, and options are delivered complete with all cables present.

Subsections and pertain to cables that are being installed for all Signa 1.5T Twin*Speed* upgrades. The table in subsection indicates cables that are being installed for a specific upgrade. Subsection lists all cables that are installed for a Signa 1.5T Twin*Speed* system at its completion along with information about each cable.

Cables shipment containers have color coded labels which identify the cable routing areas:

- Green – Equipment Room
- Purple – Operator's Room
- Orange – Magnet Room
- Yellow – Post–installation (Phantom's, Coils, etc.)

4–6 IDENTIFYING NEW CABLES FOR SIGNA 1.5T Twin*Speed* UPGRADE

Table 4–4 lists all cables installed for upgrading to Signa 1.5T Twin*Speed* from various early configurations. The letters on the right side of the table are defined as follows:

If site needs to be upgraded to LX Octane computer from Indigo, the cales in column **B** *must be installed.*

B – Cables added if upgrading from Indigo to Octane2 computer, M1033L. Instructions for this upgrade are delivered with this option.

For sites that have an existing LCC magnet, *select either column* **C***,* **D, E, F***, or* **G** *for cables to be installed.*

C Cables installed if upgrading from ACGD/PDU Signa LX system with existing WideOpen enclosure

D Cables installed if upgrading from ACGD/PDU Signa LX system with existing Horizon Box enclosure

E Cables installed if upgrading from RF/PDU Signa LX system with existing WideOpen enclosure

F Cables installed if upgrading from RF/PDU Signa LX system with existing Horizon Box enclosure

G Cables installed if upgrading from Pre–RF/PDU Signa LX system with existing WideOpen enclosure

For sites that are having a new 1.5T TwinSpeed with LCC magnet installed, *select either column* **H, I,** *or* **J** *for cables to be installed*

H Cables installed if upgrading from ACGD/PDU Signa LX system to a new Twin*Speed* magnet and enclosure

I – Cables installed if upgrading from Pre–ACGD/PDU Signa LX system to a new Twin*Speed* magnet and enclosure

J– Cables installed if upgrading from Horizon 5.x, Advantage 5.4, or Advantage 4.x system to a new Twin*Speed* magnet and enclosure

For sites that are upgrading to LX with EXCITE, *the cables in column* **K** *must be installed.*

K Cables installed if upgrading to LX with EXCITE.

Many of the cables are common to both the LX and LX with EXCITE System. The cables that are specific to LX or EXCITE installation are designated in the applicable cable maps and in the first column of the following tables as:

* Cable used on LX installation only

** Cable used on EXCITE installation only

4–6 IDENTIFYING NEW CABLES FOR SIGNA 1.5T Twin*Speed* UPGRADE (continued)

The upgrades in this manual will have many new cables delivered to the site. In some cases the new cables are the same as the old cables being removed. These are indicated in the table by the letters **E** and **M** and are defined by the following explanations:

E= Equipment Room Cable. A new cable with the same Run number is shipped to site for upgade to Twin*Speed.* Site FE should have determined whether to keep existing cable or remove it and install new cable.

M = Magnet Room Cable. A new cable with the same Run number is shipped to site for upgade to Twin*Speed.* Site FE should have determined whether to keep existing cable or remove it and install new cable.

X = New cable to be installed.

TABLE 4–4
CABLES ADDED FOR UPGRADING TO HORIZON LX FROM VARIOUS PRE–HORIZON LX CONFIGURATIONS

RUN#	FROM	TO	B	C	D	E	F	G	H	I	J	K
037	PD1–GND	MR2–A12–GND							E	X	X	
038	MR1–A7–GND	PD1–GND BUS				X	X	X	E	X	X	
040	MS1	RF COM GND							X	X	X	
044	MR1–A7–GND	PP1–GND							E	X	X	
045	PP1–GND	MG6 GND (FAN)							E	X	X	
048	OW1–A2–A5–GND	PD1–GND							E	X	X	
049	OW1–A1–A1	OW1–A2–A6–J2									X	
229	MR1–A7–J3	MR2–A11–J1							E	E	X	
231	PP1–J8	MR2–A11–J2							E	E	X	
235	PP1–J44	MR1–A7–J13							E	E	X	
236	PP1–J4	MR1–A7–J12							E	E	X	
257	PP1–J44	MG3–A3–A1–J1							M	M	X	
258	PP1–J4	MG3–A17–J1							M	M	X	
262	PP1–J8	MG3–A3–A5–OUT							M	M	X	
282	PP1–J12	MG3–A2–J6							M	M	X	
296	PP1–J18	EO2							E	E	X	
300	PP1–J15	MG2–A15			X		X	M	M	X	X	
318	MG3–A7	PP1–J11							M	X	X	
385	PP1–J20	MG2–A30		M	X	M	X	M	X	X	X	
387	PP1–J47	MG2–A29							M	M	X	
404	MG3–A17–J1	MG2–A16–A5–J6							X	X	X	X
414	MG3–A35	MG3–A2–J9		M	X	M	X	M	X	X	X	
421	MG2–A33–J3	MG3–A31–J1			X		X		X	X	X	
422	MG2–A33–J2	MG3–A1–J4							X	X	X	
485*	MG3–A17–J2	MG2–A16–A3–OUT							X	X	X	
486*	PP1–A14–J85	MR1–A7–J22							E	E	X	
487*	PP1–A15–J78	MR1–A7–J20							E	E	X	
488	PP1–J80	MR2–A11–J8							E	E	X	X
489	PP1–J81	MR2–A11–J9							E	E	X	X
490	PP1–J82	MR2–A11–J10							E	E	X	X
491	PP1–J80	MG3–A36–J7							M	M	X	X
492	PP1–J81	MG3–A36–J8							M	M	X	X
493	PP1–J82	MG3–A36–J9							M	M	X	X

4–6 IDENTIFYING NEW CABLES FOR SIGNA 1.5T Twin*Speed* UPGRADE (continued)

RUN#	FROM	TO	B	C	D	E	F	G	H	I	J	K
494*	PP1–A14–J87	MG3–A36–J6							M	M	X	
495*	PP1–A15–J78	MG3–A36–J10							M	M	X	
499	PP1–A14–J84	MR2–A11–J5							E	E	X	X
536	SCC	MG2–A12–A4		X	X	X	X	X	X	X	X	
537	SCC	MG2–A12–A4		X	X	X	X	X	X	X	X	
601	MS1 (RED)	MS6 (RED)							X	X	X	
602	MS1 (BLK)	MS6 (BLK)							X	X	X	
603	MS1–A13–A1	MS7							X	X	X	
604	MS1–A13–A1	MS6/MS7							X	X	X	
606	MS4	MS1–A3–A1							X	X	X	
611	PP1–A5 **(See Note 1)**	MS3 **(See Note 1)**		X	X	X	X	X	X	X	X	
612	PP1–A5 **(See Note 1)**	MS1–A8 **(See Note 1)**		X	X	X	X	X	X	X	X	
621	MS5–A1 (Gas Line)	MS1–A2 (Gas Line)							X	X	X	
622	MS5–A1 (Gas Line)	MS1–A2 (Gas Line)							X	X	X	
623	MS5–A1	PP1–F1,F2,F3,F4							X	X	X	
624	MS1–A2	PP1–F1,F2,F3,F4							X	X	X	
700*	PP1–A14–J86	MG3–A17–J2							M	M	X	
702	MR2–A11–J18	MR1–A7–J5							E	E	X	
708*	MR2–A11–J16 **(See Note 2)**	MR1–A7–TX **(See Note 2)**							E	E	X	
709	MR3–CAB–I/F–J2	MR1–A7–RX							E	X	X	
710*	MR3–CAB–I/F–J1 **(See Note 2)**	MR2–A11–J17 **(See Note 2)**							E	X	X	
711/712	PP1–A17–A1 F/O REPEATER BD	MG2–A33–J11,12,13 MG2–A11–A1–J9,10							M	M	X	
711/712*	MR2–A11–J13 **(See Note 2)**	PP1–A17–A1 **(See Note 2)**							E	E	X	
715	MG2–A33–J1	PP1–J14							M	M	X	
716	MG2–A11–A1–J2	PP1–J89							M	M	X	
726*	PP1–A16–J77	MR1–A7–J18							E	E	X	
727*	PP1–A16–J77	MG3–A36–J5							M	M	X	
728	MG3–A36–J11	MG2–A16–OUT–J1							X	X	X	X
729	MG3–A36–J12	MG2–A16–OUT–J2							X	X	X	X
730	MG3–A36–J13	MG2–A16–OUT–J3							X	X	X	X
731	MG3–A36–J14	MG2–A16–OUT–J4							X	X	X	X
732	MG3–A36–J15	MG2–A16–OUT–J5							X	X	X	X
733	MG3–A36–J16	MG2–A16–OUT–J6							X	X	X	X
734	MG3–A36–J17	MG2–A16–OUT–J7							X	X	X	X
735	MG3–A36–J18	MG2–A16–OUT–J8							X	X	X	X
736*	MG3–A36–J19	MG2–A16–OUT–J9							X	X	X	
743	MG2–A12–A1–J1	MG3–A3–J4		M	M	M	M	M	X	X	X	
744	MG2–A12–A1–J2	MG3–A3–J3		M	M	M	M	M	X	X	X	
749	MG2–A33–J10	MG2–A35		X	X	X	X	X	X	X	X	
768	PP1–J20	MR1–A7–J31							E	E	X	
769	PP1–J15	MR1–A7–J34							E	E	X	
770	PP1–J11	MR1–A7–J41							E	E	X	
771	PP1–J47	MR1–A7–J36							E	E	X	

4–6 IDENTIFYING NEW CABLES FOR SIGNA 1.5T Twin*Speed* UPGRADE (continued)

RUN#	FROM	TO	B	C	D	E	F	G	H	I	J	K
772	PP1–J14	MR1–A7–J40							E	E	X	
773	PP1–A17–J1	MR1–A7–J35							E	E	X	
774	MR2–A11–J25	MR1–A7–J32							E	E	X	
775	MR1–A7–J42	PP1–A11–J92							E	E	X	
776	MR1–A7–J44	PP1–A11–J93							E	E	X	
777	MR1–A7–J43	PP1–A11–J94							E	E	X	
778	MG2–A12–A13–J3	PP1–A11–J72							M	M	X	
779	MG2–A12–A13–J4	PP1–A11–J73							M	M	X	
780	MG3–A3–J6	PP1–A11–J74							M	M	X	
781	MG2–A12–A12–J5	PP1–A11–J75							M	M	X	
782	MG2–A12–A12–J6	PP1–A11–J76							M	M	X	
783	MR1–A7–J37	PP1–F5/F6							E	E	X	
784	PP1–F5/F6	MG6–J1 (FAN)							M	M	X	
788*	PP1–J12	OW1–A1–A2–J7							E	E	X	
789*	MR2–A11–J26	OW1–A1–A2–J18							E	E	X	
791*	MR2–A11–J30	OW1–A2–A4–EXP1							E	E	X	
797*	OW1–A3 (LCD DISPLAY)	OW1–A2–A1 (VIDEO)	X								X	
805*	OW1–A1–A4–J6	OW1–A7 (KEYBOARD)	X								X	
807*	OW1–A16	OW1–A5 (DASM)	X								X	
810*	OW1–A1–A2–J8	OW1–A15–KBD,MOUSE	X								X	
811*	OW1–A2–A4–PORT2	OW1–A15–ETHERNET	X								X	
812*	OW1–A13 (MODEM)	OW1–A15–COM1	X								X	
813*	OW1–A2–A1–COM2	OW1–A15–COM2	X								X	
814*	OW1–A1–A4–J9	OW1–A2–A1–KBD,MOUSE	X								X	
815*	OW1–A16–SCSI	OW1–A15–SCSI (PCI)	X								X	
817*	OW1–A1–A2–J17	OW1–A2–A5–J3	X								X	
818*	MR2–A11–J31	OW1–A16–PORT6,7,8							E	E	X	
819*	OW1–A2–A7–SCSI	OW1–A15–SCSI	X								X	
821	OW1–A15–MONITOR	OW1–A6–R,B,G (COLOR)	X								X	
823	MSM1–A1–J10	MR2–A11–J24							X	X	X	
824	PP1–J10	FJ1							X	X	X	
825	PP1–J48	MSM1–A1–J8							X	X	X	
826	MSM1–A1–J9	FJ3							X	X	X	
827	FJ3	MS5–A6–A1–J1/FJ4							X	X	X	
828	PP1–J10	MA1–A3–A1–P403							X	X	X	
829	PP1–J48	MS1–FJ2							X	X	X	
830	MS1–FJ2	MS1–A2–J2/MS1–A5–A2–J1/MG3–TB1							X	X	X	
831	FJ1	MSM1–A1–J7							X	X	X	
832	MS1–A2–J1	MS1–SLEEVE/MS1–COLDHEAD							X	X	X	
833	FJ4	MS5–A1–A6–JR							X	X	X	
836*	OW1–A15–BIT3	MR2–A11–A30–BIT3							X	X	X	
848	MG2–A11–J4	MG2–A4–J5			X		X		X	X	X	
861	MG2–A4–J4	MG2–A33–J5,6,7,8,9			X		X		X	X	X	
862	MG2–A4–J1	MG2–A6–J1			X		X		X	X	X	

4–6 IDENTIFYING NEW CABLES FOR SIGNA 1.5T Twin*Speed* UPGRADE (continued)

RUN#	FROM	TO	A	B	C	D	E	F	G	H	I	J	K
863	MG2–A4–J2	MG2–A6–J2				X		X		X	X	X	
893	MG3–A3–J2	MG3–A3–A5–INPUT								X	X	X	
897	MG2–A4–J3	MG2–A33–J4				X		X		X	X	X	
939	MDP UPS	MSM4			X	X	X	X	X	X	X	X	
940	MSM3 RS232	MSM1 J1			X	X	X	X	X	X	X	X	
941	MSM1 J11	SCC J1			X	X	X	X	X	X	X	X	
942	MSM1 J5	OW1 A2 A4 PRT7			X	X	X	X	X	X	X	X	
966	MR3–PD1–7,8,9,GND	MR1–A7–J1					X	X	X	X	X	X	
967	MR3–PD1–10,11,12,GND	MR1–CB1					X	X	X	X	X	X	
968	MR3–PD1–4,5,6,GND	MR2–A12–J1					X	X	X	X	X	X	
969	MR3–PD1–18,19,GND,N	OW1–A2–A5–J1					X	X	X	X	X	X	
971	MR2–A11–J23 **(See Note 3)**	PD1–A14–A1–J2 **(See Note 3)**								X	X	X	
972*	MR2–A11–J14 **(See Note 3)**	PD1–A14–A1–J3 **(See Note 3)**								X	X	X	
974	MR3 A11 J12	TAC J5			X	X	X	X	X	X	X	X	
976	MR3–CABI/F–J3	TAC ⊥X			X	X	X	X	X	X	X	X	
977	MR3–CABI/F–J4	TAC ⊥Y			X	X	X	X	X	X	X	X	
978	MR3–CABI/F–J5	TAC ⊥Z			X	X	X	X	X	X	X	X	
979	TAC X+,WB–,ZM–	PP1X+,WB–,ZM–			X	X	X	X	X	X	X	X	
980	TAC Y+,WB–,ZM–	PP1Y+,WB–,ZM–			X	X	X	X	X	X	X	X	
981	TAC Z+,WB–,ZM–	PP1Z+,WB–,ZM–			X	X	X	X	X	X	X	X	
982	PP1 ZZM+,ZM–	MG2 A12 A1 7/8			X	X	X	X	X	X	X	X	
983	PP1 YZM+,ZM–	MG2 A12 A1 9/10			X	X	X	X	X	X	X	X	
984	PP1 XZM+,ZM–	MG2 A12 A1 11/12			X	X	X	X	X	X	X	X	
985	PP1 ZWB+,WB–	MG2 A12 A1 1/2			X	X	X	X	X	X	X	X	
986	PP1 YWB+,WB–	MG2 A12 A1 3/4			X	X	X	X	X	X	X	X	
987	PP1 XWB+,WB–	MG2 A12 A1 5/6			X	X	X	X	X	X	X	X	
988	PP1–A7–GND	TAC–GND			X	X	X	X	X	X	X	X	
989	MR3–PD1–16,17,GND,N	TAC–J8			X	X	X	X	X	X	X	X	
992	TSCC J3	TAC J10			X	X	X	X	X	X	X	X	
1004	TAC J27 **(See Note 1)**	OW1 A16 PORT2 **(See Note 1)**			X	X	X	X	X	X	X	X	
1011**	MG2–A33–J5	MG2–A4–J4											X
1025**	MR2–A11–J40	PP1–J6											X
1026**	MR2–A11–J41	PP1–J7											X
1027**	MR2–A11–J42	PP1–J58											X
1028**	MR2–A11–J43	PP1–J59											X
1029**	MR2–A11–J62	PP1–A16–J77											X
1030**	MR2–A11–J61	PP1–A16–J78											X
1033**	MR2–A11–J16	MR1–A7–TX											X
1034**	MR2–A11–J17	MR3–A11–J1											X
1035**	MG2–A16–A3/A6–J4	MG3–A36–J21											X
1036**	PP1–J84	MG3–A36–J6											X
1037**	PP1–J6	MG3–A36–J1											X
1038**	PP1–J7	MG3–A36–J2											X
1039**	PP1–J58	MG3–A36–J3											X

4–6 IDENTIFYING NEW CABLES FOR SIGNA 1.5T Twin*Speed* UPGRADE (continued)

RUN#	FROM	TO	A	B	C	D	E	F	G	H	I	J	K
1040**	PP1–J59	MG3–A36–J4											X
1041**	PP1–A15–J78	MG3–A36–J10											X
1042**	PP1–A16–J77	MG3–A36–J5											X
1045**	MR2–A11–J13	PP1–A17–A1											X
1049**	MG3–A36–J19	MG2–A16–A8–J9											X
1053**	MR2–A11–J54	PP1–J85											X
1054**	MG3–A36–J20	MG2–A33–J15											X
1056**	OW1 A17 PRT6	OW1–A12 ETHRNET											X
1057**	MG3–A8–J1	PP1–J85											X
1059**	OW1 A17 PRT2	OW1–A15 ETHRNET											X
1060**	OW1 A19 J3	OW1 A21 J17											X
1061**	OW1 A15 KYBD/MS	OW1 A21 J8											X
1062**	OW1 A20	OW1 A21 J6											X
1063**	OW1 A15 Video 1	OW1 A6 HOST LCD											X
1064**	OW1 A15 SCSI 1	OW1 A16 SCSI TOWER											X
1065**	OW1 A11 J2	OW1 A6 Pwr											X
1066**	OW1 A15	OW1 A13											X
1067**	OW1 A15 SCSI 2	OW1 A5 DASM											X
1068**	OW1 A11 J8	OW1 A3 LCD											X
1069**	OW1 A11 J8	OW1 A3 Pwr											X
1070**	OW1 A11 J11	OW1 A16 Pwr											X
1071**	OW1 A11 J1	OW1 A15 Pwr											X
1074**	OW1 A19 J2	OW1 A11											X
1075**	OW1 A19 J4	OW1 A11											X
1078**	MG3–A36–J29,J30	MG2–A33–J18,J19											X
1081**	OW1 A19 J1	MR3 PD1											X
1082**	OW1 A15 ETH SLOT 2	MR2 A11 J63											X
1083**	MR2 A11 J22	OW1 A15 XMT1											X
1084**	OW1 A21 J6 via Run 1062	MR2 A11 J26											X
1085**	OW1 A21 J7	PP1 J12											X

Notes:

1. Cables are part of optional Resistive Shim. May not be present on all systems.
2. See Table 4–6 for connection to TYME boards within LX System Cabinet.
3. Cables are double labeled: Run 971 is also Run 703, Run 972 is also Run 706.

4–7 MODIFYING CABLE RUN 300

As indicated in table 4–5, cut off ground lead at the Bore Light connection.

TABLE 4–5
CABLE RUN 300 MODIFICATION

RUN	ONE END REWORK	OTHER END REWORK
300	PP1–J15 NO CHANGE	MG2–A15 CUT OFF GRN/BLK GND LEAD AT JACKET

4–8 LX TYME BOARD FIBER OPTIC CABLE LABEL CONNECTION INFORMATION

Runs 708, 710, 711, and 712 are used for both Horizon 5.x and Signa LX and marked as such. The fiber optic connections to the TYME board are different for 5.x and LX. Table 4–6 below indicates the connection labels as they should be marked on the TYME board end of the fiber optic cables. Use only the LX ONE END connections.

TABLE 4–6
SYSTEM CABINET FIBER OPTIC CONNECTIONS

RUN	SYSTEM CABINET ONE END		OTHER END	
	5.x ONE END	LX ONE END	5.x OTHER END	LX OTHER END
708–1	MR2–A23–A2–J5	MR2–A30–A23–J19	NO CHANGE	NO CHANGE
710–1	MR2–A23–A2–J13	MR2–A30–A23–J12	NO CHANGE	NO CHANGE
710–2	MR2–A23–A2–J15	MR2–A30–A23–J13	NO CHANGE	NO CHANGE
710–3	MR2–A23–A2–J17	MR2–A30–A23–J15	NO CHANGE	NO CHANGE
710–4	MR2–A23–A2–J14	MR2–A30–A23–J17	NO CHANGE	NO CHANGE
710–5	MR2–A23–A2–J4	MR2–A30–A23–J18	NO CHANGE	NO CHANGE
711–1	MR2–A23–A2–J6,J7	MR2–A30–A23–J25,J27	NO CHANGE	NO CHANGE
711–2	MR2–A23–A2–J8	MR2–A30–A23–J23	NO CHANGE	NO CHANGE
712–1	MR2–A23–A2–J9,J10	MR2–A30–A23–J20,J21	NO CHANGE	NO CHANGE

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION

Many of the cables are common to both the LX and EXCITE System. The cables that are specific to LX or EXCITE installation are designated in the applicable cable maps and in the first column of the following tables as:

* Cable used on LX installation only

** Cable used on EXCITE installation only

Cables shipment containers have color coded labels which identify the cable routing areas:

- Green – Equipment Room
- Purple – Operator's Room
- Orange – Magnet Room
- Yellow – Post–installation (Phantom's, Coils, etc.)

CAUTION

Ty–wraps must be cut flush with no protruding sharp edges or points. Failure to do so can result in numerous laceration hazards when servicing the equipment.

The table below provides definitions for the following cable tables.

COLUMN HEADING	DESCRIPTION	SPECIAL NOTES
RUN	The run number as seen on the delivered cable	The vendor cable may not have run numbers.
"FROM" & "TO"	Labels the destination of the cable	
DESCRIPTION	Could include information on length, number of conductors, type of cable, and end plug type	Total length of cable delivered to site, type of cable specifies power from data.
CABLE TYPE	Type designation for the cable	
VOLTAGE RATING	The highest voltage that may be continously applied to a wire	Specific to the core cable manufacturer given.
ACTUAL VOLTAGE	Nominal for continuous; maximum for variable voltage	If voltage varies during use, the maximum is given.
TEMP RATING	Maximum temperature insulating material my be used without loss of basic properties	Specific to the core cable manufacturer given.
FLAME RATING	Measure of material's ability to support combustion	Specific to the core cable manufacturer given.
REMARKS	Describe the cable's use in the MR system	

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

1. Unpack magnet room cables from the GE Magnet accessory box(s) and move them into the magnet or equipment room for routing. The shield cooler runs should have been installed previously when magnet was delivered.

   a. For magnet and equipment room standard runs delivered with GE Magnet, refer to Table 4–11.

2. Unpack and move power and ground cable boxes to the PDU area where they will be routed. Set Run 040, 044, and 045 aside. Power and ground cables are listed in Table 4–8.

TABLE 4–8
PDU POWER AND GROUND CABLES

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
037	PD1 GND	MR2 A12 GND	36 ft Ground Wire (#10)	SO	600	0	105	VW–1	MR2 "permanent" (UL) ground
038	PD1 A2 A2	MR1 A7 GND	31 ft Ground Wire (#10)	SO	600	0	105	VW–1	SRF Cabinet ground
040	MSI	RF COM GND	69 ft Ground Wire (#1/0)	SO	600	208Y	105	VW–1	Magnet Ground Cable
044	PP1 GND	MR1 A7 GND	31 ft Ground Wire (#10)	SO	600	0	105	VW–1	RF/Pen Cabinet Separate ground
045	PP1 GND	MG6 GND	41 ft Ground Wire (#10)	SO	600	0	105	VW–1	Blower Cabinet Separate ground
048	PD1 GND	OW1 A2 A5 GND	51 ft Ground Wire (#10/1)	SO	600	0	105	VW–1	Operator Workspace Cabinet ground
049	OW1 A1 A1	OW1 A2 A5 J2	Power Cord	STO	600	120	90	VW–1	Operator Workspace Table to OW Cabinet
966	MR1 A7 J1	MR3 PD1	35 ft Power (5–#8)	SO	600	208Y	75	FT–4	ACGD SSM Module Power
967	MR1 CB1	MR3 PD1	35.5 ft Power (4–#8)	SO	600	208	90	FT–4	ACGD SRF Cabinet Power
968	MR1 A12 J1	MR3 PD1	35 ft Power (5–#8)	SO	600	208Y	75	FT–4	ACGD System Cabinet Power
969	OW1 A2 A5 J1	MR3 PD1	65.5 ft Power (4–#10)	SO	600	120	75	FT–4	ACGD Operator Workspace Cabinet Power
988	PP1 A7 GND	TAC GND	60 ft. Ground (#8)	SO	600	0	80	VW–1	TAC to PP! ground
989	MR3 PD1	TAC j8	25 ft. Power (3–#10)	SO	600	120	90	FT–4	TAC Power
1081 **	OW1 A19 J1	MR3 PD1	65.5 ft Power (4–#10)	SO	600	120	75	FT–4	Operator Workspace Power
N/A	PD1 MAG/SHIM OUTLET	MAG/SHIM POWER SUPPLY	50 ft Power (5–#8) With 30A Plug and Receptacle						Cable for Compact PDU to GE Magnet Power Supply or SC Shim Supply Power

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

3. Unpack and move fixed site magnet room interconnect cables to magnet room. Refer to Table 4–9.
   a. Locate Body Coil RF input Cables (ship with Body Coil) and move cables to magnet room.
   b. If site being upgraded has a new 1.5T Twin*Speed* magnet and enclosure installed due to a magnet upgrade, Runs 414, 421, 422, 749, 848, 861 (or 1011), 862, 863, and 897 are shipped with the Magnet Enclosure.

TABLE 4–9
MAGNET ROOM RUNS (NOT CUT TO LENGTH)

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
262	PP1 J8	MG3 A3 A5 OUT	45 ft. RG223/U Coax	CMX	1900 VRMS	<30	80	VW–1	Body Coil receive
282	PP1 J12	MG3 A2 J6	45 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Patient Intercom
297	PP1 J18	EO1	90 ft. 9 pin Sub–D	CI3	300	<30	80	FT–4	Emergency off switch
300	PP1 J15	MG2 A15	60 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Bore Light power
318	PP1 J11	MG3 A7	45 ft. 9 pin Sub–D	CI3	300	38.5 VDC	80	FT–4	Long Drive Motor power
385	PP1 J20	MG2 A30	67 ft. 37 pin Sub–D	CI3	300	<30	80	FT–4	Patient Alignment Light power
387	PP1 J47	MG2 A29 J1	60 ft. 25 pin Sub–D	CI3	300	38.5 VDC	80	FT–4	Table Elevation motor power
404	MG3 A17 J1	MG2 A16 A5 J6	13.67 ft. RG58/U Coax	CI2	1900 VRMS	<30	80	VW–1	Head transmit cable take up
414	MG3 A35	MG3 A2 J9	30 ft. 9–pin Sub–D	CI3	300	<30	80	FT–4	Front Cover Microphone
421	MG2 A33 J1	MG3 A31 J1	15 ft. 15 pin Sub–D	CI3	300	<30	80	FT–4	Dock Limit
422	MG2 A33 J2	MG3 A1 J4	25 ft. 37 pin Sub–D	CI3	300	<30	80	FT–4	Long Drive Encoder/Limit Sw
458	PP1 J17	OM3	9 pin Sub–D	CI3	300	<30	80	FT–4	Optional Remote O2 Sensor
485*	MG3 A17 J2	MG2 A16 A3 OUT	13.67 ft. RG58/C Coax	CI2	1900 VRMS	<30	80	VW–1	Head receive cable take up
491	PP1–J80	MG3–A36–J7	80 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC2 Receive
492	PP1–J81	MG3–A36–J8	80 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC3 Receive
493	PP1–J82	MG3–A36–J9	80 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC4 Receive
494*	PP1–A14–J87	MG3–A36–J6	80 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC1 Receive
495*	PP1–A15–J78	MG3–A36–J10	80 ft. 15 Sub–D	CI3	300	<30	80	FT–4	Multi–coil Switching
612	PP1 SHIM	MG2 A12 A1	50 ft. Output						Shim Option
700*	PP1 A14 J86	MG2/MG3 A17 J2	45 ft. RG223/U Coax	CMX	1900 VRMS	<30	80	VW–1	Head or Surface Coil Rcv
715	PP1 J14	MG2 A33 J1	65 ft. 37 pin Sub–D	CI3	300	<30	80	FT–4	SRI Power
716	PP1 J89	MG2 A11 A1 J2	65 ft. 15 pin Sub–D	CI3	300	<30	80	FT–4	PAC Power
727*	PP1–A16–J77	MG3–A36–J5	80 ft. 15 Sub–D	CI3	300	<30	80	FT–4	Multi–coil Bias
728	MG3 A36 J11	MG2 A16 OUT J1	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
729	MG3 A36 J12	MG2 A16 OUT J2	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
730	MG3 A36 J13	MG2 A16 OUT J3	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
731	MG3 A36 J14	MG2 A16 OUT J4	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
732	MG3 A36 J15	MG2 A16 OUT J5	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

TABLE 4–9 (CONTINUED)
MAGNET ROOM RUNS (NOT CUT TO LENGTH)

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
733	MG3 A36 J16	MG2 A16 OUT J6	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
734	MG3 A36 J17	MG2 A16 OUT J7	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
735	MG3 A36 J18	MG2 A16 OUT J8	13.67 ft. BNC	CI2	500 VRMS	<30	200	VW–1	RF Cable
736*	MG3 A36 J19	MG2 A16 A8 J9	12 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	RF Cable
743	MG2 A12 A1 J2	MG3 A3 A1 J3	10 ft Coax w/M&F "N"	STO	2500 VDC	950	85	VW–1	Body Coil Drive
744	MG2 A12 A1 J1	MG3 A3 A1 J4	10 ft Coax w/M&F "N"	STO	2500 VDC	950	85	VW–1	Body Coil Drive
749	MG2 A33 J10	MG2 A36	35 ft 3 cond w/ 9–Sub D	CI3	300	<30	105	FT–4	Bore Temperature Sensor
778	PP1 A11 J72	MG2 A12 A2 J3	70 ft. MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	Dynamic Disable (body coil frnt)
779	PP1 A11 J73	MG2 A12 A2 J4	70 ft. MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	Dynamic Disable (body coil frnt)
780	PP1 A11 J74	MG3 A3 A3 J6	60 ft. MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	Inductive Drive
781	PP1 A11 J75	MG2 A12 A2 J5	60 ft. MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	Dynamic Disable (body coil rear)
782	PP1 A11 J76	MG2 A12 A2 J6	60 ft. MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	Dynamic Disable (body coil rear)
784	PP1 F5, F6	MG6 J1	40 ft. 2 cond power	SO	600	120	80	FT–4	Patient cooling blower power
848	MG2 A11 J4	MG2 A4 J5	16 ft. 25 pin Sub–D/rt.	CI3	300	<30	80	FT–4	Operator Display to PAC II
861*	MG2 A4 J4	MG2A33J5,6,7,8,9	20 ft 5/37 pin Sub–D/80pn	CI2	300	<30	80	VW–1	Operator Display to SRI
862	MG2 A4 J1	MG2 A5 J1	2 ft. 26 pin Rt. angle	CI2	300	<30	80	VW–1	Operator Display – Rt. Op Cntrl
863	MG2 A4 J2	MG2 A5 J2	2 ft. 26 pin Rt. angle	CI2	300	<30	80	VW–1	Operator Display to Lt. Op Cntrl
893	MG3 A3 J2	MG3 A3 A5 INPUT	6.6 Inch BNC		1900 VRMS	<30	80	VW–1	Spliiter to Preamp Cable
897	MG2 A4 J3	MG2 A33 J4	20 ft. 37 pin Sub–D/26 pin	CI3	300	<30	80	FT–4	Operator Display to SRI
1011**	MG2 A4 J4	MG2 A33 J5	20 ft. Data Cable (80–28)	CI2	300	<30	80	VW–1	SRI Splitter to Oper Display
1035**	MG2 A16 A3/A5 J4	MG3 A36 J21	40 ft. RG58/C Coax	CI2	1900 VRMS	<30	80	VW–1	Head or Surface Coil Receive
1036**	PP1 J84	MG3 A36 J6	BNC	CMX	1900 VRMS	<30	80	VW–1	MC4 Receive
1037**	PP1 J6	MG3 A36 J1	BNC	CMX	1900 VRMS	<30	80	VW–1	MC4 Receive
1038**	PP1 J7	MG3 A36 J2	BNC	CMX	1900 VRMS	<30	80	VW–1	MC4 Receive
1039**	PP1 J58	MG3 A36 J3	BNC	CMX	1900 VRMS	<30	80	VW–1	MC4 Receive
1040**	PP1 J59	MG3 A36 J4	BNC	CMX	1900 VRMS	<30	80	VW–1	MC4 Receive
1041**	PP1 A15 J78	MG3 A36 J10	80 ft. 15 Sub–D	CI3	300	<30	80	FT–4	SRI Power
1042**	PP1 A16 J77	MG3 A36 J5	80 ft. 15 Sub–D	CI3	300	<30	80	FT–4	Monitor to Compressor I/F
1049**	MG3 A36 J19	MG2 A16 A8 J9	12 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Multi–Coil Select Cable
1054**	MG3 A36 J20	MG2 A33 J15	Data Cable (9–#22)	CI3	300	<30	80	vw–1	MXA Signal Cable
1057**	PP1 J85	MG3 A8 J1	32 ft. R223/U Coax	CMX	1900 VRMS	<30	80	VW–1	UNTS Antenna

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

4. Unpack and move fiber optic cables into routing location. Refer to Table 4–10.

TABLE 4–10
FIBER OPTIC CABLES DELIVERED WITH FIXED–SITE KIT

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
708*	MR2 A11 J16	MR1 A7 TX	20 ft. 1/2 in. fiber optic conduit	N/A	N/A	0	85	N/A	Single simplex plastic fiber optic cable
709	MR3 A11 J2	MR1 A7 RX	20 ft. 3/4 in. fiber optic conduit	N/A	N/A	0	85	N/A	Single simplex plastic fiber optic cable
710*	MR2 A11 J17	MR3 A11 J1	20 ft. 3/4 in. fiber optic conduit	N/A	N/A	0	85	N/A	Four glass fiber optic and one plastic fiber optic cables
711/ 712*	MR2 A11 J13	PP1–J91	100 ft. 3/4 in. fiber optic conduit	N/A	N/A	0	85	N/A	Two duplex fiber optic and one simplex fiber optic cables
711/ 712	PP1–J91	MG2 A33 and MG2 A11 A1	100 ft. 3/4 in. fiber optic conduit	N/A	N/A	0	85	N/A	One duplex fiber optic cables and one simplex fiber optic cable and One duplex plastic fiber optic cable for PAC–II
836*	MR2 A11 J30 BIT3	OW1 A15 BIT3	72.2 ft. 3/8 in. jacketed cable	N/A	N/A	0	85	N/A	Two fiber optic cables wiith two spares
1033**	MR2 A11 J16	MR1 A7 TX	20 ft. 1/2 in. fiber optic conduit	N/A	N/A	0	85	N/A	Single simplex plastic fiber optic cable
1034**	MR2 A11 J17	MR3 A11 J1	20 ft. 3/4 in. fiber optic conduit	N/A	N/A	0	85	N/A	Four glass fiber optic and one plastic fiber optic cables
1044**	MR2 A11 J22	OW1 A15 SLOT2	72.2 ft. 3/8 in. jacketed cable	N/A	N/A	0	85	N/A	Two fiber optic cables with two spares
1045**	MR2 A11 J13	PP1 A17 A1	3/4 in. fiber optic conduit	N/A	N/A	0	85	N/A	Two duplex fiber optic and one simplex fiber optic cables
1078**	MG2 A33 J30/J29	MG3 A36 J18/J19	72.2 ft. 3/8 in. jacketed cable	N/A	N/A	0	85	N/A	Two fiber optic cables, SRI to Cross Point Switch
1083**	MR2 A11 J22	OW1 A15 XMT1	72.2 ft. 3/8 in. jacketed cable	N/A	N/A	0	85	N/A	Two fiber optic cables with two spares

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

TABLE 4–11
GE MAGNET CABLES

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
601	MS8	MS1	Power Cable (#4/0)	SO	600	208	80	VW–1	Ramp cables, Power Assembly Positive 4/0
602	MS8	MS1	Power Cable (#4/0)	SO	600	208	80	VW–1	Ramp cables, Power Assembly Negative 4/0
603	MS7	MS1 A3 A1	Power Cable (#4/0)	SO	600	208	80	VW–1	Ramp and Shim Cable Assembly
604	MS7 or MS8	MS1 A3 A1	Data Cable (12–#22)	CI3	150	60 VDC	80	FT–4	Switch Heaters
605	MS1	MR2 A8	Data Cable (4–#22)	CI3	300	<30	105	FT–4	Instrumentation Cable, 80 feet
606	MS4	MS1 A3 A1	Data Cable (4–#22)	CI3	300	<30	105	FT–4	Emergency Run Down Unit
608	MS1	MR2 A8	Data Cable (4–#22)	CI3	300	<30	105	FT–4	Instrumentation Cable, 15 feet
609	MS7 OR MS8	PDU	Power Cable (5–#16)	SO	300	208Y	105	FT–4	Feeder Cables
621	MS5 A1	MS1 A2	7/8" Gas Flex Line	STO	N/A	N/A	85	VW–1	Supply Flexible Gas Line (PP1 J60 or J61)
622	MS5 A1	MS1 A2	7/8" Gas Flex Line	STO	N/A	N/A	85	VW–1	Return Flexible Gas Line (PP1 J60 or J61)
623	MS5 A1	PP1 F1, F2, F3, F4	Power Cable (4–#18)	SO	600	200	105	VW–1	Compressor to Pen Panel Cable (equipment room)
624	MS1 A2	PP1 F1, F2, F3, F4	Power Cable (4–#18)	SO	600	200	105	VW–1	Cold Head Control Cable

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

5. Unpack and move interconnect cables which are cut to length to the applicable room. Refer to Table 4–12.
   a. Move gradient cable Runs 982 thru 987 into magnet room. Move gradient cable Runs 976 thru 981 into equipment room. Gradient cables will be cut, re–terminated and routed according to appropriate Direction in Tab 1.

TABLE 4–12
EQUIPMENT ROOM AND MAGNET ROOM CABLES CUT TO LENGTH

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
235	MR1 A7 J13	PP1 J44	7/8 in. HELIAX® Coax	STO	6000 VDC	<30	120	VW–1	1.5T Body Coil Run created from kit
236	MR1 A7 J12	PP1 J4	1/2 in. HELIAX® Coax	STO	4000 VDC	<30	120	VW–1	1.5T Head Coil Run created from kit
257	PP1 J44	MG3 A3 A1 J1	7/8 in. HELIAX® Coax	STO	6000 VDC	<30	120	VW–1	1.5T Body Coil Transmit
258	PP1 J4	MG3 A17 J1	1/2 in. HELIAX® Coax	STO	4000 VDC	<30	120	VW–1	1.5T Head Coil Transmit
536	WC1	MG2 A12 A1	Flexible Tubing	N/A	N/A	N/A	N/A	N/A	Gradient Coil Cooling Line
537	WC1	MG2 A12 A1	Flexible Tubing	N/A	N/A	N/A	N/A	N/A	Gradient Coil Cooling Line
976	MR3 CABI/F J3	TAC ±X	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin X Gradient Power
977	MR3 CABI/F J4	TAC ±Y	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Y Gradient Power
978	MR3 CABI/F J5	TAC ±Z	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Z Gradient Power
979	TAC X+,WB–,ZM–	PP1X+,WB–,ZM–	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin X Gradient Filter
980	TAC Y+,WB–,ZM–	PP1Y+,WB–,ZM–	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Y Gradient Filter
981	TAC Z+,WB–,ZM–	PP1Z+,WB–,ZM–	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Z Gradient Filter
982	PP1 ZZM+,ZM–	MG2 A12 A1 7/8	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Zzm Gradient Output
983	PP1 YZM+,ZM–	MG2 A12 A1 9/10	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Yzm Gradient Output
984	PP1 XZM+,ZM–	MG2 A12 A1 11/12	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin Xzm Gradient Output
985	PP1 ZWB+,WB–	MG2 A12 A1 1/2	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin ZWB Gradient Output
986	PP1 YWB+,WB–	MG2 A12 A1 3/4	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin YWB Gradient Output
987	PP1 XWB+,WB–	MG2 A12 A1 5/6	Conductor (3–#2)	STO	1000	600	90	FT–4	Twin XWB Gradient Output

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

6. Verify magnet monitoring cables for GE Magnet are delivered (or if previously installed, remain in place). Refer to Table 4–13.

TABLE 4–13
MAGNET MONITORING CABLES DELIVERED WITH MAGNET

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
823	MSM1 A1 J10	MR2 A11 J24	Data Cable (15–#22)	CI3	300	<30	80	FT–4	Monitor to System Cabinet I/F
824	PP1 J10	FJ1	Data Cable (9–#22)	CI3	300	<30	80	FT–4	Monitor Sensor I/F to Penetration Panel
825	PP1 J48	MSM1 A1 J8	Data Cable (25–#22)	CI3	300	<30	80	FT–4	Magnet Monitor connector to Penetration Panel
826	MSM1 A1 J9	FJ3	Data Cable (15–#22)	CI3	300	<30	80	FT–4	Monitor to Compressor I/F
827	FJ3	MS5 A5 A1 J1 / FJ4	Data Cable (8–#22) & Data Cable (4–#22)	CI3	300	<30	80	FT–4	Compressor I/F
828	PP1 J10	MA1 A3 A1 P403	Data Cable (9–#22)	CI3	300	<30	80	FT–4	Penetration Panel to Sensor
829	PP1 J48	MS1 FJ2	Data Cable (25–#22)	CI3	300	<30	80	FT–4	Penetration Panel to Magnet I/F
830	MS1 FJ2	MS1 A2 J2/ MS1 A5 A2 J1/ MG3 TB1	3cond/3cond/25cond	CI3	300	<30	80	FT–4	Magnet I/F
831	FJ1	MSM1 A1 J7	Data Cable (8–#24)	CI3	300	<30	80	FT–4	Monitor to Sensor I/F
832	MS1 A2 J1	MS1 SLEEVE/ MS1 COLDHEAD	Data Cable (8–#22)	CM	300	<30	80	FT–4	Buffer Amp to Cooling Sleeves
833	FJ4	MS5 A1 A6 JR	Data Cable (6–#24)	CM	300	<30	80	FT–4	Compressor to Compressor I/F
939	MDP UPS	MSM4	6 ft. Power (5–#15)	SO	600	120	85	VW–1	MDP to UPS
940	MSM3 RS232	MSM1 J1	6 ft. Data Cable (9–#22)	CI3	300	<30	80	FT–4	Monitor to Modem
941	MSM1 J11	SCC j1	50 ft. 9–pin Sub–D	CI3	300	<30	80	FT–4	Monitor to Sys Cooling Cab
942	MSM1 J5	OW1 A2 A4 PRT7	80 ft. Cat 5 Ethernet	CI3	300	<30	80	FT–4	Monitor to OW
	MR2 A11 J24	MR2 IPG J9/ MR2 PDU J5							System Cabinet I/F

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

7. Unpack and move equipment room system cables into routing location (cabinets, Operator Console, Operator Workstation, PDU). Refer to Table 2–8.

TABLE 4–14
EQUIPMENT ROOM RUNS

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
229	MR2 A11 J1	MR1 A7 J3	20 ft RG223/U Coax	CMX	1900 VRMS	<30	80	VW–1	Exciter RF output
231	MR2 A11 J2	PP1 J8	40 ft RG223/U Coax	CMX	1900 VRMS	<30	80	VW–1	Body Coil receive
296	FACILITY DISCNCT	PP1 J18	45 ft 9 pin Sub–D	CI3	300	<30	80	FT–4	Emergency off switch
457	OM1	PP1 J17	9 pin Sub–D	CI3	300	<30	80	FT–4	Optional O2 Monitor cable
486*	PP1–A14–J85	MR1–A7–J22	30 ft. 9 Sub–D	CI3	300	<30	80	FT–4	Head/MC1 Receive Select Switch
487*	PP1–A15–J78	MR1–A7–J20	40 ft.15 Sub–D	CI3	300	<30	80	FT–4	Multi–coil Switching
488	PP1–J80	MR2–A11–J8	40 ft. BNC	CMX	300	<30	80	VW–1	MC2 Receive
489	PP1–J81	MR2–A11–J9	40 ft. BNC	CMX	300	<30	80	VW–1	MC3 Receive
490	PP1–J82	MR2–A11–J10	40 ft. BNC	CMX	300	<30	80	VW–1	MC4 Receive
499/ 233	MR2 A11 J5	PP1 J7	40 ft RG223/U Coax	CMX	300	<30	80	VW–1	Head and Surface Coil receive
611	TAC J22	PP1 SHIM							Resiisteive Shim PS Option
612	MG2 A12 A1	PP1 SHIM							Resiisteive Shim PS Option
701	MR2 A11 J15	RF Door switch	70 ft 9 pin Sub–D	CI3	300	<30	80	FT–4	RF Door switch
702	MR2 A11 J18	MR1 A7 J5	20 ft 9 pin Sub–D	CI3	300	<30	80	FT–4	Unblank/EFB
726*	PP1–A16–J77	MR1–A7–J18	30 ft. 15 Sub–D	CI3	300	<30	80	FT–4	Multi–coil Bias
768	MR1 A7 J31	PP1 J20	30 ft 37 pin Sub–D	CI3	300	<30	80	FT–4	Patient Alignment Light power
769	MR1 A7 J34	PP1 J15	30 ft 25 pin Sub–D	CI3	300	<30	80	FT–4	Bore Light power
770	MR1 A7 J41	PP1 J11	30 ft 9 pin Sub–D	CI3	300	38.5 VDC	80	FT–4	Long Drive Motor power
771	MR1 A7 J36	PP1 J47	30 ft 25 pin Sub–D	CI3	300	38.5 VDC	80	FT–4	Dock Power
772	MR1 A7 J40	PP1 J14	30 ft 37 pin Sub–D	CI3	300	<30	80	FT–4	SRI Power
773	MR1 A7 J35	PP1 A17 J1	30 ft 25 pin Sub–D	CI3	300	<30	80	FT–4	PAC & Fiber Optic I/F Power
774	MR2 A11 J25	MR1 A7 J32	20 ft 25 pin Sub–D	CI3	300	<30	80	FT–4	Hydraulic Manifold Interface
775	MR1 A7 J42	PP1 A11 J92	30 ft MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	100V Dynamic Disable
776	MR1 A7 J44	PP1 A11 J93	30 ft MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	100V Dynamic Disable
777	MR1 A7 J43	PP1 A11 J94	30 ft MHV Coax	CI2	1900 VRMS	1000 VDC	80	VW–1	100V Dynamic Disable
783	MR1 A7 J37	PP1 F5/F6	30 ft 2–#8 AWG	SO	600	120	80	FT–4	Blower Cabinet Power
788	OW1 A1 A4 J7	PP1 J12	40 ft Data (25–#22)	CI3	300	<30	80	FT–4	Intercom
789	OW1 A1 A4 J18	MR2 A11 J26	51 ft Data (9–#22)	CI3	300	<30	80	FT–4	E–stop
791	OW1 A16 PORT1	MR2 A11 J30	51 ft Data (25–#22)	CI3	300	<30	80	FT–4	TNF monitoring (Octane)
797	OW1 A2 A1 PC	OW1 A3 LCD	2 line; 3.5 mm jacks	CI3	300	<30	80	FT–4	LCD Display

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

TABLE 2–8 (CONT'D)
EQUIPMENT ROOM RUNS

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
798	OW1 A2 A3 HOST	OW1 A6	10.5 ft. Data (3–#24)	CI3	300	<30	80	FT–4	Color Monitor cable
805	OW1 A1 A4 J6	OW1 A7	3.3 ft. Data	CI3	300	<30	80	FT–4	Keyboard cable
807	OW1 A2 A3 HOST	OW1 A5	9.8 ft. Data	CI3	300	<30	80	FT–4	DASM SCSI cable
810	OW1 A1 A2 J8	OW1 A15 KBD,MS	9 ft. 25 pin Sub–D	CI3	300	<30	80	UL–1581	Keyboard/Mouse cable (Octane)
811	OW1 A2 A4	OW1 A15	12 ft. Ethernet	CI3	300	<30	80	FT–4	Communication
812	OW1 A15	OW1 A13	12 ft. 25/9 pn Sub–D	CM	300	<30	80	UL–1581	Modem
813	OW1 A2 A1 COM2	OW1 A415 PORT7	12 ft. 9 pin Sub–D	CI3	600	<30	105	VW–1	Communication
814	OW1 A2 A1 KBD,MS	OW1 A1 A4 J9	9 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Keyboard/Mouse cable (PC)
815	OW1 A16	OW1 A15 SCSI	6 ft. 68/50 pin	CI3	300	<30	80	FT–4	SCSI Cable (Octane)
817	OW1 A2 A5 J3	OW1 A1 A2 J17	8 ft. 9 pin Sub –D	CI3	300	<30	80	FT–4	Workspace I/F Module
818	OW1 A16 J6,7,8	MR2 A11 J31	70 ft. 25/3–25 pin	CI3	300	<30	80	FT–4	TNF monitoring
819	OW1 A2 A7 SCSI	OW1 A15	10 ft. 68/50 pin	CI3	300	<30	80	FT–4	SCSI Cable
821	OW1 A15 MON-ITOR	OW1 A6 R,B,G	10.5 ft. 3 BNC/SubD	CI3	300	<30	80	FT–4	Color Monitor cable
971	MR2 A11 J23	MR3 PD1 J2	40 ft 15 pin Sub–D	CI3	300	<30	80	FT–4	PDU Status (ACGD)
972*	MR2 A11 J14	MR3 PD1 J3	40 ft 9 pin Sub–D	CI3	300	<30	80	FT–4	Remote PDU (ACGD)
974	MR3 PD1 J5	TAC J12	49 ft. 9 pin Sub–D	CI3	300	<30	80	FT–4	Twin GIP/GP
992	TSCC J3	TAC J10	60 ft. 9 pin/15 pin Sub–D	CI3	300	<30	80	FT–4	Twin System Cooling Cabi
1004	TAC J27	OW1 A16 PRT2	9 pin:25 pin Sub–D	CI3	300	<30	80	FT–4	MXA Signal Cable
1025**	MR2 A11 J40	PP1 J6	40 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC2 Receive
1026**	MR2 A11 J41	PP1 J7	40 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC2 Receive
1027**	MR2 A11 J42	PP1 J58	40 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC2 Receive
1028**	MR2 A11 J43	PP1 J59	40 ft. BNC	CMX	1900 VRMS	<30	80	VW–1	MC2 Receive
1029**	MR2 A11 J62	PP1 A16 J77	60 ft. 15 pin Sub–D	CI3	300	<30	80	FT–4	Monitor to Compresssor I/F
1030**	MR2 A11 J61	PP1 A16 J78	30 ft. 37 pin Sub–D	CI3	300	<30	80	FT–4	SRI Power
1031**	MR2 A11 J63	OW1 A15 SLOT1	65 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Communication
1032	MR2–A11–J31	OW1–A16–FJ100	65 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Serial Communication
1046	FJ100	OW1–A16–PORT 1,6,7,8	4.5 ft. 25 pin Sub–D	CI3	300	<30	80	FT–4	Serial Communication
1053**	PP1 J85	MR2 A11 J54	34.5 ft RG223/U Coax	CMX	1900 VRMS	<30	80	VW–1	UNTS Antenna
1056**	OW1 A17 PRT6	OW1–A12 ETHRNET	3.3 ft. Ethernet Cat 5	CI3	30	<30	80	FT–4	Laptop Access cable

4–9 SIGNA 1.5T Twin*Speed* CABLE INFORMATION (continued)

TABLE 2–8 (CONT'D)
EQUIPMENT ROOM RUNS

RUN	"FROM"	"TO"	DESCRIPTION	CABLE TYPE	VOLTAGE RATING	ACTUAL VOLTAGE	TEMP RATING	FLAME RATING	REMARKS
1059**	OW1 A17 PRT2	OW1–A15 ETHRNET	5.9 ft. Ethernet Cat 5	CI3	30	<30	80	FT–4	Lan Hub cable
1060**	OW1 A19 J3	OW1 A21 J17	3.9 ft. 9 pin Sub–D	CI3	300	<30	80	FT–4	WIM Power cord
1061**	OW1 A15 KYBD/ MS	OW1 A21 J8	2.9 ft. 25 pin Sub–D 2 PS/2s	CI3	300	<30	90	CL–2	Keyboard/Mouse cable
1062**	OW1 A20	OW1 A21 J6	13.2 ft. 50 pin SCSI, 9 pin Sub–D	CI3	300	<30	80	VW–1	SCIM cable
1063**	OW1 A15 Video 1	OW1 A6 HOST LCD	9.9 ft. 29 pin DVI, 15 pin VGA	CI3	300	<30	80	VW–1	Host LCD Display Video cable
1064**	OW1 A15 SCSI 1	OW1 A16 SCSI TOWER	9.9 ft. SCSI cable 50	CI3	300	<30	80	VW–1	SCSI Tower Data cable
1065**	OW1 A11 J2	OW1 A6 Pwr	9.9 ft. Power (3–#18)	SVT	300	120	80	VW–1	Host LCD Display Power cable
1066**	OW1 A15	OW1 A13	3.9 ft. 25/9 pn Sub–D	CM	300	<30	80	FT–4	Modem I/O cable
1067**	OW1 A15 SCSI 2	OW1 A5 DASM	5.9 ft. SCSI cable 50	CI3	30	<30	80	VW–1	DASM I/O cable
1068**	OW1 A15 Video2	OW1 A3 LCD	9.9 ft. Data (15–#28)	CI3	300	<30	80	VW–1	LCD Display Video cable
1069**	OW1 A11 J8	OW1 A3 Pwr	9.9 ft. Power (3–#18)	SVT	300	120	80	VW–1	LCD Display Power cable
1070**	OW1 A11 J11	OW1 A16 Pwr	9.9 ft. Power (3–#18)	SVT	300	120	80	VW–1	SCSI Tower Power cable
1071**	OW1 A11 J1	OW1 A15 Pwr	9.9 ft. Power (3–#18)	SVT	300	120	80	VW–1	Host Computer Power cable
1074**	OW1 A19 J2	OW1 A11	3.3 ft. Power (3–#14)	SVT	600	120	105	VW–1	Power Strip cord
1075**	OW1 A19 J4	OW1 A11	3.3 ft. Power (3–#14)	SVT	600	120	105	VW–1	Power Strip cord
1082**	OW1 A15 ETH SLOT 2	MR2 A11 J63	75 ft. Ethernet Cat 5	CI3	300	<30	80	FT–4	EXCITE Ethernet C'cable
1084**	OW1 A21 J6 via Run 1062	MR2 A11 J26	60 ft 9 pin Sub–D	CI3	300	<30	80	FT–4	E–stop
1085**	OW1 A21 J7	PP1 J12	65 ft 25 pin Sub–D	CI3	300	<30	80	FT–4	Intercom

8. Unpack additional equipment room cables for Signa 1.5T Twin*Speed* Options:
   a. Refer to the service/installation manual shipped with options.

4–10 SORTING AND ROUTING CABLES

CAUTION

Ty–wraps must be cut flush with no protruding sharp edges or points. Failure to do so can result in numerous laceration hazards when servicing the equipment.

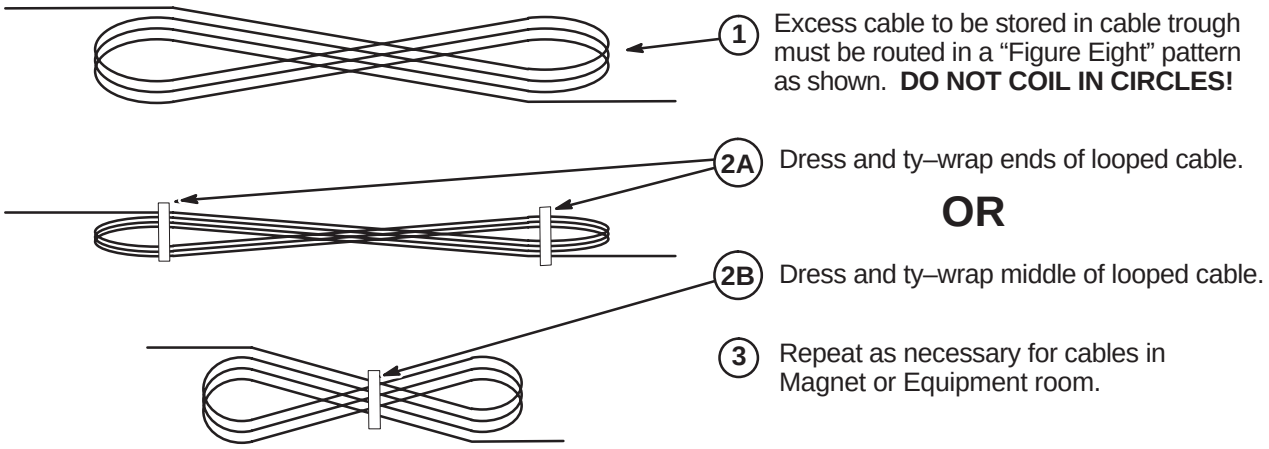
System power, ground, and data cables are color coded at each end by destination per colors shown on Cable Map.

1. Sort cables by destination. Normally, it is best to sort cables originating from the farthest cabinet or component from the PDU first. This will make it easier to pull cables through the troughs.

Note

Carefully review architectural drawings to insure that all ducts are properly installed and that all signal and power cables are accounted for before starting to route cable runs.

2. Unroll coiled cables along the intended route to insure that they will lay freely without twists or kinks. Route cables in accordance with the applicable System Interconnect Diagram.
3. Plan for storage location of coiled cable excess length if cables are to remain at delivered length. See Illustration 4–1. Some cables are usually cut to length such as gradient cables, power cables, Heliax, and Fiber–optic cables.



PROPER STORAGE OF EXCESS CABLES
ILLUSTRATION 4–1

4. Place cables in provided troughs, conduit, or ducts. Leave sufficient slack for later connection when cabinets are in final position according to site architectural plans. Route cables inside exam room to Rear Pedestal area with sufficient length remaining to complete routing and connecting within Magnet Enclosure.

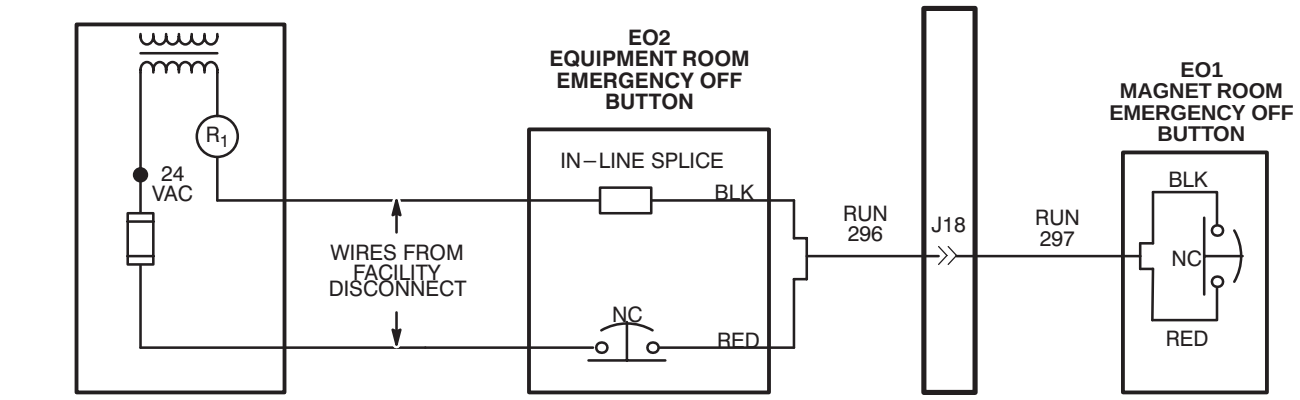
4–11 EMERGENCY OFF CONNECTIONS

Run 296 is routed to EO2 (Equipment Room Emergency Off) and connected to EO2 and wire from Facility Disconnect. Run 297 is routed from Penetration Panel to EO1 (Magnet Room Emergency Off Button). Refer to *Direction 2294003, Signa TwinSpeed Pre–Installation*, Section 5–3–1, Protective Disconnect Device, for detailed wiring diagram.

1. Complete routing of Run 296 to EO2 (Equipment Room Emergency Off) location, and trim cable to length. Locate red and black pair of wires and prepare ends for applicable terminals.

   Aside: In Illustration 4–2, black and red wires are used for connections in Runs 295 and 297. Actually any pair of wires on these runs could be used so long as both ends are consistent with one another. Runs 296 and 297 are actually nine wire cables.

2. At equipment room room "Emergency Off" (EO2) location, terminate red wire at end of Run 296 with local supplied terminal and connect to customer supplied Equipment Room Emergency Off Button (EO2). See Illustration 4–2.
3. Terminate customer supplied wire (from fuse in Protective Disconnect Device) with local supplied applicable terminal and connect to customer supplied Emergency Off Button (EO2). See Illustration 4–2.
4. Terminate customer supplied wire from R1 in Protective Disconnect Device with local supplied push–on terminal.
5. Terminate black wire at end of Run 296 with local supplied "push–on" terminal.
6. Connect black wire from end of Run 296 to customer supplied wire from protective disconnect device with local supplied in–line splice. See Illustration 4–2.
7. Complete routing of Run 297 to EO1 (Magnet Room Emergency Off) location, and trim cable to length. Locate red and black pair of wires and prepare ends for applicable terminals.
8. Terminate red and black wires at end of Run 297 with local supplied terminals and connect to customer supplied Magnet Room Emergency Off Button (EO1). See Illustration 4–2.



EMERGENCY OFF WIRING
ILLUSTRATION 4–2

4–12 RUN 701 (RF DOOR SWITCH) CONNECTIONS

1. Route Run #701 (from System Cabinet) to RF Door Switch. This 100 ft cable has a 9–pin subminature “D” plug on one end. The other end is cut off with the black and red leads from pair #1 dressed for connecting to a switch. Should it be desired to cut off excess length, make sure that the black and red leads have continuity to pins 1 and 6 on the 9 pin subminature D plug.
2. Connect black lead on Run #701 to RF Door Switch COM (common) contact.
3. If RF door switch is normally open, proceed to step 4. If normally closed, proceed to step 5.
4. Connect red lead on Run #701 to RF Door Switch N.O. (normally open) contact.
5. If RF door switch is not normally open, connect red lead on Run #701 to RF Door Switch N.C. (normally closed) contact.

4–13 CABLE INTERCONNECTION DOCUMENTATION

The cable maps illustrate the Signa Twin*Speed* System interconnect for all supplied cables and interface with customer supplied wiring.

1. Interconnects for additional cables supplied with other options (Spectroscopy, etc.) are illustrated in the installation manual shipped with the option.
   - Connections for 1.5T Spectroscopy are in *Direction 2304882, Signa Spectroscopy Subsystem*.
   - Instructions for connections for optional laser cameras are supplied with option.
   - Connection procedures for other options are covered in the installation manual shipped with the option.
2. Procedures for connections made at the Magnet Enclosure, Operator Workspace, cabinets, etc. are detailed in the respective installation section within this manual.
3. Interconnect details for magnet subsystem are covered in the applicable magnet subsystem manual.

Fold–out Twin*Speed* System Interconnect Cable Map is provided at the end of this section. They are:

Description	Page
Signa EXCITE 1.5T Twin*Speed* System Interconnect (Fixed Site)	4–41
Signa LX 1.5T Twin*Speed* System Interconnect (Fixed Site)	4–42
Signa 1.5T Twin*Speed* System Cooling Cabinet Interconnect Options (MRCC & GWHX)	4–43
Signa 1.5T Twin*Speed* System Cooling Cabinet Interconnect Options (TSCC & TGWC)	4–44
Signa EXCITE 1.5T Twin*Speed* System Interconnect (Mobile)	4–45
Signa LX 1.5T Twin*Speed* System Interconnect (Mobile)	4–46

Tape map in a convenient location to check off routed cable. Upon completion of connecting cables, return fold–out map to the binder for future reference.

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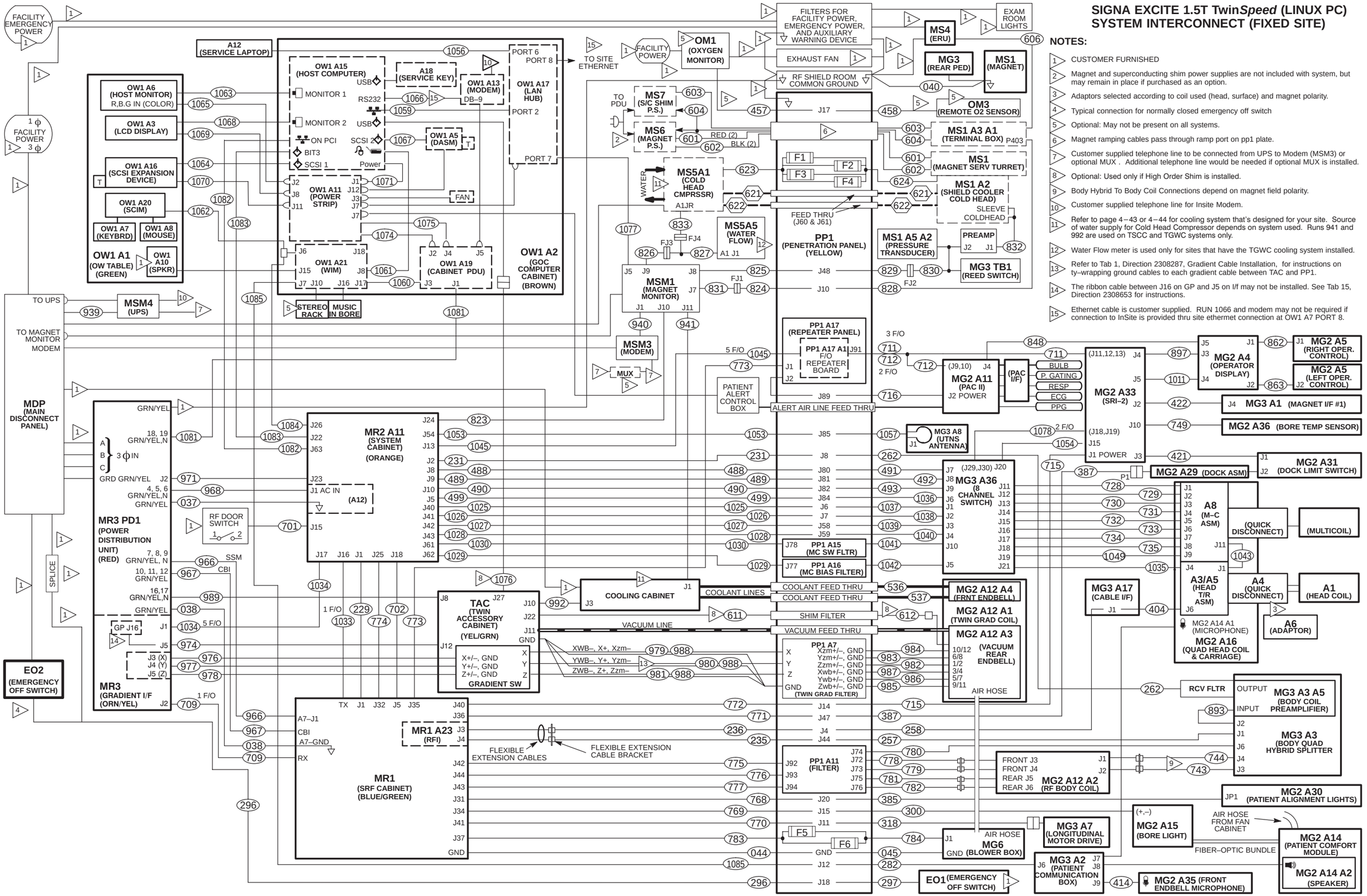
SIGNA EXCITE 1.5T Twin*Speed* (LINUX PC) SYSTEM INTERCONNECT (FIXED SITE)



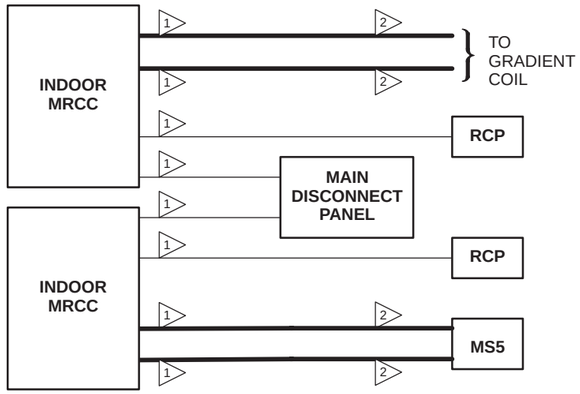
NOTES:

1. CUSTOMER FURNISHED
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Adaptors selected according to coil used (head, surface) and magnet polarity.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Magnet ramping cables pass through ramp port on pp1 plate.
7. Customer supplied telephone line to be connected from UPS to Modem (MSM3) or optional MUX . Additional telephone line would be needed if optional MUX is installed.
8. Optional: Used only if High Order Shim is installed.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Customer supplied telephone line for Insite Modem.
11. Refer to page 4–43 or 4–44 for cooling system that's designed for your site. Source of water supply for Cold Head Compressor depends on system used. Runs 941 and 992 are used on TSCC and TGWC systems only.
12. Water Flow meter is used only for sites that have the TGWC cooling system installed.
13. Refer to Tab 1, Direction 2308287, Gradient Cable Installation, for instructions on ty–wrapping ground cables to each gradient cable between TAC and PP1.
14. The ribbon cable between J16 on GP and J5 on I/f may not be installed. See Tab 15, Direction 2308653 for instructions.
15. Ethernet cable is customer supplied. RUN 1066 and modem may not be required if connection to InSite is provided thru site ethermet connection at OW1 A7 PORT 8.

SIGNA LX 1.5T Twin*Speed*
SYSTEM INTERCONNECT (FIXED SITE)

NOTES:

1. CUSTOMER FURNISHED
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Adaptors selected according to coil used (head, surface) and magnet polarity.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Magnet ramping cables pass through ramp port on pp1 plate.
7. Customer supplied telephone line to be connected from UPS to Modem (MSM3) or optional MUX . Additional telephone line would be needed if optional MUX is installed.
8. Optional: Used only if Shim Filter is installed.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Customer supplied telephone line for Insite Modem.
11. Refer to page 4–43 or 4–44 for cooling system that's designed for your stie. Source of water supply for Cold Head Compressor depends on system used.
12. Water Flow meter is used only for sites that have the TGWC cooling system installed.
13. Refer to Tab 1, Direction 2308287, Gradient Cable Installation, for instructions on ty–wrapping ground cables to each gradient cable between TAC and PP1.
14. The ribbon cable between J16 on GP and J5 on I/f must be installed. See Tab 15, Direction 2286811 for instructions.
15. Ethernet cable is customer supplied. RUN 812 and modem may not be required if connection to InSite is proveided thru site ethernet connection at OW1A2A4 PORT8.



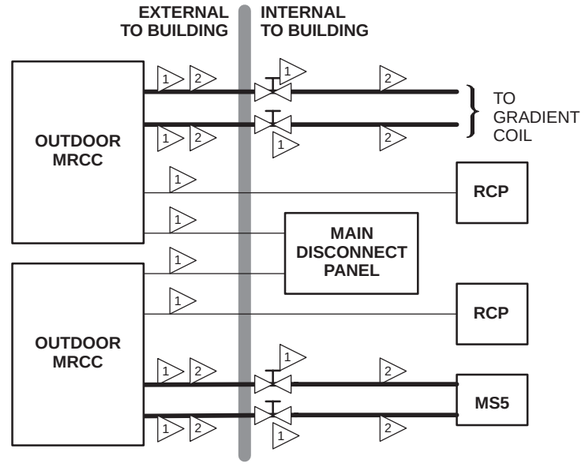
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO MRCC SUBSYSTEM EQUIPMENT SHOWN HERE.

DUAL INDOOR MRCC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



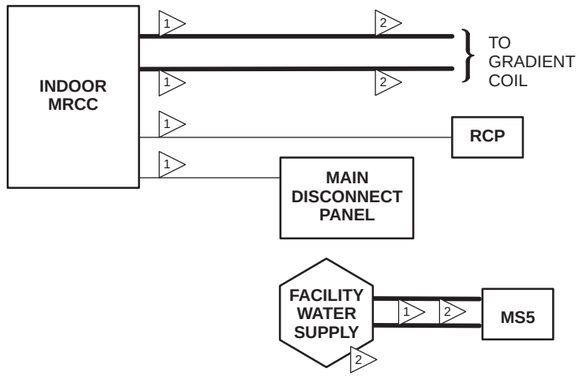
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO MRCC SUBSYSTEM EQUIPMENT SHOWN HERE.

DUAL OUTDOOR MRCC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



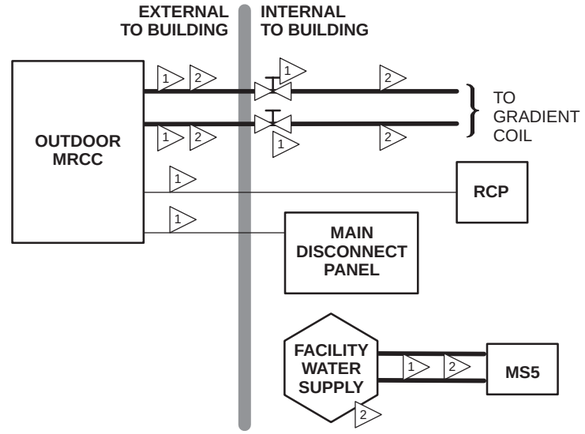
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO MRCC SUBSYSTEM EQUIPMENT SHOWN HERE.

INDOOR MRCC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



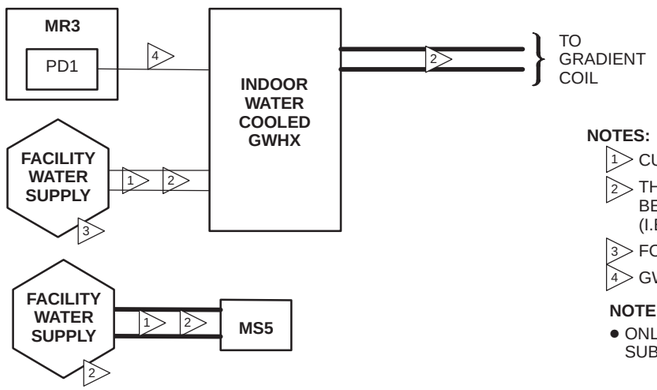
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO MRCC SUBSYSTEM EQUIPMENT SHOWN HERE.

OUTDOOR MRCC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



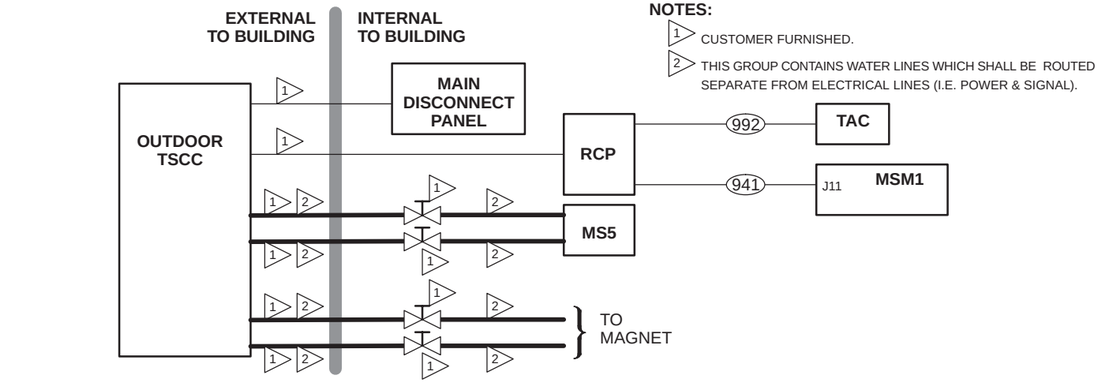
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).
3. FOR INDOOR WATER COOLED GWHX ONLY.
4. GWHX PROVIDED CABLE.

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO GWHX SUBSYSTEM EQUIPMENT SHOWN HERE.

INDOOR GWHX SUBSYSTEM GROUP INTERCONNECT DIAGRAM



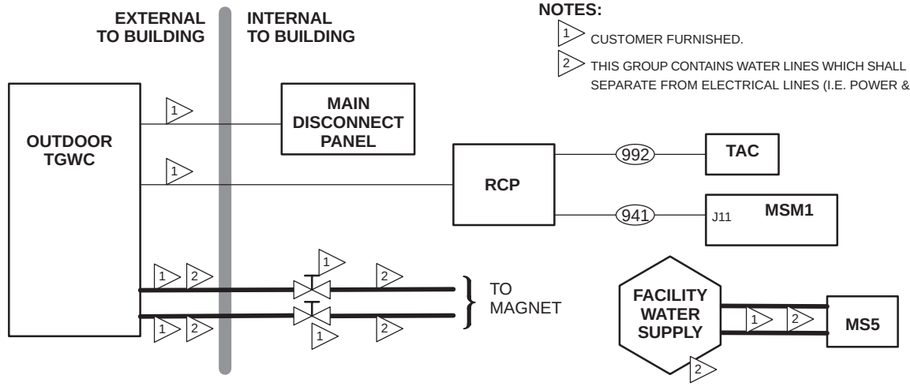
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO TSCC SUBSYSTEM EQUIPMENT SHOWN HERE.

OUTDOOR TSCC & RCP SUBSYSTEM GROUP INTERCONNECT DIAGRAM



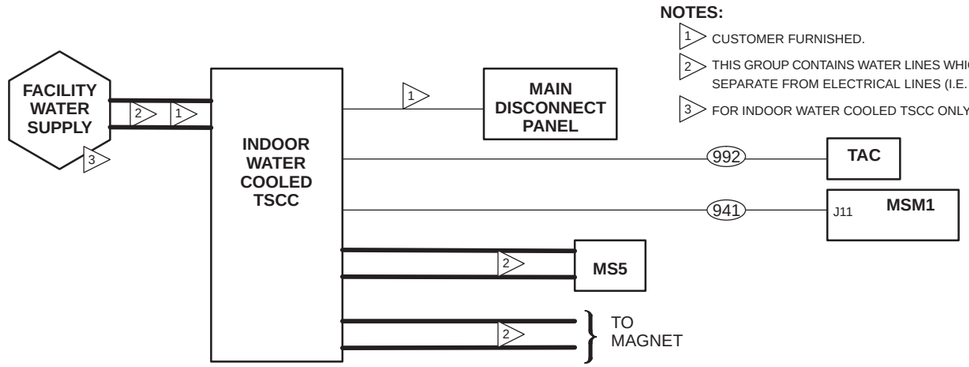
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO TGWC SUBSYSTEM EQUIPMENT SHOWN HERE.

OUTDOOR TGWC & RCP SUBSYSTEM GROUP INTERCONNECT DIAGRAM



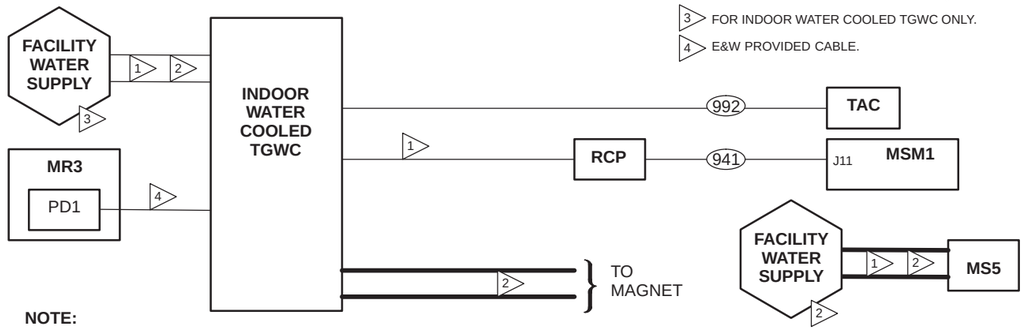
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).
3. FOR INDOOR WATER COOLED TSCC ONLY.

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO TSCC SUBSYSTEM EQUIPMENT SHOWN HERE.

INDOOR WATER COOLED TSCC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



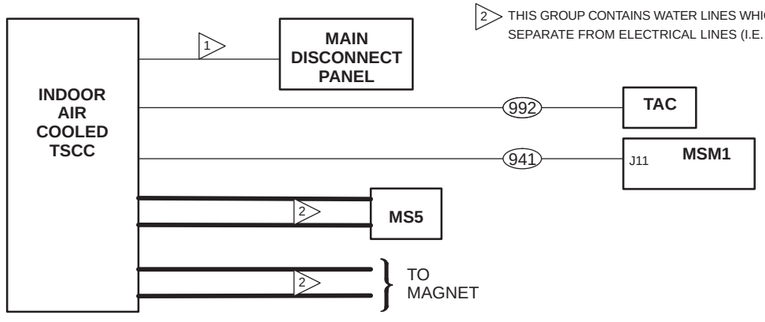
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).
3. FOR INDOOR WATER COOLED TGWC ONLY.
4. E&W PROVIDED CABLE.

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO TGWC SUBSYSTEM EQUIPMENT SHOWN HERE.

INDOOR WATER COOLED TGWC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



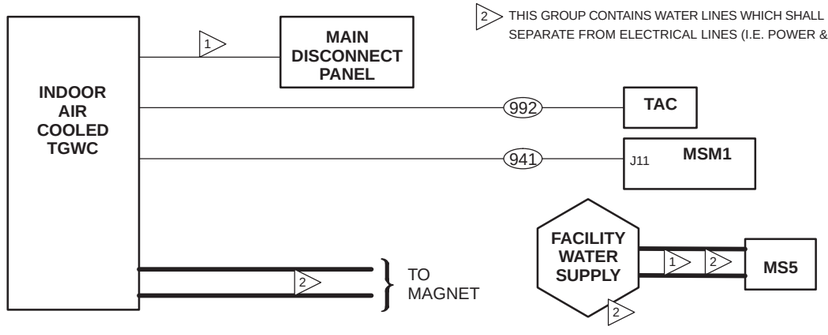
NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO TSCC SUBSYSTEM EQUIPMENT SHOWN HERE.

INDOOR AIR COOLED TSCC SUBSYSTEM GROUP INTERCONNECT DIAGRAM



NOTES:

1. CUSTOMER FURNISHED.
2. THIS GROUP CONTAINS WATER LINES WHICH SHALL BE ROUTED SEPARATE FROM ELECTRICAL LINES (I.E. POWER & SIGNAL).

NOTE:

- ONLY INTERCONNECTS SPECIFIC TO TGWC SUBSYSTEM EQUIPMENT SHOWN HERE.

INDOOR AIR COOLED TGWC SUBSYSTEM GROUP INTERCONNECT DIAGRAM

SIGNA EXCITE 1.5T Twin*Speed* (LINUX PC) SYSTEM INTERCONNECT (MOBILE)

NOTES:

1. CUSTOMER FURNISHED
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Adaptors selected according to coil used (head, surface) and magnet polarity.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Magnet ramping cables pass through ramp port on pp1 plate.
7. Customer supplied telephone line to be connected from UPS to Modem (MSM3) or optional MUX . Additional telephone line would be needed if optional MUX is installed.
8. Optional: Used only if High Order Shim is installed.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Customer supplied telephone line for Insite Modem.
11. Not used for Mobile.
12. Water Flow meter is used only for sites that have the TGWC cooling system installed.
13. Refer to Tab 1, Direction 2308287, Gradient Cable Installation, for instructions on ty–wrapping ground cables to each gradient cable between TAC and PP1.
14. The ribbon cable between J16 on GP and J5 on I/f must be installed. See Tab 15, Direction 2308653 for instructions.
15. Ethernet cable is customer supplied. RUN 1066 and modem may not be required if connection to InSite is provided thru site ethermet connection at OW1 A7 PORT 8.

FACILITY EMERGENCY POWER
1 ϕ FACILITY POWER 3 ϕ
A12 (SERVICE LAPTOP)
OW1 A15 (HOST COMPUTER)
OW1 A6 (HOST MONITOR) R,B,G IN (COLOR)
OW1 A3 (LCD DISPLAY)
OW1 A16 (SCSI EXPANSION DEVICE)
OW1 A20 (SCIM)
OW1 A7 (KEYBRD)
OW1 A8 (MOUSE)
OW1 A1 (OW TABLE) (GREEN)
OW1 A10 (SPKR)
A18 (SERVICE KEY)
OW1 A13 (MODEM)
OW1 A5 (DASM)
OW1 A11 (POWER STRIP)
FAN
OW1 A21 (WIM)
OW1 A19 (CABINET PDU)
OW1 A17 (LAN HUB)
OW1 A2 (GOC COMPUTER CABINET) (BROWN)
STEREO RACK
MUSIC IN BORE
TO SITE ETHERNET
FACILITY POWER
OM1 (OXYGEN MONITOR)
FILTERS FOR FACILITY POWER, EMERGENCY POWER, AND AUXILIARY WARNING DEVICE
EXHAUST FAN
RF SHIELD ROOM COMMON GROUND
EXAM ROOM LIGHTS
MS4 (ERU)
MG3 (REAR PED)
MS1 (MAGNET)
OM3 (REMOTE O2 SENSOR)
MS7 (S/C SHIM P.S.)
MS6 (MAGNET P.S.)
MS5A1 (COLD HEAD CMPRSSR)
WATER FROM VAN CHILLER
MS1 A3 A1 (TERMINAL BOX)
MS1 (MAGNET SERV TURRET)
MS1 A2 (SHIELD COOLER COLD HEAD)
SLEEVE COLDHEAD
FEED THRU (J60 & J61)
PP1 (PENETRATION PANEL) (YELLOW)
MS1 A5 A2 (PRESSURE TRANSDUCER)
PREAMP
MG3 TB1 (REED SWITCH)
TO UPS
MSM4 (UPS)
TO MAGNET MONITOR MODEM
MSM1 (MAGNET MONITOR)
MSM3 (MODEM)
MUX
PP1 A17 (REPEATER PANEL)
PP1 A17 A1 F/O REPEATER BOARD
PATIENT ALERT CONTROL BOX
ALERT AIR LINE FEED THRU
MDP (MAIN DISCONNECT PANEL)
MR3 PD1 (POWER DISTRIBUTION UNIT) (RED)
RF DOOR SWITCH
MR2 A11 (SYSTEM CABINET) (ORANGE)
MG3 A8 (UTNS ANTENNA)
MG2 A11 (PAC II)
(PAC I/F)
BULB
P. GATING
RESP
ECG
PPG
MG2 A33 (SRI–2)
MG2 A4 (OPERATOR DISPLAY)
MG2 A5 (RIGHT OPER. CONTROL)
MG2 A5 (LEFT OPER. CONTROL)
MG3 A1 (MAGNET I/F #1)
MG2 A36 (BORE TEMP SENSOR)
MG2 A31 (DOCK LIMIT SWITCH)
MG2 A29 (DOCK ASM)
MG3 A36 (8 CHANNEL SWITCH)
A8 (M–C ASM)
(QUICK DISCONNECT)
(MULTICOIL)
A3/A5 (HEAD T/R ASM)
A4 (QUICK DISCONNECT)
A1 (HEAD COIL)
A6 (ADAPTOR)
MG2 A14 A1 (MICROPHONE)
MG2 A16 (QUAD HEAD COIL & CARRIAGE)
MG3 A17 (CABLE I/F)
MG2 A12 A4 (FRNT ENDBELL)
MG2 A12 A1 (TWIN GRAD COIL)
MG2 A12 A3 (VACUUM REAR ENDBELL)
AIR HOSE
MG2 A12 A2 (RF BODY COIL)
RCV FLTR
MG3 A3 A5 (BODY COIL PREAMPLIFIER)
MG3 A3 (BODY QUAD HYBRID SPLITTER)
MG2 A30 (PATIENT ALIGNMENT LIGHTS)
MG2 A15 (BORE LIGHT)
AIR HOSE FROM FAN CABINET
MG2 A14 (PATIENT COMFORT MODULE)
MG2 A14 A2 (SPEAKER)
FIBER–OPTIC BUNDLE
MG3 A7 (LONGITUDINAL MOTOR DRIVE)
MG3 A2 (PATIENT COMMUNICATION BOX)
MG2 A35 (FRONT ENDBELL MICROPHONE)
MG6 (BLOWER BOX)
EO1 (EMERGENCY OFF SWITCH)
EO2 (EMERGENCY OFF SWITCH)
SPLICE
TAC (TWIN ACCESSORY CABINET) (YEL/GRN)
GRADIENT SW
VAN CHILLER
MR1 A23 (RFI)
MR1 (SRF CABINET) (BLUE/GREEN)
FLEXIBLE EXTENSION CABLES
FLEXIBLE EXTENSION CABLE BRACKET
PP1 A11 (FILTER)
PP1 A7 (TWIN GRAD FILTER)
PP1 A15 (MC SW FLTR)
PP1 A16 (MC BIAS FILTER)
COOLANT LINES
SHIM FILTER
VACUUM LINE
VACUUM FEED THRU
XWB–, X+, Xzm–
YWB–, Y+, Yzm–
ZWB–, Z+, Zzm–
X+/–, GND
Y+/–, GND
Z+/–, GND
Xzm+/–, GND
Yzm+/–, GND
Zzm+/–, GND
Xwb+/–, GND
Ywb+/–, GND
Zwb+/–, GND
COOLANT FEED THRU
F1
F2
F3
F4
F5
F6
FJ1
FJ2
FJ3
FJ4
RED (2)
BLK (2)
3 F/O
2 F/O
5 F/O
1 F/O

SIGNA LX 1.5T Twin*Speed* SYSTEM INTERCONNECT (MOBILE)

NOTES:

1. CUSTOMER FURNISHED
2. Magnet and superconducting shim power supplies are not included with system, but may remain in place if purchased as an option.
3. Adaptors selected according to coil used (head, surface) and magnet polarity.
4. Typical connection for normally closed emergency off switch
5. Optional: May not be present on all systems.
6. Magnet ramping cables pass through ramp port on pp1 plate.
7. Customer supplied telephone line to be connected from UPS to Modem (MSM3) or optional MUX . Additional telephone line would be needed if optional MUX is installed.
8. Optional: Used only if Shim Filter is installed.
9. Body Hybrid To Body Coil Connections depend on magnet field polarity.
10. Customer supplied telephone line for Insite Modem.
11. Not used for Mobile.
12. Water Flow meter is used only for sites that have the TGWC cooling system installed.
13. Refer to Tab 1, Direction 2308287, Gradient Cable Installation, for instructions on ty–wrapping ground cables to each gradient cable between TAC and PP1.
14. The ribbon cable between J16 on GP and J5 on I/f must be installed. See Tab 15, Direction 2286811 for instructions.
15. Ethernet cable is customer supplied. RUN 812 and modem may not be required if connection to InSite is proveided thru site ethernet connection at OW1A2A4 PORT8.

SECTION 5 – SYSTEM START UP

5–1 RETURNING SHIPPING MATERIAL

The shipping material must be returned **as soon as possible.** Prompt return is required so that production shipments can continue with these labor saving dollies and carts. These can be included with the "Return pile", Recycling Operation will route them to appropriate location. Refer to Section 1–4.

5–2 PHANTOMS AND SERVICE KITS

1. Locate Phantom Kit (Loader with Head TLT sphere, 4.38 inch Surface Coil) and SPT Phantom Cart Kit.
2. Unpack the phantoms carefully to reduce risk of damage, breakage, or chemical spill.
3. Locate the multilingual (provided in eight languages) phantom attention labels shipped with each of the phantoms.

CAUTION

Three types of multilingual phantom attention labels are provided and each type must be applied to the correct phantom. The directions at the top of each label sheet describe which phantoms that can receive that label.

4. Read the directions proveded at the top of each of the multilingual attention label sheets and apply the appropriate language attention label for the site to each of the phantoms that should receive that type of label.
   a. Each phantom will receive the correct type of attention label written in the appropriate language for that site.
   b. Note that the LVshim phantom assembly will receive 3 labels, one for each phantom component.
5. Place service phantoms into SPT Phantom Cart or service storage cabinet to be organized and ready to be used during applicable checks and calibrations. The DQA Phantom is to be stored in a customer designated location.
6. Locate TPS RF I/F Kit (if applicable) and Signa Spares Kit. Place kits into service storage cabinet for ready use.

5–3 POWER ON

1. Notify field service and other installation personnel that are working at the site that the PDU main disconnect locks and tags will be removed so PDU power can be turned on.
2. Restore power to the PDU from main disconnect.
3. Refer to the CD–ROM, Set–Up & Calibration, and perform the following:
   - PDU Voltage Checks Compact
   - Startup Checks Compact
   - Transformer Taps Compact
4. Press the FULL ON button on the PDU front control panel.
5. Except for the ACGD Gradient power modules, switch all cabinet circuit breakers to ON. The ACGD power module circuit breakers should remain OFF until room humidity stabilizes under 60%.

5–4 CALIBRATION AND SYSTEM CHECKS

Refer to Installation Flow Chart to perform:

- Software load and Configuration file edit.
- Functional checks
- Set−up and calibration
- System performance checks

5–5 FINAL COORDINATION

1. Confirm that the blower box has been anchored properly and installed outside the minimum service area.
2. Complete assembly of PPG cable and probe head.
3. Consult with customer as to location of Operator Alert squeeze bulb. Route, terminate, and connect tubing at PAC Assembly connection. Verify squeeze bulb will operate alarm.
4. Replace cabinet covers that have not been previously replaced.
5. Replace Magnet Enclosure and Rear Pedestal covers.
6. Dock Patient Transport in position at front of bore.
7. Record and enter applicable data into applicable site configuration files and records.
8. Process product locater information as detailed in Section 1–6.

Note

Failure to fill out and return Product Locator information may result in failure of site to receive future FMI's.

9. Process the **Supplier Performance Report** located in Common Forms. A reference copy of the form is provided at the end of this section.
10. Store the delivered site's set of service tools and spares kit in service cabinet at site.
11. Locate surface coil ("quick disconnect") adapters and any optional surface coils and positioning accessories and place on Patient Transport. Be sure only the correct polarity (normal or reverse **but not both**) head coil adapter is left at site.
12. Locate Box "To be opened by Applications Specialist" and set aside for later visit by Applications Specialist.
13. Leave the site's set of Manuals and CD–ROM at site. Organize and set up reference cabinet for the Manuals.
14. Locate Material Safety Data Sheets (MSDS) packed with phantoms and gradient coil coolant. They must be retained on site. Customer is to be informed that material with MSDS was brought into site and customer should know/decide where MSDS should be retained at site.
15. Verify that coordination of application support for instruction of site users on Software Release 5.5 or 8.0 has been made before returning system to the users. Turn site over to applications who will instruct users.

GE Medical Systems Field Service

SUPPLIER PERFORMANCE REPORT

Send completed forms to the 4 addresses at the end of this form.

Supplier Name: _____ Date: _____

Work Performed / Evaluated: _____

Commodity / Item Purchased: _____

GE Customer Name: _____

FDO Number: _____ Test Equipment Bar–code No; _

GEMS Evaluator Name: _____

Please rate suppliers as 1 to 5 on each of the 15 questions below:
1 = Unacceptable 2 = Poor 3 = Average 4 = Excellent 5 = Outstanding

There are 5 groups with three related questions in each group. Groups can be rated either as a group or 3 separate questions.

Any rating below 3 triggers a discrepancy review with the supplier.

Corrective actions will be faster and more effective when you provide examples and/or detail information.

	Supplier schedules well and:					
1	starts on time?	1	2	3	4	5
2	finishes on time?	1	2	3	4	5
3	avoids disruptions?	1	2	3	4	5
	Supplier is flexible and:					
4	responds to GEMS/customer requests?	1	2	3	4	5
5	cooperates with changes in schedule?	1	2	3	4	5
6	deals with unexpected problems?	1	2	3	4	5
	Supplier tools and equipment are:					
7	appropriate for contracted work?	1	2	3	4	5
8	adequate for contracted work?	1	2	3	4	5
9	calibrated and in good working order?	1	2	3	4	5
	Supplier meets GEMS quality standards with employees who:					
10	are trained, skilled and technically competent?	1	2	3	4	5
11	always keep job sites clean and free of debris?	1	2	3	4	5
12	ensure both function and appearance are as expected?	1	2	3	4	5
	Supplier employees enhance GEMS image by their:					
13	appearance?	1	2	3	4	5
14	behavior?	1	2	3	4	5
15	attitude?	1	2	3	4	5

Examples / Details: _____

_____

_____

Any rating below 3 triggers a discrepancy review with the supplier.

SEND COMPLETED FORMS TO:

1. Senior Operations Specialist for your LCT
2. The contractor who performed the work
3. ISS (already in default distribution)
4. Sourcing Supplier Quality (already in default distribution)

SYSTEM INSTALLATION INSTRUCTIONS

1–1 Tab 1, System, contains installation instructions for the following:

Use only the applicable System Installation Instruction Directions

- *DIRECTION 2147593* – 1.5T Heliax Cable Installation Instructions
- *DIRECTION 2389819* – 1.5T Times Microwave RF Cable Installation Instructions
- *DIRECTION 2308287* – Signa 1.5T Twin*Speed* ACGD Gradient Cable Installation Instructions
- *DIRECTION 2287106* – Signa ACGD Fiber Optic Cable Installation Instructions
- *DIRECTION 2398342* – Signa EXCITE II Fiber Optic Cable Installation Instructions
- *DIRECTION 2287109* – Signa ACGD System Power Cable Installation Instructions

1.5T HELIAX CABLE INSTALLATION

INSTALLATION STEPS SUMMARY

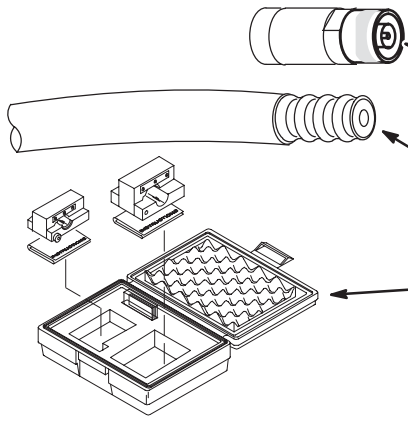
- ❑ **A – Routing, Cutting, Terminating Heliax Cables**
- ❑ **B – Connecting Runs 235, 236, 257, and 258**

CAUTION

Do not subject 1/2 inch diameter heliax cable to a bend radius less than 5 inches (127mm). Do not subject 7/8 inch diameter heliax cable to a bend radius less than 10 inches (254mm). This cable will be permanently damaged if it is kinked by a bend radius less than the specified minimum.

❑ A – ROUTING, CUTTING, TERMINATING HELIAX CABLES

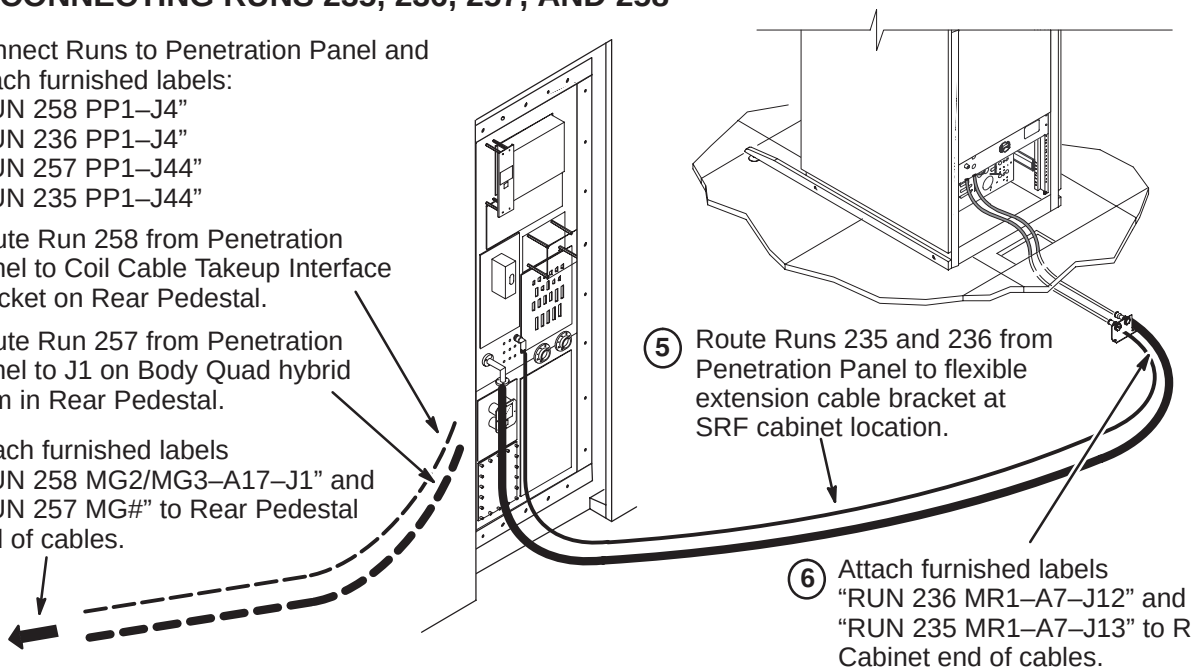
Runs 236 and 258 are created during installation from 50 foot and/or 55 foot cables along with four pre–marked labels. The installer may use both lengths of cables as provided, or if storage of excess length is a problem, cut one length (If runs are short, it may be feasible to cut one cable into two lengths) or both lengths and re–terminate each cut end. Either way, labels are attached after length is decided and cables are installed. Runs 235 and 257 are created during installation from a 100 foot cable along with four pre–marked labels.



1. Decide if cables are to be cut and re–terminated. If yes, continue to Step 2. If no, proceed to Step B.
2. Procure a new connector (46–230011P1) for each cable that needs to be shortened and re–terminated.
3. Route cables and mark at length for cut–off.
4. Cut cables to length with a fine–tooth hack saw. Remove about one inch of jacket to expose outer conductor.
5. Obtain the Heliax Termination Kit (46–320362G1) field service tool and follow instructions supplied with the kit. This will enable precise cut–off of cable.
6. Attach new connector(s) to cable(s) according to instruction sheets supplied with connector.

❑ B – CONNECTING RUNS 235, 236, 257, AND 258

1. Connect Runs to Penetration Panel and attach furnished labels:
   “RUN 258 PP1–J4”
   “RUN 236 PP1–J4”
   “RUN 257 PP1–J44”
   “RUN 235 PP1–J44”
2. Route Run 258 from Penetration Panel to Coil Cable Takeup Interface bracket on Rear Pedestal.
3. Route Run 257 from Penetration Panel to J1 on Body Quad hybrid Asm in Rear Pedestal.
4. Attach furnished labels “RUN 258 MG2/MG3–A17–J1” and “RUN 257 MG#” to Rear Pedestal end of cables.



5. Route Runs 235 and 236 from Penetration Panel to flexible extension cable bracket at SRF cabinet location.
6. Attach furnished labels “RUN 236 MR1–A7–J12” and “RUN 235 MR1–A7–J13” to RF Cabinet end of cables.

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1–1 TIMES MICROWAVE RF CABLES INFORMATION 1–2
1–2 LAYOUT OF CABLES 1–3
1–3 TERMINATE AND CONNECT RF BODY CABLES AT PENETRATION PANEL 1–4
1–4 TERMINATE AND CONNECT RF HEAD COIL CABLES 1–5

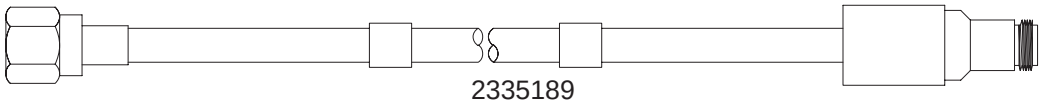
1–1 TIMES MICROWAVE RF CABLES INFORMATION

Four cables and other associated parts to be installed are provided for this procedure.

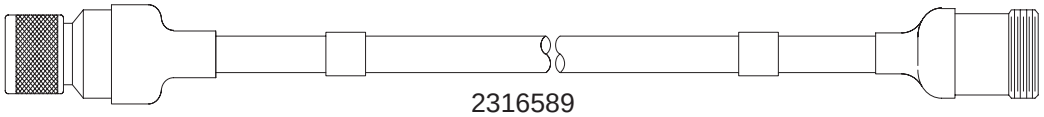
CAUTION

Do not subject LMR–600FR cable (Head) to a bend radius less than 1.5 inches (138mm). Do not subject LMR–900FR cable (Body) to a bend radius less than 3 inches (75mm). The cables will be permanently damaged if it is kinked by a bend radius less than the specified minimum.

The two short cables, 2335189 (Head) and 2316589 (Body) are connected to the SRFD2 cabinet.

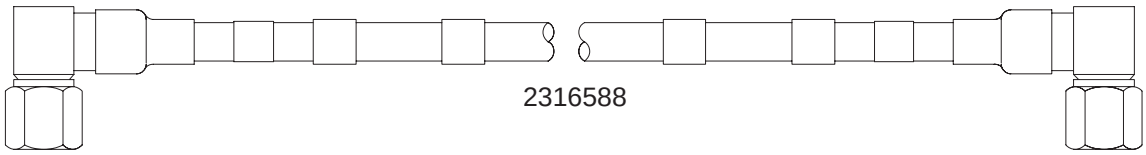


2335189

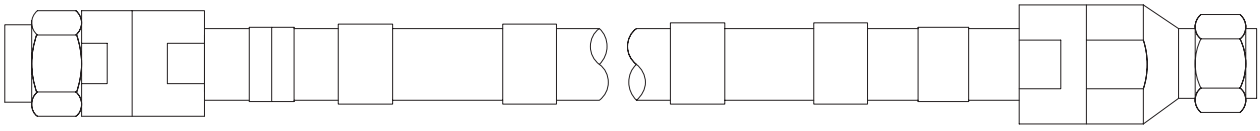


2316589

The two long cables, 2316588 (Head, Runs 236 & 258) and 2316584 (Body, Runs 235 & 257), will be cut to length and terminated for routing in the equipment and scan rooms.



2316588



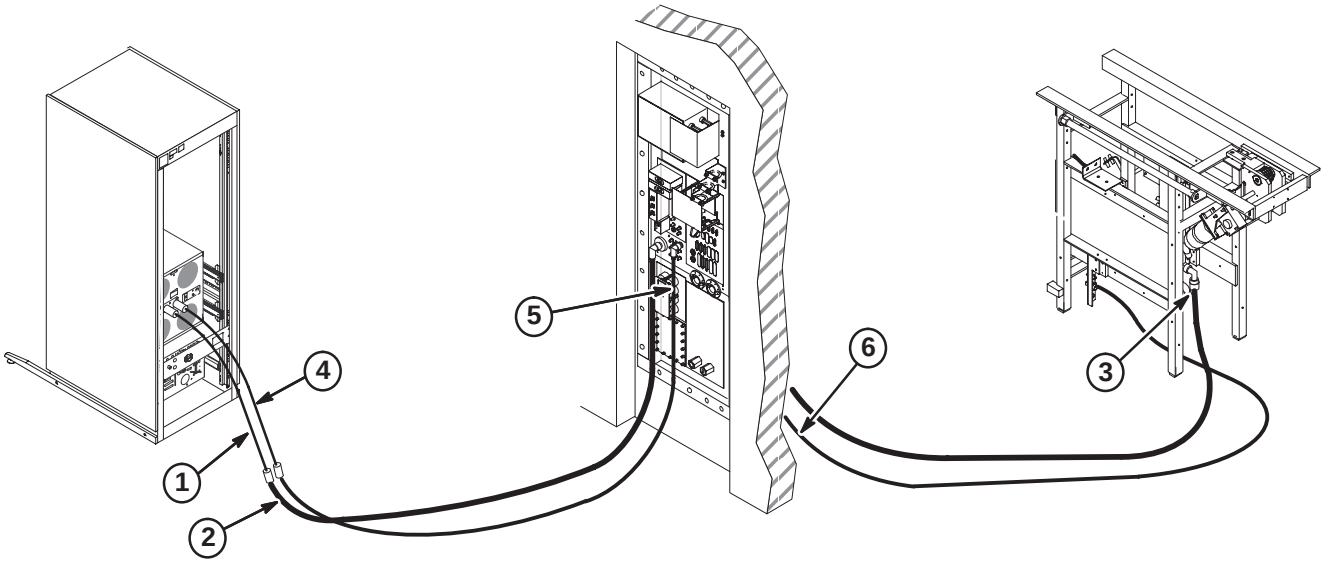
2316584

The remaining connectors, fasteners, and labels will be installed as directed in the following steps.

1–2 LAYOUT OF CABLES

RF cables will be routed and connected as indicated in the following steps.

1. Connect extension cable 2316589 to J4 Body Output at rear of RF module in RF cabinet.
2. Connect end of Times RF Body cable (2316584) marked “(RUN 235) FJ5” to Body extension cable. Route to J44 at Penetration Panel. Determine if any take–up slack is needed and cut to length. Refer to *Times Connector Installation Procedures* provided with cables for cutting information. Refer to Section 1–3 for termination procedure of cut end.
3. Move remainder of RF Body cable to Scan Room and connect other end of cable (2316584) marked “(RUN 257) MG3A3–J1” to Rear Pedestal as shown below. Route to J44 at Penetration Panel. Determine if any take–up slack is needed and cut to length. Refer to *Times Connector Installation Procedures* provided with cables for cutting information. Refer to Section 1–3 for termination procedure of cut end.
4. Connect extension cable 2335189 to J3 Head Output at rear of RF module in RF cabinet.
5. Connect end of Times RF Head cable (2316588) marked “(RUN 236) PP1–J4” to J4 at Penetration Panel. Route to RF Head extrension cable at rear of RF cabinet. Determine if any take–up slack is needed and cut to length. Refer to *Times Connector Installation Procedures* provided with cables for cutting information. Refer to Section 1–4 for termination procedure of cut end.
6. Move remainder of RF Head cable to Scan Room and connect other end of cable marked (RUN 258) PP1–J4” to Penetration Panel at J4. Route to Rear Pedestal Takeup bracket J1. Determine if any take–up slack is needed and cut to length. Refer to *Times Connector Installation Procedures* provided with cables for cutting information. Refer to Section 1–4 for termination procedure of cut end.



1–3 TERMINATE AND CONNECT RF BODY CABLES AT PENETRATION PANEL

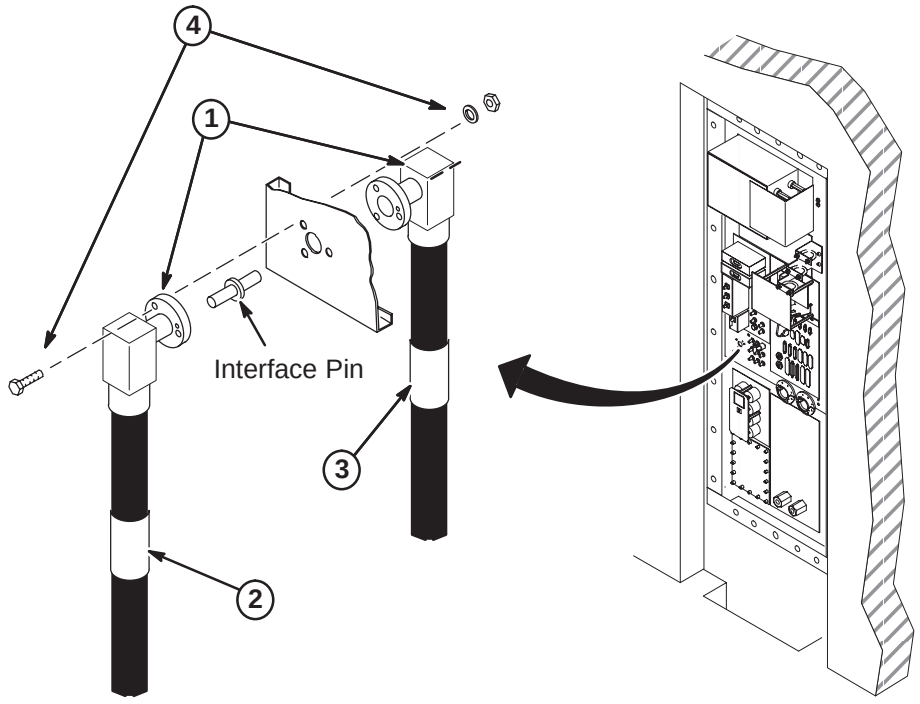
Perform the following steps for terminating and connecting the RF Body cables at the Penetration Panel J44.

1. Refer to *Times Connector Installation Procedures* provided with cables for information on installing an EIA Right Angle Connector (2319986) on each end of the RF cables. Use provided LMR900 Stripping Tool (2335190).

Note

Make sure the fastener holes in the connector flanges align with the holes in the Penetration Panel so the cables will route toward floor when installed.

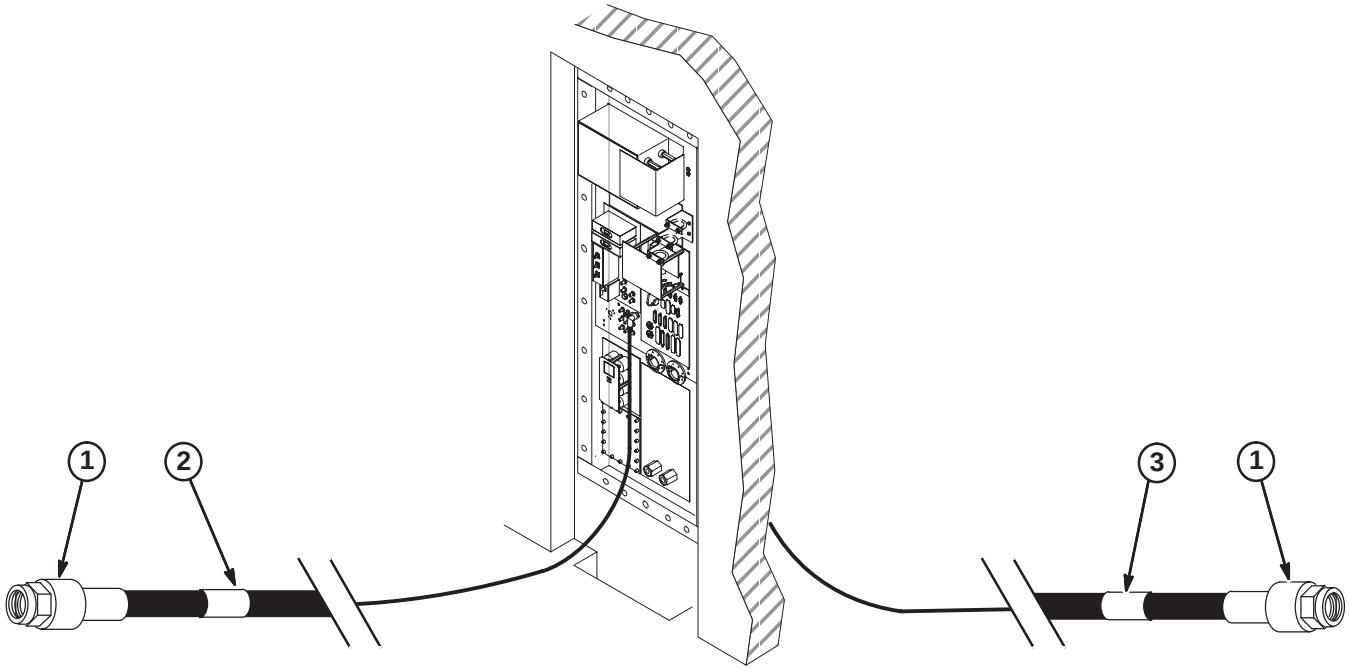
2. Attach label “RUN 235, PP1–J44” (2357230) to cable as shown on Equipment room side of Penetration Panel.
3. Attach label “RUN 257, PP1–J44” (2357230–2) to cable as shown on Scan room side of Penetration Panel.
4. Insert Interface Pin into one of the connectors. At J44, align connectors on each side of Penetration Panel and push together. Fasten together using three of each of the following:
   - 1/4–20 x 1.25 Hex Head Bolt (brass)
   - 1/4 Screw Size Washer (phos bronze)
   - 1/4–20, 7/16” Hex x 3/16” thk Nut (brass)



1–4 TERMINATE AND CONNECT RF HEAD COIL CABLES

Perform the following steps for terminating and connecting the RF Head cables in the Equipment and Scan rooms.

1. Refer to *Times Connector Installation Procedures* provided with cables for information on installing an Straight Male N Connector (2352195) on each end of the RF cable. Use provided LMR600 Stripping Tool (2352193).
   - Connect Equipment room end to Extension cable at FJ6.
   - Connect Scan room end to MG3A17–J1 at Interface bracket on Rear Pedestal.
2. Attach label “RUN 236 FJ6” (2357230–3) to cable as shown in Equipment room.
3. Attach label “RUN 258 MG3A17–J1” (2357230–4) to cable as shown in Scan room.



SIGNA Twin*Speed* ACGD GRADIENT OUTPUT CABLE INSTALLATION INSTRUCTIONS

INSTALLATION STEPS SUMMARY

- ❑ **A1 – Gradient Cable Information and Supplied Labels**
- ❑ **A2 – Instructions for Magnet Room Cable Installation**

❑ A1 – GRADIENT CABLE INFORMATION AND SUPPLIED LABELS

Nine cables have been delivered to site for either non–EXCITE, EXCITE I or EXCITE II. The difference between the cables is the length of six of the nine cables. All cables have three lead wires with terminals and attached cable labels at one end. The leads on this cable end are connected to the Twin Gradient Filter on the Penetration Panel. The other end is cut flush with no labels or terminals.

The nine cables with supplied labels are as follows for each group:

NON–EXCITE & EXCITE I GRADIENT CABLES:

RUN	PART #	LABEL	LENGTH	SUPPLIED LABELS
979	2100948–34	PP1–A7–X	75.5 ft.	(1) RUN 976, (1) RUN 979, (2) X+, (1) X–, (1) GND, (1) $X_{ZM–}$, (1) $X_{WB–}$
980	2100948–35	PP1–A7–Y	75.5 ft.	(1) RUN 977, (1) RUN 980, (2) Y+, (1) Y–, (1) GND, (1) $Y_{ZM–}$ (1) $Y_{WB–}$
981	2100948–36	PP1–A7–Z	75.5 ft.	(1) RUN 978, (1) RUN 981, (2) Z+, (1) Z–, (1) GND, (1) $Z_{ZM–}$ (1) $Z_{WB–}$
982	2100948–42	PP1–A7–Z_{ZM}	50.5 ft.	(1) RUN 982, (1) $Z_{ZM–}$ (1) Z_{ZM+}
983	2100948–41	PP1–A7–Y_{ZM}	50.5 ft.	(1) RUN 983, (1) $Y_{ZM–}$ (1) Y_{ZM+}
984	2100948–40	PP1–A7–X_{ZM}	50.5 ft.	(1) RUN 984, (1) $X_{ZM–}$ (1) X_{ZM+}
985	2100948–45	PP1–A7–Z_{WB}	50.5 ft.	(1) RUN 985, (1) $Z_{WB–}$ (1) Z_{WB+}
986	2100948–44	PP1–A7–Y_{WB}	50.5 ft.	(1) RUN 986, (1) $Y_{WB–}$ (1) Y_{WB+}
987	2100948–43	PP1–A7–X_{WB}	50.5 ft.	(1) RUN 987, (1) $X_{WB–}$ (1) X_{WB+}

Note: Verify that 50.5 ft. (15.4M) length of supplied Runs 982, 983, 984, 985, 986, and 987 cable is sufficient to route from the Penetration Panel to Body Coil Gradient Cables at rear of magnet.

EXCITE II – CONFIG A GRADIENT CABLES:

RUN	PART #	LABEL	LENGTH	SUPPLIED LABELS
979	2345400–10	PP1–A7–X	59.5 ft.	(1) RUN 976, (1) RUN 979, (2) X+, (1) X–, (1) GND, (1) XZM–, (1) XWB–
980	2345400–11	PP1–A7–Y	59.5 ft.	(1) RUN 977, (1) RUN 980, (2) Y+, (1) Y–, (1) GND, (1) YZM– (1) YWB–
981	2345400–12	PP1–A7–Z	59.5 ft.	(1) RUN 978, (1) RUN 981, (2) Z+, (1) Z–, (1) GND, (1) ZZM– (1) ZWB–
982	2345400–18	PP1–A7–Z_{ZM}	26.5 ft.	(1) RUN 982, (1) ZZM– (1) ZZM+
983	2345400–17	PP1–A7–Y_{ZM}	26.5 ft.	(1) RUN 983, (1) YZM– (1) YZM+
984	2345400–16	PP1–A7–X_{ZM}	26.5 ft.	(1) RUN 984, (1) XZM– (1) XZM+
985	2345400–24	PP1–A7–Z_{WB}	26.5 ft.	(1) RUN 985, (1) ZWB– (1) ZWB+
986	2345400–23	PP1–A7–Y_{WB}	26.5 ft.	(1) RUN 986, (1) YWB– (1) YWB+
987	2345400–22	PP1–A7–X_{WB}	26.5 ft.	(1) RUN 987, (1) XWB– (1) XWB+

Note: Verify that 26.5 ft. (8.1M) length of supplied Runs 982, 983, 984, 985, 986, and 987 cable is sufficient to route from the Penetration Panel to Body Coil Gradient Cables at rear of magnet.

EXCITE II – CONFIG C GRADIENT CABLES:

RUN	PART #	LABEL	LENGTH	SUPPLIED LABELS
979	2345400–10	PP1–A7–X	59.5 ft.	(1) RUN 976, (1) RUN 979, (2) X+, (1) X–, (1) GND, (1) XZM–, (1) XWB–
980	2345400–11	PP1–A7–Y	59.5 ft.	(1) RUN 977, (1) RUN 980, (2) Y+, (1) Y–, (1) GND, (1) YZM– (1) YWB–
981	2345400–12	PP1–A7–Z	59.5 ft.	(1) RUN 978, (1) RUN 981, (2) Z+, (1) Z–, (1) GND, (1) ZZM– (1) ZWB–
982	2345400–21	PP1–A7–Z_{ZM}	47.5 ft.	(1) RUN 982, (1) ZZM– (1) ZZM+
983	2345400–20	PP1–A7–Y_{ZM}	47.5 ft.	(1) RUN 983, (1) YZM– (1) YZM+
984	2345400–19	PP1–A7–X_{ZM}	47.5 ft.	(1) RUN 984, (1) XZM– (1) XZM+
985	2345400–27	PP1–A7–Z_{WB}	47.5 ft.	(1) RUN 985, (1) ZWB– (1) ZWB+
986	2345400–26	PP1–A7–Y_{WB}	47.5 ft.	(1) RUN 986, (1) YWB– (1) YWB+
987	2345400–25	PP1–A7–X_{WB}	47.5 ft.	(1) RUN 987, (1) XWB– (1) XWB+

Note: Verify that 39.5 ft. (12M) length of supplied Runs 982, 983, 984, 985, 986, and 987 cable is sufficient to route from the Penetration Panel to Body Coil Gradient Cables at rear of magnet.

WARNING!

FERROUS MATERIAL HAZARD! THE RATCHETING CRIMP TOOL REQUIRED FOR THIS PROCEDURE CONTAINS FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME A DANGEROUS PROJECTILE. KEEP ALL FERROUS TOOLS AS FAR FROM THE MAGNET AS POSSIBLE.

IF MAGNET IS AT FULL FIELD – CUT GRADIENT CABLE TO LENGTH AND REMOVE FROM MAGNET ROOM TO PERFORM CABLE TERMINATION PROCEDURES.

TOOLS REQUIRED: 2134776 – Cable Crimper/Stripper Kit

❑ A2 – INSTRUCTIONS FOR MAGNET ROOM CABLE INSTALLATION

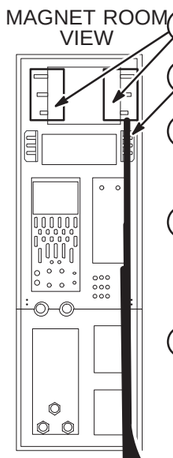
1. Move Run 982, 983, 984, 985, 986, and 987 cables to magnet room. The end of cable with terminals will be connected to Penetration Panel. See Procedures **B1** and **B2.**
2. Route cables from Gradient Filter of Penetration Panel to Body Coil gradient cables at rear of magnet.
3. Verify sufficient slack of at least two feet (610mm) is allowed for termination and connection. Mark location for cutting. Cut cables to length and label cut ends with applicable run number. **Do not cut Body Coil gradient cables.**
4. Locate furnished bag of parts and attach terminal and labels to each cable which was cut to length. See Procedures **B3** and **B4.**
5. See Procedure **C1** and **C2** for connection of Runs 982, 983, 984, 985, 986, and 987 to Body Coil gradient cables.

SIGNA Twin*Speed* ACGD GRADIENT OUTPUT CABLE INSTALLATION INSTRUCTIONS

INSTALLATION STEPS SUMMARY

- ❑ **B1 – Connect ZM (Zoom) Cables to Pentration Panel**
- ❑ **B2 – Connect WB (Whole Body) Cables to Pentration Panel**
- ❑ **B3 – Terminate Runs 982, 983, and 984 for Magnet Room**
- ❑ **B4 – Terminate Runs 985, 986, and 987 for Magnet Room**

❑ B1 – CONNECT ZM (ZOOM) CABLES TO PENETRATION PANEL

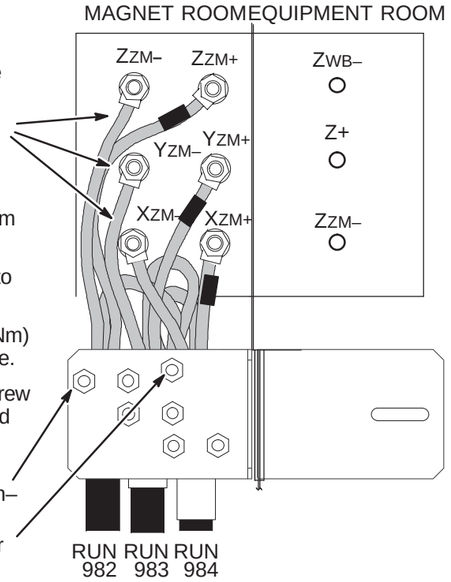


1. Remove gradient filter terminal covers.
2. Route Run 982, 983, and 984 to right side of gradient filter on Penetration Panel.
3. Connect six ZM– and ZM+ wires to gradient filter terminals as marked.

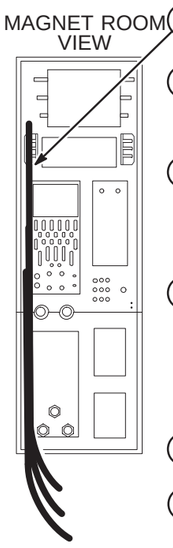
   Note: Red tape indicates positive (+) wires.
4. Align cables to obtain maximum spacing from other cables and conductive metal objects.

   Note: When tightening nuts, it is important to hold screw body.
5. Tighten nuts to a torque of 35 ft–lbs (67–74Nm) or after tightening, verify that nothing is loose.

   Note: Final check is by hand. Make sure screw is fixed, nut is tight, and cable is not detached from terminal lug.
6. Route and secure each cable Run to strain–relief bracket with U–bolts.
7. Secure GND lead wire on Ground Stud for each cable Run.



❑ B2 – CONNECT WB (WHOLE BODY) CABLES TO PENETRATION PANEL

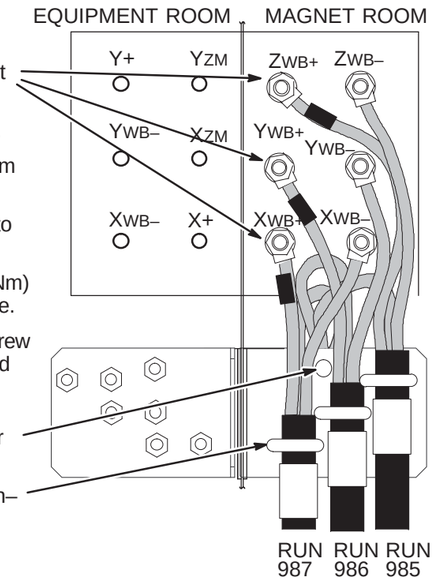


1. Route Run 985, 986, and 987 to left side of gradient filter on Penetration Panel.
2. Connect six WB– and WB+ wires to gradient filter terminals as marked.

   Note: Red tape indicates positive (+) wires.
3. Align cables to obtain maximum spacing from other cables and conductive metal objects.

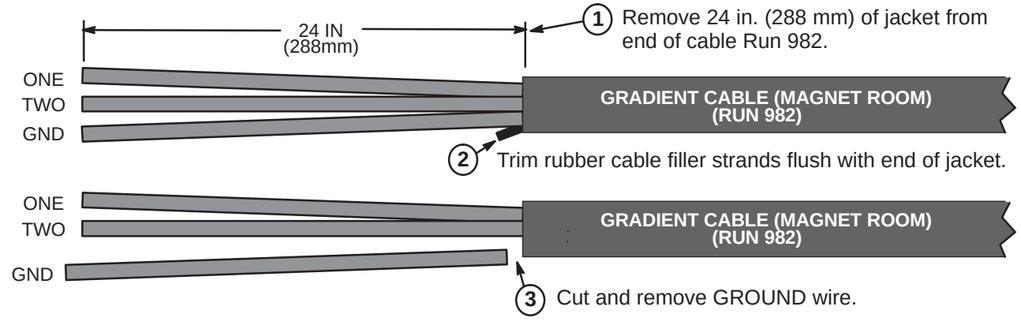
   Note: When tightening nuts, it is important to hold screw body.
4. Tighten nuts to a torque of 35 ft–lbs (67–74Nm) or after tightening, verify that nothing is loose.

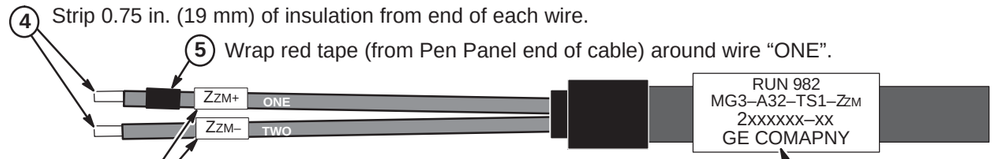
   Note: Final check is by hand. Make sure screw is fixed, nut is tight, and cable is not detached from terminal lug.
5. Secure GND lead wire on Ground Stud for each cable Run.
6. Route and secure each cable Run to strain–relief bracket with U–bolts.
7. Replace gradient filter terminal covers.



❑ B3 – TERMINATE RUNS 982, 983, AND 984 FOR MAGNET ROOM

Note: The following steps are required to terminate the end of the cable that was cut in Step **A2**. The other end of the cable is connected to the Penetration Panel.

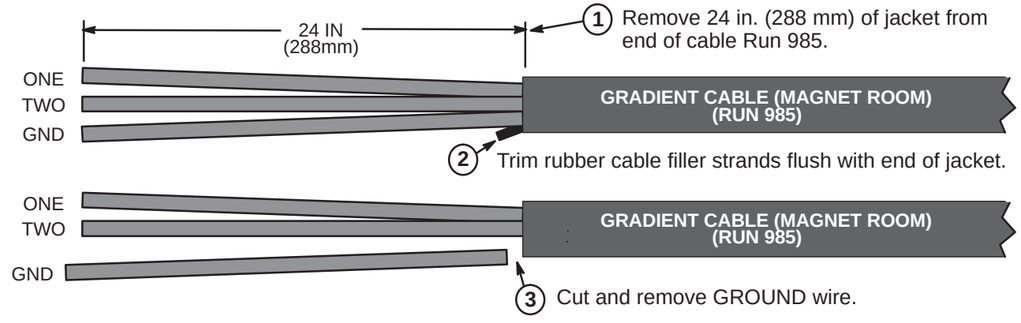


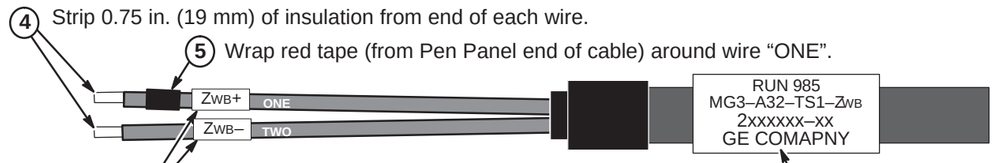


6. Place furnished ”ZZM+” label on wire “ONE”.
   Place furnished ”ZZM–” label on wire ”TWO”.
7. Place furnished ”Run 982” label on cable.
8. Repeat above process for Runs 983 and 984.
   Note: Red tape, Y_{ZM+} (RUN 983) **and X_{ZM+}** (RUN 984) **labels are attached to wire ”ONE”.**

❑ B4 – TERMINATE RUNS 985, 986, AND 987 FOR MAGNET ROOM

Note: The following steps are required to terminate the end of the cable that was cut in Step **A2**. The other end of the cable is connected to the Penetration Panel.





6. Place furnished ”ZWB+” label on wire “ONE”.
   Place furnished ”ZWB–” label on wire ”TWO”.
7. Place furnished ”Run 985” label on cable.
8. Repeat above process for Runs 986 and 987.
   Note: Red tape, Y_{WB+} (RUN 986) **and X_{WB+}** (RUN 987) **labels are attached to wire ”ONE”.**

INSTALLATION STEPS SUMMARY

- ❑ **C1 – Routing of Body Coil Gradient Cables**
- ❑ **C2 – Connection of Body Coil Gradient Cables**

CAUTION

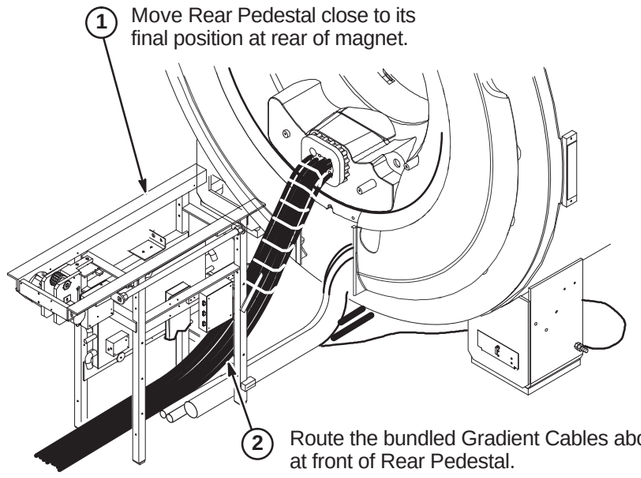
Rear End Bell MUST be installed on magnet with gradient coil cables routed thru block before connecting gradient coil cables to gradient cables routed from Penetration Panel with splices in cable trough. Failure to do so will result in inablility to install Rear End Bell.

❑ C1 – ROUTING OF BODY COIL GRADIENT CABLES

WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR WHICH IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.

Note: Cables and hoses can be routed to exit out of rear or side of Rear Pedestal.



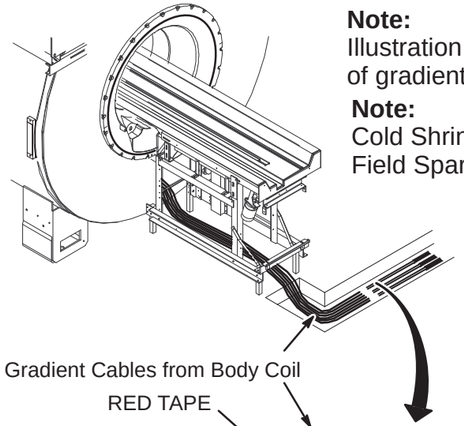
1. Move Rear Pedestal close to its final position at rear of magnet.
2. Route the bundled Gradient Cables above lower cross brace at front of Rear Pedestal.

   Note: Routing the Gradient Cables above rather than below the cross brace will reduce white pixels

CAUTION

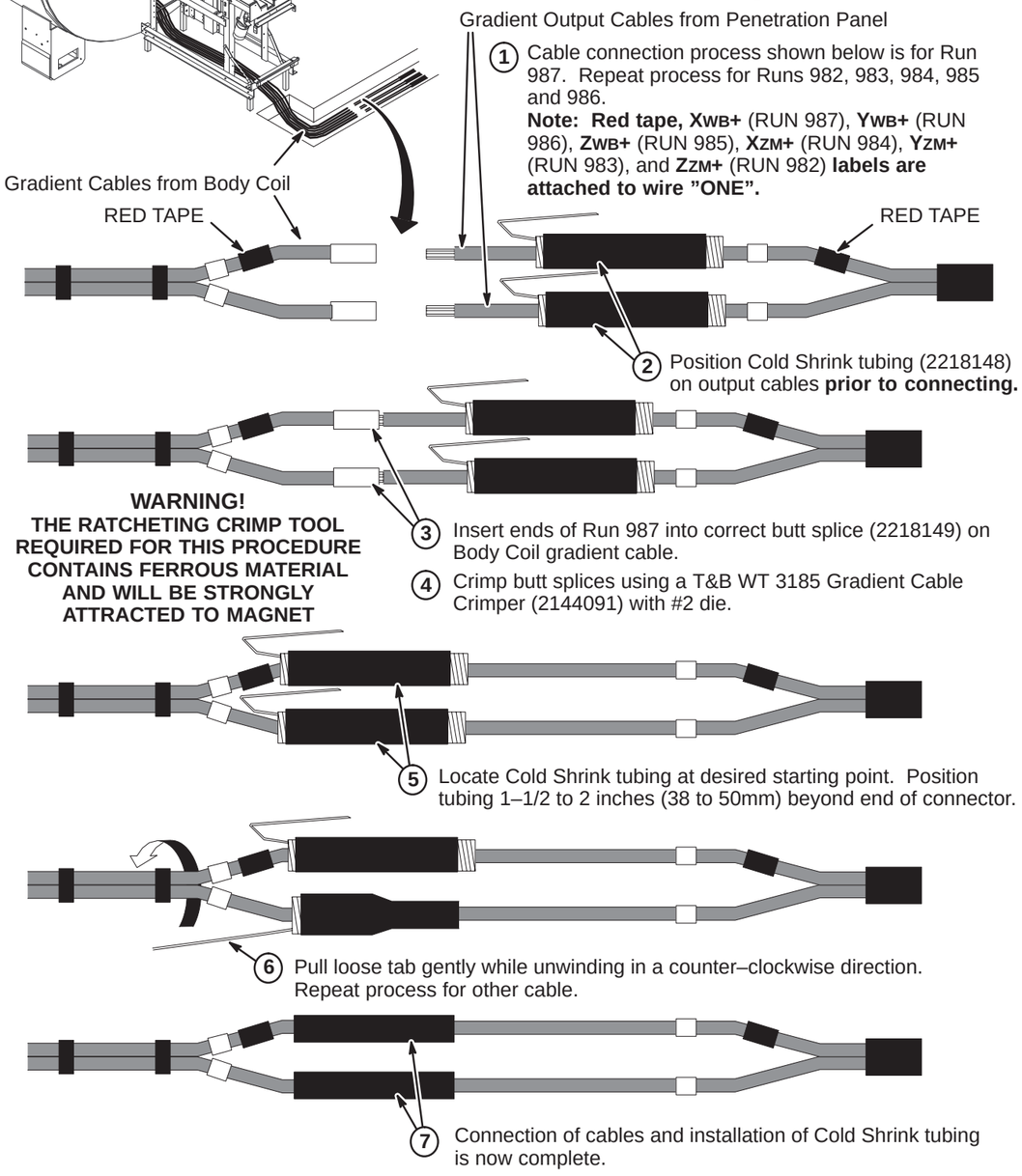
Do not cut TRM Body Coil gradient cables. Only Gradient Output cables from Penetration Panel are to be cut to length.

❑ C2 – CONNECTION OF BODY COIL GRADIENT CABLES



Note:
Illustration below shows a typical cable routing for connection of gradient output cables within an enclosed cable trough.

Note:
Cold Shrink Tubing (2218148) can be found in the Magnet Field Spares Kit delivered with the Magnet



1. Cable connection process shown below is for Run 987. Repeat process for Runs 982, 983, 984, 985 and 986.
   Note: Red tape, XWB+ (RUN 987), **YWB+** (RUN 986), **ZWB+** (RUN 985), **XZM+** (RUN 984), **YZM+** (RUN 983), and **ZZM+** (RUN 982) **labels are attached to wire "ONE".**
2. Position Cold Shrink tubing (2218148) on output cables **prior to connecting.**

WARNING!
THE RATCHETING CRIMP TOOL REQUIRED FOR THIS PROCEDURE CONTAINS FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET

3. Insert ends of Run 987 into correct butt splice (2218149) on Body Coil gradient cable.
4. Crimp butt splices using a T&B WT 3185 Gradient Cable Crimper (2144091) with #2 die.

5. Locate Cold Shrink tubing at desired starting point. Position tubing 1–1/2 to 2 inches (38 to 50mm) beyond end of connector.

6. Pull loose tab gently while unwinding in a counter–clockwise direction. Repeat process for other cable.

7. Connection of cables and installation of Cold Shrink tubing is now complete.

INSTALLATION STEPS SUMMARY

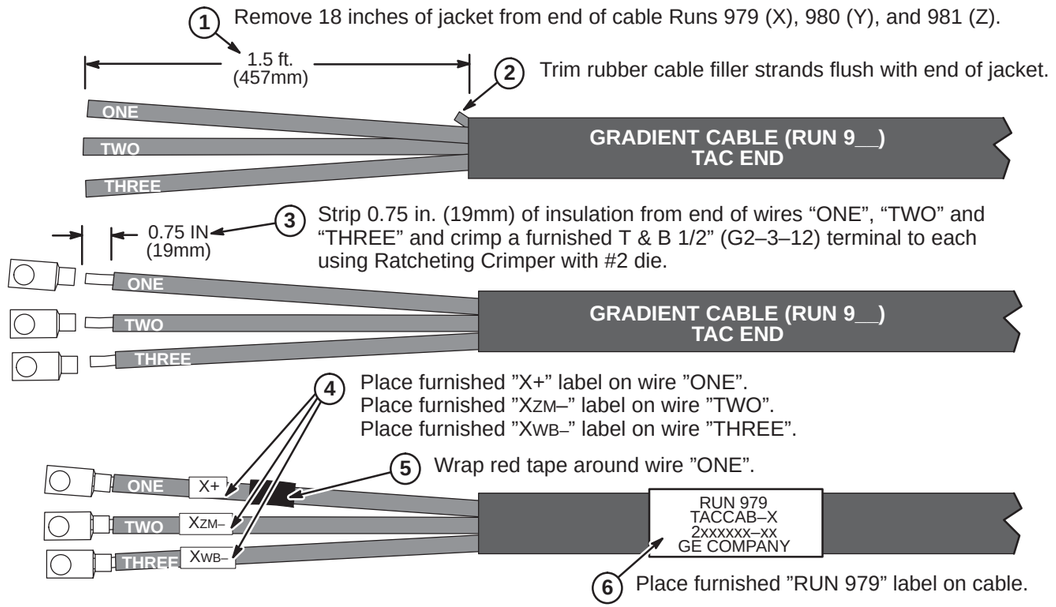
- ❑ **D1 – Cut cables to length and route in Equipment Room**
- ❑ **D2 – Terminate Runs 979, 980, and 981 For TAC Cabinet from Penetration Panel**
- ❑ **D3 – Route Ground Cables to Runs 979, 980, and 981**
- ❑ **D4 – Connection Ground Cables and Runs 979, 980, and 981 to Penetration Panel**

❑ D1 – CUT CABLES TO LENGTH AND ROUTE IN EQUIPMENT ROOM

1. Move Run 979, 980, and 981 cables to equipment room. Route cables from Gradient Filter of Penetration Panel to right side of interface panel at rear of Twin Accessory Cabinet (TAC). The end of cable with terminals will be connected to Penetration Panel.
2. Verify sufficient slack of at least two feet (610mm) is provided for termination and connection. Mark location for cutting. Cut cables to length and label cut ends with applicable run number.
3. Route remainder of cables from rear of TAC to rear of ACGD/PDU cabinet. Make sure enough slack is provided for termination and connection to cabinet. Mark location for cutting. Cut cables to length.
4. Locate furnished bag of parts and attach terminals and labels to each cable which was cut to length. See Procedures **C2** and **D2a** or **D2b** for TAC Cabinet terminations and **D1** for ACGD/PDU cabinet terminations**.**
5. See Procedure **C3** for routing and terminating of Run 988 ground wires.
6. See Procedure **C4** for connection to Equipment room side of Penetration Panel.
7. See TAC installation instructions **(DIRECTION 2308633 IN TAB 17)** for connection of Runs 976, 977, 978, 979, 980, and 981 to TAC cabinet.
8. See ACGD/PDU Cabinet installation instructions **(DIRECTION 2308653 IN TAB 15)** for connection of Runs 976, 977, and 978 to ACGD/PDU cabinet.

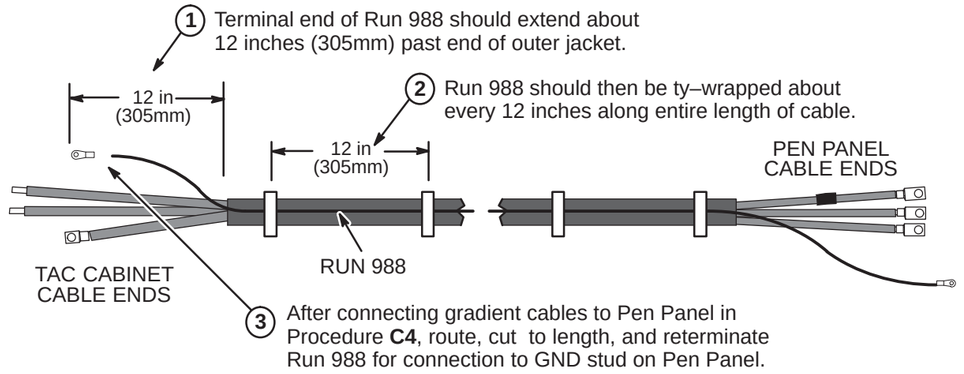
❑ D2 – TERMINATE RUNS 979, 980, & 981 FOR TAC CABINET FROM PEN PANEL

Note: The following steps are required to terminate the end of the cable that was cut in Procedure **C1, Step 2**. The other end of the cable is connected to the Penetration Panel.



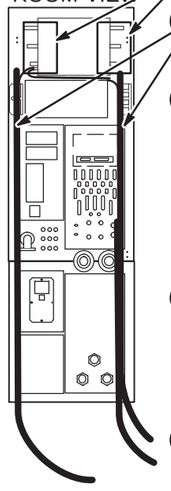
❑ D3 – ROUTE GROUND CABLES TO RUNS 979, 980, AND 981

Note: For each gradient cable routed between the Pen Panel and TAC, a ground wire, Run 988 (2283297), has to be ty–wrapped to each cable.



Excess ground cable can not be coiled. It must be cut to length and reterminated.

❑ D4 – CONNECT GROUND CABLES AND RUNS 979, 980, AND 981 TO PEN PANEL



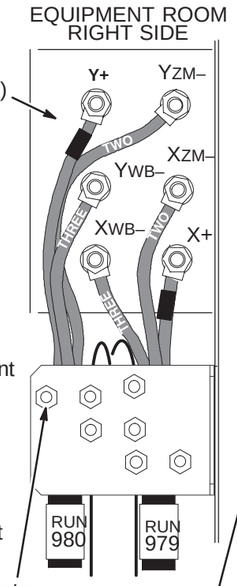
1. Remove gradient filter terminal covers.
2. Route Run 981 (Z) to left side and Runs 979 (X) and 980 (Y) to right side of gradient filter on Penetration Panel.
3. Connect +, ZM– (TWO), & WB– (THREE) wires to gradient filter terminals as marked.

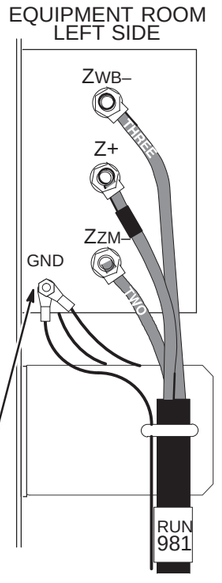
   Note: Three X and Y terminals on right side and three Z terminals on left side.

   Note: Red tape indicates positive (+) wires.
4. Align cables to obtain maximum spacing from other cables and conductive metal objects.

   Note: When tightening nuts, it is important to hold screw body.
5. Tighten nuts to a torque of 35 ft–lbs (67–74Nm) or after tightening, verify that nothing is loose.

   Note: Final check is by hand. Make sure screw is fixed, nut is tight, and cable is not detached from terminal lug.
6. Route and secure each cable Run to strain–relief bracket with U–bolts.
7. Route the three Run 988 ground wires, that are ty–wrapped to each cable, to GND on left side.
8. Cut all three to length and reterminate with 3/8 ring terminal. Connect to stud.
9. Replace gradient filter terminal covers removed in Step 1.





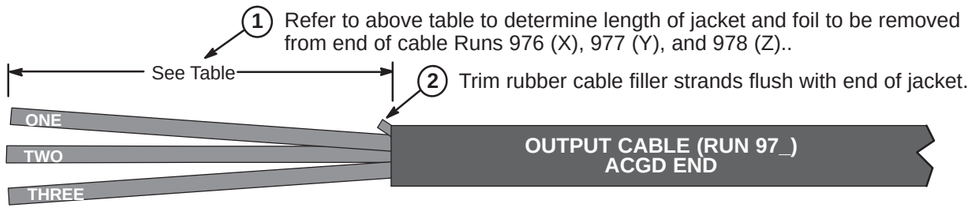
INSTALLATION STEPS SUMMARY

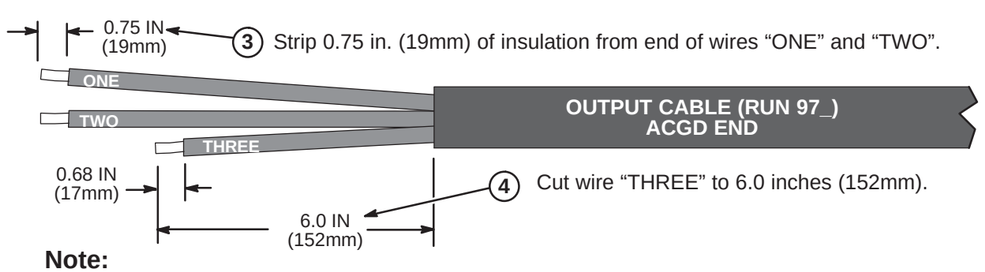
- ❑ **E1 – Terminate Runs 976, 977, and 978 for Connection to ACGD/PDU Cabinet**
- ❑ **E2a – Connect Runs 976, 977, and 978 to TAC Cabinet from ACGD/PDU**
  OR
- ❑ **E2b – Terminate Runs 976, 977, and 978 for TAC Cabinet from ACGD/PDU**

❑ E1 – TERMINATE RUN 976, 977, & 978 FOR CONNECTION TO ACGD/PDU CABINET

Note: The following steps are required to terminate the end of the cable that was cut in Procedure **C1, Step 3**. The other end of the cable is connected to the TAC Cabinet.

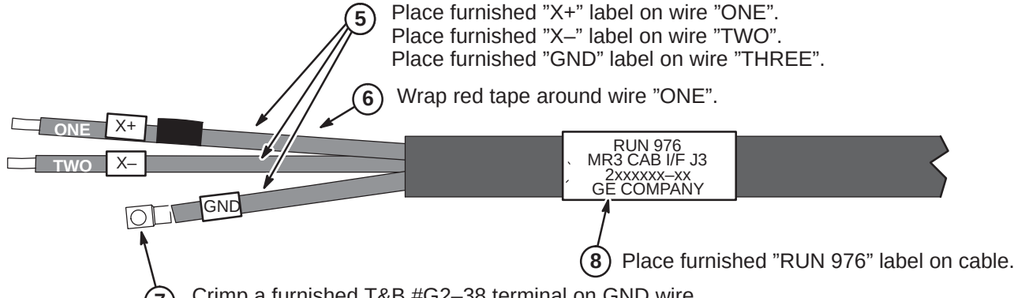
	Run 976	Run 977	Run 978
Jacket Length to be Removed	8.0 IN (203mm)	11.0 IN (280mm)	14.0 IN (356mm)





Note:
Steps in illustration below show completion of Run 976. Repeat same process for Runs 977 (Y+, Y–) and 978 (Z+, Z–).

Red tape, Y+ (RUN 977) **and Z+** (RUN 978) **labels are attached to wire ”ONE”.**

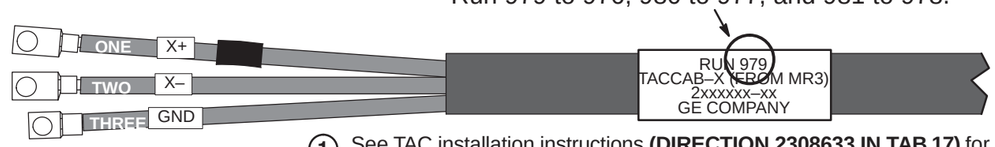


9 See ACGD/PDU Cabinet installation instructions **(DIRECTION 2308653 IN TAB 15)** for connection of Runs 976, 977, and 978 to ACGD/PDU cabinet.

❑ E2a – CONNECT RUNS 976, 977, AND 978 TO TAC CABINET FROM ACGD/PDU

A change is in process where cables delivered to site will be preterminated for the TAC Cabinet connection of Runs 976, 977, and 978. (The remainder of the cable cut in Procedure **C1.** If this is the cable delivered to your site, then proceed to Step 1 below.

Note: Early production cables contain an error on the label. Correct the label(s) as follows: Change Run 979 to 976, 980 to 977, and 981 to 978.

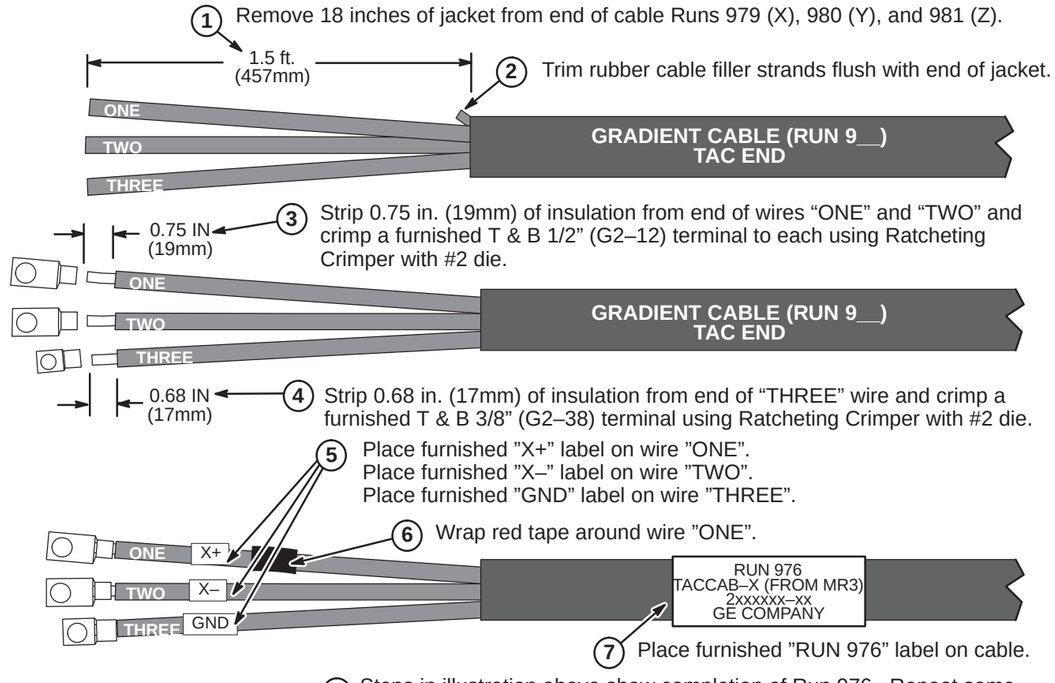


1 See TAC installation instructions **(DIRECTION 2308633 IN TAB 17)** for connection of Runs 976, 977, 978, 979, 980, and 981 to TAC cabinet.

Note: Early versions of the gradient cables delivered to site required the cable wires to be terminated for connection to the TAC Cabinet for Runs 976, 977, and 978 as in Procedure **D2b** below. Complete steps 1 thru 9 in Procedure **D2b** below is these are the style of cables delivered to your site.

❑ E2b – TERMINATE RUNS 976, 977, AND 978 FOR TAC CABINET FROM ACGD/PDU

Note: The following steps are required to terminate the end of the cable that was cut in Procedure **C1, Step 3**. The other end of the cable is connected to the ACGD/PDU Cabinet.



8 Steps in illustration above show completion of Run 976. Repeat same process for Runs 977 (Y+, Y+, GND) and 978 (Z+, Z–, GND).

9 See TAC installation instructions **(DIRECTION 2308633 IN TAB 17)** for connection of Runs 976, 977, 978, 979, 980, and 981 to TAC cabinet.

INSTALLATION STEPS SUMMARY

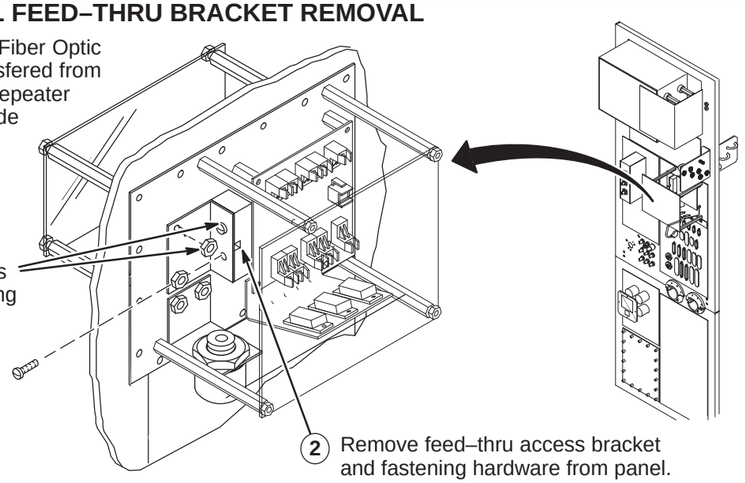
- ❑ **A1 – Repeater Panel Feed–thru Bracket Removal**
- ❑ **A2 – Routing Run 711/712 in Magnet Room**
- ❑ **A3 – Connecting Magnet Room Run 711/712 to Repeater Panel**
- ❑ **A4 – Route/Connect Equipment Room Run 711/712 to Repeater Panel**
- ❑ **A5 – Route/Connect Fiber Optic Equipment Room Runs 708, 709, 710, 711/712, and 836**

CAUTION

Fiber optic cables are easily damaged! Handle fiber optic cables very carefully. Failure to do so may cause intermittent problems difficult to isolate. Do not bend fiber optic cables to radius smaller than two inches.

❑ A1 – REPEATER PANEL FEED–THRU BRACKET REMOVAL

Note (For Upgrades Only): If Fiber Optic Repeater is present, it was transfered from old Penetration Panel. If new Repeater needs to be installed, the upgrade (M1090ZA) must be ordered.



1. Unfasten two #10–32 screws and two #10–32 nuts securing feed–thru access bracket to J91 feed–thru block.
2. Remove feed–thru access bracket and fastening hardware from panel.

❑ A2 – ROUTING RUN 711/712 IN MAGNET ROOM

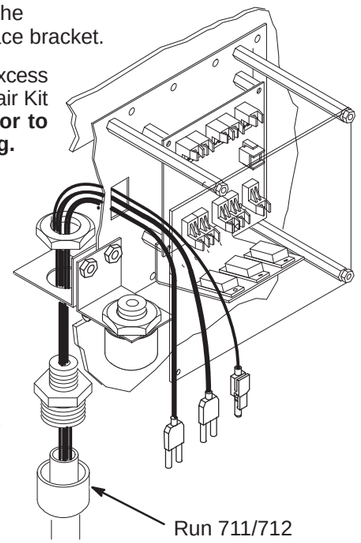
1. Move Run 711/712 (46–328079G9) to the Magnet Room side of the Penetration Panel. The “PP1–J91” end will be attached to interface bracket.

Note: If Run 711/712 excess conduit is a problem in the magnet room, excess may be cutoff and ends terminated with the Fiber Optic Connector Repair Kit per page 2. **If cables need to be shortened, mark each cable prior to cutting. This will aid in identifying the cables when reterminating.**

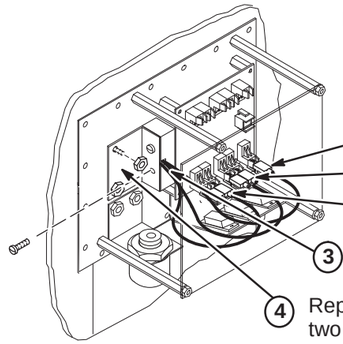
2. Attach Run 711/712 to access bracket. Refer to Direction 2123149 (packed with bag of FO Conduit connectors) for connection installation.
3. Route ends of individual fiber–optic Runs through J91 opening to the Repeater Board (PP1 A17 A1)
4. Route Run 711/712 to Magnet Enclosure Rear Pedestal and underneath magnet.

Note: For the next two steps, refer to Magnet Enclosure Installation (Tab 2) for connecting Run 711 to SRI Module and Run 712 to PAC–II.

5. Route Run 711/712 to the front right side of the magnet (SRI location). .
6. Route Run 712 into the magnet enclosure front cover, across the top and down the right side to the PAC–II.



❑ A3 – CONNECTING MAGNET ROOM RUN 711/712 TO REPEATER PANEL



Note: Take care to maintain the minimum 2 inch bend radius.

1. Adjust route of individual fiber optic runs to maintain large radius.
2. Connect Runs 712–1, 711–1, and 711–2 as shown.

Run 711–2 (J5)
Run 711–1 (J3, J4)
Run 712–1 (J1, J2)

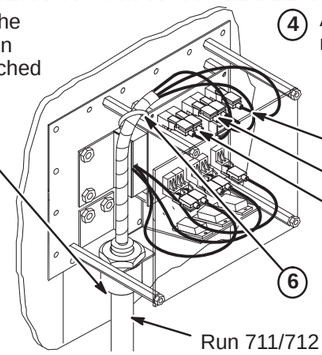
3. Gather fiber optic runs and route through wave guide notch in feed–thru block.
4. Replace feed–thru access bracket and fasten with two #10–32 screws and two #10–32 nuts removed in step A1.

❑ A4 – ROUTE/CONNECT EQUIPMENT ROOM RUN 711/712 TO REPEATER PANEL

1. Move Run 711/712 (46–328078G5) to the Equipment Room side of the Penetration Panel. The “PP1–A17” end will be attached to interface bracket.
2. Attach Run 711/712 to access bracket. Refer to Direction 2123149 (packed with bag of FO Conduit connectors) for connector installation instructions.
3. Route other end of Run 711/712 to System Cabinet. Refer to Direction 2170004 (Tab 8) for connecting fiber optics in System Cabinet.
4. Adjust route of individual fiber optic runs to maintain large radius.
5. Connect Runs 712–1, 711–1, and 711–2 as shown.

Run 711–2 (J11)
Run 711–1 (J9, J10)
Run 712–1 (J7, J8)

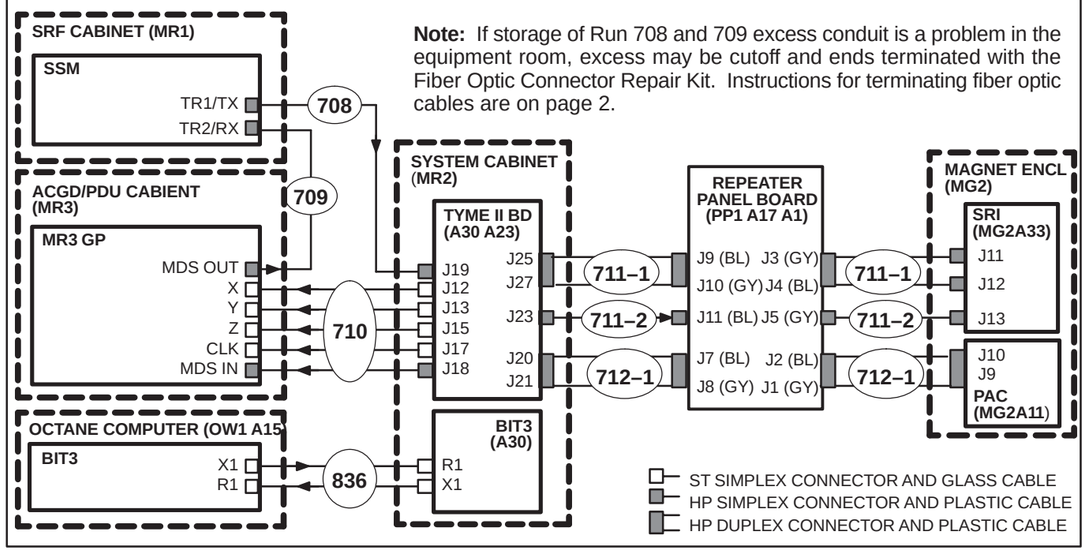
6. Adjust position of protective spiral wrap and secure with tie–wrap.



❑ A5 – ROUTE/CONNECT F/O EQUIPMENT ROOM RUNS 708, 709, 710, 711/712 & 836

1. Unroll coiled fiber optic conduits for Runs 708, 709, and 710 along intended route. Connection of Runs is shown in diagram below. Plan for storage of excess Run 710 conduit of as it cannot be reterminated.

Note: If storage of Run 708 and 709 excess conduit is a problem in the equipment room, excess may be cutoff and ends terminated with the Fiber Optic Connector Repair Kit. Instructions for terminating fiber optic cables are on page 2.



SIGNA ACGD FIBER OPTIC CABLE INSTALLATION INSTRUCTIONS

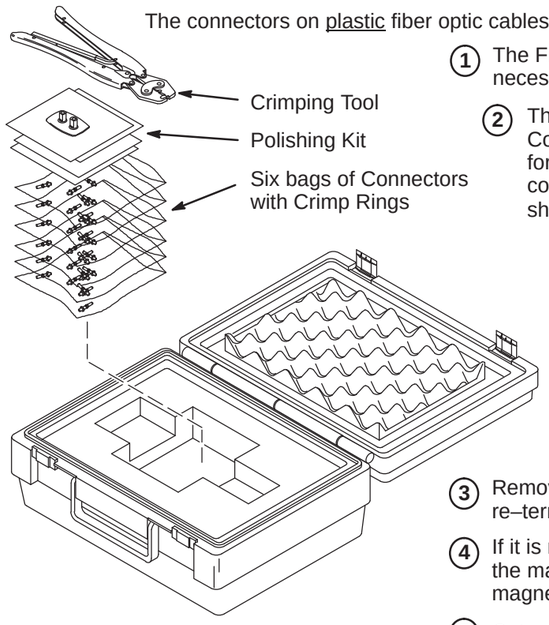
INSTALLATION STEPS SUMMARY

- ❑ **B1 – Fiber Optic Cable Termination Kit**
- ❑ **B2 – Stripping Fiber Optic Outer Jacket**
- ❑ **B3 – Crimping Connector to Fiber Optic Cable**
- ❑ **B4 – Trimming Excess Fiber Optic from Connector**
- ❑ **B5 – Polishing Fiber Optic End**

WARNING!

FERROUS MATERIAL HAZARD! CRIMP TOOL AND OTHER TOOLS REQUIRED FOR THIS PROCEDURE CONTAIN FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME DANGEROUS PROJECTILES. KEEP ALL FERROUS TOOLS AS FAR FROM THE MAGNET AS POSSIBLE.

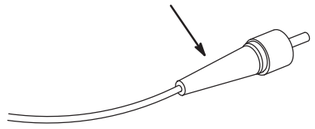
❑ B1 – FIBER OPTIC CABLE TERMINATION KIT



The connectors on plastic fiber optic cables can be replaced if damaged or cut off to shorten.

1. The Fiber Optic Repair Kit, 46–301450G1, contains all the necessary materials to replace a damaged connector.
2. The “Spares Kit”, delivered with the Shipping Collector, contains a 46–320119P1 Termination Kit for Fiber Optic Cables. This kit consists of consumables such as terminals and polishing sheets used to terminate cables during installation.

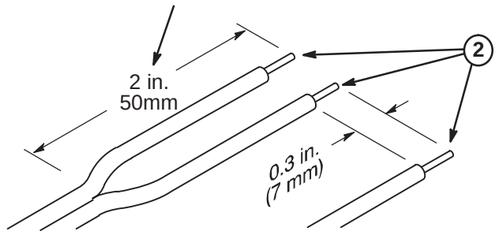
Note: The connectors on glass fiber optic cables **cannot** be replaced using the F/O Repair Kit. At this time, there is no kit available to repair glass fiber optic cable connectors.



3. Remove the end of fiber optic cable to be re–terminated from magnet room if possible.
4. If it is not possible to remove the end to be repaired from the magnet room, the cable must be as far from the magnet as possible before it can be worked on.
5. Cut cable to desired length.

❑ B2 – STRIPPING FIBER OPTIC OUTER JACKET

1. For Duplex Cables, seperate the two fibers approximately 2 in. (50mm) back from the ends.



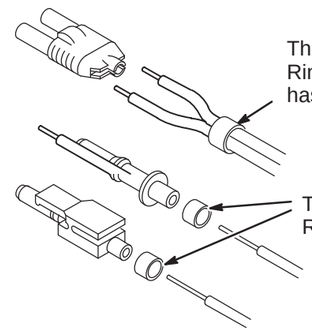
Note: The separated duplex cable must be stripped to equal lengths on each side of the cable. This allows proper seating of the cable into the connector.

2. Strip off approximately 0.3 in. (7 mm) of the outer jacket with the 16 gauge wire strippers. Excess webbing on duplex cable may have to be trimmed to allow the connector to slide over the cable.

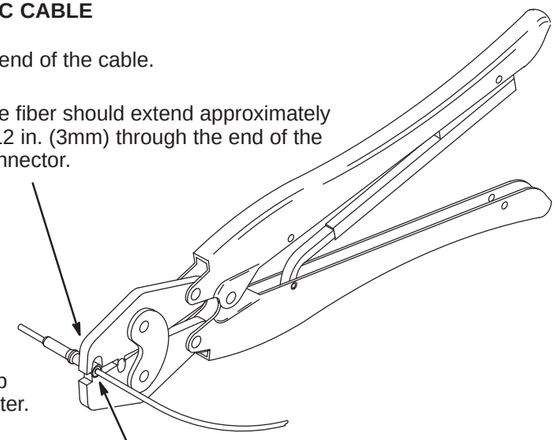
❑ B3 – CRIMPING CONNECTOR TO FIBER OPTIC CABLE

1. Place the Crimp Ring and Connector over the end of the cable.

Note: The Connector Crimp Rings cannot be interchanged between simplex and duplex connectors.

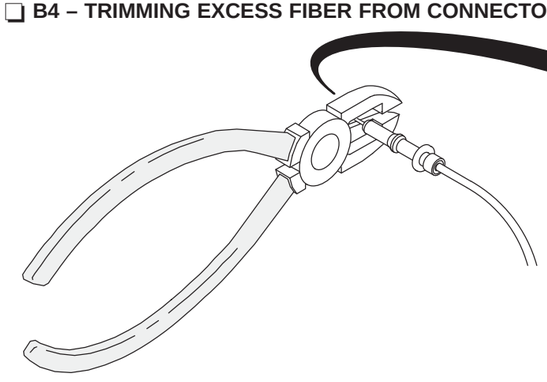


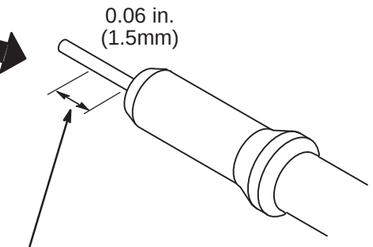
2. The fiber should extend approximately 0.12 in. (3mm) through the end of the connector.



3. Carefully position the ring so that it is entirely on the connector and then crimp the ring in place with the crimping tool.

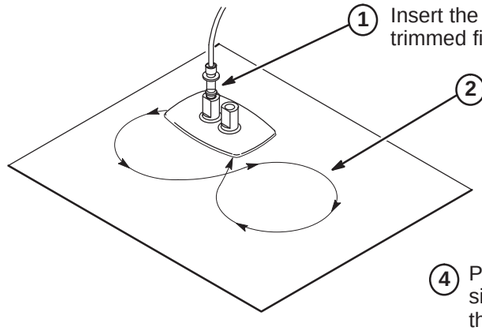
❑ B4 – TRIMMING EXCESS FIBER FROM CONNECTOR





1. Cut off excess fiber protruding from the connector. The trimmed fiber should extend approximately 0.06 in. (1–1/2mm).

❑ B5 – POLISHING FIBER OPTIC END



1. Insert the connector fully into the polishing fixture with the trimmed fiber end protruding from the bottom of the fixture.
2. Place the 600 grit abrasive paper on a flat smooth surface. Pressing down on the indicator, polish the fiber and the connector using a figure eight motion until the connector is flush with the end of the polishing fixture.
3. Wipe the connector and fixture with a clean cloth or tissue.
4. Place the flush connector and polishing fixture on the dull side of the 3 micron pink lapping film and continue to polish the fiber and connector for approximately 25 strokes.
5. The fiber end should be flat, smooth and clean. The cable end can now be connected.

Note: The four dots on the bottom of the polishing fixture are wear indicators. Replace the polishing fixture when any dot is no longer visible.

SIGNA EXCITE II FIBER OPTIC CABLE INSTALLATION INSTRUCTIONS

INSTALLATION STEPS SUMMARY

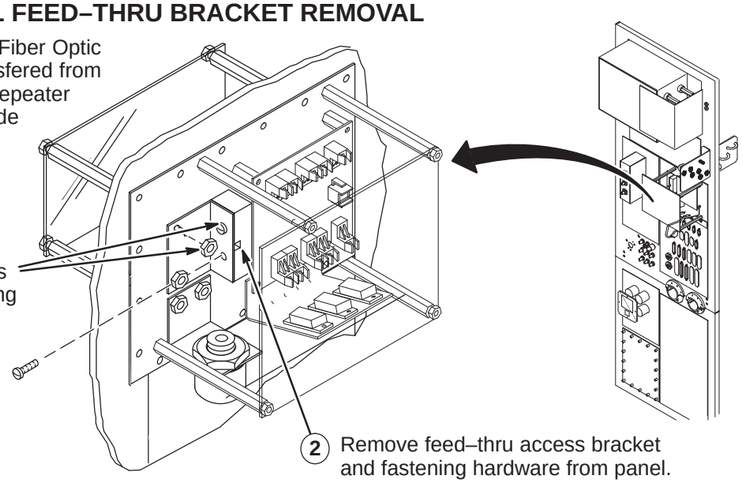
- ❑ **A1 – Repeater Panel Feed–thru Bracket Removal**
- ❑ **A2 – Routing Run 711/712 in Magnet Room**
- ❑ **A3 – Connecting Magnet Room Run 711/712 to Repeater Panel**
- ❑ **A4 – Route/Connect Equipment Room Run 1045 to Repeater Panel**
- ❑ **A5 – Cable Map of Fiber Optic Runs 709, 711/712, 1032, 1033, 1034, 1044, and 1045**

CAUTION

Fiber optic cables are easily damaged! Handle fiber optic cables very carefully. Failure to do so may cause intermittent problems difficult to isolate. Do not bend fiber optic cables to radius smaller than two inches.

❑ A1 – REPEATER PANEL FEED–THRU BRACKET REMOVAL

Note (For Upgrades Only): If Fiber Optic Repeater is present, it was transfered from old Penetration Panel. If new Repeater needs to be installed, the upgrade (M1090ZA) must be ordered.



1. Unfasten two #10–32 screws and two #10–32 nuts securing feed–thru access bracket to J91 feed–thru block.
2. Remove feed–thru access bracket and fastening hardware from panel.

❑ A2 – ROUTING RUN 711/712 IN MAGNET ROOM

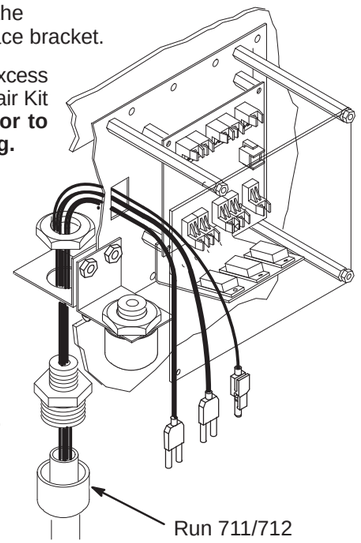
1. Move Run 711/712 (46–328079G9) to the Magnet Room side of the Penetration Panel. The “PP1–J91” end will be attached to interface bracket.

Note: If Run 711/712 excess conduit is a problem in the magnet room, excess may be cutoff and ends terminated with the Fiber Optic Connector Repair Kit per page 2. **If cables need to be shortened, mark each cable prior to cutting. This will aid in identifying the cables when reterminating.**

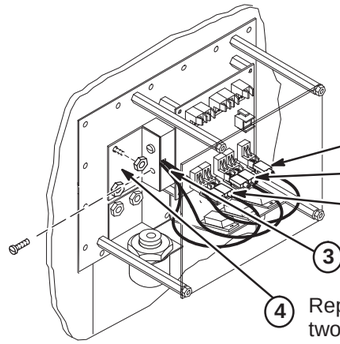
2. Attach Run 711/712 to access bracket. Refer to Direction 2123149 (packed with bag of FO Conduit connectors) for connection installation.
3. Route ends of individual fiber–optic Runs through J91 opening to the Repeater Board (PP1 A17 A1)
4. Route Run 711/712 to Magnet Enclosure Rear Pedestal and underneath magnet.

Note: For the next two steps, refer to Magnet Enclosure Installation (Tab 2) for connecting Run 711 to SRI Module and Run 712 to PAC–II.

5. Route Run 711/712 to the front right side of the magnet (SRI location). .
6. Route Run 712 into the magnet enclosure front cover, across the top and down the right side to the PAC–II.



❑ A3 – CONNECTING MAGNET ROOM RUN 711/712 TO REPEATER PANEL



Note: Take care to maintain the minimum 2 inch bend radius.

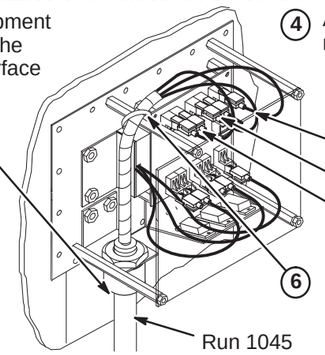
1. Adjust route of individual fiber optic runs to maintain large radius.
2. Connect Runs 712–1, 711–1, and 711–2 as shown.

Run 711–2 (J5)
Run 711–1 (J3, J4)
Run 712–1 (J1, J2)

3. Gather fiber optic runs and route through wave guide notch in feed–thru block.
4. Replace feed–thru access bracket and fasten with two #10–32 screws and two #10–32 nuts removed in step A1.

❑ A4 – ROUTE/CONNECT EQUIPMENT ROOM RUN 1045 TO REPEATER PANEL

1. Move Run 1045 (2331846) to the Equipment Room side of the Penetration Panel. The “PP1–A17” end will be attached to interface bracket.
2. Attach Run 1045 to access bracket. Refer to Direction 2123149 (packed with bag of FO Conduit connectors) for connector installation instructions.
3. Route other end of Run 1045 to System Cabinet. Refer to Direction 2338502 (Tab 8) for connecting fiber optics in System Cabinet.
4. Adjust route of individual fiber optic runs to maintain large radius.
5. Connect Run 1045 as shown.



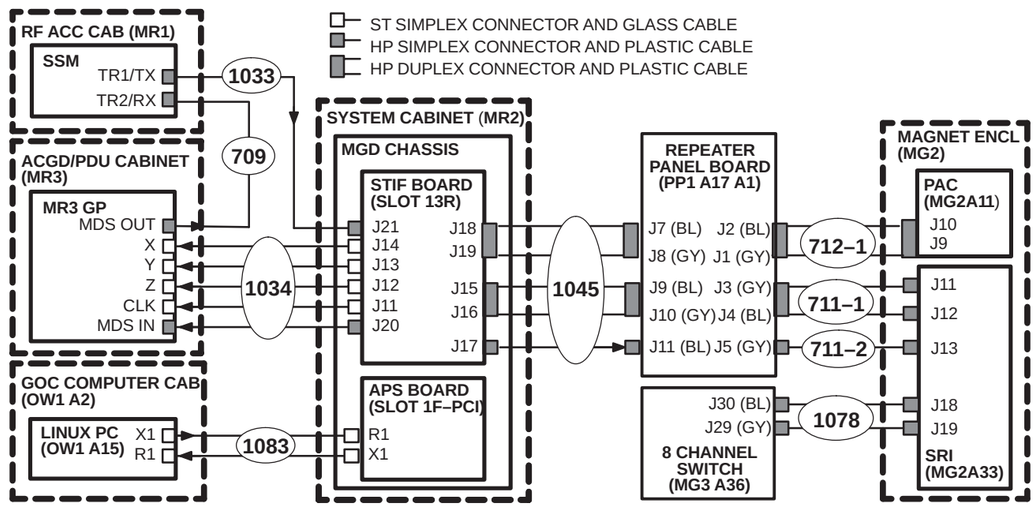
2338146 (J11)
2338146–3 (J9, J10)
2338146–2 (J7, J8)

6. Adjust position of protective spiral wrap and secure with tie–wrap.

Run 1045

❑ A5 – CABLE MAP OF F/O RUNS 709, 1033, 1034, 1045, 1078, AND 1083

1. Unroll coiled fiber optic conduits for Runs 709, 1033, 1034, 1045, 1078, and 1083 along intended routes. Connection of Runs is shown in diagram below. Plan for storage of excess Run 1034 conduit of as it cannot be reterminated.



SIGNA EXCITE II FIBER OPTIC CABLE INSTALLATION INSTRUCTIONS

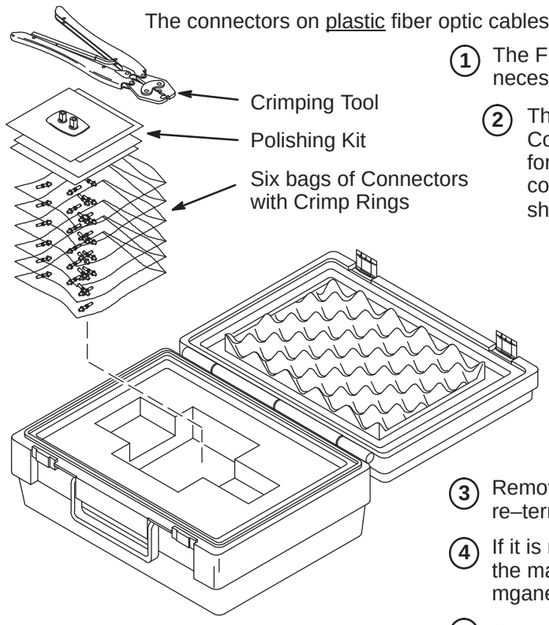
INSTALLATION STEPS SUMMARY

- ❑ **B1 – Fiber Optic Cable Termination Kit**
- ❑ **B2 – Stripping Fiber Optic Outer Jacket**
- ❑ **B3 – Crimping Connector to Fiber Optic Cable**
- ❑ **B4 – Trimming Excess Fiber Optic from Connector**
- ❑ **B5 – Polishing Fiber Optic End**

WARNING!

FERROUS MATERIAL HAZARD! CRIMP TOOL AND OTHER TOOLS REQUIRED FOR THIS PROCEDURE CONTAIN FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME DANGEROUS PROJECTILES. KEEP ALL FERROUS TOOLS AS FAR FROM THE MAGNET AS POSSIBLE.

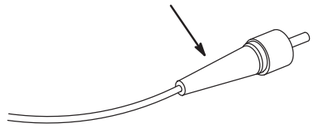
❑ B1 – FIBER OPTIC CABLE TERMINATION KIT



The connectors on plastic fiber optic cables can be replaced if damaged or cut off to shorten.

1. The Fiber Optic Repair Kit, 46–301450G1, contains all the necessary materials to replace a damaged connector.
2. The “Spares Kit”, delivered with the Shipping Collector, contains a 46–320119P1 Termination Kit for Fiber Optic Cables. This kit consists of consumables such as terminals and polishing sheets used to terminate cables during installation.

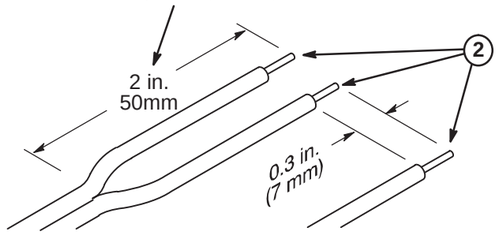
Note: The connectors on glass fiber optic cables **cannot** be replaced using the F/O Repair Kit. At this time, there is no kit available to repair glass fiber optic cable connectors.



3. Remove the end of fiber optic cable to be re–terminated from magnet room if possible.
4. If it is not possible to remove the end to be repaired from the magnet room, the cable must be as far from the mganet as possible before it can be worked on.
5. Cut cable to desired length.

❑ B2 – STRIPPING FIBER OPTIC OUTER JACKET

1. For Duplex Cables, seperate the two fibers approximately 2 in. (50mm) back from the ends.



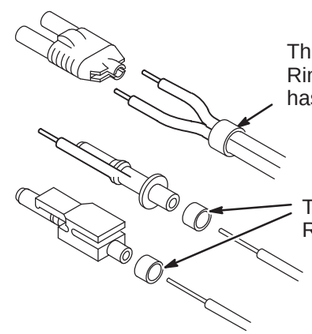
Note: The separated duplex cable must be stripped to equal lengths on each side of the cable. This allows proper seating of the cable into the connector.

2. Strip off approximately 0.3 in. (7 mm) of the outer jacket with the 16 gauge wire strippers. Excess webbing on duplex cable may have to be trimmed to allow the connector to slide over the cable.

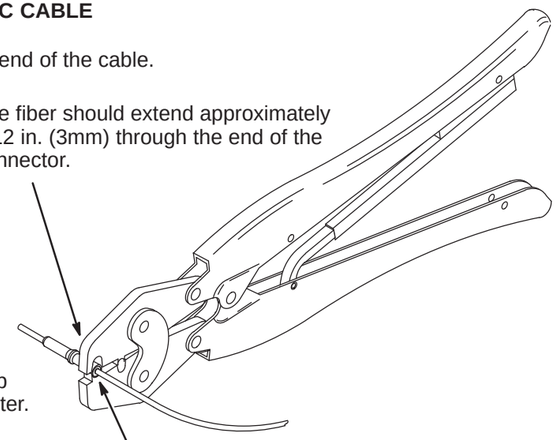
❑ B3 – CRIMPING CONNECTOR TO FIBER OPTIC CABLE

1. Place the Crimp Ring and Connector over the end of the cable.

Note: The Connector Crimp Rings cannot be interchanged between simplex and duplex connectors.

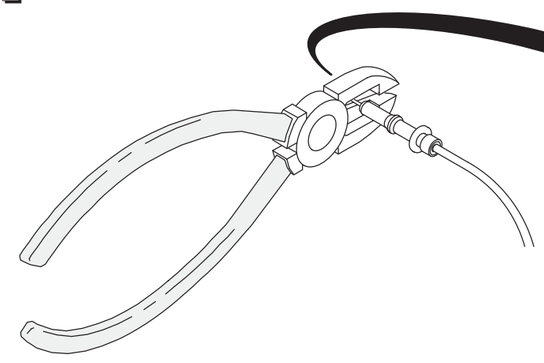


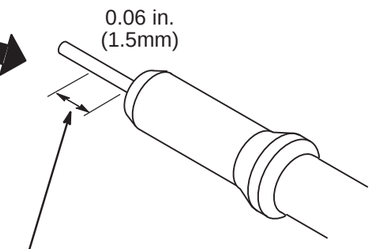
2. The fiber should extend approximately 0.12 in. (3mm) through the end of the connector.



3. Carefully position the ring so that it is entirely on the connector and then crimp the ring in place with the crimping tool.

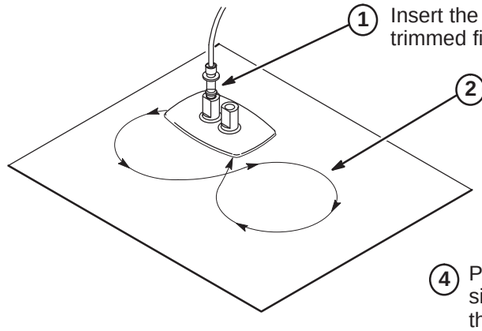
❑ B4 – TRIMMING EXCESS FIBER FROM CONNECTOR





1. Cut off excess fiber protruding from the connector. The trimmed fiber should extend approximately 0.06 in. (1–1/2mm).

❑ B5 – POLISHING FIBER OPTIC END



1. Insert the connector fully into the polishing fixture with the trimmed fiber end protruding from the bottom of the fixture.
2. Place the 600 grit abrasive paper on a flat smooth surface. Pressing down on the indicator, polish the fiber and the connector using a figure eight motion until the connector is flush with the end of the polishing fixture.
3. Wipe the connector and fixture with a clean cloth or tissue.
4. Place the flush connector and polishing fixture on the dull side of the 3 micron pink lapping film and continue to polish the fiber and connector for approximately 25 strokes.
5. The fiber end should be flat, smooth and clean. The cable end can now be connected.

Note: The four dots on the bottom of the polishing fixture are wear indicators. Replace the polishing fixture when any dot is no longer visible.

SIGNA ACGD SYSTEM POWER CABLE INSTALLATION

INSTALLATION STEPS SUMMARY

- ❑ **A – System Power Cable Installation**
- ❑ **B – Power Cable Re–termination**
- ❑ **C – Power Cable Pre–connect checks**
- ❑ **D – Power Cable Connections Details**

❑ A – SYSTEM POWER CABLE INSTALLATION

1. Verify that all power and ground cables for the Signa System with ACGD are present. Refer to Section 2–1, LOCATING AND UNPACKING CABLES.
2. **Lengths of PDU Power cables for:**

	FIXED SITE	MOBILE	T/R
Run 966, SSM	35.0 ft. (10.7M)	35.0 ft. (10.7M)	48.0 ft. (14.6M)
Run 967, SRF Cabinet	35.5 ft. (11.1M)	29.5 ft. (9.0M)	49.0 ft. (15.0M)
Run 968, System Cabinet	35.0 ft. (10.7M)	25.0 ft. (7.6M)	45.0 ft. (13.7M)
Run 969, Operator Workspace Computer	65.5 ft. (20.0M)	33.0 ft. (10.0M)	33.0 ft. (10.0M)
Run 970, Water Chiller (Fixed–Site) **(Note 1)**	82.0 ft. (25.0M)		
Run 973, Heat Exchanger (Mob & T/R) **(Note 1)**		82.0 ft. (25.0M)	82.0 ft. (25.0M)
Run 989, Twin Accessory Cabinet **(Note 1)**	25.0 ft. (7.62M)	25.0 ft. (7.62M)	25.0 ft. (7.62M)

Note 1: Runs 970 and 973 are for Non–Twin*Speed* systems, Run 989 is only used on Twin*Speed.*

If insufficient room exists to store excess cables:
Plan for storage location if cables are not being cut to length. Proceed to Step **C**.

If insufficient room exists to store excess cables:
They can be cut shorter and re–terminated at the PDU. Complete Step **B**. Then proceed to Step **C**.

3. Route all power cables per applicable System Interconnect Diagram. Unroll cables to lay without twists or kinks from cabinet to PDU through provided troughs, conduit, or ducts.

❑ B – POWER CABLE RE–TERMINATION

1. Cut power and ground cables to length as necessary. Leave sufficient slack for later connection when cabinets are in final position according to site architectural plans.
2. Cut and trim insulation for connection of power and ground cable conductors to connectors at PDU.
3. Transfer color code tape, run–number labels, and applicable wire marking labels as each cable is cut to size.

❑ C – POWER CABLE PRE–CONNECT CHECKS

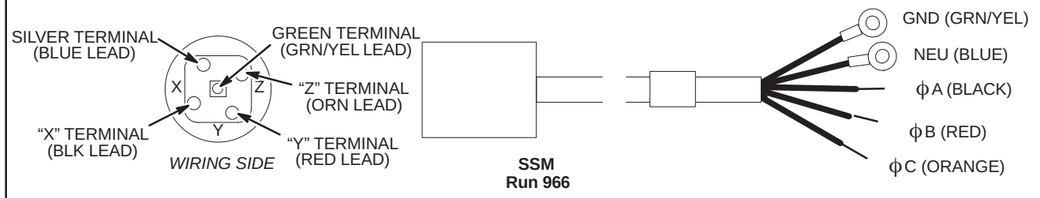
Checks for opens, shorts, and crossed connections are made for field re–terminated power cables prior to connection to PDU and cabinets. This does not provide ground resistance checks for cabinets. Ground resistance checks are in MR CD–ROM, Set Up and Calibration: System, GROUNDING AND LEAKAGE CURRENT CHECKS.

1. Use the ohmmeter and the cable plug connector Illustration to check each power cable for the following:
   - Open circuit between cable neutral and cable ground.
   - Open circuit between cable neutral and each line on the cable.
   - Open circuit between cable ground and each line on the cable.
   - Less than 1 ohm between cable neutral and the light blue (or white) conductor.
   - Less than 1 ohm between cable ground and the green/yellow conductor.
2. Any out–of–spec conditions must be immediately corrected. See Procedure **D** for plug connection details. After all power cables have been satisfactorily checked out, continue installation.

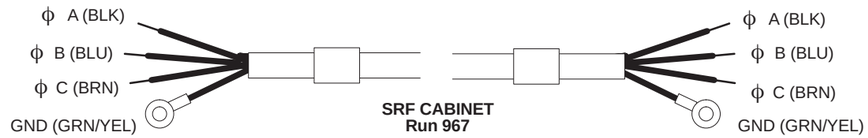
❑ D – POWER CABLE CONNECTIONS DETAILS

Note

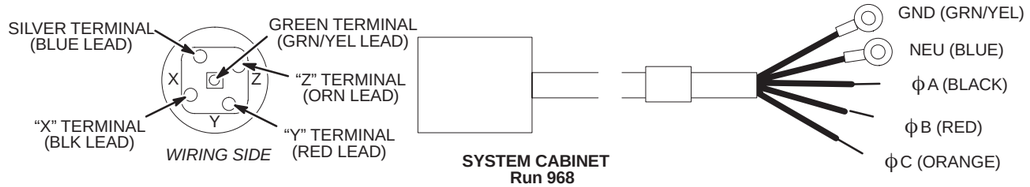
After performing cable pre–connect checks, **avoid potential problems by taping up exposed ACGD Gradient Cabinet cables** or immediately install ACGD/PDU Gradient Cabinet and connect terminals to power modules before PDU power is turned on.



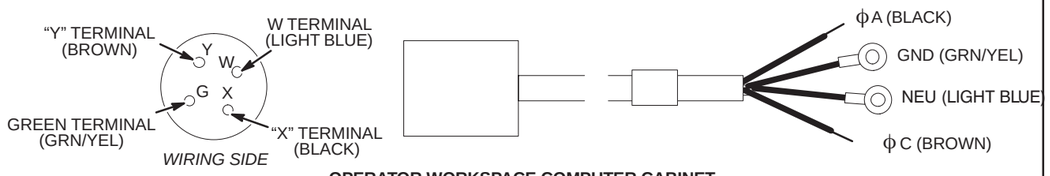
SSM
Run 966



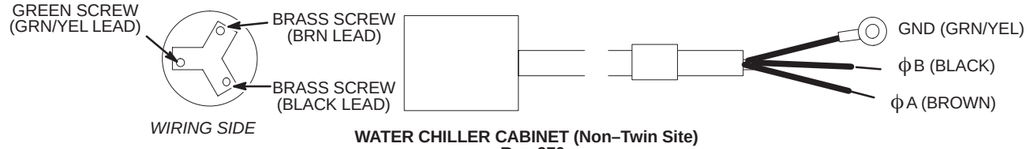
SRF CABINET
Run 967



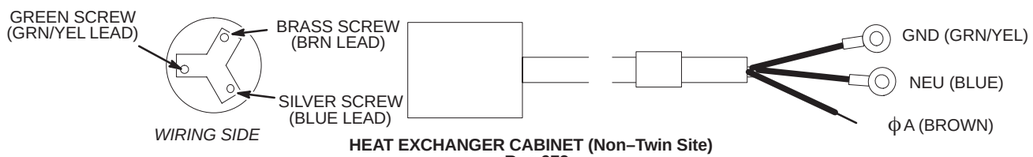
SYSTEM CABINET
Run 968



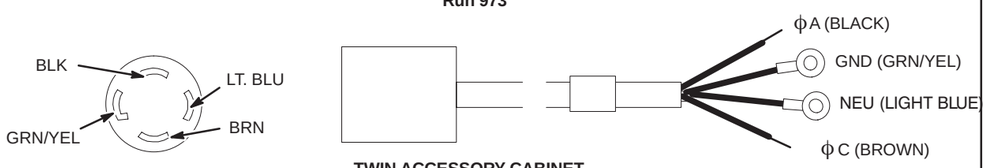
OPERATOR WORKSPACE COMPUTER CABINET
Run 969



WATER CHILLER CABINET (Non–Twin Site)
Run 970



HEAT EXCHANGER CABINET (Non–Twin Site)
Run 973



TWIN ACCESSORY CABINET
Run 989

MAGNET ENCLOSURE UPGRADE INSTRUCTIONS

1–1 Tab 2, Magnet Enclosure, contains upgrade installation instructions for the following:

- *DIRECTION 2309132* – Fixed & T/R Twin*Speed* Magnet Enclosure Installation Instructions
- *DIRECTION 2309133* – WideOpen to Twin*Speed* Magnet Enclosure Upgrade Instructions
- *DIRECTION 2319224* – LCC Box Enclosure to Twin*Speed* Enclosure Upgrade Instructions
- *DIRECTION 2403142* – Signa Magnet Enclosure Upgrade for EXCITE II

Use only the applicable Magnet Enclosure Upgrade Installation Instruction Directions

LIST OF EFFECTIVE PAGES

PAGE	REV	PAGE	REV
1	6	7	6
2	6	8	1
3	6	9	6
4	3	10	1
5	2	11	5
6	1	12	5

WARNING!

FERROUS MATERIAL HAZARD! PARTS REQUIRED FOR THIS UPGRADE INSTALLATION CONTAIN FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME DANGEROUS PROJECTILES.

IF MAGNET IS AT FULL FIELD – KEEP ALL FERROUS TOOLS AND MATERIALS AS FAR FROM THE MAGNET AS POSSIBLE.

GENERAL ENCLOSURE NOTES:

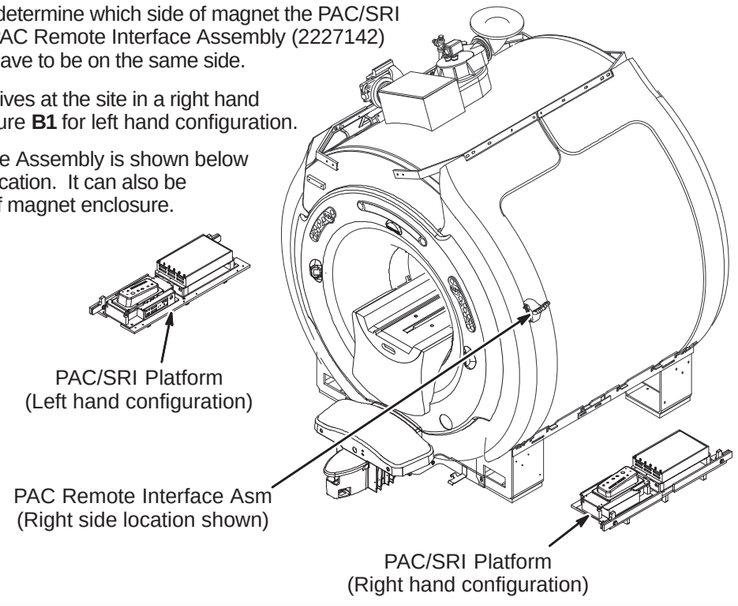
- Front, rear, left, and right, as used in this section, are defined as follows: the patient entrance end of the magnet is the front; the opposite end is the rear; left and right are in respect to a person's left and right while facing the patient entrance end of the magnet.
- A 1–ounce tube of Permatex "Anti–Seize" lubricant (2119594) is provided. Follow instructions on back of tube. "Anti–Seize" lubricant is to be applied to threads of stainless–steel screws before installing into tapped holes of magnet to prevent galling and seizing of cap screw.

INSTALLATION PROCEDURES SUMMARY

- ❑ **A1 – Determine PAC/SRI Platform and PAC Remote Interface Location**
- ❑ **A2 – Route/Connect Coolant Hoses**
- ❑ **A3 – Coolant Valve Installation**

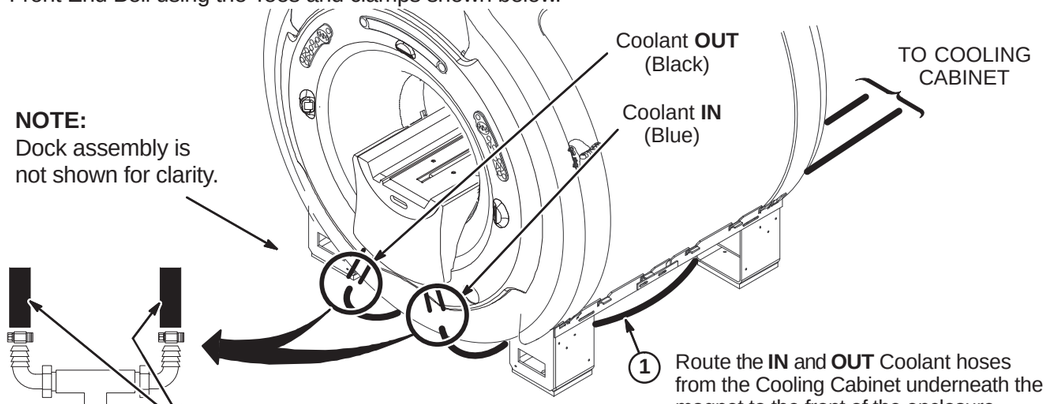
❑ A1 – DETERMINE PAC/SRI PLATFORM AND PAC REMOTE INTERFACE LOCATION

1. Consult with customer to determine which side of magnet the PAC/SRI Platform (2223440) and PAC Remote Interface Assembly (2227142) should be located. They have to be on the same side.
2. The PAC/SRI Platform arrives at the site in a right hand configuration.See Procedure **B1** for left hand configuration.
3. The PAC Remote Interface Assembly is shown below installed in the right side location. It can also be mounted on the left side of magnet enclosure.



❑ A2 – ROUTE/CONNECT COOLANT HOSES

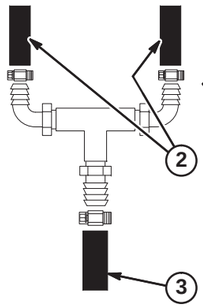
NOTE: Magnet is delivered to site with four 1/2 inch hoses connected to the Front End Bell. The Twin Gradient Hose Assembly (2295225) is delivered to site and also has four duplicate 1/2" hoses .
Discard the 1/2 inch black (2293610–2) and blue (2293610–3) hoses that are part of 2295225.
Connect the IN and OUT coolant hoses from the Cooling Cabinet to the 1/2 inch hoses attached to the Front End Bell using the Tees and clamps shown below.



1. Route the **IN** and **OUT** Coolant hoses from the Cooling Cabinet underneath the magnet to the front of the enclosure.

   Note: It is important that the **IN** and **OUT** hoses are connected to the respective **IN** and **OUT** ports on the Cooling Cabinet.

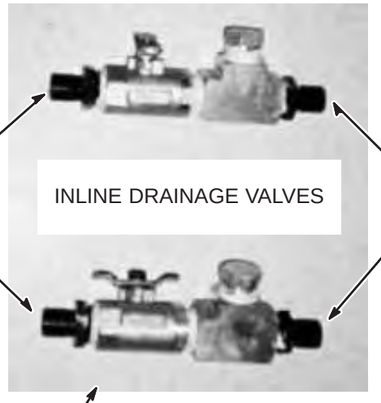
2. Locate Twin Gradient Hose Asm (2295225). Remove and discard the existing 1/2 inch hoses connected to each Tee. Reuse clamps for connecting Tees to existing 1/2 inch hoses that are connected to Front End Bell.



3. Connect the **IN** and **OUT** coolant hoses to the correct Tee's at the front of the enclosure. Secure with hose clamps.

❑ A3 – COOLANT VALVE INSTALLATION

Typical coolant Supply (**IN**) and Return (**OUT**) piping for outdoor cooling unit that is provided by customer in equipment room.



2. Connect **IN** and **OUT** coolant hoses to respective piping hose barbs.

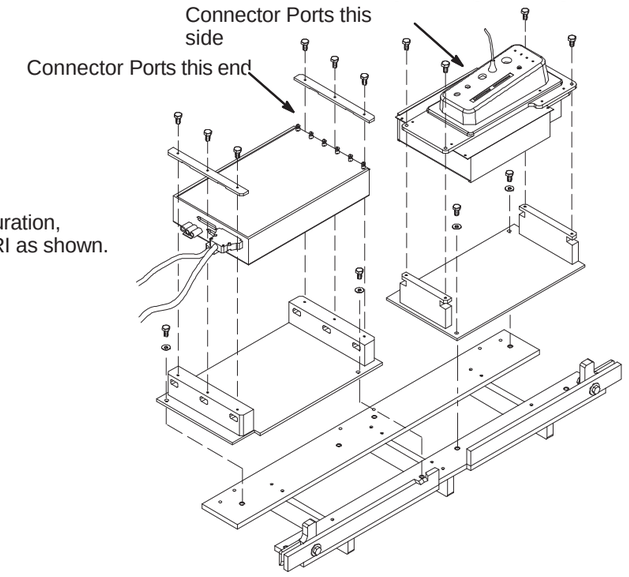
1. The Inline Drainage Valves shown above are installed in coolant hoses near the Penetration Panel on the Equipment Room side. The valve end must be positioned towards the Cooling Cabinet and the Tee end towards the TRM coil.

COOLANT LEAK TEST:
For Fixed sites only; refer to applicable vendor supplied Cooling Cabinet Manual. Manual can also be found on the MR Service Methods CD – ROM: Blowers & Chillers/System Operation
If leak is found, determine source of leak and repair it. **DO NOT ADD MORE COOLANT UNTIL ALL LEAKS ARE FOUND AND REPAIRED.**

INSTALLATION PROCEDURES SUMMARY

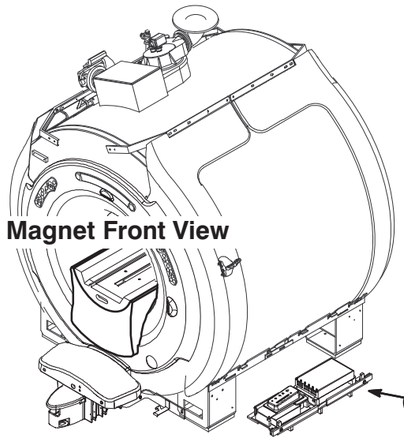
- ❑ **B1 – PAC/SRI Platform Left Hand Configuration (If Required)**
- ❑ **B2 – Location of Magnet Ground Cable**
- ❑ **B3 – 200 Gauss Zone Limit for Movement of Blower Box**
- ❑ **B4 – Preparation of Hoses and Cables Under Rear Pedestal**
- ❑ **B5 – Location of Rear Pedestal**

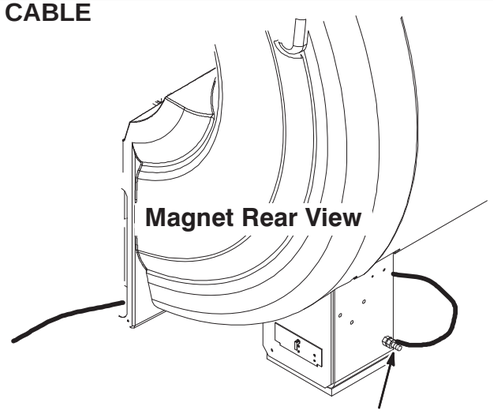
❑ B1 – PAC/SRI PLATFORM LEFT HAND CONFIGURATION (IF REQUIRED)



(1) For left hand configuration, reassemble PAC/SRI as shown.

❑ B2 – LOCATION OF MAGNET GROUND CABLE





(1) If PAC/SRI Platform is located on right side of magnet, then the Magnet ground cable , RUN 040, has to be connected to the opposite side rear left leg as shown above. The other end of Run 040 is connected to the RF Screen Room common ground.

(2) If PAC/SRI Platform is located on left side of magnet, then the Magnet ground cable has to be connected to the opposite side rear right leg.

❑ B3 – 200 GAUSS ZONE LIMIT FOR MOVEMENT OF FERROUS COMPONENTS

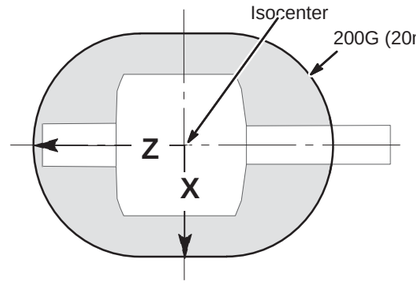


Illustration is not to scale

The movement of ferrous components in the magnet room must be maintained outside of the 200 gauss zone.

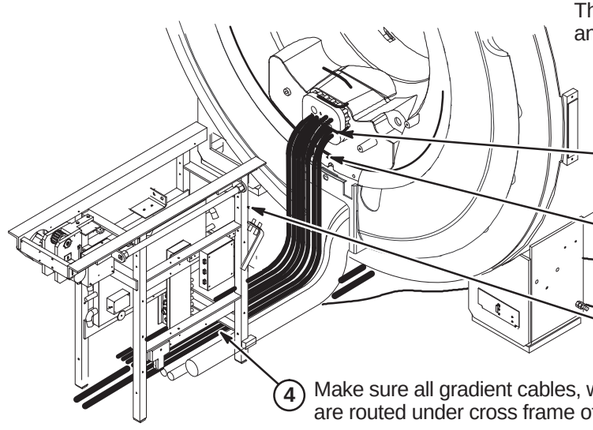
Approximate Distance from isocenter to 200G Line		
	X	**Z**
1.5T	150 cm (59 in)[1]	205 cm (81 in)[1]

Note 1:
These distances represent maximum distances for the magnet strength listed. Use gauss meter if needed.

WARNING! **THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR WHICH IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.**

❑ B4 – PREPARATION OF HOSES AND CABLES UNDER REAR PEDESTAL

Note:
The Bridge sections mounted on the Rear Pedestal and in the bore of the magnet are not shown for clarity.



Note:
Cables and hoses can be routed to exit out of rear or side of Rear Pedestal.

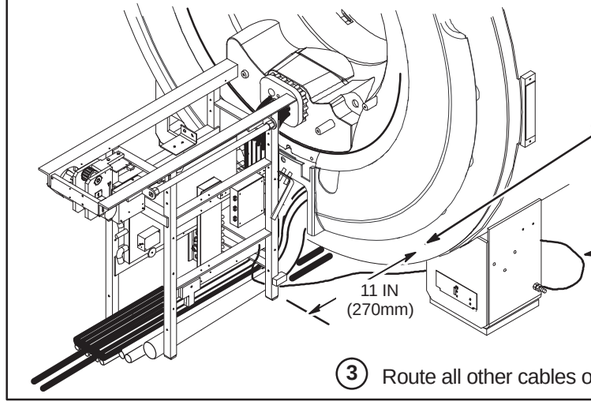
(1) Make sure all twelve cable foam covers are installed as close as possible to Rear End Bell.

(2) Use Ty–wraps to hold bundle together. Space Ty–wraps every 4 inches until 18 inches above floor.

(3) Position Rear Pedestal over cables and hoses at rear of magnet.

(4) Make sure all gradient cables, water lines, gas lines, and 2” air hose are routed under cross frame of Rear Pedestal as shown.

❑ B5 – LOCATION OF REAR PEDESTAL



(1) Center Rear Pedestal on Rear Endbell and locate approximately 11 inches (270mm) from face of magnet.

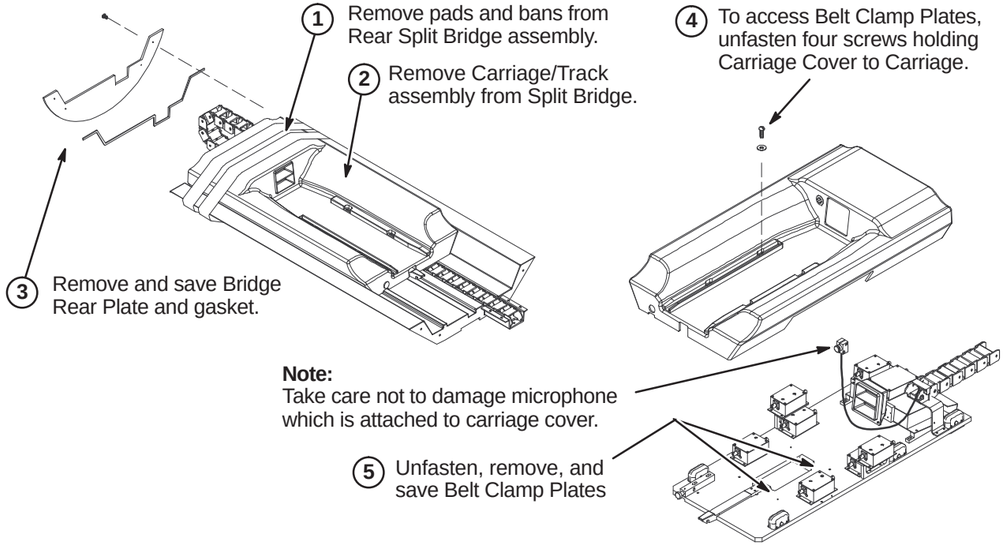
(2) Route Ground cable from Rear Pedestal under magnet and connect to same Ground Stud as Magnet ground.

(3) Route all other cables on top of the above cables and hoses.

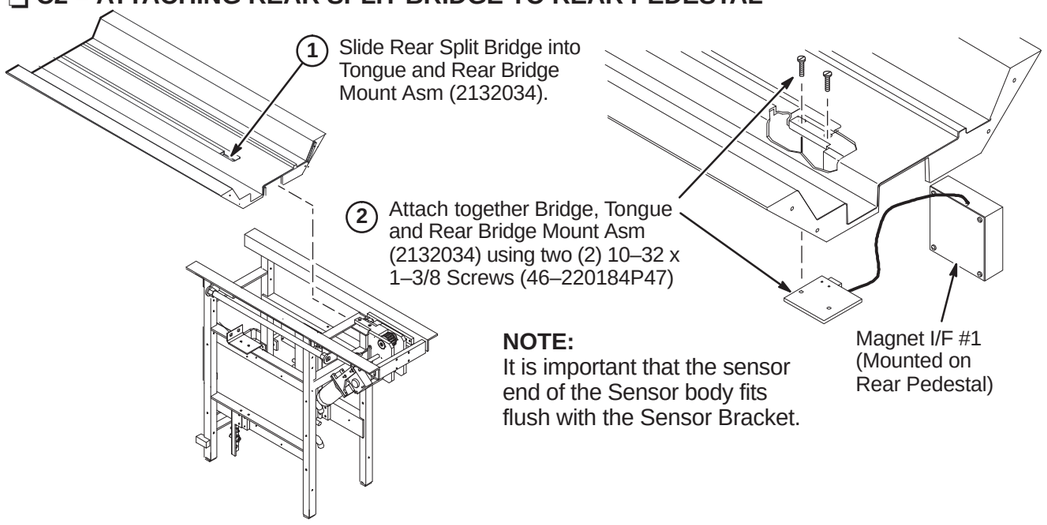
INSTALLATION PROCEDURES SUMMARY (for new style Split Bridge)

- ❑ **C1 – Preparing Rear Split Bridge for Installation**
- ❑ **C2 – Attaching Rear Split Bridge to Rear Pedestal**
- ❑ **C3 – Attaching Rear Split Bridge to Front Split Bridge**
- ❑ **C4 – Aligning Bridge on Rear Pedestal**
- ❑ **C5 – Installing Bridge Locators**

❑ C1 – PREPARING REAR SPLIT BRIDGE FOR INSTALLATION



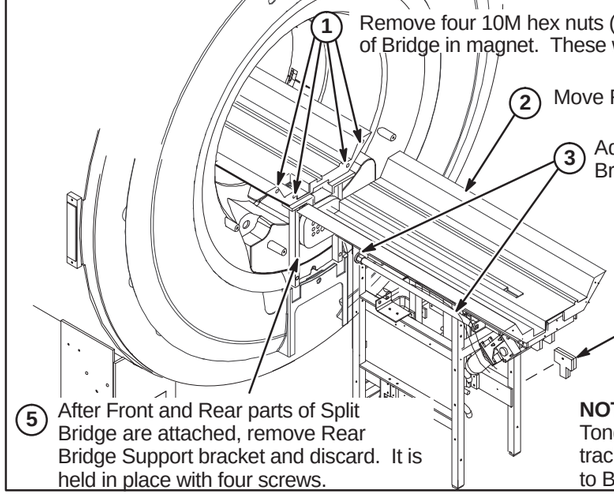
❑ C2 – ATTACHING REAR SPLIT BRIDGE TO REAR PEDESTAL



❑ C3 – PREPARATION FOR FRONT AND REAR BRIDGE CONNECTION

WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR WHICH IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.



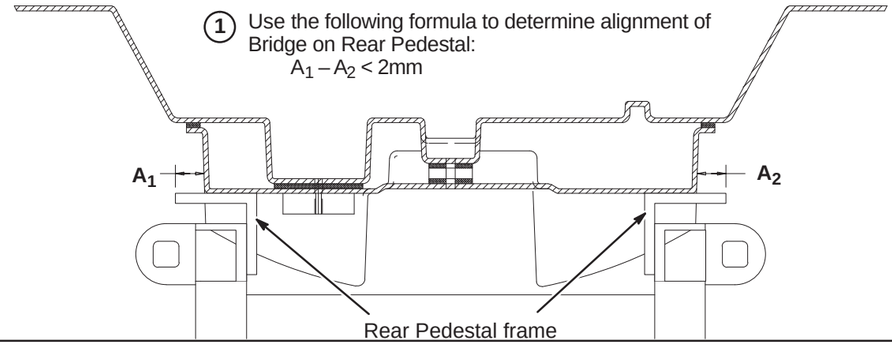
1. Remove four 10M hex nuts (2109877–3) and washers (2228717–2) from end of Bridge in magnet. These will be used for attaching the Rear Split Bridge.
2. Move Rear Pedestal/Bridge into position.
3. Adjust the Rear Pedestal to level the rear Split Bridge with the front Split Bridge.

Fasten front and rear Split Bridge parts with four nuts and washers that were removed from end of Front Split Bridge.

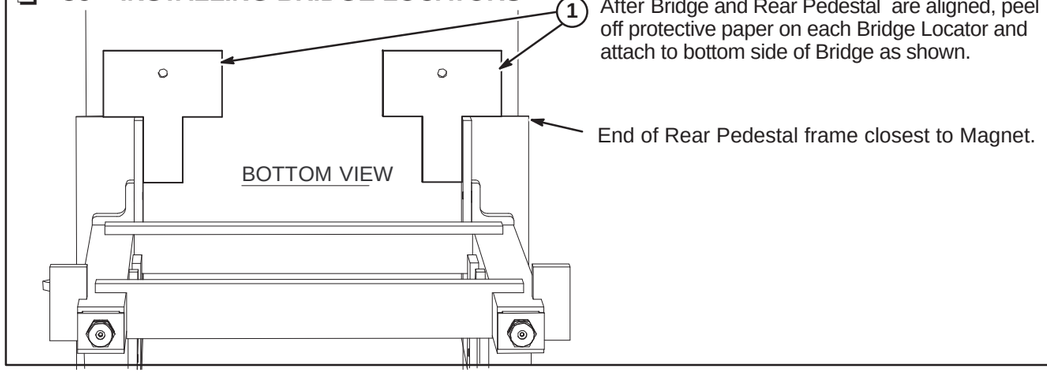
4. Remove two Bridge Locators (2235607) from shipping location on Rear Pedestal. These will be used for aligning Rear Pedestal to Bridge.
5. After Front and Rear parts of Split Bridge are attached, remove Rear Bridge Support bracket and discard. It is held in place with four screws.

NOTE:
Tongue to Bridge alignment is critical to smooth belt tracking and operation. Make sure Tongue is square to Bridge and Rear Pedestal.

❑ C4 – ALIGNING BRIDGE ON REAR PEDESTAL



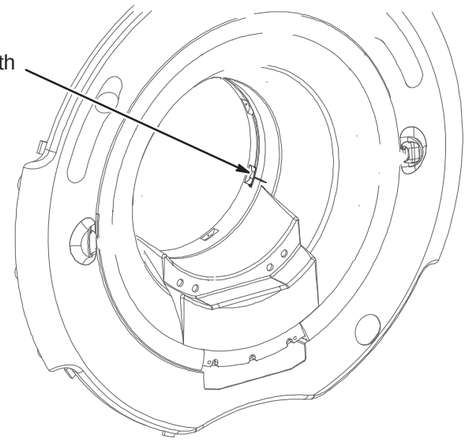
❑ C5 – INSTALLING BRIDGE LOCATORS



INSTALLATION PROCEDURES SUMMARY

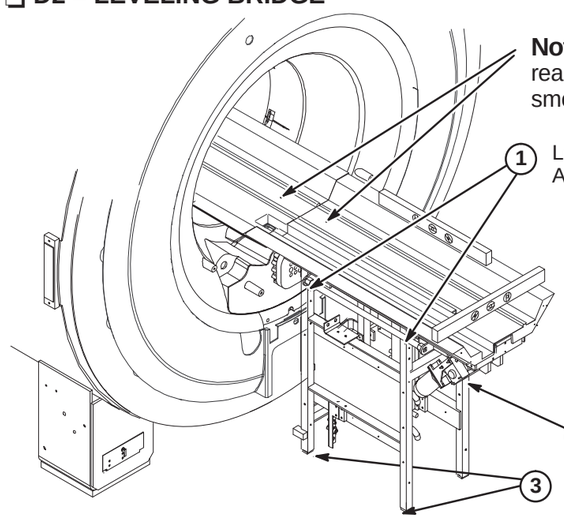
- ❑ D1 – Leveling Front of Bridge
- ❑ D2 – Leveling Bridge
- ❑ D3 – Installing Carriage on Bridge
- ❑ D4 – Routing Drive Belt

❑ D1 – LEVELING FRONT OF BRIDGE



1. Top of front end of Bridge should line up with alignment marks on side of Front End Bell
2. Put a level across front of Bridge.
3. Level front of Bridge by adjusting right or left slider screws to center the bubble.

❑ D2 – LEVELING BRIDGE



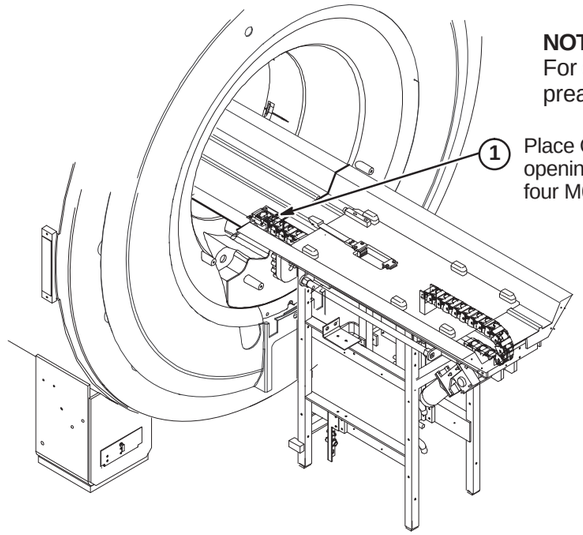
Note: Make sure that surfaces between front and rear Bridge surfaces are even. This will provide smooth travel for the Carriage Cover wheels.

1. Level Rear Pedestal Bridge and tighten Vertical Adjustment Fasteners.

NOTE:
Rear Pedestal must be adjusted to maintain full contact between bottom of Bridge and top of Rear Pedestal.

2. Make sure that Longitudinal Drive Asm is level.
3. Adjust leg screws on both sides as needed to level Rear Pedetal.

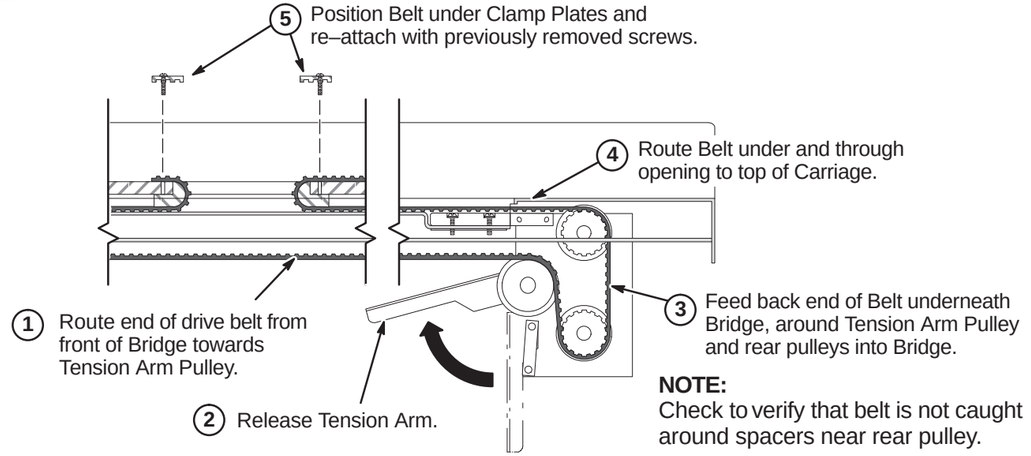
❑ D3 – INSTALLING CARRIAGE ON BRIDGE



NOTE:
For clarity, the carriage is shown without preamps, preamp protect module, and cables.

1. Place Carriage on Bridge and route all cables thru opening in Bridge and fasten plate to Front Bridge with four M6 x 12mm nylon screws (2296958) provided.

❑ D4 – ROUTING OF DRIVE BELT



5. Position Belt under Clamp Plates and re–attach with previously removed screws.
4. Route Belt under and through opening to top of Carriage.
1. Route end of drive belt from front of Bridge towards Tension Arm Pulley.
2. Release Tension Arm.
3. Feed back end of Belt underneath Bridge, around Tension Arm Pulley and rear pulleys into Bridge.

NOTE:
Check to verify that belt is not caught around spacers near rear pulley.

INSTALLATION PROCEDURES SUMMARY (for new style Split Bridge)

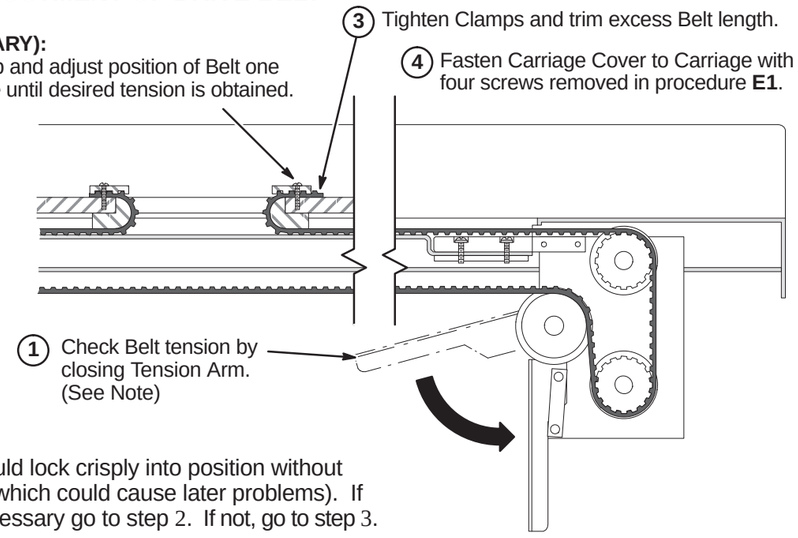
- ❑ **M1 – Final Adjustment of Drive Belt**
- ❑ **M2 – Installation of Sensor Flag**
- ❑ **M3A – Route Non–MGD Runs 404 and 485 (and Multi–coil Cables if Required)**
  OR
- ❑ **M3B – Route/Connect MGD Cables from LPCA to Rear Pedestal**
- ❑ **M4 – Installing Carriage Cover to Trolley and Bridge Cover**

❑ E1 – FINAL ADJUSTMENT OF DRIVE BELT

(2) **(IF NECESSARY):**
Loosen Clamp and adjust position of Belt one tooth at a time until desired tension is obtained.

(3) Tighten Clamps and trim excess Belt length.

(4) Fasten Carriage Cover to Carriage with four screws removed in procedure **E1**.



(1) Check Belt tension by closing Tension Arm. (See Note)

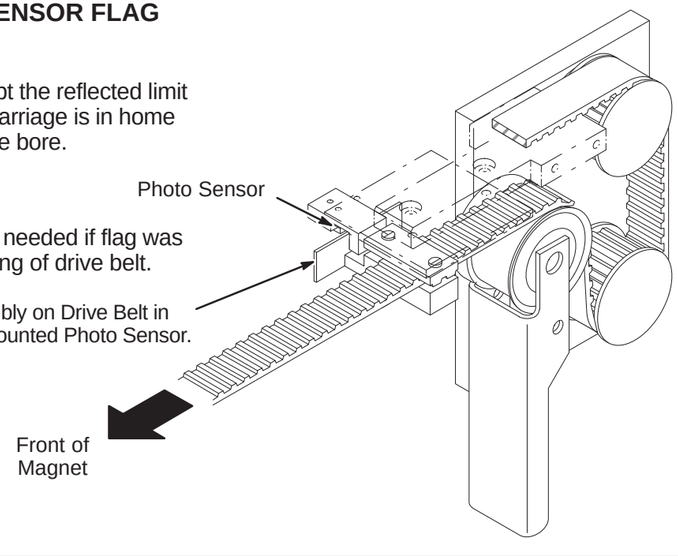
NOTE:
Tension Arm should lock crisply into position without excessive force (which could cause later problems). If adjustment is necessary go to step 2. If not, go to step 3.

❑ E2 – INSTALLATION OF SENSOR FLAG

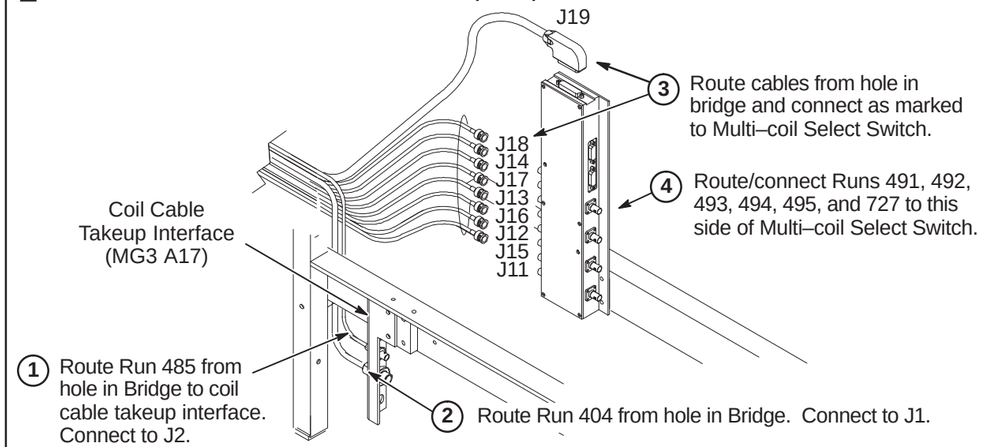
NOTE:
Function of the Flag is to interrupt the reflected limit switch sensor beam when the Carriage is in home position all the way forward in the bore.

NOTE:
The following Step is needed if flag was removed during routing of drive belt.

(1) Install Flag Assembly on Drive Belt in line with Bridge mounted Photo Sensor.



❑ E3A – ROUTE NON–MGD RUNS 404, 485, AND MULTI–COIL CABLES



(3) Route cables from hole in bridge and connect as marked to Multi–coil Select Switch.

(4) Route/connect Runs 491, 492, 493, 494, 495, and 727 to this side of Multi–coil Select Switch.

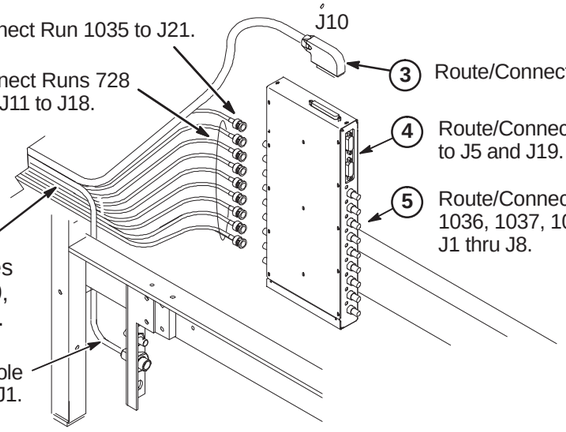
(1) Route Run 485 from hole in Bridge to coil cable takeup interface. Connect to J2.

(2) Route Run 404 from hole in Bridge. Connect to J1.

❑ E3B – ROUTE/CONNECT MGD CABLES FROM LPCA TO REAR PEDESTAL

(1) Route/Connect Run 1035 to J21.

(2) Route/Connect Runs 728 thru 735 to J11 to J18.



(3) Route/Connect Run 1041 to J19.

(4) Route/Connect Runs 1042 and 1049 to J5 and J19.

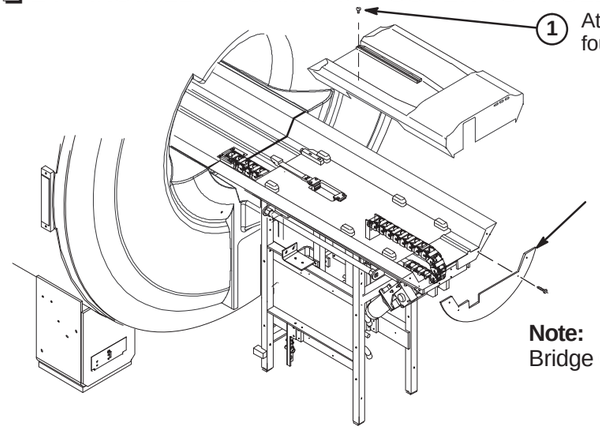
(5) Route/Connect Runs 491, 492, 493, 1036, 1037, 1038, 1039, and 1040 to J1 thru J8.

NOTE:
If required, cable track replacement procedures covered in Dir. 2333499, shipped with M3090EB.

(6) Route Run 404 from hole in Bridge. Connect to J1.

❑ E4 – INSTALLING CARRIAGE COVER TO TROLLEY AND BRIDGE COVER

(1) Attach Carriage Cover to Trolley using four previously removed fasteners.



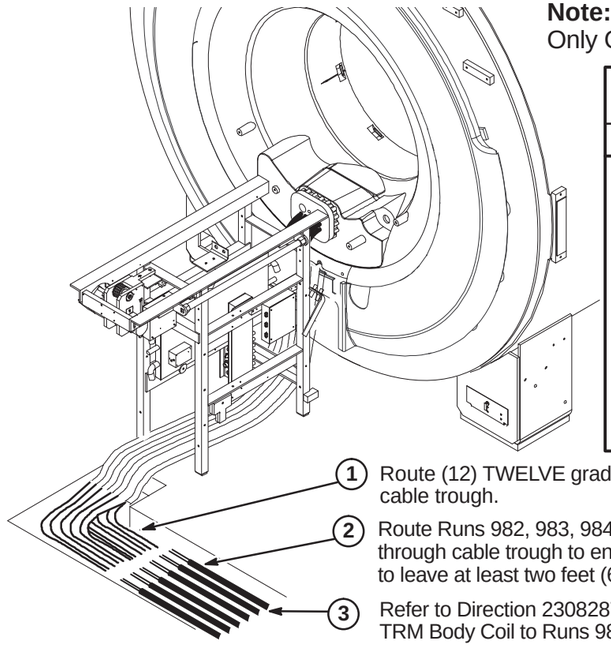
Replace previously removed Bridge Cover and fasten with (4) screws to end of Bridge.

Note:
Bridge Cover has enclosure rating plates on it.

INSTALLATION PROCEDURES SUMMARY

- ❑ **E1 – Routing and Connecting Gradient Output Cables**
- ❑ **E2 – Route/Connect Runs 282, 414, 422, 781, 782, & Front End Bell Speaker Cable**
- ❑ **E3 – Route/Connect Runs 257, 262, 743, 744, and 780**
- ❑ **E4 – Route/Connect Runs 258, 318, 700, and Drive Cables**

❑ E1 – ROUTING AND CONNECTING GRADIENT OUTPUT CABLES

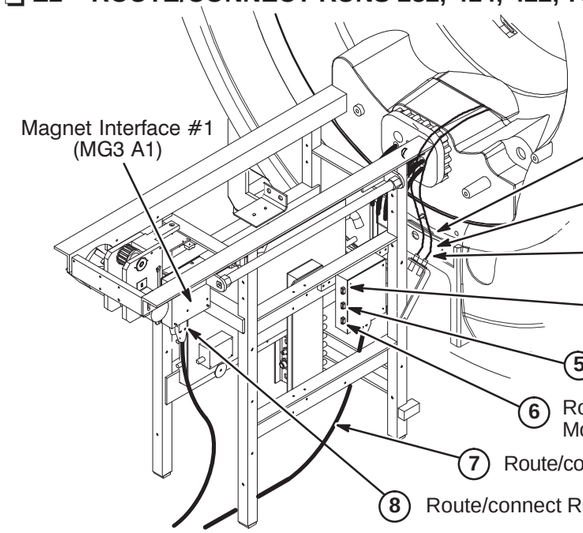


Note:
Only Gradient Cables are shown for clarity.

TRM COIL CABLE LABELS		OUTPUT CABLE LABELS		
WIRE #	LABEL	RUN #	LABEL	WIRE #
1	Z ZM–	982	ZM–	2
2	Z ZM+	982	ZM+	1
3	X WB–	987	WB–	2
4	X WB+	987	WB+	1
5	Y WB+	986	WB+	1
6	Y ZM–	983	ZM–	2
7	Y WB–	986	WB–	2
8	Y ZM+	983	ZM+	1
9	Z WB+	985	WB+	1
10	X ZM–	984	ZM–	2
11	Z WB–	985	WB–	2
12	X ZM+	984	ZM+	1

1. Route (12) TWELVE gradient Output Cables from TRM Body Coil to cable trough.
2. Route Runs 982, 983, 984, 985, 986, and 987 from Penetration Panel through cable trough to ends of Body Coil gradient cables. Make sure to leave at least two feet (610mm) of slack before cutting to length.
3. Refer to Direction 2308287 in Tab 1 for connecting Output cables from TRM Body Coil to Runs 982, 983, 984, 985, 986, and 987.

❑ E2 – ROUTE/CONNECT RUNS 282, 414, 422, 781, 782, & FRONT END BELL CABLE



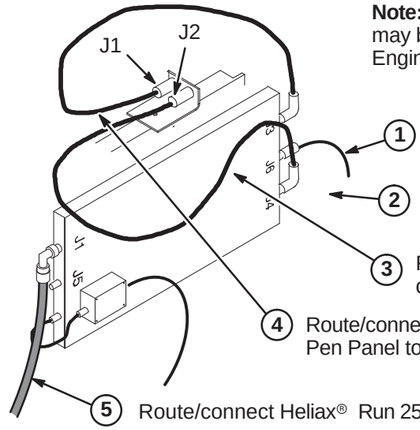
1. Route and connect RF Bias cables from RF Coil to bracket as marked.
2. Route and connect Run 781 from Bias cable J5 to J75 on the Penetration Panel.
3. Route and connect Run 782 from Bias cable J6 to J76 on the Penetration Panel.
4. Route/connect microphone cable from Carriage Cover to J7.
5. Route/connect Front End Bell microphone cable Run 414 to J9.
6. Route/connect speaker cable from Patient Comfort Module to J8.
7. Route/connect Run 282 from J12 on Pen Panel to J6.
8. Route/connect Run 422 from J2 on SRI to J4 on Magnet Interface #1.

❑ E3 – ROUTE/CONNECT RUNS 257, 262, 743, 744, AND 780

CAUTION

The RF Drive Input cables, Runs 743 and 744, utilize a corregated solid RF shield. If mishandled, the cable can be kinked and subsequently broken.

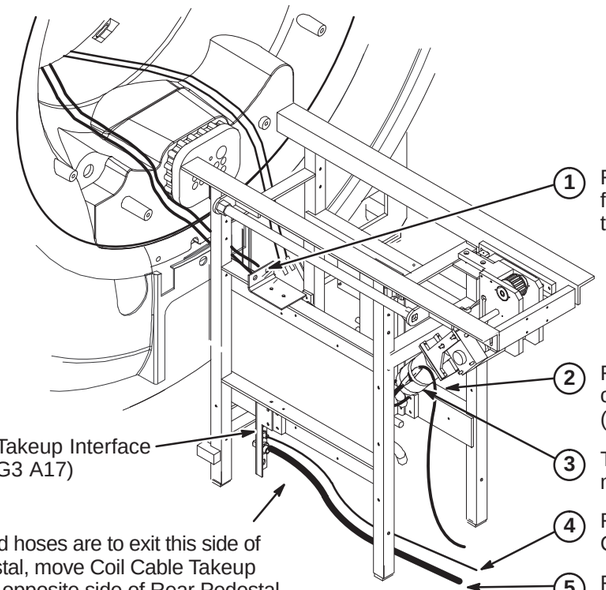
Also, use care when connecting these cable to the bulkhead connectors J1 and J2 and RF Splitter connectors J3 and J4. Cross threading or inadequate engagement of the center pin can cause arcing and damage the cables.



Note: Runs 743 and 744, Body Coil to RF Splitter cable connections may be reversed depending on magnet field polarity. Consult local Field Engineer for proper routing.

1. Route/connect Run 780 from J74 on Pen Panel to J6 on RF Splitter.
2. Route and connect Run 744 from J1 on bracket to J4 on the RF Splitter.
3. Route and connect Run 743 from J2 on the bracket to J3 on the RF Splitter.
4. Route/connect Run 262 from J8 on Pen Panel to Body Coil Preamplifier.
5. Route/connect Heliax® Run 257 to J1 on RF Splitter.

❑ E4 – ROUTE/CONNECT RUNS 258, 318, 700, AND DRIVE CABLES



1. Route I & Q RF Drive Input cables from RF Coil and connect as marked to J1 and J2 on bracket.
2. Route/connect Run 318 to short cable on Longitudinal Motor Drive (MG3 A7).
3. Ty–wrap cable to motor to prevent movement.
4. Route/connect Run 700 to J2 on Coil Cable Takeup Interface.
5. Route/connect Run 258 to J1 on Coil Cable Takeup Interface.

Note:
If cables and hoses are to exit this side of Rear Pedestal, move Coil Cable Takeup Interface to opposite side of Rear Pedestal.

If Interface bracket is moved to other side, connectors on bracket need to be removed, turned end for end, and reinstalled.

INSTALLATION PROCEDURES SUMMARY

- ❑ **F1 – Install Blower Box and Route/Connect Air Hose**
- ❑ **F2 – Install Bore Lamp Assembly**
- ❑ **F3 – Route/Connect Vacuum Hose and Elbow**

❑ F1 – INSTALL BLOWER BOX AND ROUTE/CONNECT AIR HOSE

CAUTION

THE BLOWER BOX CONTAINS FERROUS MATERIAL. The proper mounting of the Blower Box is critical to safety. It MUST be mounted per these instructions

IMPORTANT!

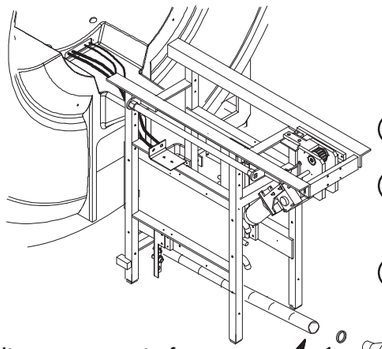
Location of cabinet and type of fastener used for securing Blower Box outside of minimum service area should be specified in the Site Design (architectural/Construction) drawings. If proper mounting area is not specified, contact the Project Manager of Installation (PMI).

WARNING!

RF SHIELD INTEGRITY MUST BE MAINTAINED FOR MOUNTING BLOWER BOX WITHIN THE MAGNET ROOM

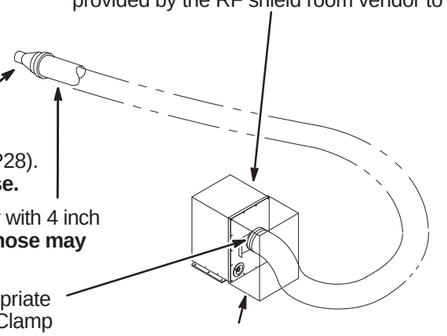
WARNING!

THE BLOWER BOX IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE BLOWER BOX REQUIRES TWO PEOPLE AND MUST BE OUTSIDE THE 200 GAUSS ZONE. REFER TO THE TABLE IN SECTION 1–1 UPGRADE INTRODUCTION.



1. Refer to site design (architectural)/customer construction drawings or contact PMI for locating and securing Blower Box (2121199).
2. Check for correct installation of the anchors:
   - Confirm that the anchors are physically secured to the building structure, not to a removable computer floor, raised floor, or false floor.
   - Confirm there are at least four (4) anchors.
   - If any or the anchors appears wobbly or loose, stop the installation and contact the PMI to fix anchoring.
3. Remove any mounting hardware from the anchors. Hoses should face the back of the room
4. Position the blower box on top of 4 or more anchors. Hoses should face th eback of the room.
5. Secure the blower box using the hardware provided by the RF shield room vendor to attach.

Note:
The following items are part of Blower Hose Kit, 2129412–5.

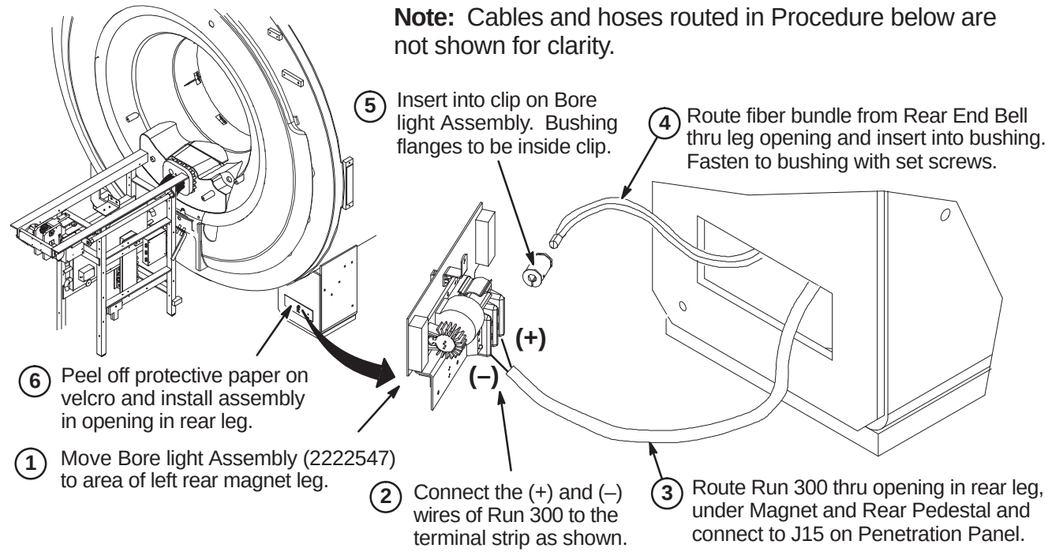


6. Connect 2 inch air hose from Rear End Bell to Reducer (2175143) with 2 inch clamp (46–208765P28). **Do not cut or reduce the length of the 2 inch hose.**
7. Connect 4 inch air hose (46–282666P11) to reducer with 4 inch clamp (46–208765P34). **If necessary, the 4 inch hose may need to be cut to reduce length.**
8. Route 4 inch hose to Blower Cabinet. Trim to appropriate length and attach to vent opening with 4 inch Hose Clamp (46–208765P34).

NOTE: If needed, Blower Hose Cover can be cut and modified.

❑ F2 – INSTALL BORE LAMP ASSEMBLY

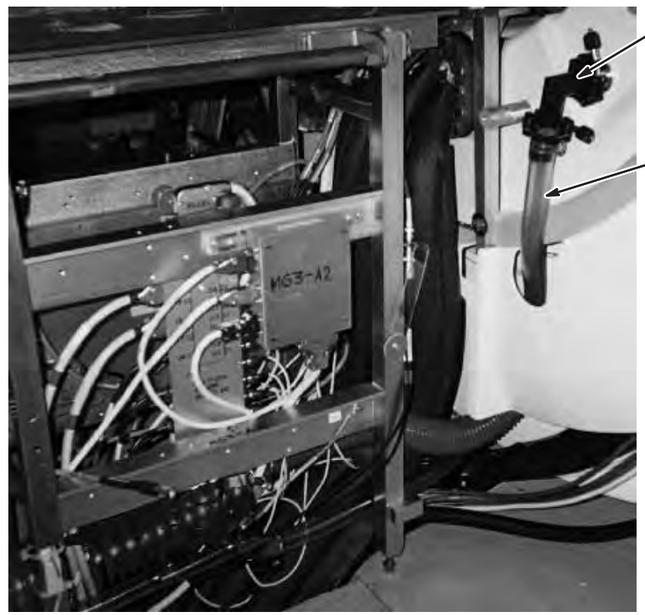
Note: Cables and hoses routed in Procedure below are not shown for clarity.



5. Insert into clip on Bore light Assembly. Bushing flanges to be inside clip.
4. Route fiber bundle from Rear End Bell thru leg opening and insert into bushing. Fasten to bushing with set screws.
6. Peel off protective paper on velcro and install assembly in opening in rear leg.
1. Move Bore light Assembly (2222547) to area of left rear magnet leg.
2. Connect the (+) and (–) wires of Run 300 to the terminal strip as shown.
3. Route Run 300 thru opening in rear leg, under Magnet and Rear Pedestal and connect to J15 on Penetration Panel.

❑ F3 – ROUTE/CONNECT VACUUM HOSE AND ELBOW

Note:
Vacuum Grease **must** be applied to all Centering Rings (2293608) and outside edge of vacuum connector flanges.



1. Install Elbow (2293609) to End Bell using centering ring (2293608) and chain clamp (2293618–2). Tighten chain clamp to **"finger tight"**.
2. Route vacuum hose (2293607) from Elbow on End Bell, thru Penetration Panel, to connection at rear of TAC Cabinet in Equipment Room. Cut to length.
3. At each end of vacuum hose insert Hose Connector (2293616), apply vacuum grease to ouside edge of connector and fasten with two (2) Clamps (2294010–3).
4. Apply vacuum grease to outside edge of Hose Connector flanges and respective connector flanges on TAC and End Bell.
5. Connect each end of Vacuum Hose using centering ring (2293608) and chain clamp (2293618–2). Tighten chain clamp to **"finger tight"**.

INSTALLATION PROCEDURES SUMMARY

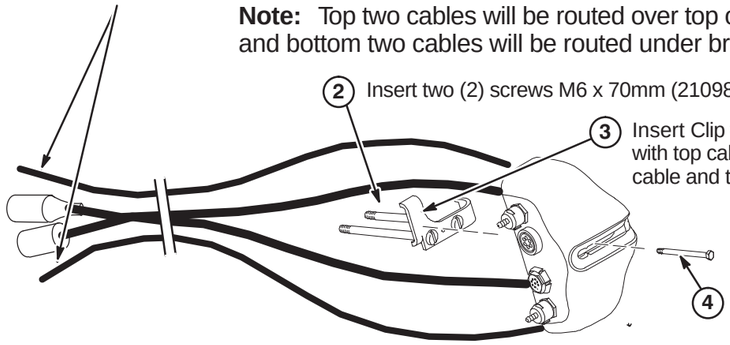
- ❑ **H1 – Prepare Cables and Tubes for Routing**
- ❑ **H2 – Position Remote PAC Interface Mounting Clip**
- ❑ **H3 – Route Remote PAC Interface Cables and Tubes**
- ❑ **H4 – Installing Remote PAC Interface to Arc Cover**
- ❑ **H5 – Install PAC Hanger Bar**

❑ H1 – PREPARE CABLES AND TUBES FOR ROUTING

Note:
Consult with customer for correct location of Remote PAC Interface assembly. It must be on the same side as the PAC/SRI Platform, as positioned in Procedure **A1**

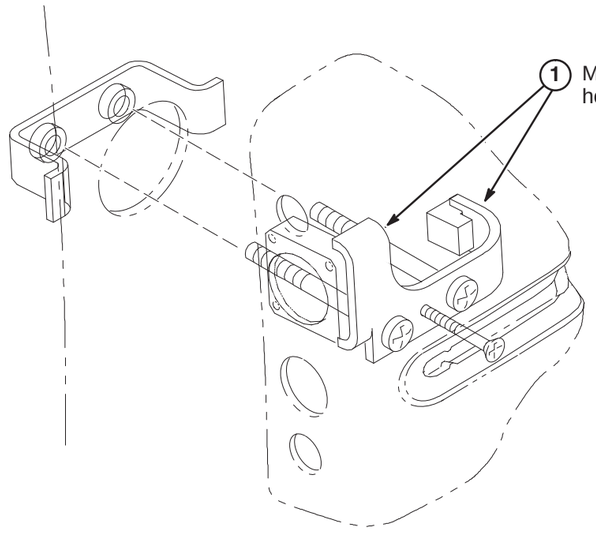
1. Apply tape around end of pneumatic tubes and mark "TOP" to the opposite end of the tube connected to the top connector in the Remote PAC Interface Assembly and "BOTTOM" to the tube connected to the lower connector.

Note: Top two cables will be routed over top of bracket and bottom two cables will be routed under bracket.



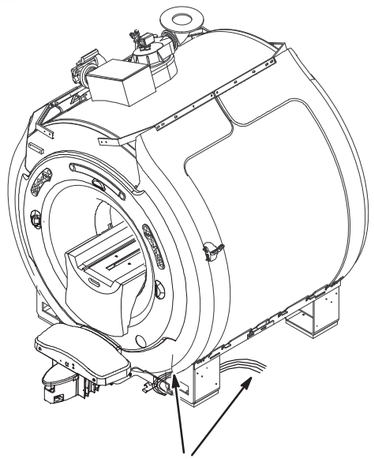
2. Insert two (2) screws M6 x 70mm (2109873–33) screws into Clip (2221023).
3. Insert Clip with screws into shell as shown with top cable and tube above Clip and bottom cable and tube below.
4. Hold in place by inserting provided M4 screw thru slot and turning about 3 or 4 turns into Clip.

❑ H2 – POSITION REMOTE PAC INTERFACE MOUNTING CLIP



1. Make sure each side of clip is mounted behind housing blocks.

❑ H3 – ROUTE REMOTE PAC INTERFACE CABLES AND TUBES

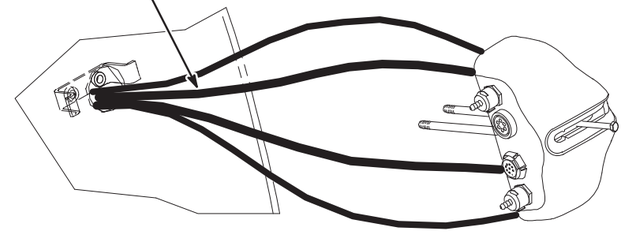


3. Route around foot of magnet to PAC/SRI Platform location.

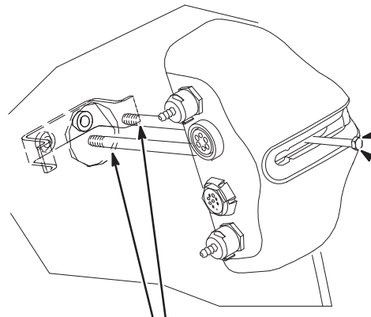
Note: Top two cables will be routed over top of bracket and bottom two cables will be routed under bracket.

Note: Insert cables/tubes separately thru hole and make sure they come out at bottom of arc cover.

1. **Insert ECG Cable first.** Route this thru pre–mounted foam tube (if available) located on inside of Arc cover.
2. Route Peripheral Pulse cable and tubes next.



❑ H4 – INSTALLING REMOTE PAC INTERFACE TO ARC COVER

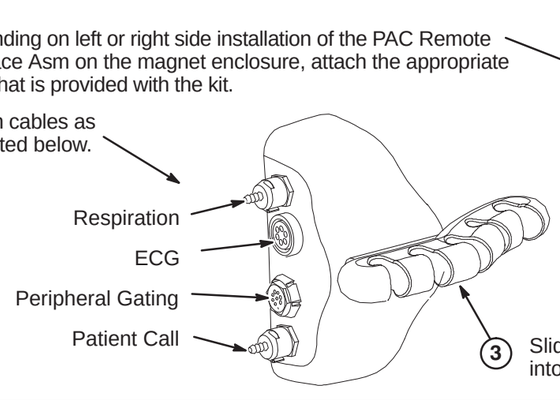


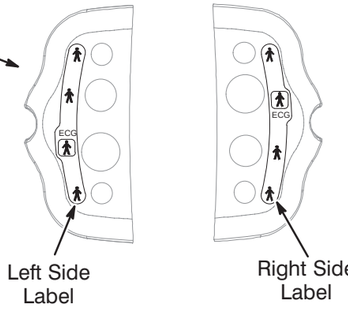
Note:
Routed cables and tubes not shown for clarity.

1. Use M4 screw thru slot to lift and guide small end of Clamp over block inside housing.
3. Remove M4 screw and save for use at at later time since it would be required if Remote PAC Interface Assembly would need to be removed at any time in the future.
   OR
   Turn the M4 screw inward until there is clearance for sliding the PAC Hanger Bar in **T5** into place.
2. Using screwdriver thru housing slot, tighten down the M6 screws to lock housing in place.

❑ H5 – INSTALL PAC HANGER BAR

1. Depending on left or right side installation of the PAC Remote Interface Asm on the magnet enclosure, attach the appropriate label that is provided with the kit.
2. Attach cables as indicated below.



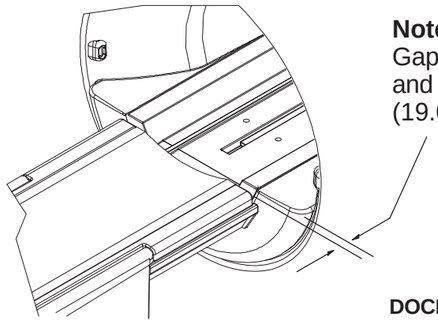


3. Slide PAC Hanger Bar (2221023) into position.

INSTALLATION PROCEDURES SUMMARY

- ❑ **J1 – Dock Adjustment for Patient Transport Gap**
- ❑ **J2 – Route and Connect Magnet Enclosure Front Area Cables**
- ❑ **J3 – Cable Connection to PAC Module**

❑ J1 – DOCK ADJUSTMENT FOR PATIENT TRANSPORT GAP



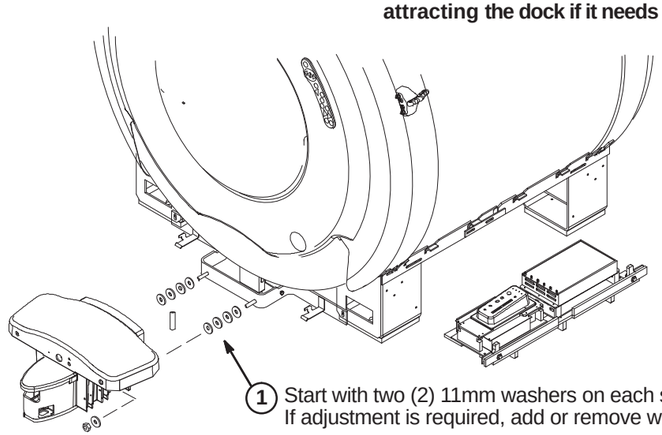
Note:
Gap between Patient Transport front rubber inlay and front of End Bell must be 0.75 Inches ±0.25 (19.0±6.4mm). See Step 1 below.

WARNING!

DOCK CONTAINS FERROUS MATERIAL. HANDLE WITH CARE DURING INSTALLATION. IF MAGNET IS RAMPED, WHENEVER MOVING DOCK, DOWNWARD PRESSURE MUST BE CONSTANTLY APPLIED TO THE TOP OF THE DOCK ASSEMBLY BY TWO PEOPLE. DOCK MUST BE MOVED SLOWLY ALONG THE GROUND AND NOT LIFTED VERTICALLY

WARNING!

DO NOT LIFT THE DOCK MORE THAN 2 INCHES (5 CM) OFF THE FLOOR. If the height (to clear the dock anchor) exceeds two inches (5 cm), the magnet must be ramped down prior to removing or installling the dock as there is significant risk of the magnet attracting the dock if it needs to be raised more that 2 inches (5 cm).



1. Start with two (2) 11mm washers on each side between Dock and Dock Support. If adjustment is required, add or remove washers until proper gap is acheived.

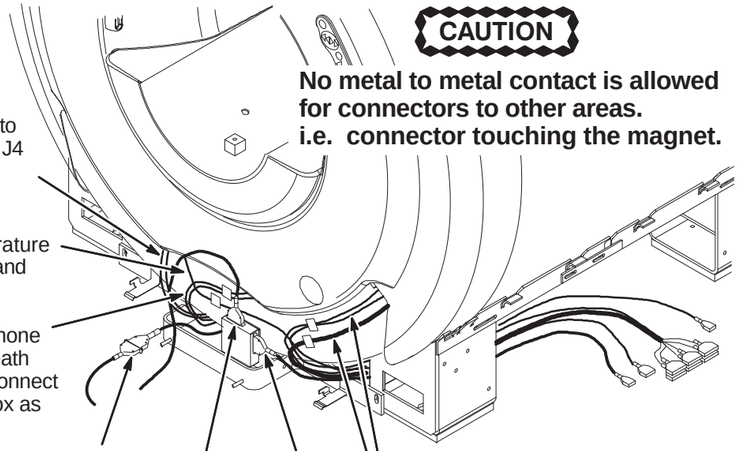
Note:
Floor stud installed by RF room vendor/mechanical contractor.

❑ J2 – ROUTE AND CONNECT MAGNET ENCLOSURE FRONT AREA CABLES

Note:
Dock Assembly not shown for clarity.

CAUTION

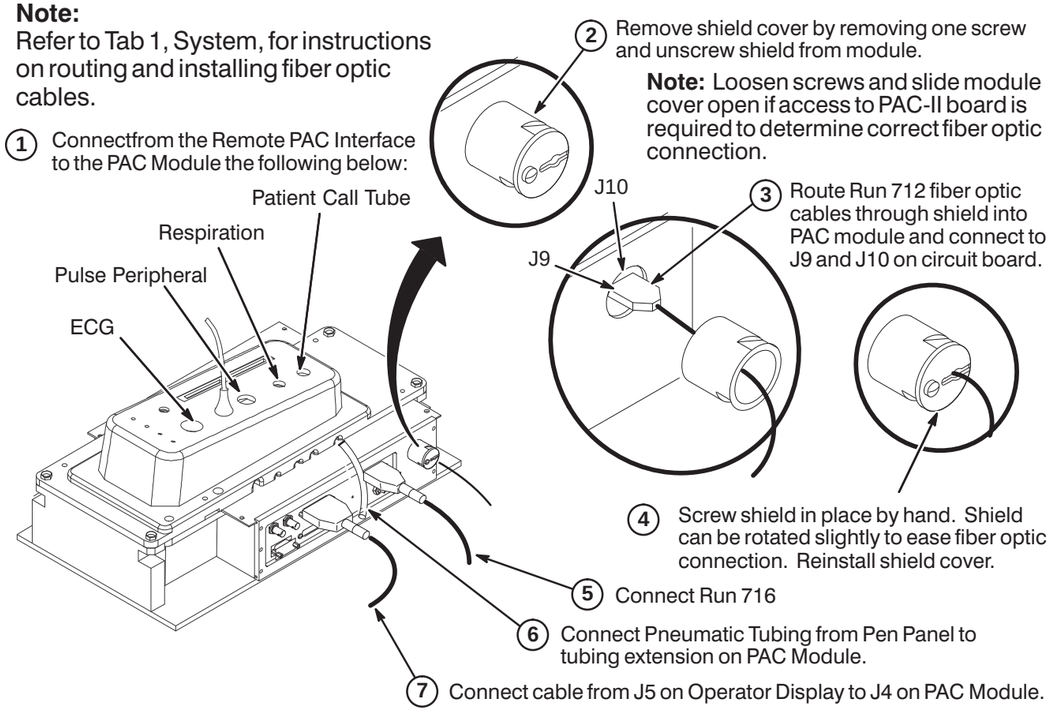
No metal to metal contact is allowed for connectors to other areas. i.e. connector touching the magnet.



1. Route Runs 778 and 779 to front RF Bias cables J3 & J4 and connect as marked.
2. Route Run 749, Bore Temperature Sensor, from Front End Bell and connect ot J10 on SRI.
3. Route Front End Bell Microphone and Speaker cables underneath manet to ReaPedestal and connect to Patient Communication Box as marked.
4. Connect Run 387 to Dock Cable (MG2 A29 P1). If needed to prevent contact with other metal parts, cover connectors with provided velcro jacket or tape.
5. Connect Dock Cable to J2 on Dock Limit Box
6. Route/Connect Run 421 from SRI J3 and connect to J1 on Dock Limit Box.
7. Route cables from Operator Display to area of PAC/SRI Platform and connect as marked to SRI and PAC.

❑ J3 – CABLE CONNECTION TO PAC MODULE

Note:
Refer to Tab 1, System, for instructions on routing and installing fiber optic cables.



1. Connectfrom the Remote PAC Interface to the PAC Module the following below:
2. Remove shield cover by removing one screw and unscrew shield from module.

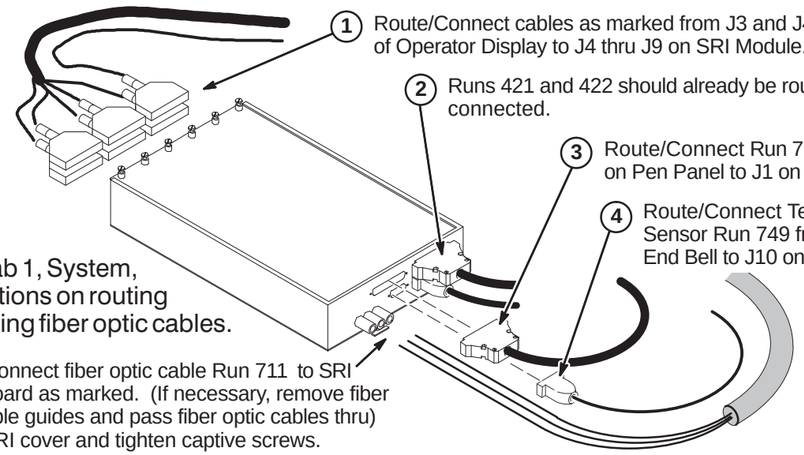
Note: Loosen screws and slide module cover open if access to PAC-II board is required to determine correct fiber optic connection.

3. Route Run 712 fiber optic cables through shield into PAC module and connect to J9 and J10 on circuit board.
4. Screw shield in place by hand. Shield can be rotated slightly to ease fiber optic connection. Reinstall shield cover.
5. Connect Run 716
6. Connect Pneumatic Tubing from Pen Panel to tubing extension on PAC Module.
7. Connect cable from J5 on Operator Display to J4 on PAC Module.

INSTALLATION PROCEDURES SUMMARY

- ❑ **K1 – Connect Cables to SRI Module**
- ❑ **K2 – Routing of Photo–Plethysmograph Cable**
- ❑ **K3 – Route and Tie–wrap Cables to PAC/SRI Platform**
- ❑ **K4 – Install PAC/SRI Platform under Magnet**

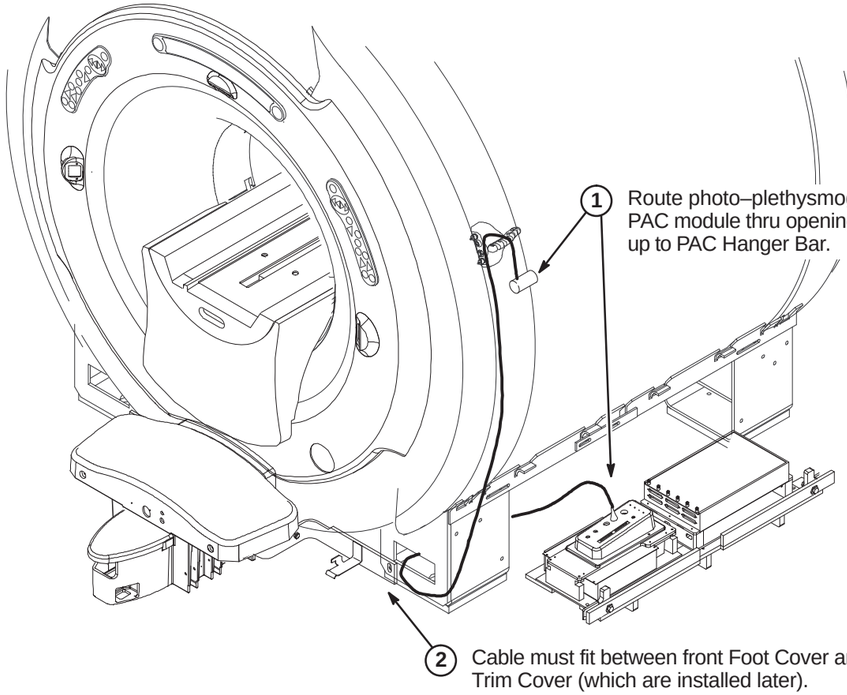
❑ K1 – CONNECT CABLES TO SRI MODULE



1. Route/Connect cables as marked from J3 and J4 of Operator Display to J4 thru J9 on SRI Module.
2. Runs 421 and 422 should already be routed and connected.
3. Route/Connect Run 715 from J14 on Pen Panel to J1 on SRI Module.
4. Route/Connect Temperture Sensor Run 749 from Front End Bell to J10 on SRI Module
5. Route/Connect fiber optic cable Run 711 to SRI circuit board as marked. (If necessary, remove fiber optic cable guides and pass fiber optic cables thru) Close SRI cover and tighten captive screws.

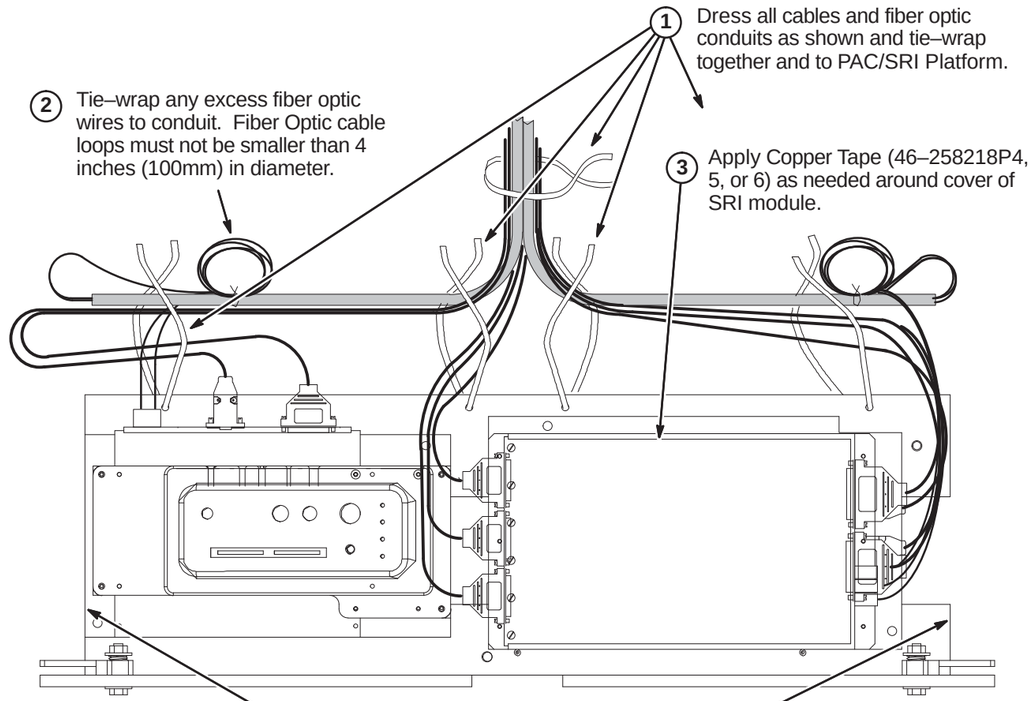
Note:
Refer to Tab 1, System, for instructions on routing and installing fiber optic cables.

❑ K2 – ROUTING OF PHOTO–PLETHYSMOGRAPH CABLE



1. Route photo–plethysmograph cable from PAC module thru opening in front leg and up to PAC Hanger Bar.
2. Cable must fit between front Foot Cover and side Trim Cover (which are installed later).

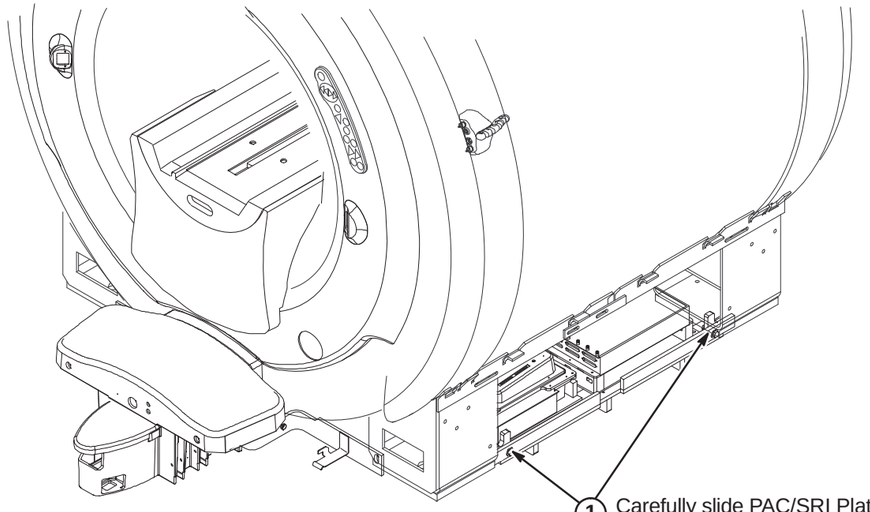
❑ K3 – ROUTE AND TIE–WRAP CABLES TO PAC/SRI PLATFORM



1. Dress all cables and fiber optic conduits as shown and tie–wrap together and to PAC/SRI Platform.
2. Tie–wrap any excess fiber optic wires to conduit. Fiber Optic cable loops must not be smaller than 4 inches (100mm) in diameter.
3. Apply Copper Tape (46–258218P4, 5, or 6) as needed around cover of SRI module.

Note: Keep cables dressed inside edge so unit slides between legs easily for service.

❑ K4 – INSTALL PAC/SRI PLATFORM UNDER MAGNET

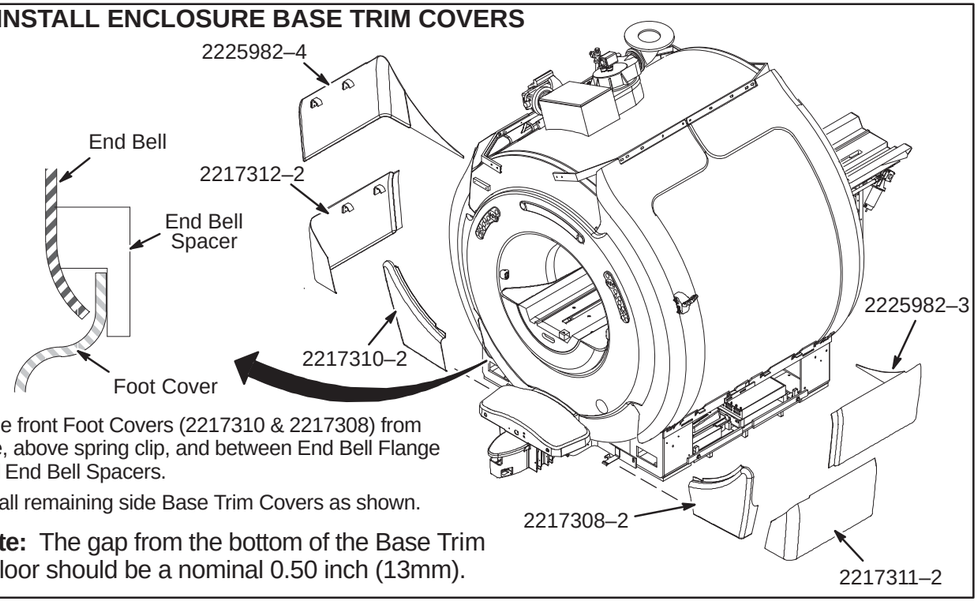


1. Carefully slide PAC/SRI Platform between legs of magnet and lock in place at each end.

INSTALLATION PROCEDURES SUMMARY

- ❑ **L1 – Install Enclosure Base Trim Covers**
- ❑ **L2 – Install Enclosure Top Covers**
- ❑ **L3 – Install Rear Pedestal Covers**

❑ L1 – INSTALL ENCLOSURE BASE TRIM COVERS



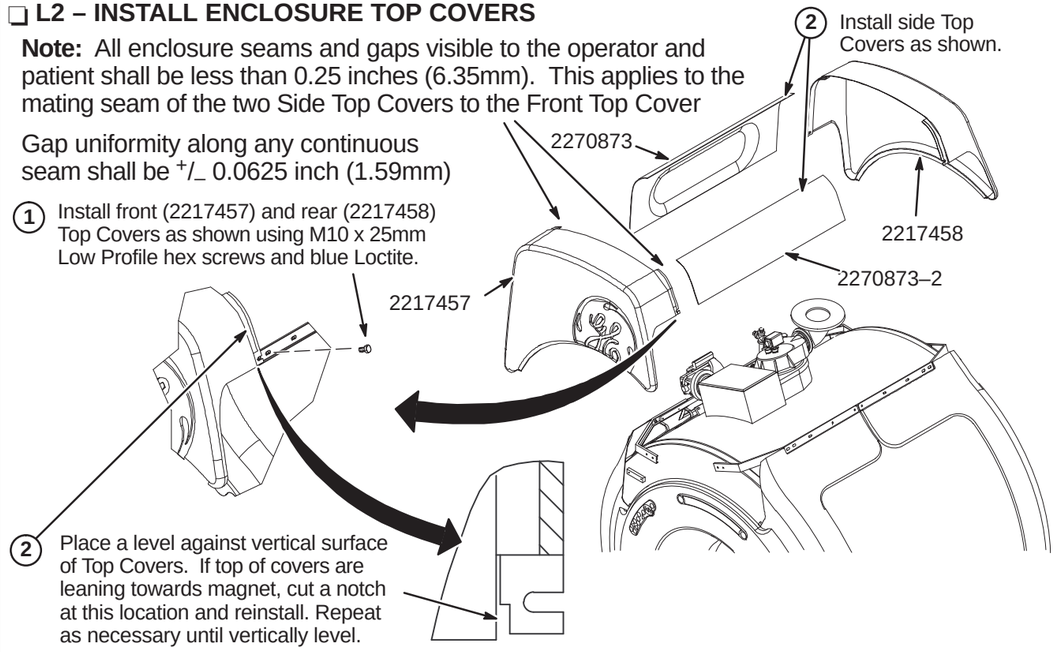
1. Slide front Foot Covers (2217310 & 2217308) from side, above spring clip, and between End Bell Flange and End Bell Spacers.
2. Install remaining side Base Trim Covers as shown.

Note: The gap from the bottom of the Base Trim to floor should be a nominal 0.50 inch (13mm).

❑ L2 – INSTALL ENCLOSURE TOP COVERS

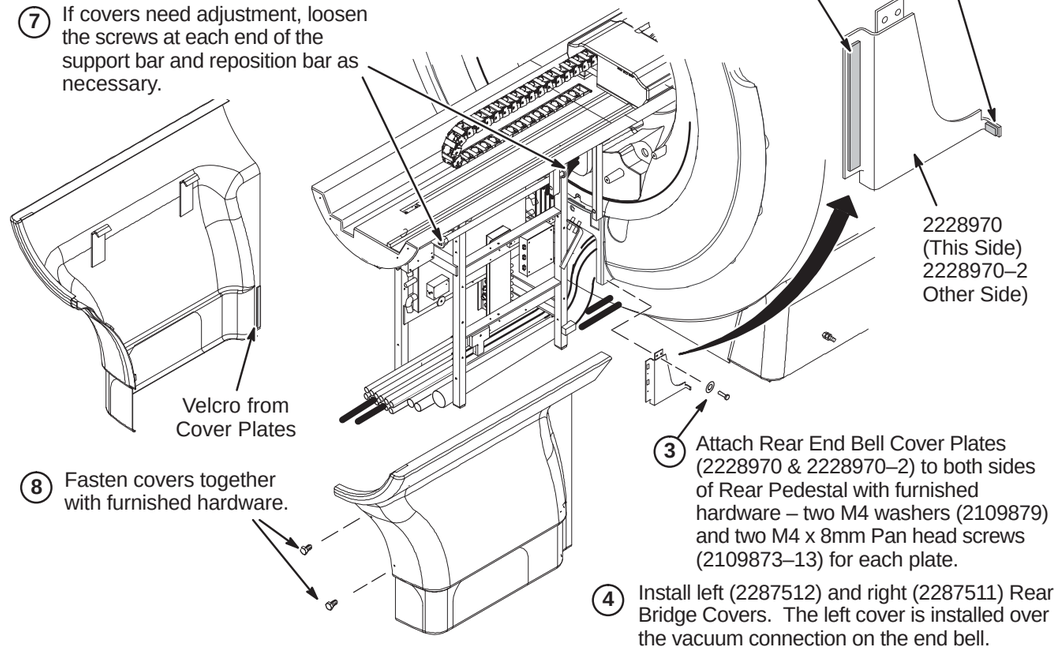
Note: All enclosure seams and gaps visible to the operator and patient shall be less than 0.25 inches (6.35mm). This applies to the mating seam of the two Side Top Covers to the Front Top Cover

Gap uniformity along any continuous seam shall be $^{+}$/_ 0.0625 inch (1.59mm)



❑ L3 – INSTALL REAR PEDESTAL COVERS

5. Pedestal Covers require an opening to be cut out depending on routing of cables and hoses. Covers are marked in three places (left side, right side, or rear) for cutting.
6. After cutting out appropriate opening, hang covers on Rear Pedestal.
7. If covers need adjustment, loosen the screws at each end of the support bar and reposition bar as necessary.



4. Install left (2287512) and right (2287511) Rear Bridge Covers. The left cover is installed over the vacuum connection on the end bell.

INSTALLATION PROCEDURES SUMMARY

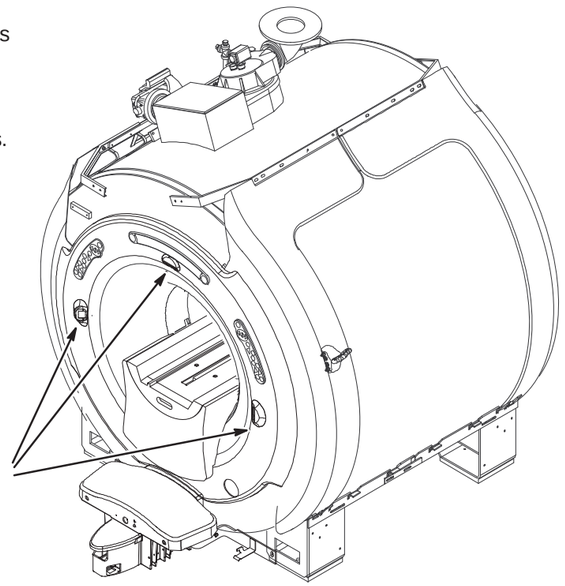
❑ **M1 – Install Laser Alignment Light Warning Labels**

❑ M1 – INSTALL LASER ALIGNMENT LIGHT WARINING LABELS

A sheet of Laser Alignment Light Warning Labels has been supplied with the magnet, attached to the magnet bridge.

The magnet enclosure is shipped with a label in English attached below each of the three laser lights.

English



① For those sites which require a label other than English, peel off the appropriate label and affix over the English labels at the three laser light locations.

French

German

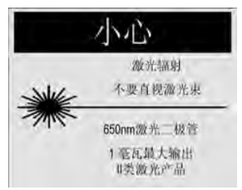
Portuguese

Spanish

Italian

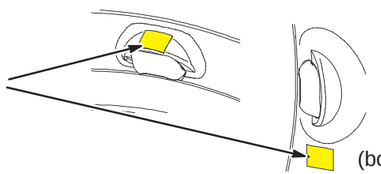
Swedish

Japanese



Chinese

② If enclosure does not have labels attached, attach new labels as indicated.



(both sides)

LIST OF EFFECTIVE PAGES

PAGE	REV	PAGE	REV
1	3	13	3
2	0	14	3
3	0	15	0
4	0	16	2
5	0	17	0
6	3	18	2
7	0	19	2
8	1	20	0
9	0	21	3
10	2	22	0
11	0	23	0
12	0	24	0

WARNING!

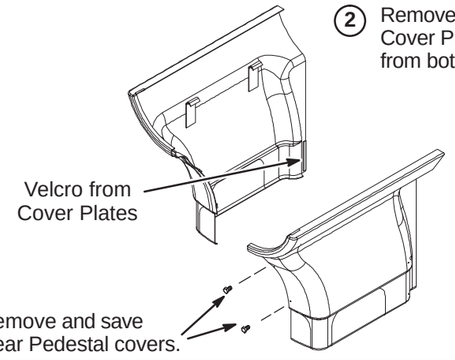
FERROUS MATERIAL HAZARD! PARTS REQUIRED FOR THIS UPGRADE INSTALLATION CONTAIN FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME DANGEROUS PROJECTILES.

IF MAGNET IS AT FULL FIELD – KEEP ALL FERROUS TOOLS AND MATERIALS AS FAR FROM MAGNET AS POSSIBLE.

INSTALLATION PROCEDURES SUMMARY

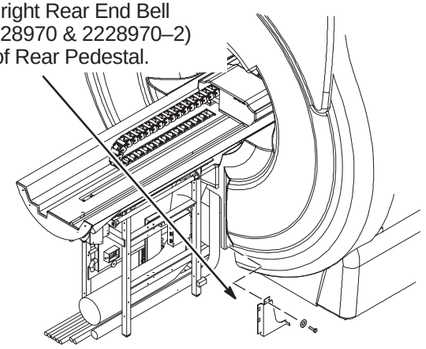
- ❑ **A1 – Remove Rear Pedestal Covers**
- ❑ **A2 – Remove Enclosure Top Covers**
- ❑ **A3 – Remove Enclosure Base Trim Covers**
- ❑ **A4 – Remove Bridge Cover and Drive Belt**

❑ A1 – REMOVE REAR PEDESTAL COVERS



(1) Remove and save Rear Pedestal covers.

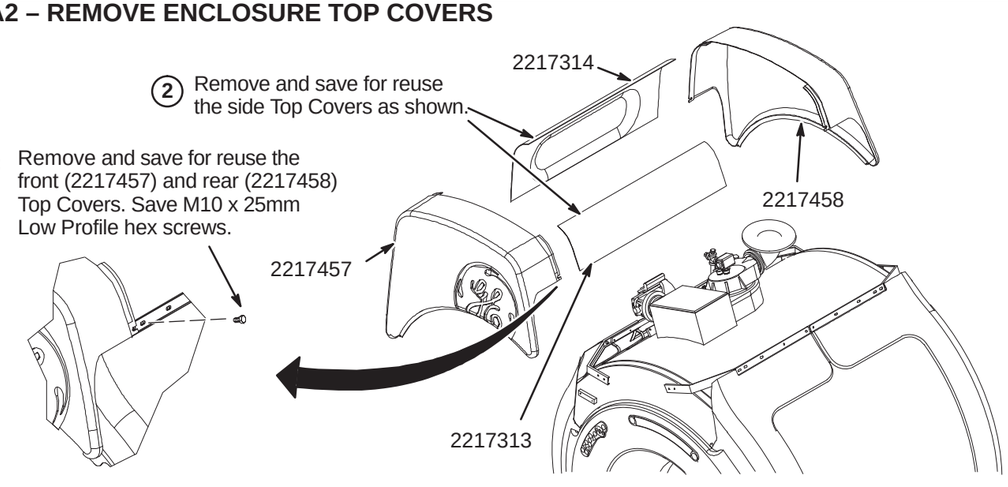
(2) Remove left and right Rear End Bell Cover Plates (2228970 & 2228970–2) from both sides of Rear Pedestal.



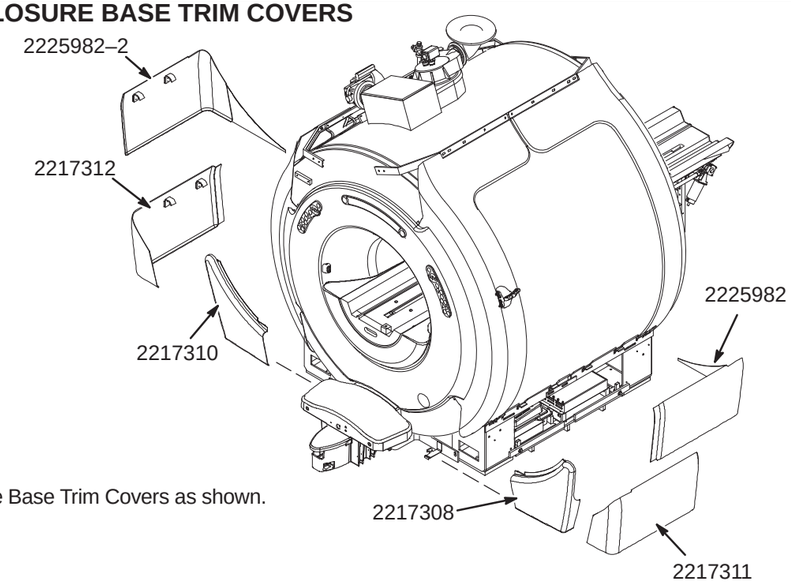
❑ A2 – REMOVE ENCLOSURE TOP COVERS

(1) Remove and save for reuse the front (2217457) and rear (2217458) Top Covers. Save M10 x 25mm Low Profile hex screws.

(2) Remove and save for reuse the side Top Covers as shown.

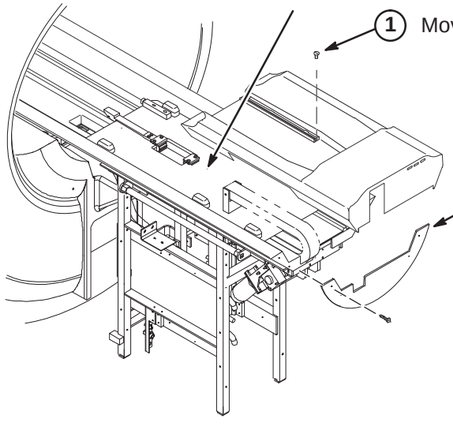


❑ A3 – REMOVE ENCLOSURE BASE TRIM COVERS



(1) Remove remaining side Base Trim Covers as shown.

❑ U5 – REMOVE BRIDGE COVER AND DRIVE BELT

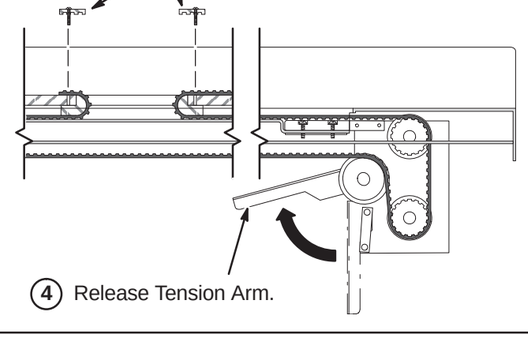


(1) Move Carriage to limit of travel at rear of Bridge.

(2) To access Belt Clamp Plate, unfasten four screws holding Carriage Cover to Carriage. Leave cables attached.

(3) Remove Bridge Cover. Save (4) screws for reinstallation of Bridge.

(5) Unfasten Clamp Plates and remove drive belt.

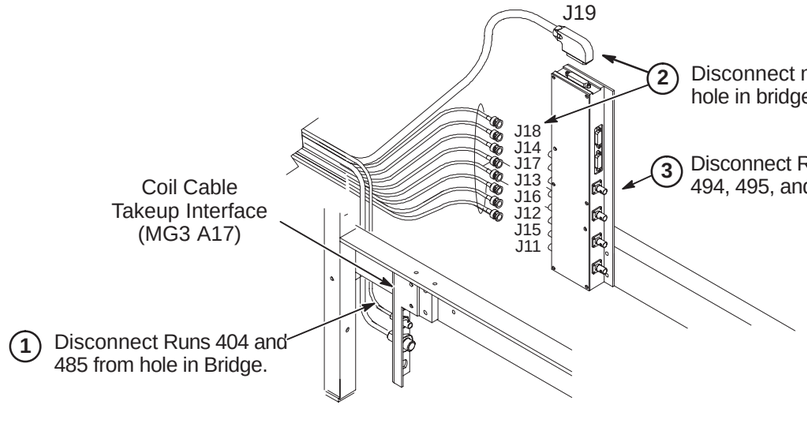


(4) Release Tension Arm.

INSTALLATION PROCEDURES SUMMARY

- ❑ **B1 – Disconnect Runs 404, 485 and Multi–coil Cables**
- ❑ **B2 – Disconnect Bridge Mount Assembly**
- ❑ **B3 – Unfasten Saddle Bracket Screws (MR/i only)**
- ❑ **B4 – Remove Bridge**
- ❑ **B5 – Disconnect Air Hoses at Rear of Magnet**

❑ B1 – DISCONNECT RUNS 404, 485 AND MULTI–COIL CABLES

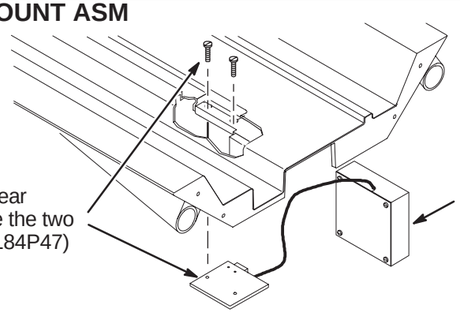


2 Disconnect multi–coil cables from hole in bridge.

3 Disconnect Runs 491, 492, 493, 494, 495, and 727.

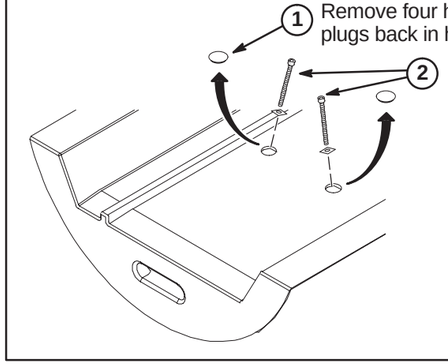
1 Disconnect Runs 404 and 485 from hole in Bridge.

❑ B2 – DISCONNECT BRIDGE MOUNT ASM



1 Unfasten the Bridge, Tongue and Rear Bridge Mount Asm (2132034). Save the two (2) 10–32 x 1–3/8 Screws (46–220184P47) for refastening later.

❑ B3 – UNFASTEN SADDLE BRACKET SCREWS (MR/*i* ONLY)



1 Remove four hole plugs from Bridge Assembly. After Bridge is removed, install plugs back in holes.

2 Remove and discard four (4) M6 x 90mm Hex Socket screws and square Bridge Support Washers. Two thru Front End Bell and two thru Rear End Bell.

NOTE:
CV/*i* Enclosures did not require the installation of the above screws.

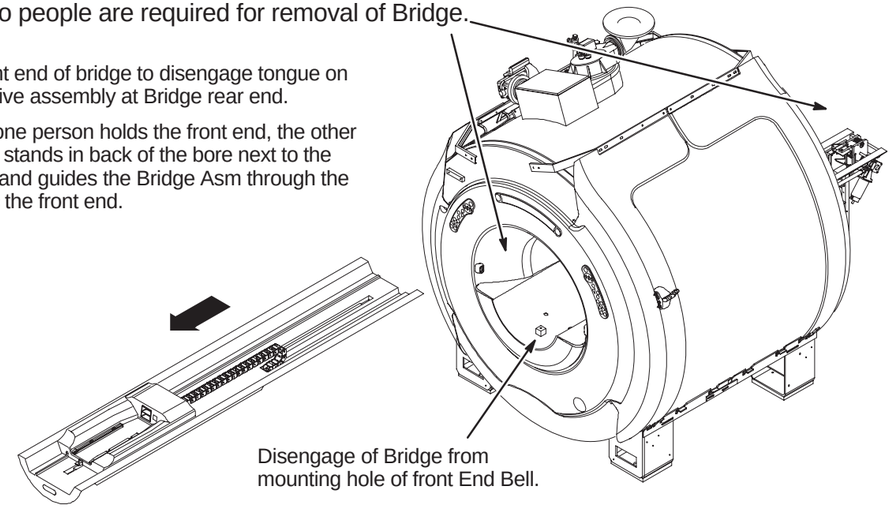
❑ B4 – REMOVE BRIDGE

NOTE: If site is an MR/i then Bridge will be reused in new Twin*Speed* enclosure. If site is CV/i then Bridge will be discarded and a new Split Bridge will be installed for new Twin*Speed* enclosure.

NOTE: Two people are required for removal of Bridge.

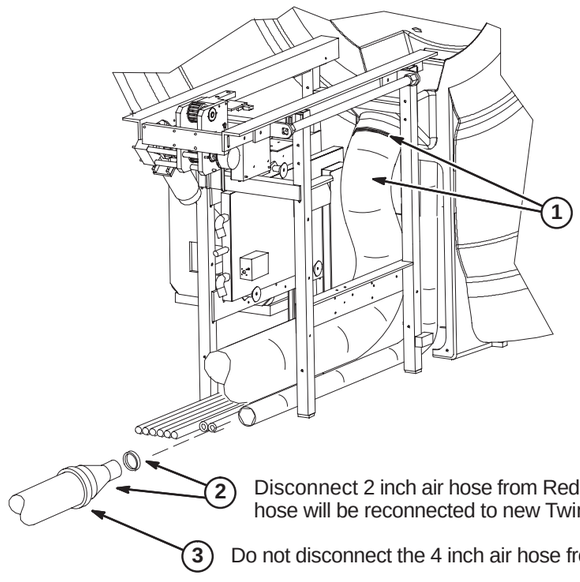
1 Lift front end of bridge to disengage tongue on long drive assembly at Bridge rear end.

2 While one person holds the front end, the other person stands in back of the bore next to the bridge and guides the Bridge Asm through the bore to the front end.



Disengage of Bridge from mounting hole of front End Bell.

❑ B5 – DISCONNECT AIR HOSES AT REAR OF MAGNET



1 Disconnect and discard 6 inch air hose at Rear End Bell.

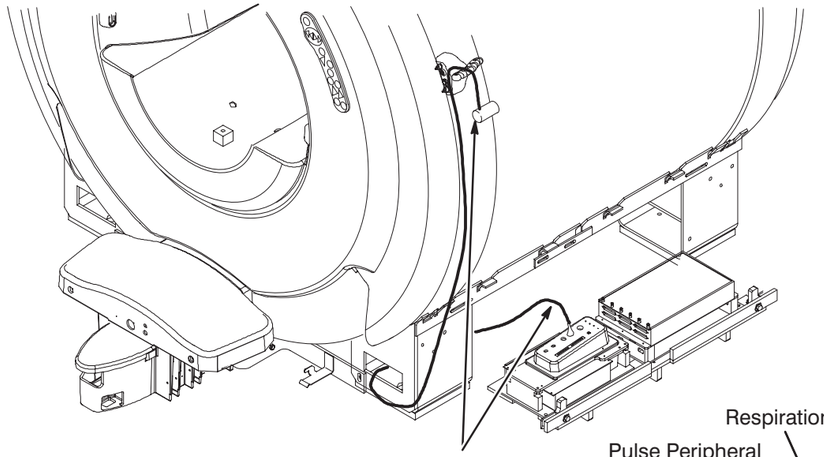
2 Disconnect 2 inch air hose from Reducer and 4” air hose. The reducer and 4” air hose will be reconnected to new Twin*Speed* 2” air hose.

3 Do not disconnect the 4 inch air hose from the Blower Box.

INSTALLATION PROCEDURES SUMMARY

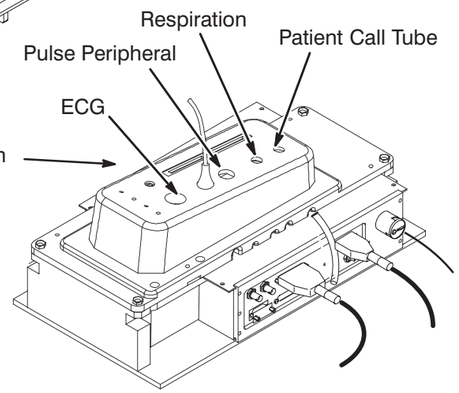
- ❑ **C1 –Disconnect Cables at PAC Module**
- ❑ **C2 – Removing Remote PAC Interface from Arc Cover**
- ❑ **C3 – Remove Remote PAC Intereface Cables and Tubes**

❑ C1 – DISCONNECT CABLES AT PAC MODULE



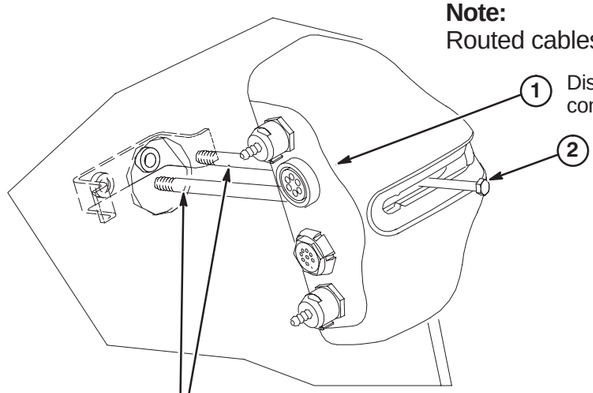
① Remove photo–plethysmograph cable from PAC module to PAC Hanger Bar.

② Disconnect the remaining four cables routed from the Remote PAC Interface to the PAC Module.



❑ C2 – REMOVING REMOTE PAC INTERFACE TO ARC COVER

Note:
Routed cables and tubes not shown for clarity.



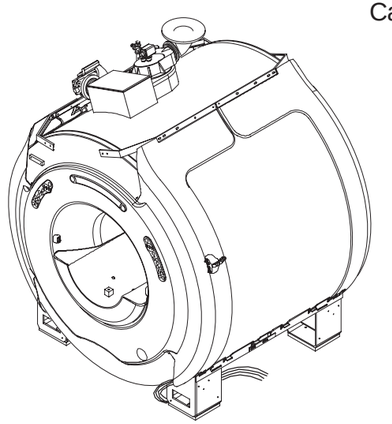
① Disconnect and save the four cables and tubes connected to the front of the Remote PAC.

② If available, insert M4 screw thru slot and into Clamp inside housing.

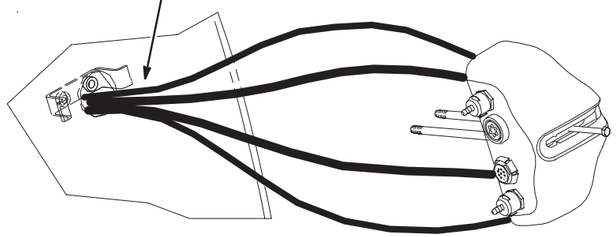
① Using screwdriver thru housing slot, unfasten the M6 screws that lock housing in place.

❑ C3 – REMOVING REMOTE PAC INTERFACE CABLES AND TUBES

Note:
The ECG, Pulse Peripheral, Respiration, and Patient Call Tube will be reused on new Twin*Speed* enclosure.



① Carefully remove the four tubes and cables from the opening in the arc cover.

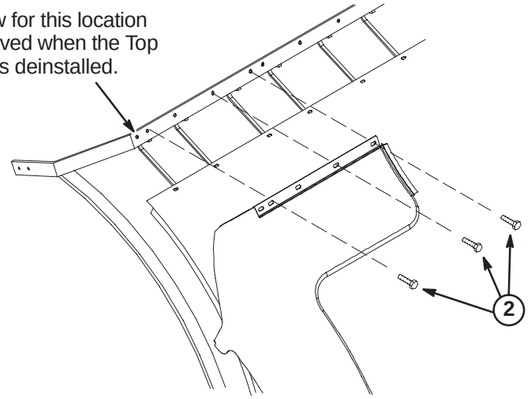


INSTALLATION PROCEDURES SUMMARY

- ❑ D1 – Unfasten Top of Arc Cover
- ❑ D2 – De–Install Arc Cover
- ❑ D3 – De–Install Right and Left Side Wrap Covers
- ❑ D4 – Unfasten Bore Light Panels

❑ D1 – UNFASTEN TOP OF ARC COVER

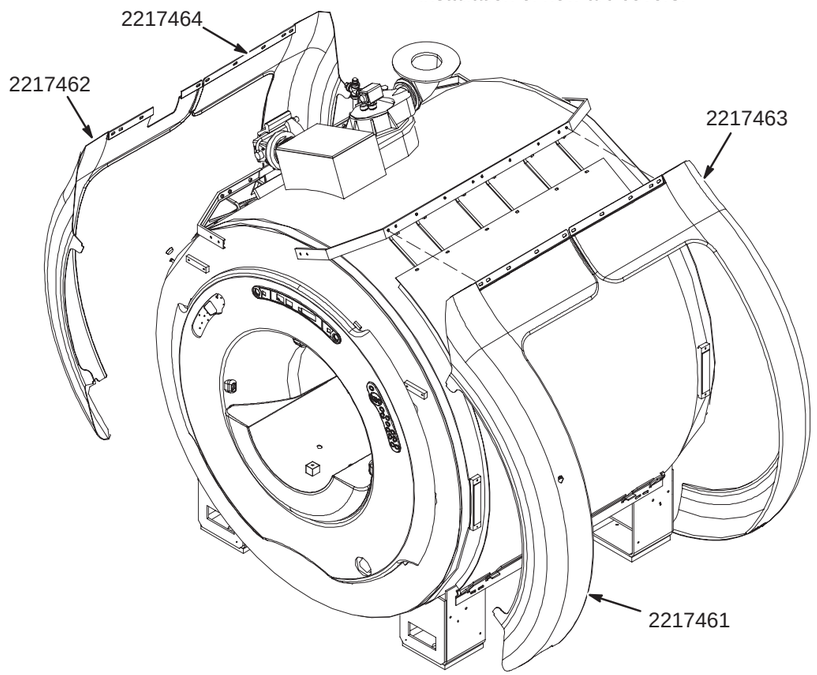
(1) The screw for this location was removed when the Top Cover was deinstalled.



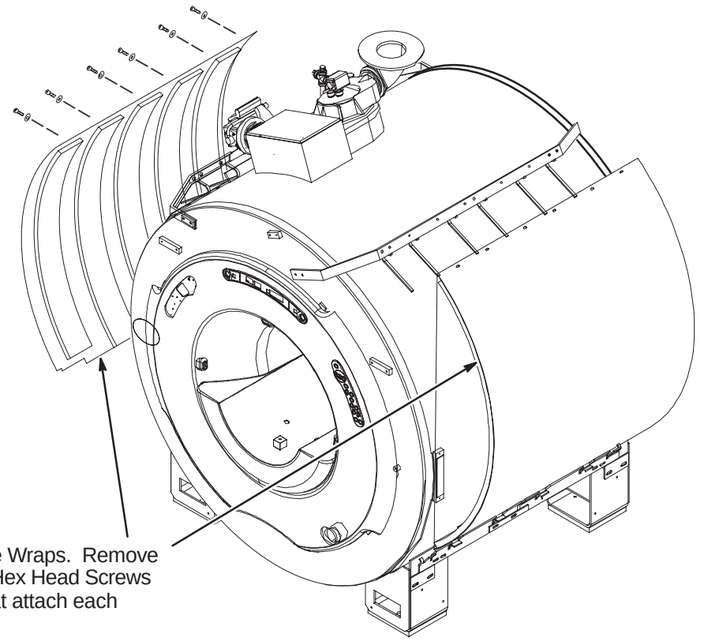
(2) For de–isntalling the arc covers, remove and save the three (3) M10 x 25mm Hex Head screws

❑ D2 – DE–INSTALL ARC COVER

(1) De–install the four arc covers. Save mounting hardware for installation of new arc covers.



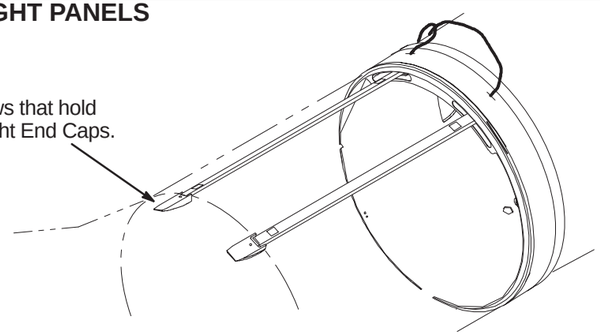
❑ D3 – DE–INSTALL RIGHT AND LEFT SIDE WRAP COVERS



(1) De–install the left and right Side Wraps. Remove and save the six M10 x 14mm Hex Head Screws (2109866–50) and washers that attach each wrap to bracket.

❑ D4 – UNFASTEN BORE LIGHT PANELS

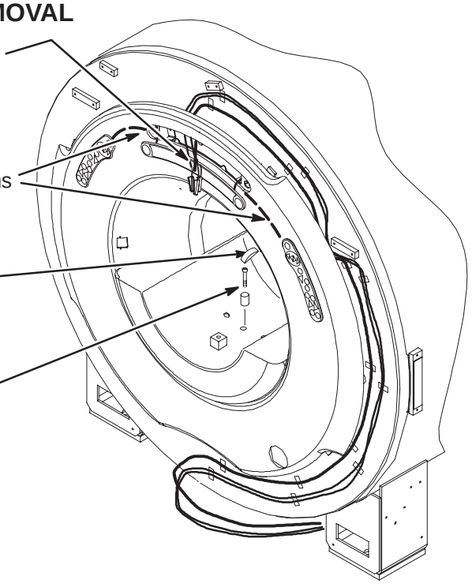
(1) At front End Bell, remove screws that hold Bore Light Panels into Bore Light End Caps.



INSTALLATION PROCEDURES SUMMARY

- ❑ **E1 – Prepare Front End Bell for Removal**
- ❑ **E2 – Disconnect Front and Rear End Bell Cables**
- ❑ **E3 – De0Install Front End Bell From Magnet**
- ❑ **E4 – Disconnect Gradient Cable Runs 762, 763, and 764**

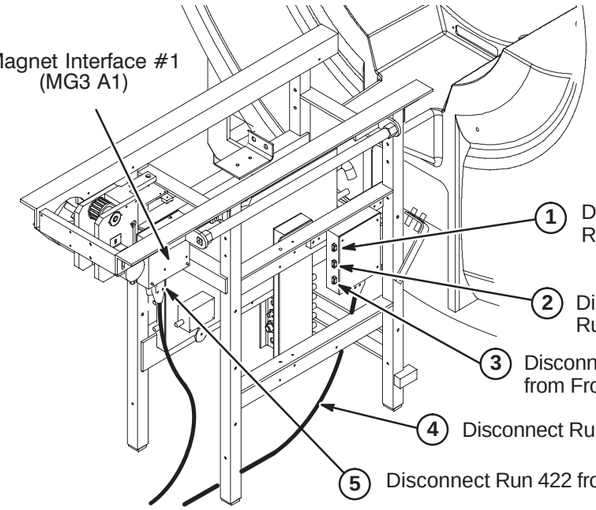
❑ E1 – PREPARE FRONT END BELL FOR REMOVAL



1. Disconnect the three cables (Runs 848, 861, & 897) at J1, J2 and J3 on the back of the Operator Display.
2. Remove and save for installation on nre front cover Runs 862 and 863 which are routed between the Operator Display and the left and right Operator Control Boards.
3. Open two End Bell latches.
4. Unfasten the M6 x 30mm Hex Socket screw and remove location pin.

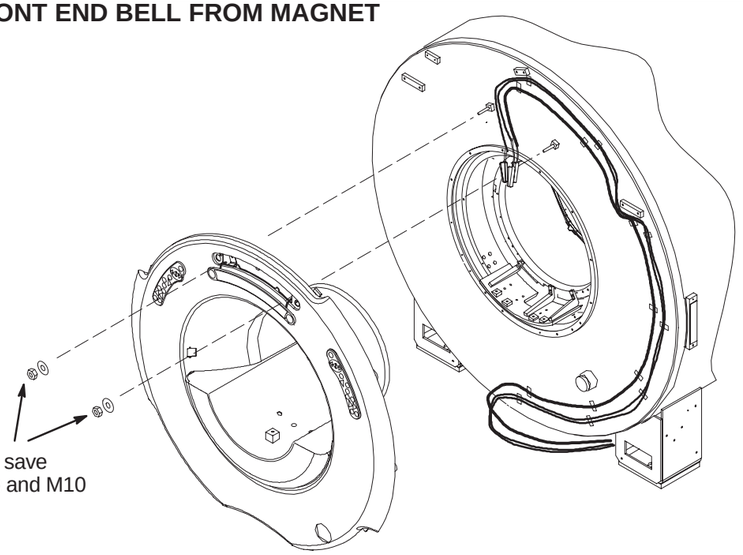
❑ E2 – DISCONNECT FRONT AND REAR END BELL CABLES

Note:
Depending on type of upgrade, all cables connected to Rear Pedestal may be disconnected as noted by the term “(optional)” below. Site FE must determine what cables are to be reused – or removed for installation of new cables. Refer to cable information in Overview Tab, Section 4.



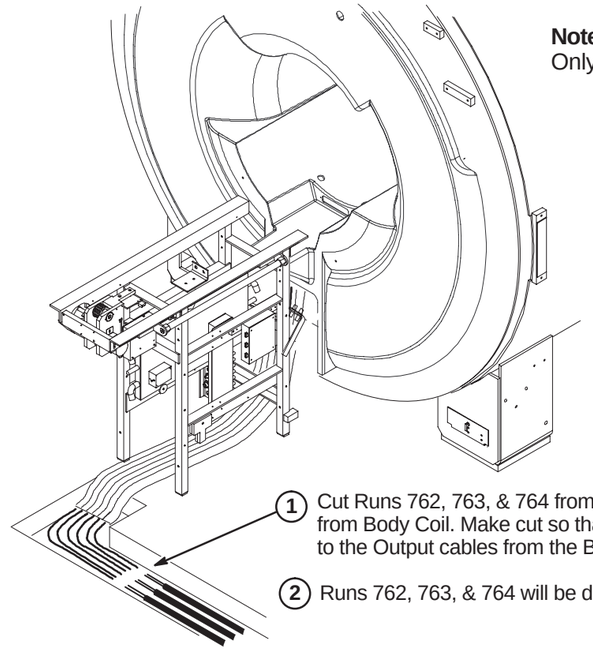
1. Disconnect the Microphone cable at J7 from Rear End Bell.
2. Disconnect Front End Bell microphone cable Run 414 from J 9.
3. Disconnect speaker cable at J8 from Front End Bell.
4. Disconnect Run 282 from J12. (optional)
5. Disconnect Run 422 from J4 on Magnet Interface #1.

❑ E3 – DE–INSTALL FRONT END BELL FROM MAGNET



1. On each stud, remove and save Rubber Washer (2167321) and M10 Lock Nut (2109877–3).

❑ E4 – DISCONNECT GRADIENT CABLE RUNS 762, 763, AND 764



Note:
Only Gradient Cables are shown for clarity.

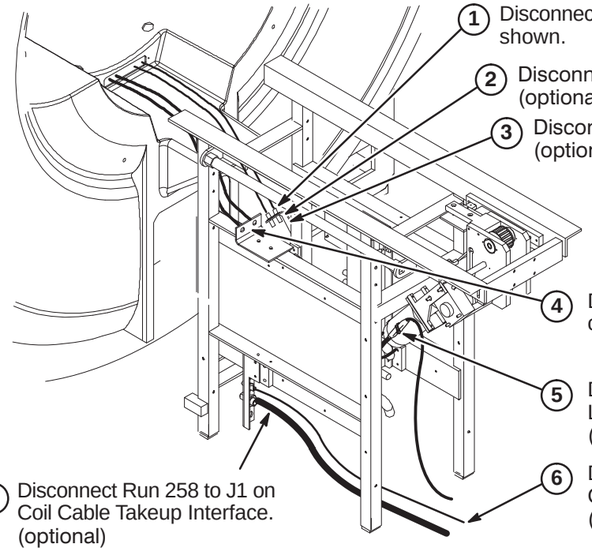
1. Cut Runs 762, 763, & 764 from the (6) six gradient Output Cables from Body Coil. Make cut so that shrink tube and splice are attached to the Output cables from the Body Coil.
2. Runs 762, 763, & 764 will be discarded and returned for recycling.

INSTALLATION PROCEDURES SUMMARY

- ❑ **F1 – Disconnect RF Coil Bias and Drive Cables**
- ❑ **F2 – De–Install Rear Pedestal**
- ❑ **F3 – De–Install Bore Light Panels**
- ❑ **F4 – Unfasten Rear End Bell from RF coil and Magnet**
- ❑ **F5 – De–Install Rear End Bell**

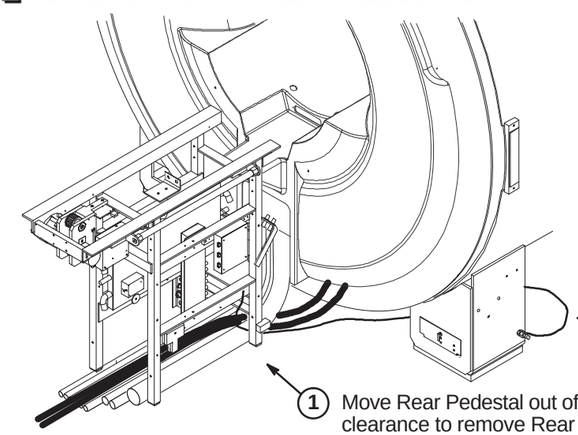
❑ F1 – DISCONNECT RF COIL BIAS & DRIVE CABLES

Note:
Depending on type of upgrade, all cables connected to Rear Pedestal may be disconnected as noted by the term "(optional)" below. Site FE must determine what cables are to be reused – or removed for installation of new cables. Refer to cable information in Overview Tab, Section 4.



1. Disconnect RF Bias cables from RF Coil to bracket as shown.
2. Disconnect Run 781 from Bias cable J5. (optional)
3. Disconnect Run 782 from Bias cable J6. (optional)
4. Disconnect I & Q RF Drive Input cables from RF Coil.
5. Disconnect Run 318 to short cable on Longitudinal Motor Drive (MG3 A7). (optional)
6. Disconnect Run 700 to J2 on Coil Cable Takeup Interface. (optional)
7. Disconnect Run 258 to J1 on Coil Cable Takeup Interface. (optional)

❑ F2 – LOCATION OF REAR PEDESTAL



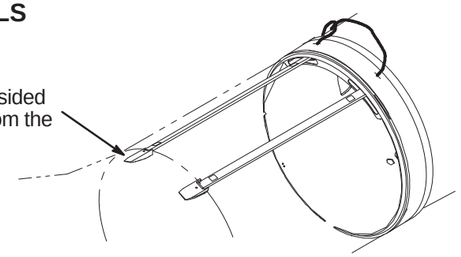
WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR THAT IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.

2. Disconnect Ground cable from Rear Pedestal.
1. Move Rear Pedestal out of the way so there is enough clearance to remove Rear End Bell Cover.

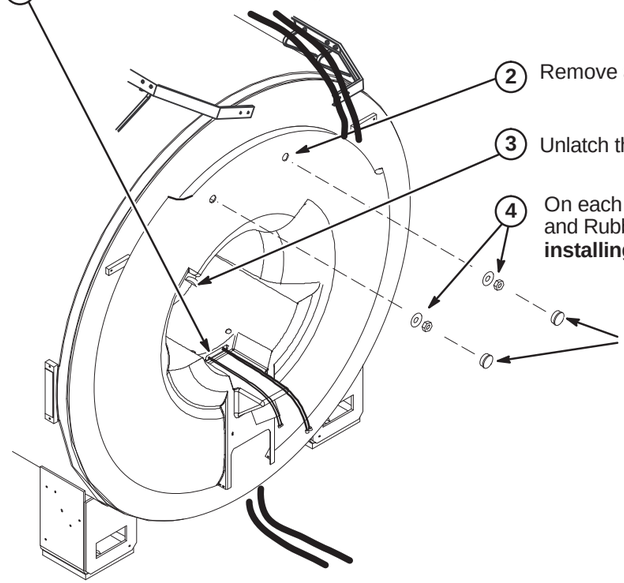
❑ F3 – DE–INSTALL BORE LIGHT PANELS

1. Bore Light Panels are held in place with double–sided tape. Carefully remove the Bore Light Panels from the surface of the RF Coil.



❑ F4 – UNFASTEN REAR END BELL FROM RF COIL AND MAGNET

1. Remove feed thru cover and gasket over the Body Coil cables.

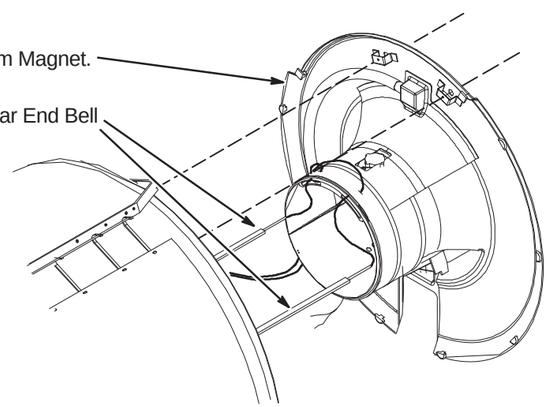


2. Remove and save Access Hole Plugs
3. Unlatch the two latches.
4. On each stud, unfasten M10 Lock Nut (2109877–3) and Rubber Washer (2167321). **Save and reuse for installing new Rear Cover**

Access Hole Plugs

❑ F5 – DE–INSTALL REAR END BELL

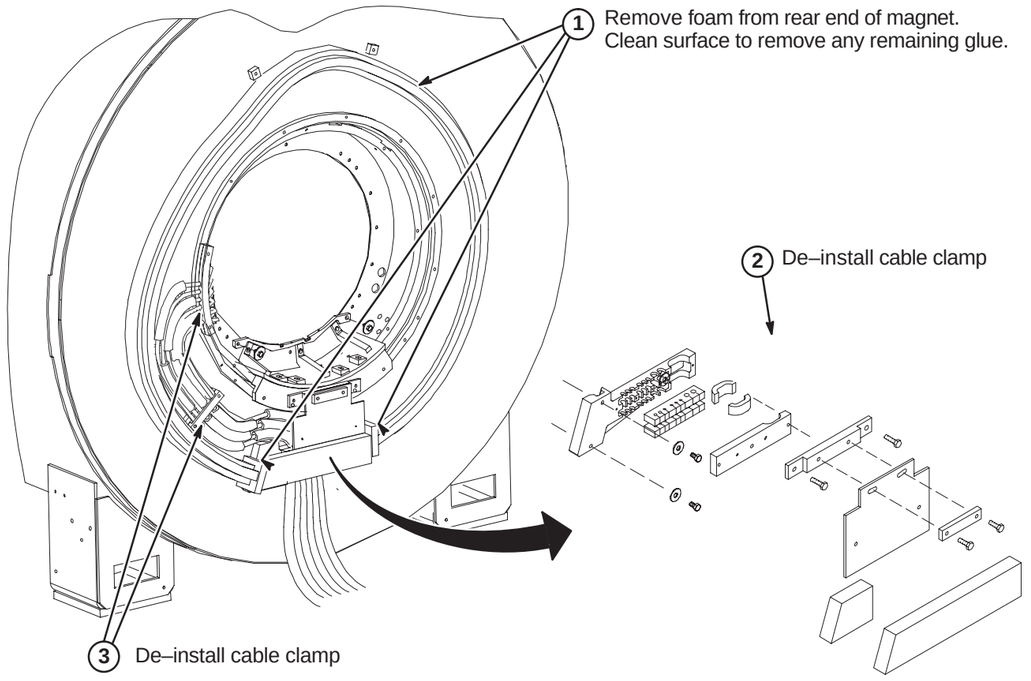
1. Carefully remove Rear End Bell from Magnet.
2. Remove Bore Light Panels from Rear End Bell



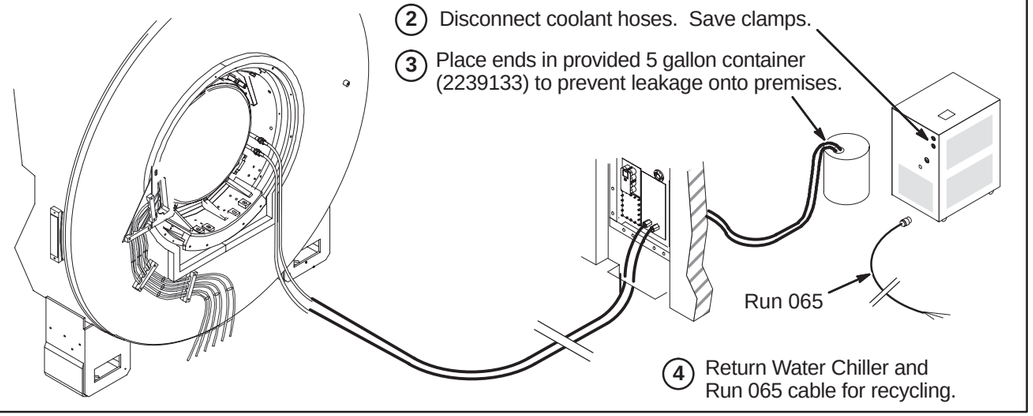
INSTALLATION PROCEDURES SUMMARY

- ❑ **G1 – Remove Foam and Cable Clamps**
- ❑ **G2 – Disconnect Water Chiller**
- ❑ **G3 – Drain Coolant from Body coil and Coolant Hoses**
- ❑ **G4 – Gradient Coil Upgrade Information**

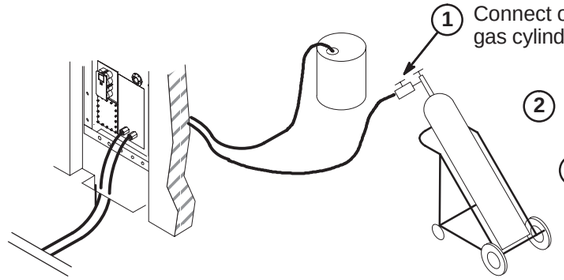
❑ G1 – REMOVE FOAM AND CABLE CLAMPS



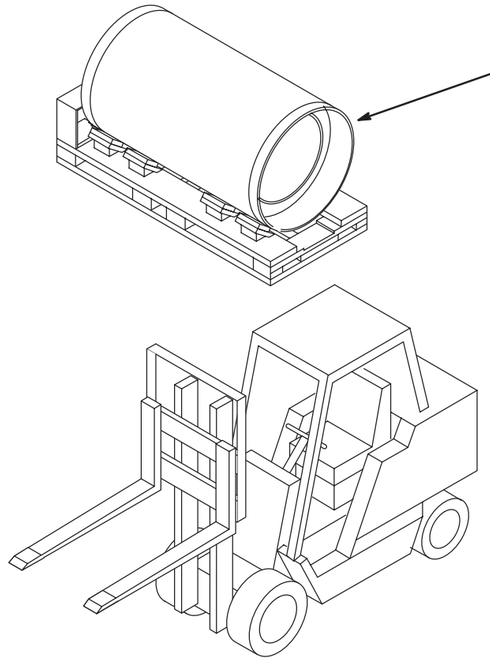
❑ G2 – DISCONNECT WATER CHILLER



❑ G3 – DRAIN COOLANT FROM BODY COIL AND COOLANT HOSES



❑ G4 – GRADIENT COIL UPGRADE INFORMATION



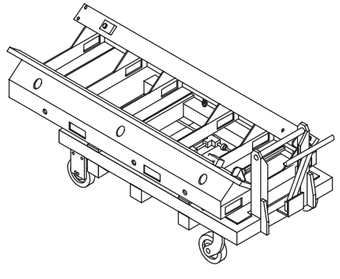
The new Twin*Speed* TRM Body Coil will arrive on site on a wooden pallet only. It will not be on a movable coil cart.

Arrangements should also have been made to:

- Have riggers and/or lift truck on site to unload new TRM coil from delivery truck
- Have coil cart and cradle, 2134817 & 2134810–2, on site to de–install existing BRM or CRM Body Coil
- Have BRM/TRM Insertion Tool, 2164744–3 on site to remove the existing BRM and install the new TRM Body Coil

Refer to Tab 3, BODY COIL, for instructions on :

- Removing existing Body Coil
- Installation of Twin*Speed* End Rings using Ring Alignement Tool, 2299496
- Installation of new TRM Body Coil

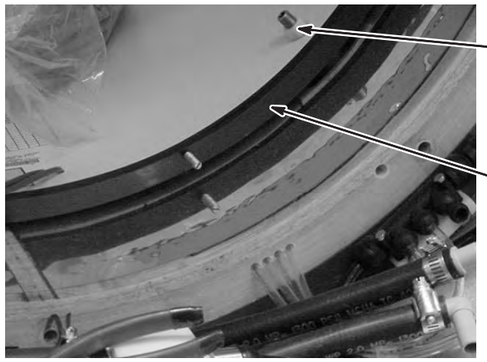


Refer to MR Service Methods Web site at http://3.87.118.28/optec3/common/8xdocs/coils/gc1reala.pdf or CD–ROM for instructions to remove existing Body Coil using provided cradle and coil cart.

INSTALLATION PROCEDURES SUMMARY

- ❑ **H1 – Front End Bell Installation Preparation**
- ❑ **H2 – Position Front End Bell on Studs**

❑ H1 – FRONT END BELL INSTALLATION PREPARATION



1. Make sure RF Body Coil is centered in the gradient coil using the Feeler Guage Tool provided with coil. Adjust as necessary.

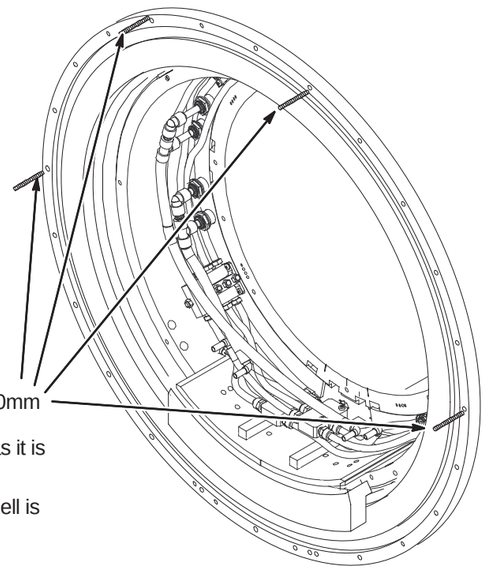
2. Install 6mm RF Tube–End Bell Gasket (2294358–2) onto studs of RF Coil. Make sure gasket is clean. DO NOT APPLY VACUUM GREASE.

Note: Nominal length between Front and Rear Alignment Ring surfaces is about 70–1/16 inch (1780mm).

If length is shorter, a thinner gasket may be required – 4mm gasket (2294358).

If length is longer, a thicker gasket may be required – 9.5mm gasket (2294358–3).

3. Apply Vacuum Grease (2297760) to the entire 3/4 inch diameter O–Ring (2293323) and install in the slot on the aluminum ring. The vacuum grease will hold it in place.

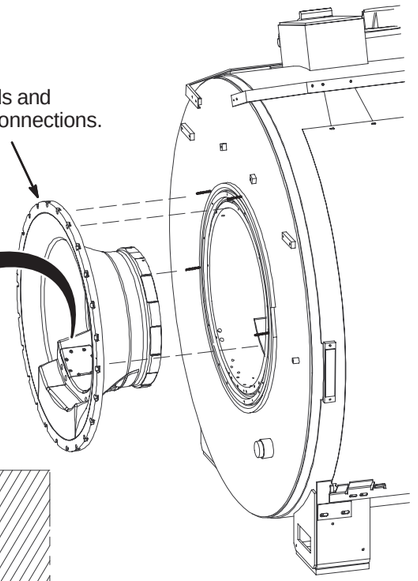


4. From the TRM Coil Insertion Tool Kit, get four M10 x 140mm studs and insert at four positioins on outer bolt circle of aluminum ring. These will be used to support End Bell as it is being installed.

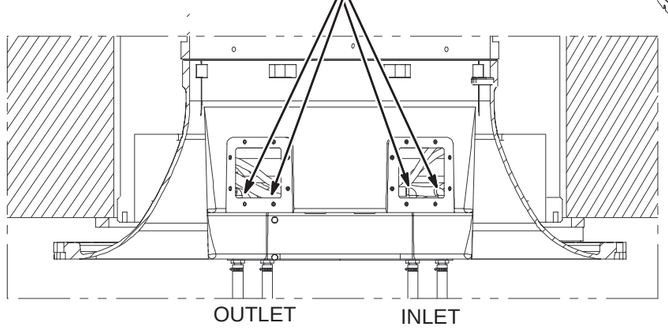
   These must be returned to Insertion Tool Kit after End Bell is installed.

❑ H2 – POSITION FRONT END BELL ON STUDS

1. Hang the Front End Bell in place on studs and remove access covers for the coolant connections.



2. Connect the four coolant hoses to the internal fittings on the End Bell using Safety Clip (2262660–9) on each fitting.
   Note: The hoses must be free of kinks.



Note: The parts in the next steps are obtained from the Water Line Assembly Kit (2295225).

3. Install the End Bell coolant lines:
   – Black hose (2293610–2) to be marked OUTLET
   – Blue hose (2293610–3) to be marked INLET
   – Attach to hose barbs on End Bell using (4) worm drive Hose Clamps (2294010).

4. Connect the 3/4” hose routed from the System Cooling Cabinet to the 3/4” connector using worm drive Hose Clamp (2294010–2).

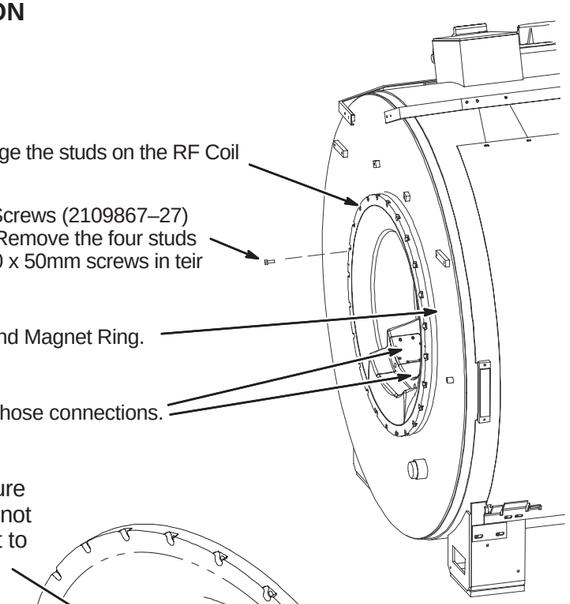
5. Repeat Step 4 to attach Union Tee to INLET hose.

6. Test for leakage by circulating coolant through out system.

INSTALLATION PROCEDURES SUMMARY

- ❑ **I1 – Front End Bell Installation**
- ❑ **I2 – Install Rear End Bell Gaskets and Mounting Studs**
- ❑ **I3 – Install Rear End Bell on Studs**

❑ I1 – FRONT END BELL INSTALLATION



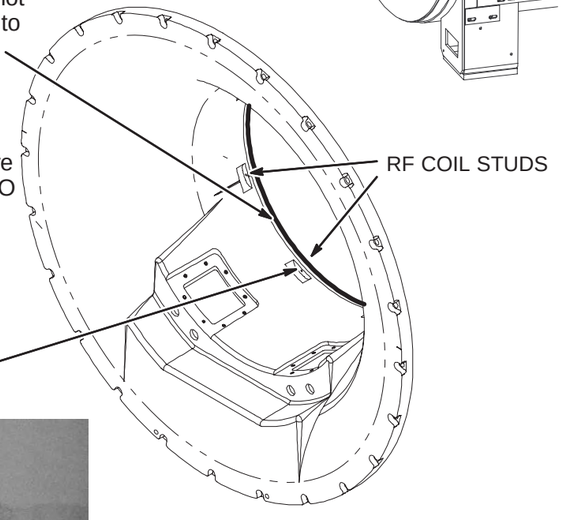
1. Push the End Bell inward and align it to engage the studs on the RF Coil
2. Install (24) M10 x 50mm Socket Head Cap Screws (2109867–27) around the perimeter of the Front End Bell. Remove the four studs after End Bell is secured and install thee M10 x 50mm screws in teir place.
3. Tighten to eliminate gap between End Bell and Magnet Ring. SEE **NOTE** BELOW.
4. Re–install the access panels over the water hose connections.

NOTE:
As Front End Bell is being tightened, make sure the RF Coil Gasket installed previously does not expand into the bore. This will make it difficult to install Front Cover Strap (2287881) in a later procedure.

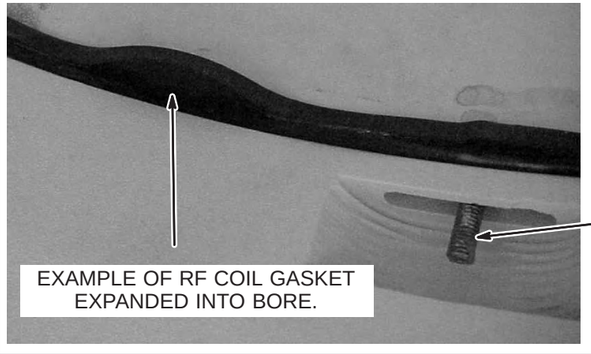
If RF Coil Gasket is too thin or too thick:
– Remove M10 x 50mm screws and slide End Bell away from RF coil so that RF Coil studs are disengaged. END BELL DOES NOT HAVE TO BE COMPLETELY REMOVED.

– If thinner gasket is required, install 4mm gasket (2294358).

– If thicker gasket is required, install 9.5mm gasket (2294358–3).

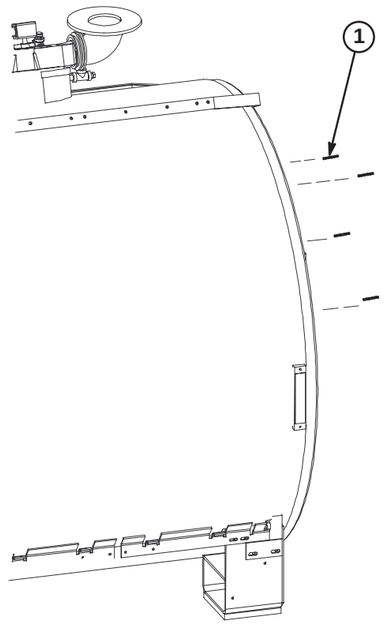


5. Fasten M6 Nylon nuts to each RF stud.



EXAMPLE OF RF COIL GASKET EXPANDED INTO BORE.

❑ I2 – INSTALL REAR END BELL GASKETS AND MOUNTING STUDS



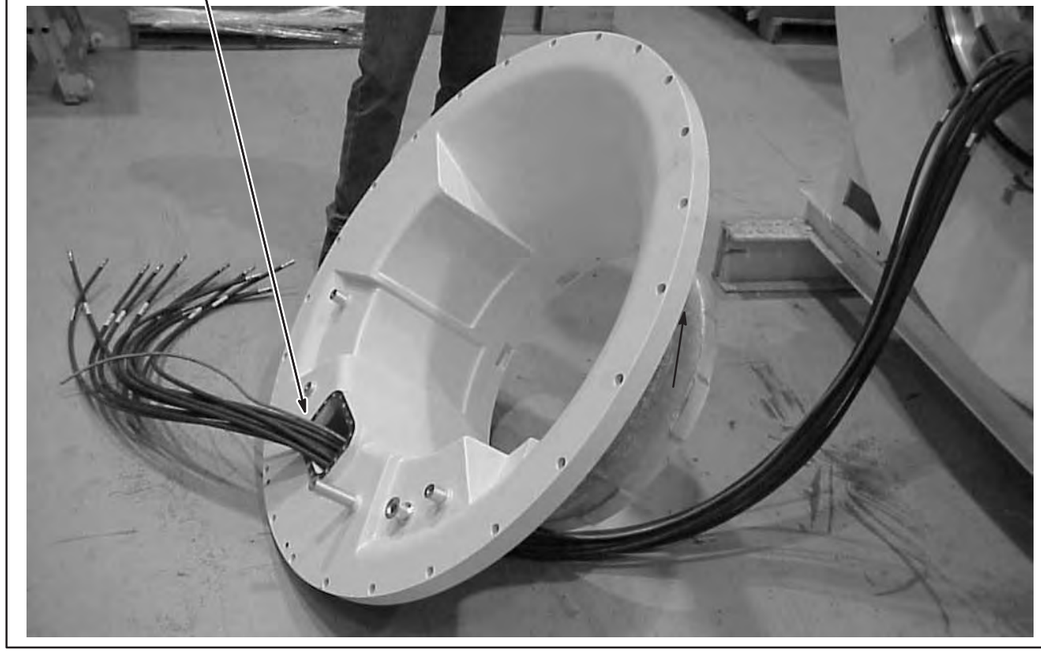
1. From the TRM Coil Insertion Tool Kit, get four M10 x 140mm studs and insert at four positions on outer bolt circle of aluminum ring. These will be used to support End Bell as it is being installed.

   These must be returned to Insertion Tool Kit after End Bell is installed.

2. Install 9.5mm RF Tube–End Bell Gasket (2294358–3) onto studs of RF Coil. Make sure gasket is clean. DO NOT APPLY VACUUM GREASE.
3. Apply Vacuum Grease (2297760) to the entire 3/4 inch diameter O–Ring (2293323) and install in the slot on the aluminum ring. The vacuum grease will hold it in place.

❑ I3 – INSTALL REAR END BELL ON STUDS

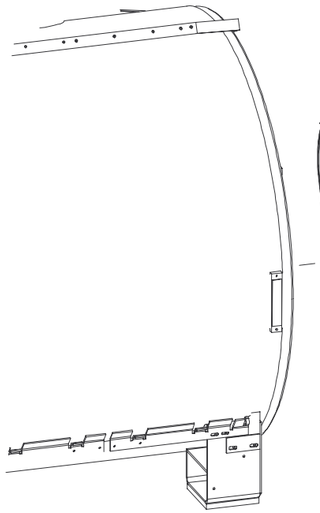
1. Place the Rear End Bell (2284170) at rear of magnet and route gradient cables thru opening.
2. Move End Bell into position, again hanging it on the four studs temporarily.



INSTALLATION PROCEDURES SUMMARY

- ❑ **J1 – Rear End Bell Installation**
- ❑ **J2 – Gradient Block Gasket and Cover Installation**
- ❑ **J3 – Tightening Gradient Block Gasket and Cover**
- ❑ **J4 – Coolant Leak Test**
- ❑ **J5 – Vacuum Leak Test**

❑ J1 – REAR END BELL INSTALLATION



1. Hang the Rear End Bell (2284170) in place on the temporary studs.
2. Push the End Bell inward and align it to engage the studs on the RF Coil
3. Install (24) M10 x 50mm Socket Head Cap Screws (2109867–27) around the perimeter of the Rear End Bell. Remove the four studs after End Bell is secured and install M10 x 50mm screws.
4. Tighten to eliminate gap between End Bell and Magnet Ring. SEE **NOTE** BELOW.

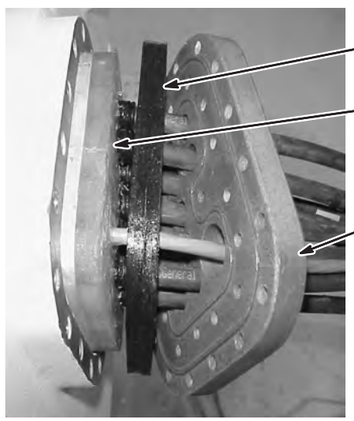
NOTE:
As Rear End Bell is being tightened, make sure the RF Coil Gasket installed previously does not expand into the bore. This will make it difficult to install Rear Cover Strap (2287881–2) in a later procedure.

If RF Coil Gasket is too thin or too thick:
– Remove M10 x 50mm screws and slide End Bell away from RF coil so that RF Coil studs are disengaged. END BELL DOES NOT HAVE TO BE COMPLETELY REMOVED.

– If thinner gasket is required, install 4mm gasket (2294358) or 6mm gasket (2294358–2).

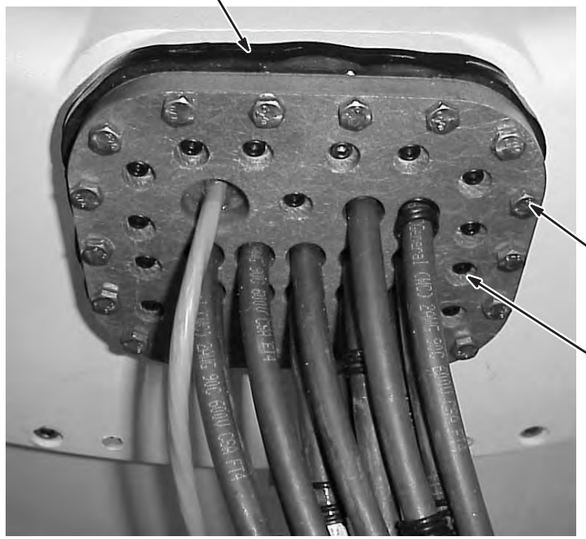
– If thicker gasket is required, add any combination of the remaining 4mm and 6mm gaskets with the existing 9.5mm until correct thickness is produced.

❑ J2 – GRADIENT BLOCK GASKET AND COVER INSTALLATION



1. Install the 12.7mm thick Gradient Block Gasket (2297540–3) over gradient cables.
2. When in place, gasket should stick out just past end of Gradient Block. If adjustment is needed, add 4mm gasket (2297540) and/or 6mm gasket (2297540–2) or replace 12.7mm gasket with 4mm gasket (2297540) and/or 6mm gasket (2297540–2).
3. Thread the gradient cables thru the corresponding holes in the Gradient Block Cover (2285381).
4. Apply Vacuum Grease (2297760) to the sealing surfaces of the cover plate and gasket.

❑ J3 – TIGHTENING OF GRADIENT BLOCK GASKET AND COVER



1. Determine total gasket thickness.
2. Select the gasket thickness from the table below to determine which length of screw to use. Eighteen (18) screws of each length are supplied for this upgrade.

GASKET THICKNESS	SCREW LENGTH	PART NUMBER
4mm	25mm	2109873–27
6mm	25mm	2109873–27
10mm	30mm	2109873–28
12.7mm	35mm	2109873–29
16.7mm	35mm	2109873–29
18.7mm	40mm	2109873–30
22.7mm	50mm	2109873–31

3. After the correct length of screw is determined, insert the selected (18) M6 Pan Head Screws around the Block Cover and start them into the threads.
4. Insert (16) M4 x 25mm Pan Head Screws (2109873–18) in the inner holes of the Block Cover and start them into the threads.
5. Tighten all the inner and outer screws uniformly to compress the gasket and to form a leak–free vacuum seal.

❑ J4 – COOLANT LEAK TEST

Note:
For Fixed sites only; refer to applicable vendor supplied Cooling Cabinet Manual. Manual can also be found on the MR Service Methods CD – ROM: Blowers & Chillers/System Operation

1. Verify Set Point is at 20 degrees C.
2. At front of magnet, remove plexiglass inspection ports and check coolant line connections for leaks. Replace plexiglass when complete.
3. Check for leaks at shut off valves.

Note:
If leak is found, determine source of leak and repair it. **DO NOT ADD MORE COOLANT UNTIL ALL LEAKS ARE FOUND AND REPAIRED.**

❑ J5 – VACUUM LEAK TEST

Note:
Vacuum Grease **must** be applied to all Centering Rings (2293608 & 2293608 – 2).

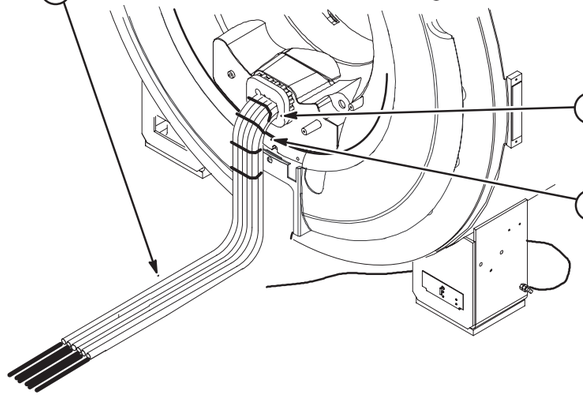
1. Refer to MR Service Methods CD–ROM, Direction 2160623: Twin Accesssry Cabinet and complete Twin*Speed* vacuum system Funtional Checks (tacfca3).
2. To conduct vacuum leak test, refer to MR Service Methods CD–ROM, Direction 2160623: Magnet Enclosures/WideOpen Magnet Enclosures/Troubleshooting/Vacuum Enclosure Toubleshooting (me3tsa1).

INSTALLATION PROCEDURES SUMMARY

- ❑ **K1 – Install Gradient Cable Foam Covers**
- ❑ **K2 – Loosen RF Coil Alignment Set Screws**
- ❑ **K3 – Front Cosmetic Cover Install Preparation**
- ❑ **K4 – Front Cometic Cover Installation**

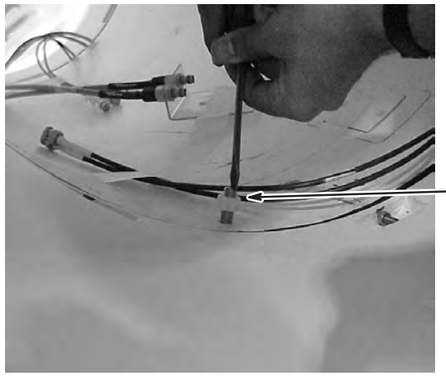
❑ K1 – INSTALL GRADIENT CABLE FOAM COVERS

1. Slide the twelve foam covers onto the gradient cables.

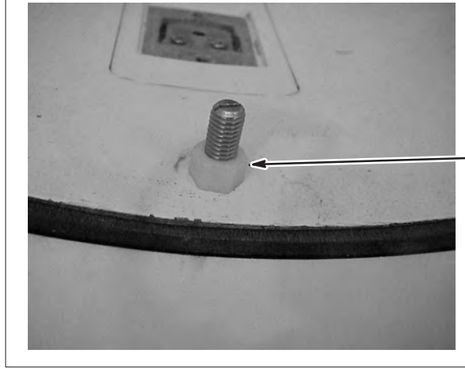


2. Make sure all twelve cable foam covers are installed as close as possible to Rear End Bell.
3. Use Ty–wraps to hold bundle together. Space Ty–wraps every 4 inches until 18 inches above floor.

❑ K2 – LOOSEN RF COIL ALIGNMENT SET SCREWS

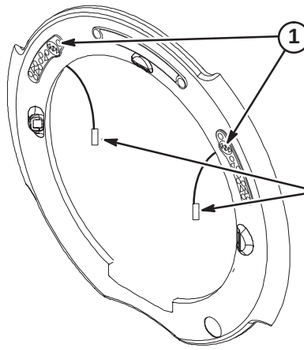


1. Loosen all the set screws that were required for centering the RF Coil within the TRM Coil. **DO NOT REMOVE.**

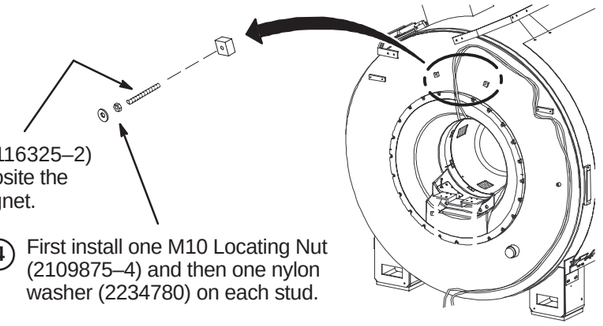


2. Tighten the Nut to lock set screw in place.

❑ K3 – FRONT COSMETIC COVER INSTALL PREPARATION



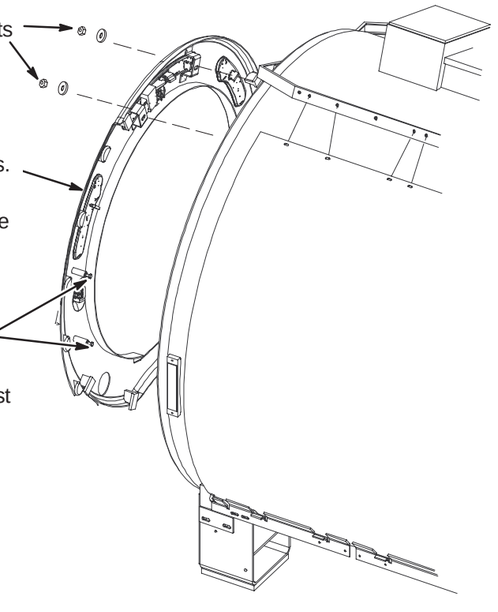
1. Install Left (2215716–3) and Right (2215716–2) Control Panels on Front Cosmetic Cover (2287744) if not already installed.
2. Install Left and Right (2221946) Control Panels on Front Cosmetic Ring. These were transferred from removed WideOpen Front End Bell.



3. Locate two M10 x 65mm Studs (2116325–2) and apply Blue Loctite to end opposite the slot and install into bosses on magnet.
4. First install one M10 Locating Nut (2109875–4) and then one nylon washer (2234780) on each stud.

❑ K3 – FRONT COSMETIC COVER INSTALLATION

4. Put Nylon Washers (2234780) and M10 Locking Nuts (2109875–4) on the mounting studs and tighten.



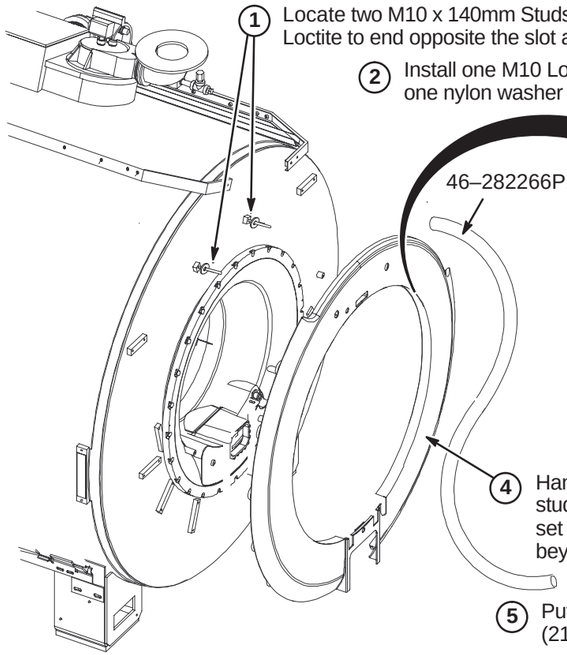
1. Hang the Front Cosmetic Cover on the mounting studs.
2. Adjust the locating nuts installed in previous procedure to set the face of the Cosmetic Cover 12mm (1/2inch) beyond the Front End Bell surface.
3. Set the standoff screws on the back of the Front Cosmetic Cover for the same 12mm (1/2 inch) depth. Tighten the lock nuts.

   Note: Make sure the head of the bolts are hard against the magnet front surface.

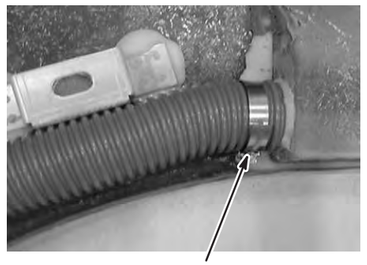
INSTALLATION PROCEDURES SUMMARY

- ❑ **L1 – Install Rear Cosmetic Cover**
- ❑ **L2 – Install Thremal Sensor Cable, Run 749**
- ❑ **L3 – Installation of Front Cover Strap**

❑ L1 – INSTALL REAR COSMETIC COVER

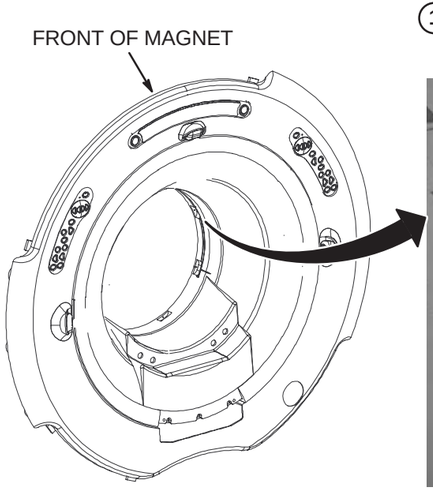


1. Locate two M10 x 140mm Studs (2116325–11) and apply Blue Loctite to end opposite the slot and install into bosses on magnet.
2. Install one M10 Locating Nut (2109875–4) and then one nylon washer (2234780) on each stud.

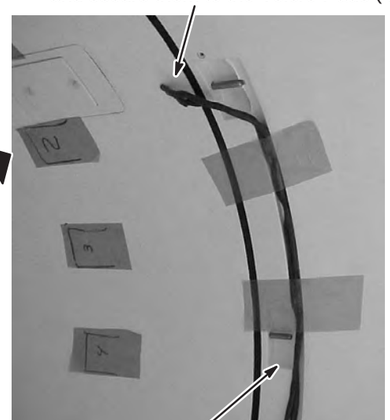


3. Attach 2 inch dia hose (46–282266P18) to Rear Cosmetic Cover (2296182) using Hose Clamp (46–208765P28)
4. Hang the Rear Cosmetic Cover on the mounting studs. Adjust the locating nuts installed in Step 2 to set the face of the Cosmetic Cover 12mm (1/2inch) beyond the Rear End Bell surface.
5. Put Nylon Washer (2234780) and M10 Locking Nut (2109875–4) on each mounting stud and tighten.

❑ L2 – INSTALL THERMAL SENSOR CABLE, RUN 749



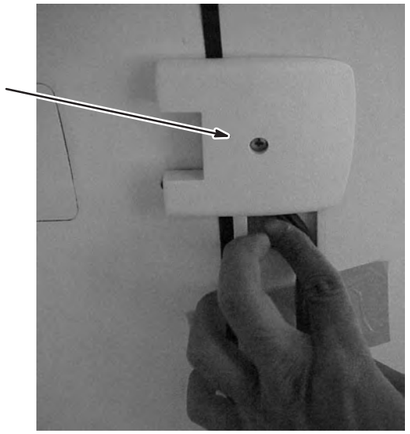
1. Insert the Thermal Sensor Cable, Run 749 (2285729), in the corresponding holes at the top inside surface of the RF Coil and secure them to the Velcro Pads (46–136246P11 & 12)



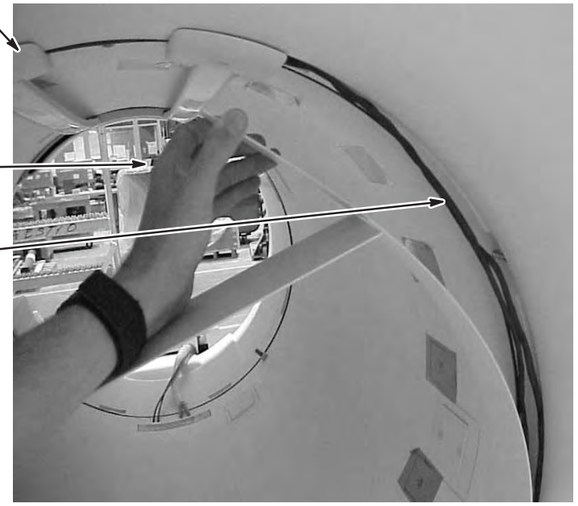
2. Route Sensor Cable in groove.

❑ L3 – INSTALLATION OF FRONT COVER STRAP

1. Retain the end of Sensor Cable by installing the Bore Light End Cap (2303834) using a M6 x 16mm Pan Head Screw (2109873–25).



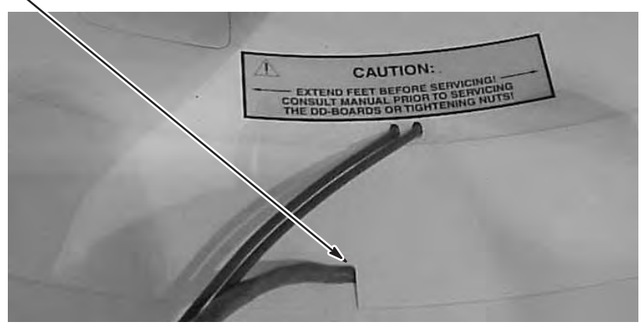
2. Install the second Bore Light End Cap.



3. Install the Front Cover Strap (2287881) over the End Bell gasket capturing the Thermal Cable in the groove.

   Note: Use tape to hold the cable in place temprarily.

4. View at bottom of RF Coil showing Thermal Cable exiting from underneath the Cover Strap



5. Go to Procedures **R3** and **R4** to install Comort Module (2284175) and Bore Lights and Procedure **S1** for installing Rear Cover Strap (2287881–2). **This must be completed before installing Bridge.**

INSTALLATION PROCEDURES SUMMARY

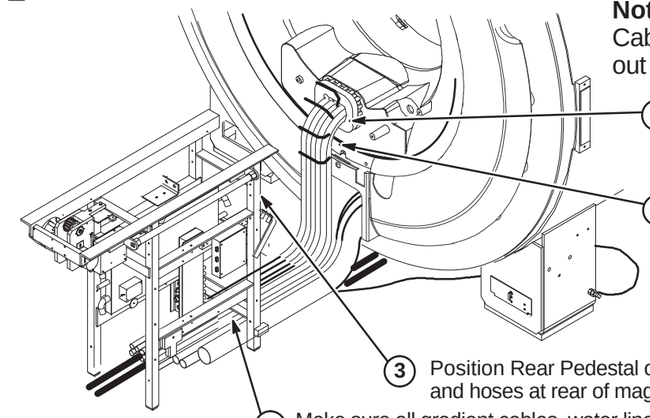
- ❑ **M1 – Preparation of Hoses and Cables Under Rear Pedestal**
- ❑ **M2 – Location of Rear Pedestal**
- ❑ **M3 – Routing and Connecting Gradient Output Cables**
- ❑ **M4 – Route/Connect Runs 257, 262, 743, 744, and 780**

Note: If system being upgraded was a CV/i, then a new Split Bridge will be installed. Refer to Procedures in Direction 2309132 (located in this Magnet Enclosure Tab) for instructions on installing Rear Pedstal with Split Bridge.

WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR THAT IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.

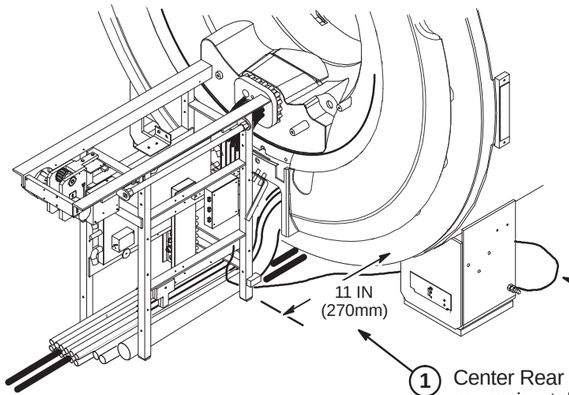
❑ M1 – PREPARATION OF HOSES AND CABLES UNDER REAR PEDESTAL



Note:
Cables and hoses can be routed to exit out of rear or side of Rear Pedestal.

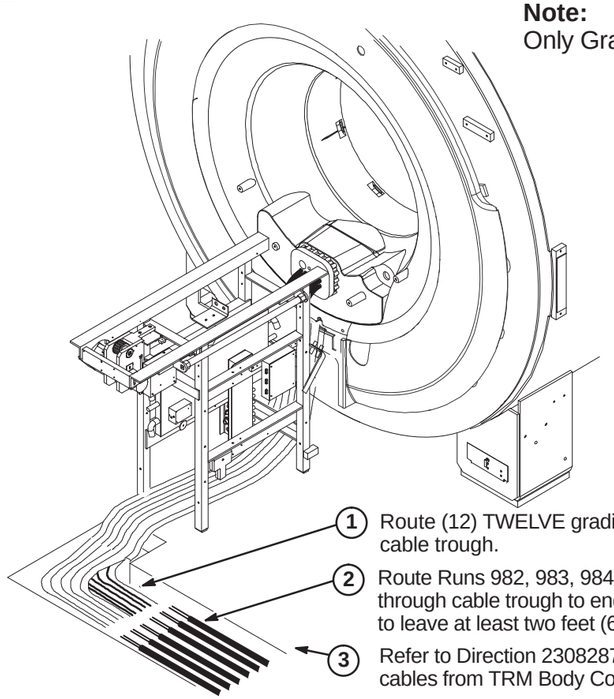
1. Make sure all twelve cable foam covers are installed as close as possible to Rear End Bell.
2. Use Ty–wraps to hold bundle together. Space Ty–wraps every 4 inches until 18 inches above floor.
3. Position Rear Pedestal over cables and hoses at rear of magnet.
4. Make sure all gradient cables, water lines, gas lines, and 2” air hose are routed under cross frame of Rear Pedestal as shown.

❑ M2 – LOCATION OF REAR PEDESTAL



1. Center Rear Pedestal on Rear Endbell and locate approximately 11 inches (270mm) from face of magnet.
2. Route Ground cable from Rear Pedestal under magnet and connect to same Ground Stud as Magnet ground.
3. Route all other cables on top of the above cables and hoses.

❑ M3 – ROUTING AND CONNECTING GRADIENT OUTPUT CABLES



Note:
Only Gradient Cables are shown for clarity.

TRM COIL CABLE LABELS		OUTPUT CABLE LABELS		
WIRE #	LABEL	RUN #	LABEL	WIRE #
1	Z ZM–	982	ZM–	2
2	Z ZM+	982	ZM+	1
3	X WB–	987	WB–	2
4	X WB+	987	WB+	1
5	Y WB+	986	WB+	1
6	Y ZM–	983	ZM–	2
7	Y WB–	986	WB–	2
8	Y ZM+	983	ZM+	1
9	Z WB+	985	WB+	1
10	X ZM–	984	ZM–	2
11	Z WB–	985	WB–	2
12	X ZM+	984	ZM+	1

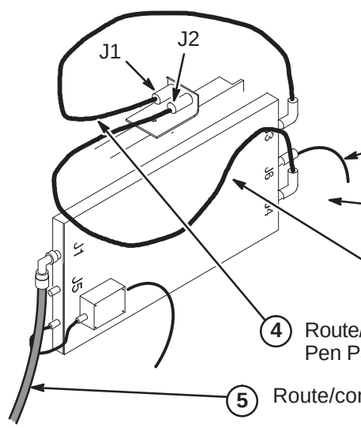
1. Route (12) TWELVE gradient Output Cables from TRM Body Coil to cable trough.
2. Route Runs 982, 983, 984, 985, 986, and 987 from Penetration Panel through cable trough to ends of Body Coil gradient cables. Make sure to leave at least two feet (610mm) of slack before cutting to length.
3. Refer to Direction 2308287 in Tab 1 and table above for connecting Output cables from TRM Body Coil to Runs 982, 983, 984, 985, 986, and 987.

❑ M4 – ROUTE/CONNECT RUNS 257, 262, 743, 744, AND 780

CAUTION

The RF Drive Input cables, Runs 743 and 744, utilize a corregated solid RF shield. If mishandled, the cable can be kinked and subsequently broken.

Also, use care when connecting these cable to the bulkhead connectors J1 and J2 and RF Splitter connectors J3 and J4. Cross threading or inadequate engagement of the center pin can cause arcing and damage the cables.



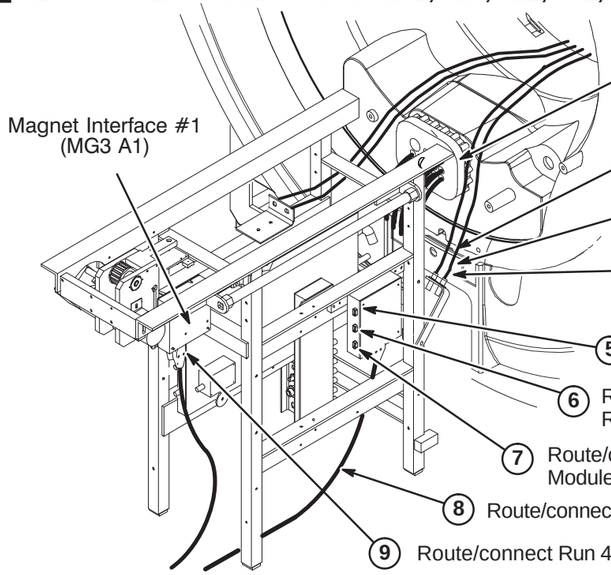
Note: Runs 743 and 744, Body Coil to RF Splitter cable connections may be reversed depending on magnet field polarity. Consult local Field Engineer for proper routing.

1. Route/connect Run 780 from J74 on Pen Panel to J6 on RF Splitter.
2. Route and connect Run 744 from J1 on bracket to J4 on the RF Splitter.
3. Route and connect Run 743 from J2 on the bracket to J3 on the RF Splitter.
4. Route/connect Run 262 from J8 on Pen Panel to Body Coil Preamplifier.
5. Route/connect Heliax® Run 257 to J1 on RF Splitter.

INSTALLATION PROCEDURES SUMMARY

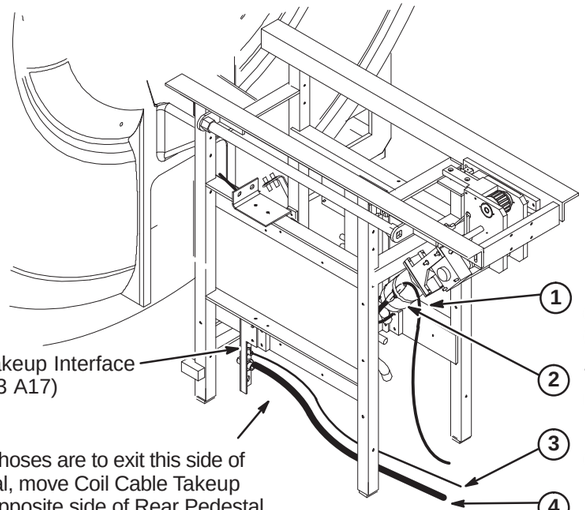
- ❑ **N1 – Route/Connect Runs 282, 414, 422, 781, 782, and Front End Bell Speaker Cable**
- ❑ **N2 – Route/Connect Runs 258, 318, and 700**
- ❑ **N3 – Remove Six Inch Hose Connector Ring from Blower Box**
- ❑ **N4 – Install Blower Box and Route/Connect Air Hose**

❑ N1 – ROUTE/CONNECT RUNS 282, 414, 422, 781, 782, & FRONT END BELL CABLE



1. Route I & Q RF Drive Input cables from RF coil and connect as marked to J1 and J2 on bracket.
2. Route and connect RF Bias cables from RF Coil to bracket as marked.
3. Route and connect Run 781 from Bias cable J5 to J75 on the Penetration Panel.
4. Route and connect Run 782 from Bias cable J6 to J76 on the Penetration Panel.
5. Route/connect microphone cable from Carriage Cover to J7.
6. Route/connect Front End Bell microphone cable Run 414 to J9.
7. Route/connect speaker cable from Patient Comfort Module to J8.
8. Route/connect Run 282 from J12 on Pen Panel to J6.
9. Route/connect Run 422 from J2 on SRI to J4 on Magnet Interface #1.

❑ N2 – ROUTE/CONNECT RUNS 258, 318, AND 700



1. Route/connect Run 318 to short cable on Longitudinal Motor Drive (MG3 A7).
2. Ty–wrap cable to motor to prevent movement.
3. Route/connect Run 700 to J2 on Coil Cable Takeup Interface.
4. Route/connect Run 258 to J1 on Coil Cable Takeup Interface.

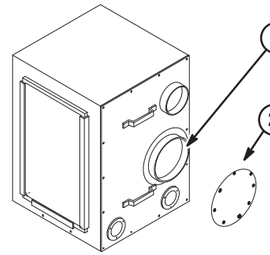
Note:
If cables and hoses are to exit this side of Rear Pedestal, move Coil Cable Takeup Interface to opposite side of Rear Pedestal.

If Interface bracket is moved to other side, connectors on bracket need to be removed, turned end for end, and reinstalled.

❑ N3 – REMOVE SIX INCH HOSE CONNECTOR RING FROM BLOWER BOX

WARNING!

THE BLOWER BOX IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE BLOWER BOX REQUIRES TWO PEOPLE AND MUST BE OUTSIDE THE 200 GAUSS ZONE. REFER TO THE TABLE IN SECTION 1–1 UPGRADE INTRODUCTION.

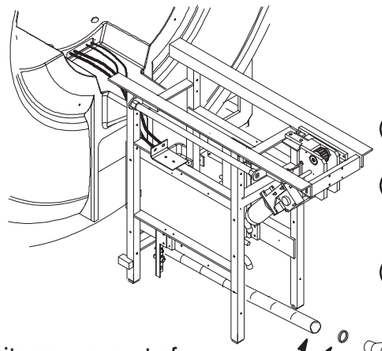


1. Unfasten and save mounting hardware. Remove and discard mounting ring for large air hose.
2. Install Blower Box Cover Plate (2295632) using same fastening hardware .

❑ N4 – INSTALL BLOWER BOX AND ROUTE/CONNECT AIR HOSE

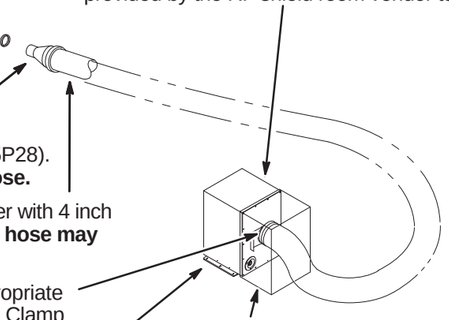
WARNING!

RF SHIELD INTEGRITY MUST BE MAINTAINED FOR MOUNTING BLOWER BOX WITHIN THE MAGNET ROOM



1. Refer to site design (architectural)/customer construction drawings or contact PMI for locating and securing Blower Box (2121199).
2. Check for correct installation of the anchors:
   - Confirm that the anchors are physically secured to the building structure, not to a removable computer floor, raised floor, or false floor.
   - Confirm there are at least four (4) anchors.
   - If any or the anchors appears wobbly or loose, stop the installation and contact the PMI to fix anchoring.
3. Remove any mounting hardware from the anchors. Hoses should face the back of the room
4. Position the blower box on top of 4 or more anchors. Hoses should face th eback of the room.
5. Secure the blower box using the hardware provided by the RF shield room vendor to attach.

Note:
The following items are part of Blower Hose Kit, 2129412–5.



6. Connect 2 inch air hose from Rear End Bell to Reducer (2175143) with 2 inch clamp (46–208765P28). **Do not cut or reduce the length of the 2 inch hose.**
7. Connect 4 inch air hose (46–282666P11) to reducer with 4 inch clamp (46–208765P34). **If necessary, the 4 inch hose may need to be cut to reduce length.**
8. Route 4 inch hose to Blower Cabinet. Trim to appropriate length and attach to vent opening with 4 inch Hose Clamp (46–208765P34).

NOTE: If needed, Blower Hose Cover can be cut and modified.

CAUTION

THE BLOWER BOX CONTAINS FERROUS MATERIAL. The proper mounting of the Blower Box is critical to safety. It MUST be mounted per these instructions

IMPORTANT!

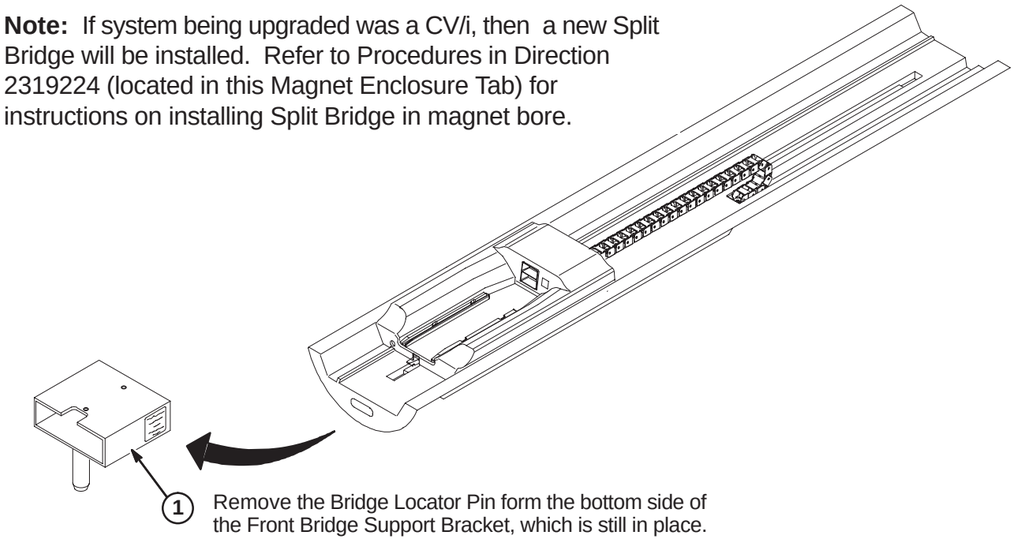
Location of cabinet and type of fastener used for securing Blower Box outside of minimum service area should be specified in the Site Design (architectural/Construction) drawings. If proper mounting area is not specified, contact the Project Manager of Installation (PMI).

INSTALLATION PROCEDURES SUMMARY

- ❑ **O1 – Remove Existing Bridge Locator Pin**
- ❑ **O2 – Install Topo Right Clamp on Bridge Support**
- ❑ **O3 – Install Bridge Support onto Bridge**
- ❑ **O4 – Remove Rear Bridge Plate**

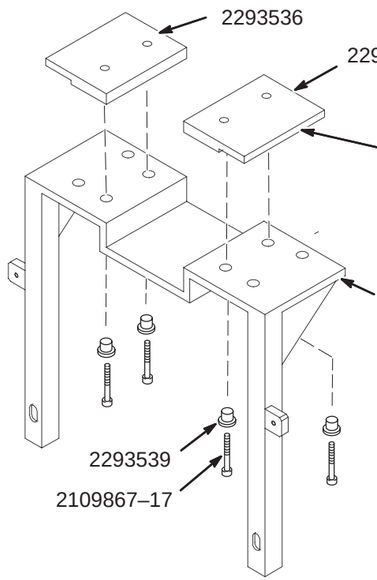
❑ O1 – REMOVE EXISTING BRIDGE LOCATOR PIN

Note: If system being upgraded was a CV/i, then a new Split Bridge will be installed. Refer to Procedures in Direction 2319224 (located in this Magnet Enclosure Tab) for instructions on installing Split Bridge in magnet bore.



1. Remove the Bridge Locator Pin form the bottom side of the Front Bridge Support Bracket, which is still in place.

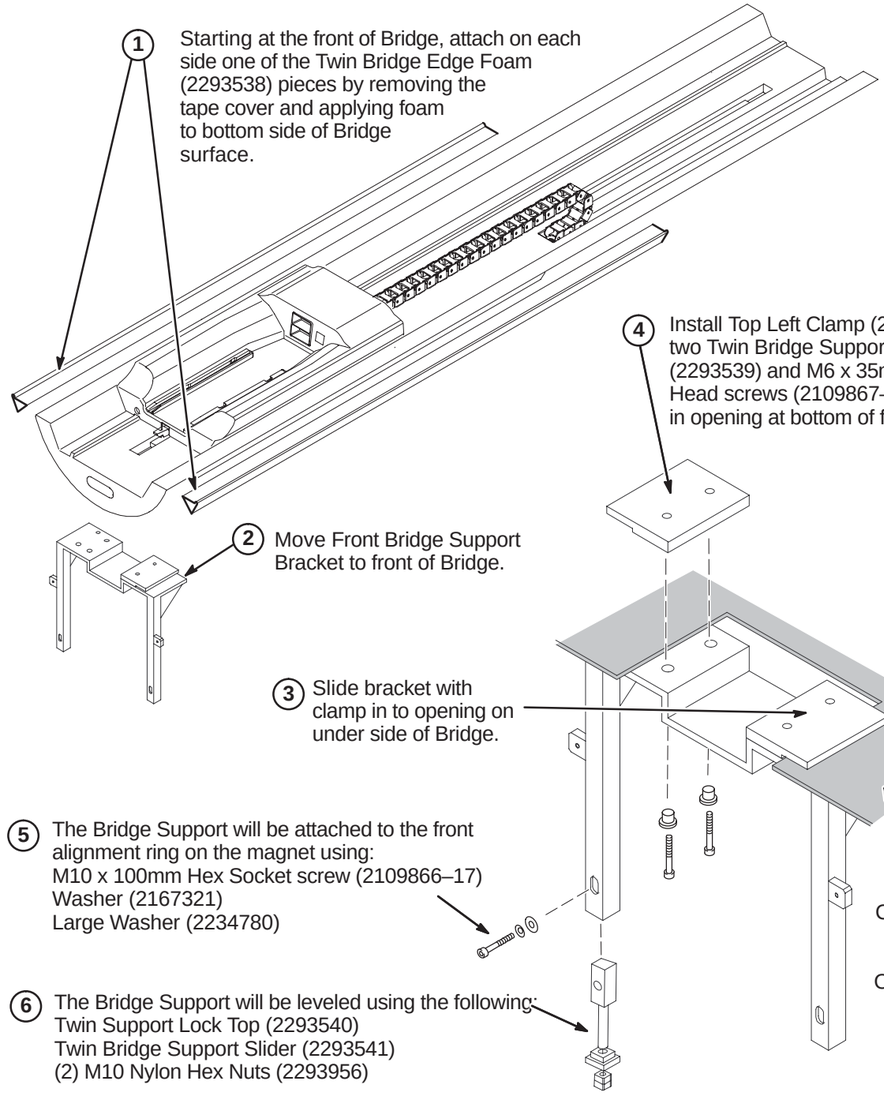
❑ O2 – INSTALL TOP RIGHT CLAMP ON BRIDGE SUPPORT



1. Install Top Right Clamp (2293537) using two Twin Bridge Support Bushings (2293539) and M6 x 35mm long Socket Head screws (2109867–17) onto Front Twin Bridge Support (2293202).

2. Top Left Clamp (2293536) and two Twin Bridge Support Bushings (2293539) and M6 x 35mm long Socket Head screws (2109867–17) will be installed in next procedure after Front Twin Bridge Support is positioned under front of Bridge.

❑ O3 – INSTALL BRIDGE SUPPORT ONTO BRIDGE



1. Starting at the front of Bridge, attach on each side one of the Twin Bridge Edge Foam (2293538) pieces by removing the tape cover and applying foam to bottom side of Bridge surface.

2. Move Front Bridge Support Bracket to front of Bridge.

3. Slide bracket with clamp in to opening on under side of Bridge.

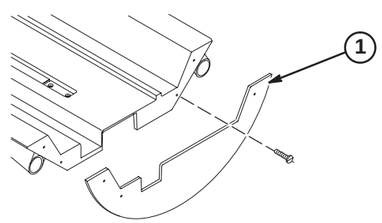
4. Install Top Left Clamp (2293536) and two Twin Bridge Support Bushings (2293539) and M6 x 35mm long Socket Head screws (2109867–17) as shown in opening at bottom of front of Bridge.

5. The Bridge Support will be attached to the front alignment ring on the magnet using:
   M10 x 100mm Hex Socket screw (2109866–17)
   Washer (2167321)
   Large Washer (2234780)

6. The Bridge Support will be leveled using the following:
   Twin Support Lock Top (2293540)
   Twin Bridge Support Slider (2293541)
   (2) M10 Nylon Hex Nuts (2293956)

CUT–AWAY VIEW OF BOTTOM OF BRIDGE

❑ O4 – REMOVE REAR BRIDGE PLATE

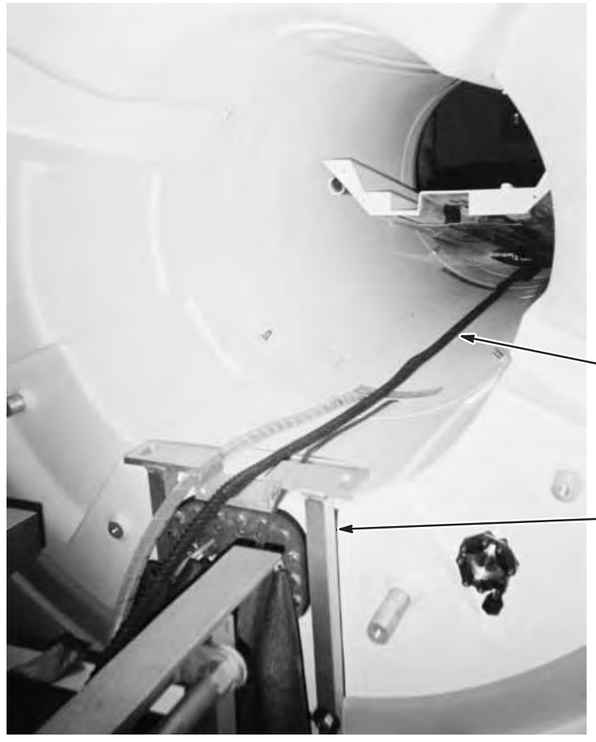


1. Remove Rear Cover from end of bridge before inserting bridge into magnet bore.

INSTALLATION PROCEDURES SUMMARY

- ❑ **P1 – Installation of Bridge**
- ❑ **P2 – Reattach Bridge Mount Asm**
- ❑ **P3 – Attaching Front of Bridge**
- ❑ **P4 – Leveling Front of Bridge**

❑ P1 – INSTALLATION OF BRIDGE

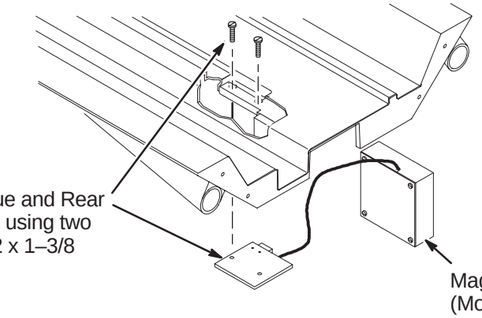


1. Roll out belt prior to installation of Bridge.
2. Guide the Bridge thru the bore to the other end. Lift front end of bridge to engage tongue on long drive assembly into Bridge.

Note: If Rear Bridge support is present, **remove** prior to installation of Bridge.

❑ P2 – REATTACH BRIDGE MOUNT ASM

NOTE:
It is important that the sensor end of the Sensor body fits flush with the Sensor Bracket.

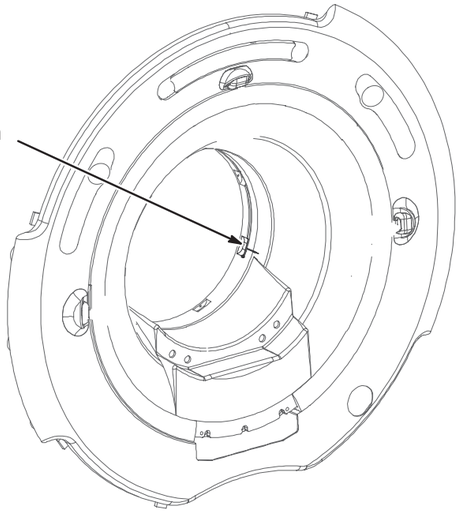


1. Attach together Bridge, Tongue and Rear Bridge Mount Asm (2132034) using two (2) previously removed 10–32 x 1–3/8 Screws (46–220184P47)

Magnet I/F #1
(Mounted on Rear Pedestal)

❑ P3 – ATTACHING FRONT OF BRIDGE

1. Top of front end of Bridge should line up with alignment marks on side of Front End Bell



2. Align the Front Bridge Support screws (2109866–26) and washers (2234780 & 2167321) with the corresponding holes in the End Bell.
3. Snug the screws. Do not overtighten, since adjustments may be needed.

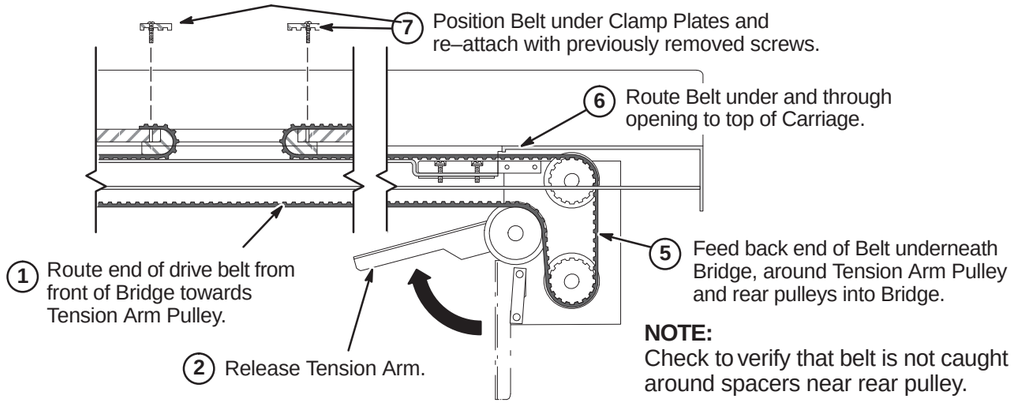
❑ P4 – LEVELING FRONT OF BRIDGE

1. Put a level across front of Bridge and level it by adjusting right or left slider screws to center the bubble.

INSTALLATION PROCEDURES SUMMARY

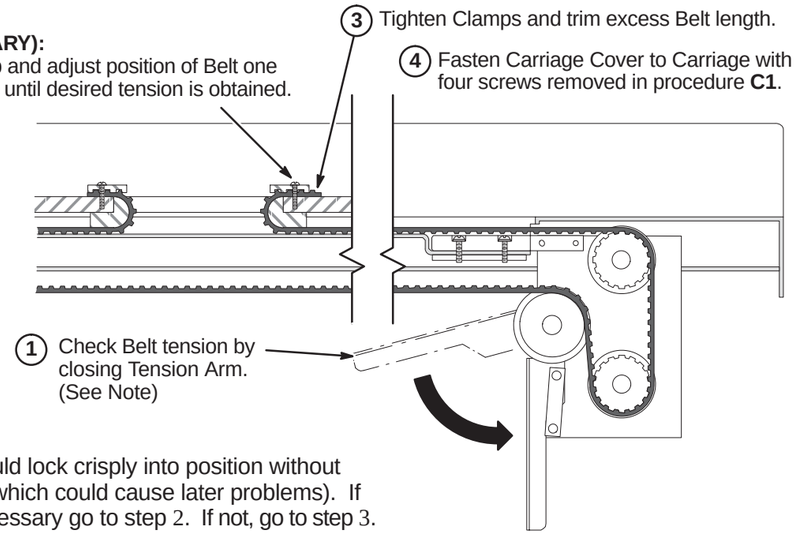
- ❑ **Q1 – Routing Drive Belt**
- ❑ **Q2 – Final Adjustment of Drive Belt**
- ❑ **Q3 – Installation of Sensor Flag**
- ❑ **Q4 – Attach Bridge Cover**
- ❑ **Q5 – Leveling Rear of Bridge**

❑ Q1 – ROUTING OF DRIVE BELT



NOTE:
Check to verify that belt is not caught around spacers near rear pulley.

❑ Q2 – FINAL ADJUSTMENT OF DRIVE BELT



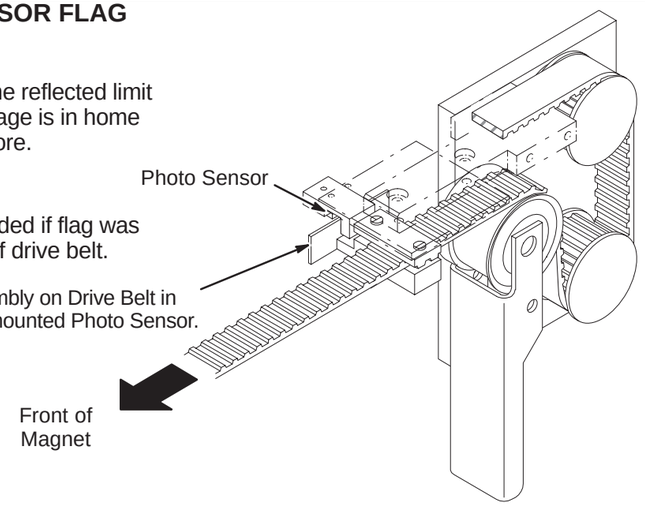
NOTE:
Tension Arm should lock crisply into position without excessive force (which could cause later problems). If adjustment is necessary go to step 2. If not, go to step 3.

❑ Q3 – INSTALLATION OF SENSOR FLAG

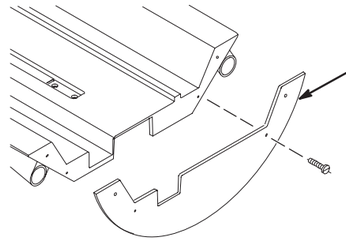
NOTE:
Function of the Flag is to interrupt the reflected limit switch sensor beam when the Carriage is in home position all the way forward in the bore.

NOTE:
The following Step is needed if flag was removed during routing of drive belt.

1 Install Flag Assembly on Drive Belt in line with Bridge mounted Photo Sensor.



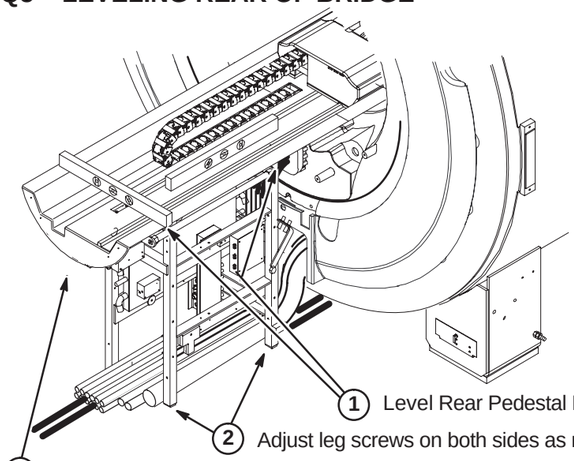
❑ Q4 – ATTACH BRIDGE COVER



1 Replace previously removed Bridge Cover and fasten with (4) screws to end of Bridge.

Note:
Bridge Cover has enclosure rating plates on it.

❑ Q5 – LEVELING REAR OF BRIDGE



1 Level Rear Pedestal Bridge and tighten Vertical Adjustment Fasteners.

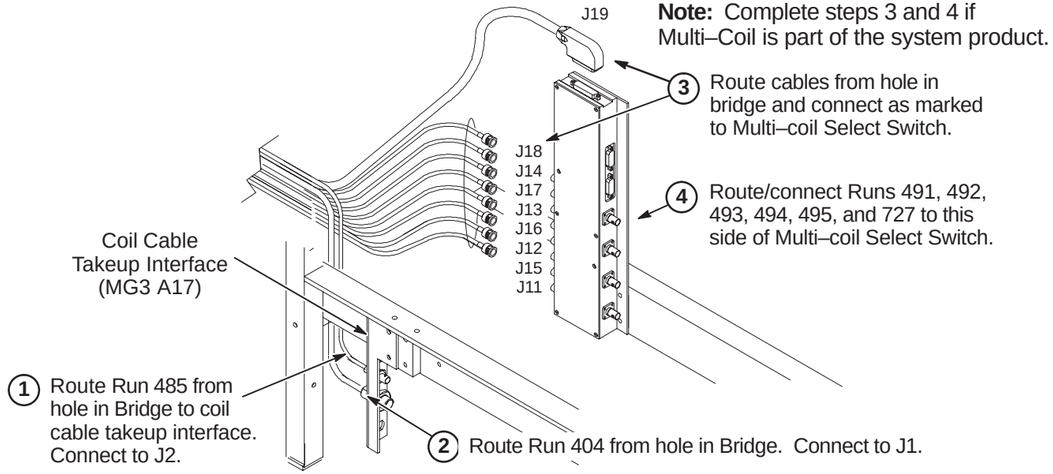
2 Adjust leg screws on both sides as needed to level Rear Pedetal.

3 Make sure that Longitudinal Drive Asm is level.

INSTALLATION PROCEDURES SUMMARY

- ❑ **R1 – Route/Connect Runs 404, 485 and Multi–coil Cables**
- ❑ **R2 – Route/Connect Vacuum Hose and Elbow**
- ❑ **R3 – Installatin of Comfort Module Clips**
- ❑ **R4 – Installation of Comfort Module**

❑ R1 – ROUTE/CONNECT RUNS 404, 485 AND MULTI–COIL CABLES

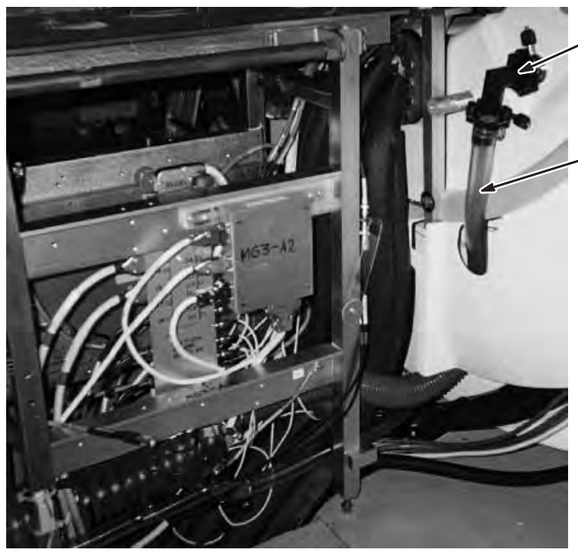


Note: Complete steps 3 and 4 if Multi–Coil is part of the system product.

3. Route cables from hole in bridge and connect as marked to Multi–coil Select Switch.
4. Route/connect Runs 491, 492, 493, 494, 495, and 727 to this side of Multi–coil Select Switch.
1. Route Run 485 from hole in Bridge to coil cable takeup interface. Connect to J2.
2. Route Run 404 from hole in Bridge. Connect to J1.

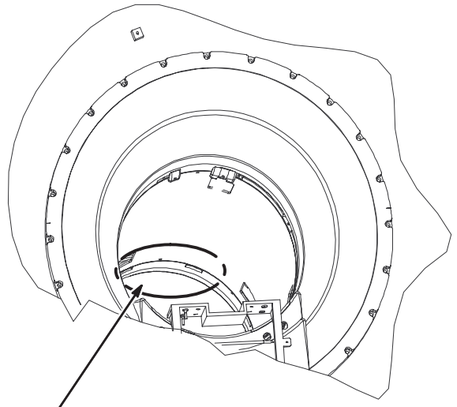
❑ R2 – ROUTE/CONNECT VACUUM HOSE AND ELBOW

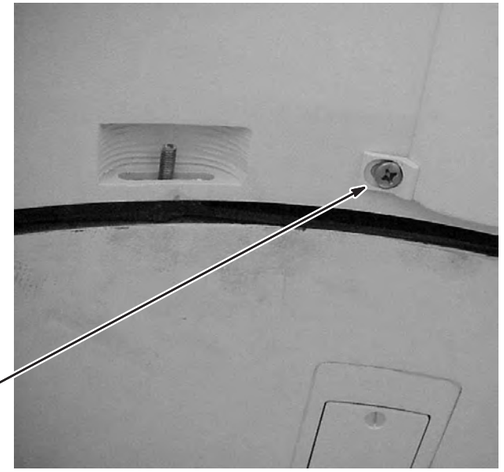
Note:
Vacuum Grease **must** be applied to all Centering Rings (2293608) and outside edge of vacuum connector flanges.



1. Install Elbow (2293609) to End Bell using centering ring (2293608) and chain clamp (2293618–2). Tighten chain clamp to **"finger tight"**.
2. Route vacuum hose (2293607) from Elbow on End Bell, thru Penetration Panel, to connection at rear of TAC Cabinet in Equipment Room. Cut to length.
3. At each end of vacuum hose insert Hose Connector (2293616), apply vacuum grease to ouside edge of connector and fasten with two (2) Clamps (2294010–3).
4. Apply vacuum grease to outside edge of Hose Connector flanges and respective connector flanges on TAC and End Bell.
5. Connect each end of Vacuum Hose using centering ring (2293608) and chain clamp (2293618–2). Tighten chain clamp to **"finger tight"**.

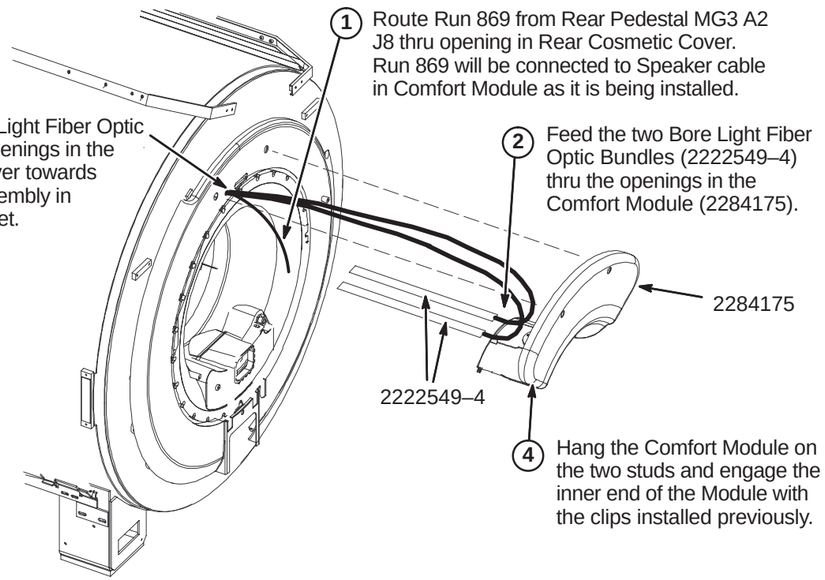
❑ R3 – INSTALLATION OF COMFORT MODULE CLIPS





1. Install the two Comfort Module Clips (2284174) using M6 x 16mm Pan Head Screws in the location at the rear of upper bore indicated above.

❑ R4 – INSTALLATION OF COMFORT MODULE



1. Route Run 869 from Rear Pedestal MG3 A2 J8 thru opening in Rear Cosmetic Cover. Run 869 will be connected to Speaker cable in Comfort Module as it is being installed.
2. Feed the two Bore Light Fiber Optic Bundles (2222549–4) thru the openings in the Comfort Module (2284175).
3. Feed the two Bore Light Fiber Optic Bundles thru the openings in the Rear Cosmetic Cover towards the Bore Lamp Assembly in the leg of the magnet.
4. Hang the Comfort Module on the two studs and engage the inner end of the Module with the clips installed previously.

INSTALLATION PROCEDURES SUMMARY

- ❑ **S1 – Installation of Bore Light Panels and Rear Cover Straps**
- ❑ **S2 – Route/Connect Fiber Optic Bundle to Bore Lamp**
- ❑ **S3 – Install Front and Rear Blue Ring Sections**
- ❑ **S4 – Install Right and Left Side Wraps**

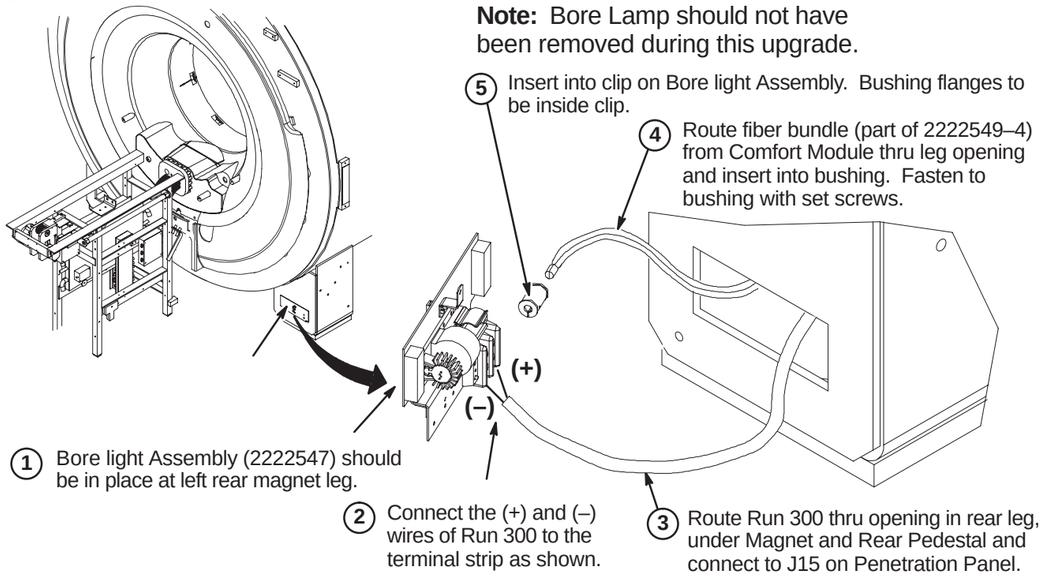
❑ S1 – INSTALLATION OF BORE LIGHT PANELS AND REAR COVER STRAP

1. Bend the Bore Light Panels and slip them into place. Peel off the paper from the double–sided tape and stick the light panels to the bore of the RF Coil.

2. Snap the Rear Cover Strap (2287881–2) over gasket between RF and End Bell.

❑ S2 – ROUTE/CONNECT FIBER OPTIC BUNDLE TO BORE LAMP

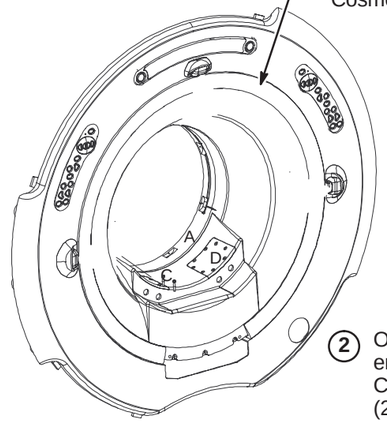
Note: Bore Lamp should not have been removed during this upgrade.



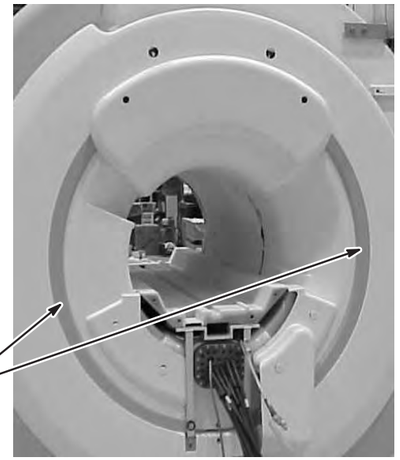
1. Bore light Assembly (2222547) should be in place at left rear magnet leg.
2. Connect the (+) and (–) wires of Run 300 to the terminal strip as shown.
3. Route Run 300 thru opening in rear leg, under Magnet and Rear Pedestal and connect to J15 on Penetration Panel.
4. Route fiber bundle (part of 2222549–4) from Comfort Module thru leg opening and insert into bushing. Fasten to bushing with set screws.
5. Insert into clip on Bore light Assembly. Bushing flanges to be inside clip.

❑ S3 – INSTALL FRONT AND REAR BLUE RING SECTIONS

1. On the front of the magnet enclosure, install front blue Cosmetic Ring (2331842).

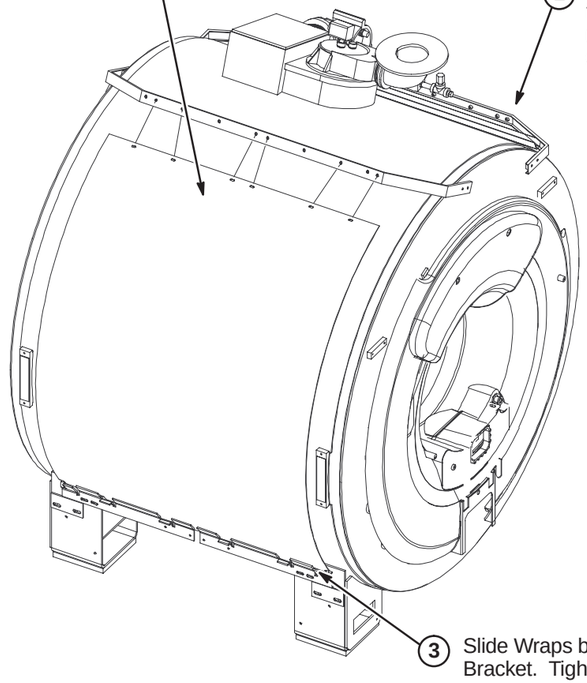


2. On the rear of the magnet enclosure, install two Cosmetic Ring Sections (2331842–2 & 2231842–3).



❑ S4 – INSTALL RIGHT AND LEFT SIDE WRAPS

2. Connect the Right Side Wrap (2217702–2) to frame with (6) M6 x 12mm Button head screws (2109872–6) and M6 Nylon washers (2229794) and blue Loctite.
1. Connect the Left Side Wrap (2217703–2) to frame with (6) M6 x 12mm Button head screws (2109872–6) and M6 Nylon washers (2229794) and blue Loctite.

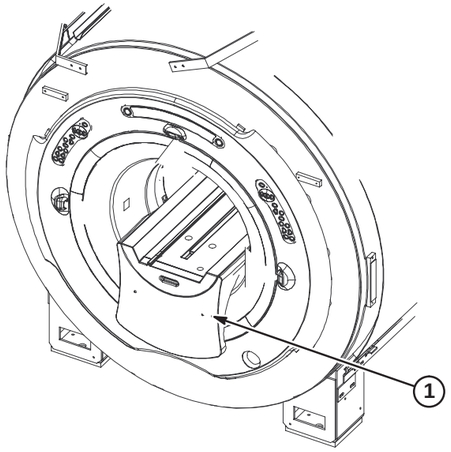


3. Slide Wraps between magnet and notches in Clamping Bracket. Tighten clamping bracket screws.

INSTALLATION PROCEDURES SUMMARY

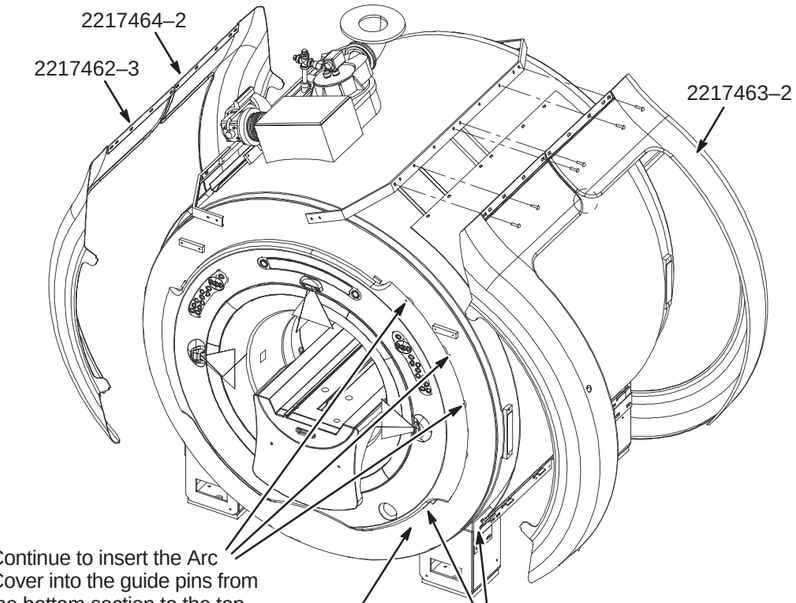
- ❑ **T1 – Installation of Front Bridg Cover**
- ❑ **T2 – Installation of Arc Covers**
- ❑ **T3 – Fasten Top Arc Cover**
- ❑ **T4 – Adjust Bottom of Arc Covers**
- ❑ **T5 – Complete Arc Cover Installation**

❑ T1 – INSTALLATION OF FRONT BRIDGE COVER



1. Install the Front Bridge Cover (2287607) with (2) M6 x 16mm Screws (2284368)

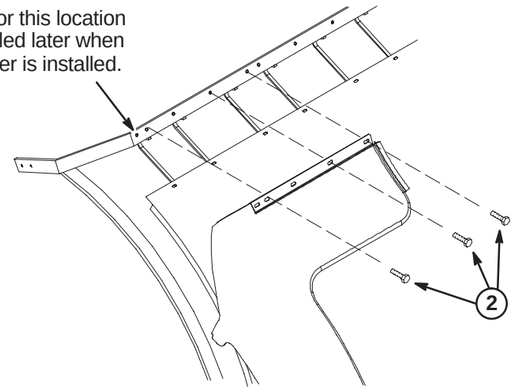
❑ T2 – INSTALLATION OF ARC COVERS



2. Continue to insert the Arc Cover into the guide pins from the bottom section to the top.
3. Make sure the arc rests on the rectangular pin at the bottom of the End Bell.
1. Install Right Front Arc Cover (2217461–3) and insert lower section of the arc between the End Bell and lower guide pin.

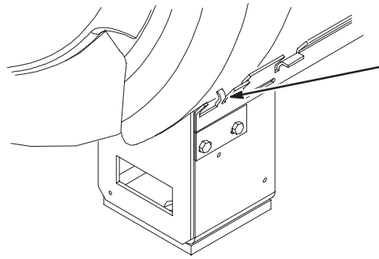
❑ T3 – FASTEN TOP OF ARC COVER

1. The screw for this location will be installed later when the Top Cover is installed.



2. Attach the Arc to the top frame using three (3) M10 x 25mm Hex Head screws (2109866–20) and Blue Loctite.

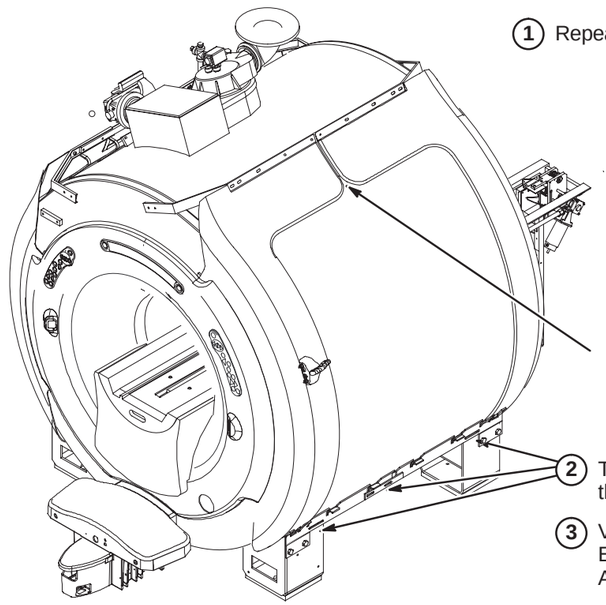
❑ T4 – ADJUST BOTTOM OF ARC COVERS



1. Adjust the bottom rails so that the finger fits into the slot in the bottom of the Arc Cover.

Note: The above process will help pull bottom of Rear End Bell flange closer to the magnet. Adjust Rear End Bell as required to keep distance between flange and magnet equal at top and bottom of End Bell.

❑ T5 – COMPLETE ARC COVER INSTALLATION



1. Repeat process for the other three Arc Covers.

Note: All enclosure seams and gaps visible to the operator and patient shall be less than 0.25 inches (6.35mm). Exceptions can be made where esthetic visual enhancement of the component gap is required by industrial design.

Gap uniformity along any continuos seam shall be $^{+}/_{-}$ 0.0625 inch (1.59mm)

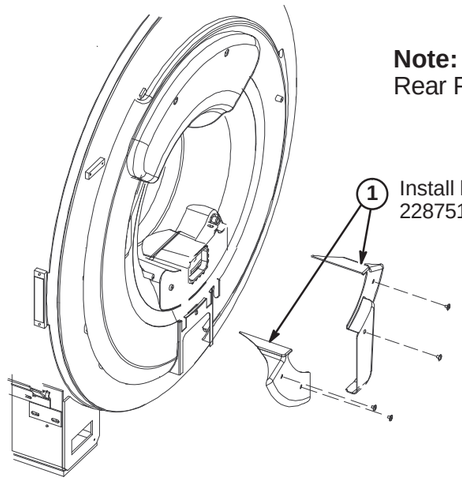
Note: This gap is not included in specification above.

2. Tighten screws in bottom rails. First front rail, then middle connector, then rear of rail.
3. Visually inspect the gap between Arc Cover and End Bell, then the Arc Cover and side Wraps. Adjust as necessary.

INSTALLATION PROCEDURES SUMMARY

- ❑ U1 – Installation of Rear Bridge Covers
- ❑ U2 – Dock Adjustment for Patient Transport Gap
- ❑ U3 – Route and Connect Magnet Enclosure Front Area Cables
- ❑ U4 – Cable Connection to PAC Module

❑ U1 – INSTALLATION OF REAR BRIDGE COVERS



Note:
Rear Pedestal and Bridge are not shown for clarity.

1. Install left and right Rear Bridge covers (2287511 & 2287512) using (4) Bridge Cover Screws (2284368).

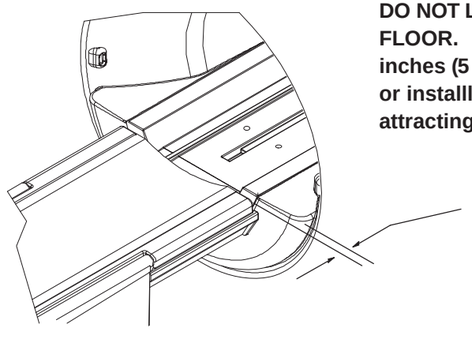
❑ U2 – DOCK ADJUSTMENT FOR PATIENT TRANSPORT GAP

WARNING!

DOCK CONTAINS FERROUS MATERIAL. HANDLE WITH CARE DURING INSTALLATION. IF MAGNET IS RAMPED, WHENEVER MOVING DOCK, DOWNWARD PRESSURE MUST BE CONSTANTLY APPLIED TO THE TOP OF THE DOCK ASSEMBLY BY TWO PEOPLE. DOCK MUST BE MOVED SLOWLY ALONG THE GROUND AND NOT LIFTED VERTICALLY

WARNING!

DO NOT LIFT THE DOCK MORE THAN 2 INCHES (5 CM) OFF THE FLOOR. If the height (to clear the dock anchor) exceeds two inches (5 cm), the magnet must be ramped down prior to removing or installling the dock as there is significant risk of the magnet attracting the dock if it needs to be raised more that 2 inches (5 cm).



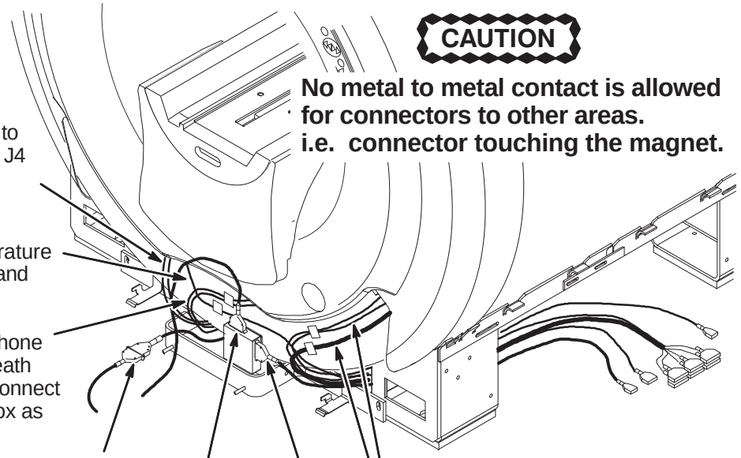
Note:
Gap between Patient Transport front rubber inlay and front of End Bell must be 0.75 Inches ±0.25 (19.0±6.4mm). See Step 1 below.

❑ U3 – ROUTE AND CONNECT MAGNET ENCLOSURE FRONT AREA CABLES

Note:
Dock Assembly not shown for clarity.

CAUTION

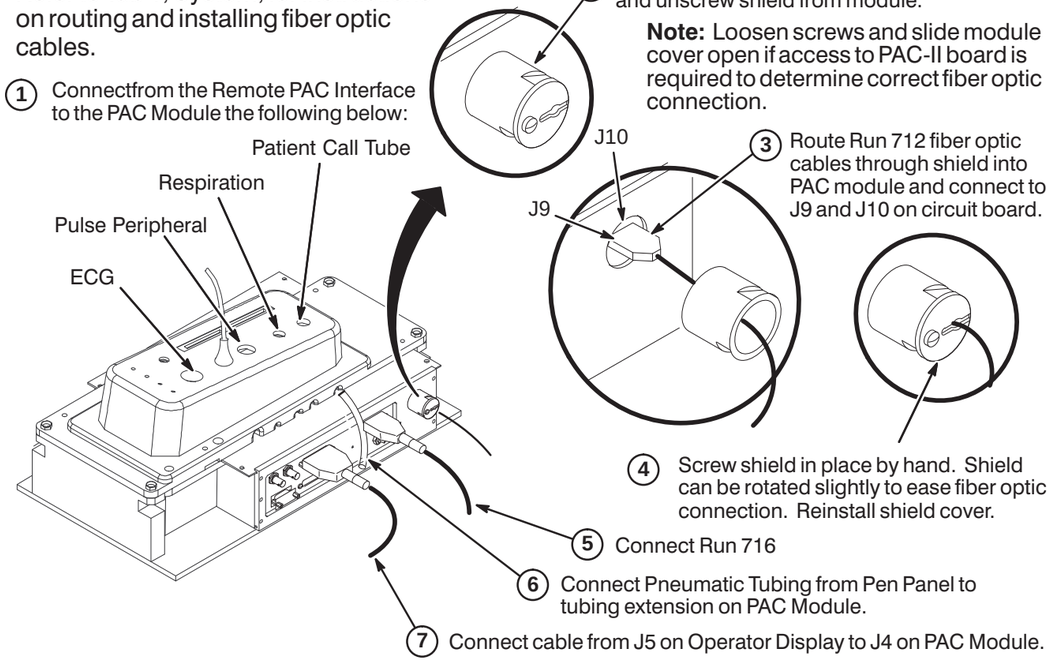
No metal to metal contact is allowed for connectors to other areas. i.e. connector touching the magnet.



1. Route Runs 778 and 779 to front RF Bias cables J3 & J4 and connect as marked.
2. Route Run 749, Bore Temperature Sensor, from Front End Bell and connect ot J10 on SRI.
3. Route Front End Bell Microphone and Speaker cables underneath manet to ReaPedestal and connect to Patient Communication Box as marked.
4. Connect Run 387 to Dock Cable (MG2 A29 P1). If needed to prevent contact with other metal parts, cover connectors with provided velcro jacket or tape.
5. Connect Dock Cable to J2 on Dock Limit Box
6. Route/Connect Run 421 from SRI J3 and connect to J1 on Dock Limit Box.
7. Route cables from Operator Display to area of PAC/SRI Platform and connect as marked to SRI and PAC.

❑ U4 – CABLE CONNECTION TO PAC MODULE

Note:
Refer to Tab 1, System, for instructions on routing and installing fiber optic cables.



1. Connectfrom the Remote PAC Interface to the PAC Module the following below:
2. Remove shield cover by removing one screw and unscrew shield from module.

Note: Loosen screws and slide module cover open if access to PAC-II board is required to determine correct fiber optic connection.

3. Route Run 712 fiber optic cables through shield into PAC module and connect to J9 and J10 on circuit board.
4. Screw shield in place by hand. Shield can be rotated slightly to ease fiber optic connection. Reinstall shield cover.
5. Connect Run 716
6. Connect Pneumatic Tubing from Pen Panel to tubing extension on PAC Module.
7. Connect cable from J5 on Operator Display to J4 on PAC Module.

INSTALLATION PROCEDURES SUMMARY

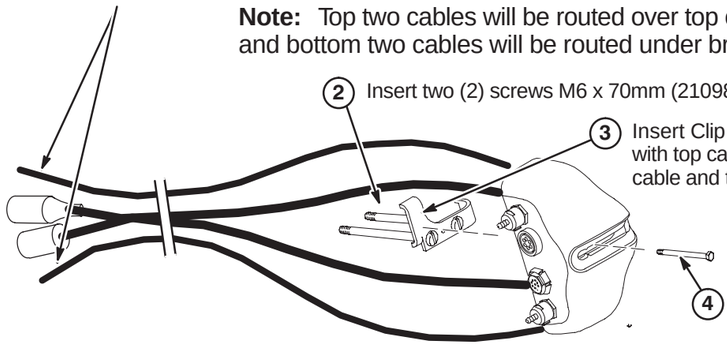
- ❑ **V1 – Prepare Cables and Tubes for Routing**
- ❑ **V2 – Position Remote PAC Interface Mounting Clip**
- ❑ **V3 – Route Remote PAC Interface Cables and Tubes**
- ❑ **V4 – Installing Remote PAC Interface to Arc Cover**
- ❑ **V5 – Install PAC Hanger Bar**

❑ V1 – PREPARE CABLES AND TUBES FOR ROUTING

Note:
Consult with customer for correct location of Remote PAC Interface assembly. It must be on the same side as the PAC/SRI Platform, as positioned in Procedure **A1**

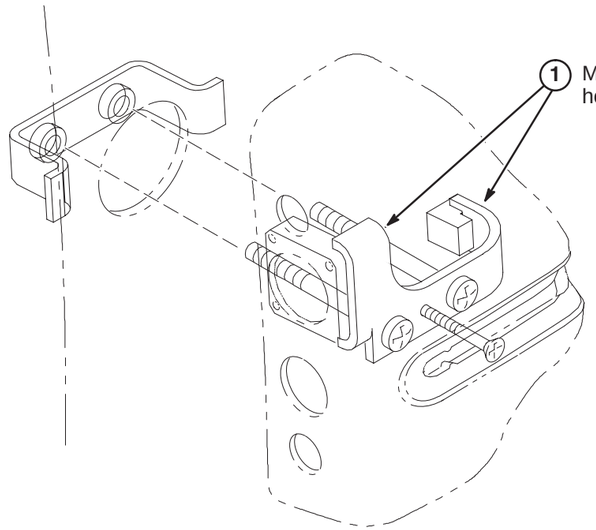
1. Apply tape around end of pneumatic tubes and mark "TOP" to the opposite end of the tube connected to the top connector in the Remote PAC Interface Assembly and "BOTTOM" to the tube connected to the lower connector.

Note: Top two cables will be routed over top of bracket and bottom two cables will be routed under bracket.



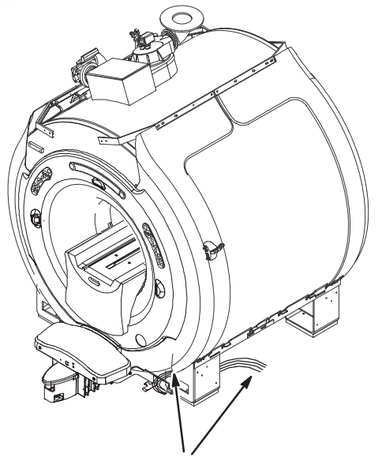
2. Insert two (2) screws M6 x 70mm (2109873–33) screws into Clip (2221023).
3. Insert Clip with screws into shell as shown with top cable and tube above Clip and bottom cable and tube below.
4. Hold in place by inserting provided M4 screw thru slot and turning about 3 or 4 turns into Clip.

❑ V2 – POSITION REMOTE PAC INTERFACE MOUNTING CLIP



1. Make sure each side of clip is mounted behind housing blocks.

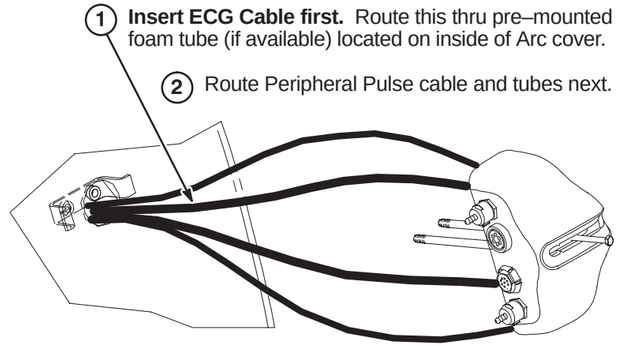
❑ V3 – ROUTE REMOTE PAC INTERFACE CABLES AND TUBES



3. Route around foot of magnet to PAC/SRI Platform location.

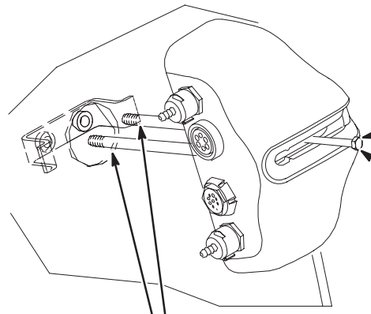
Note: Top two cables will be routed over top of bracket and bottom two cables will be routed under bracket.

Note: Insert cables/tubes separately thru hole and make sure they come out at bottom of arc cover.



1. **Insert ECG Cable first.** Route this thru pre–mounted foam tube (if available) located on inside of Arc cover.
2. Route Peripheral Pulse cable and tubes next.

❑ V4 – INSTALLING REMOTE PAC INTERFACE TO ARC COVER

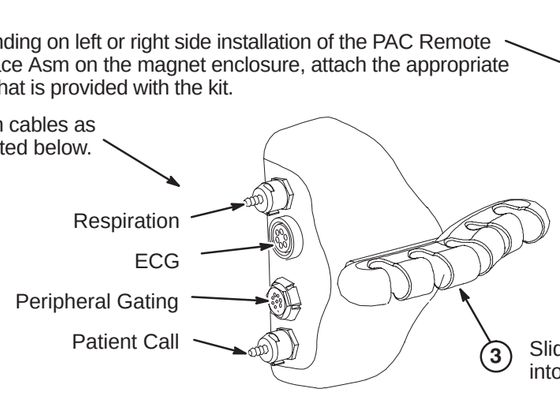


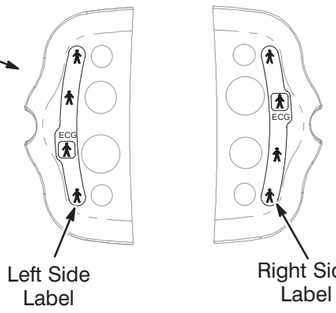
Note:
Routed cables and tubes not shown for clarity.

1. Use M4 screw thru slot to lift and guide small end of Clamp over block inside housing.
3. Remove M4 screw and save for use at at later time since it would be required if Remote PAC Interface Assembly would need to be removed at any time in the future.
   OR
   Turn the M4 screw inward until there is clearance for sliding the PAC Hanger Bar in **T5** into place.
2. Using screwdriver thru housing slot, tighten down the M6 screws to lock housing in place.

❑ V5 – INSTALL PAC HANGER BAR

1. Depending on left or right side installation of the PAC Remote Interface Asm on the magnet enclosure, attach the appropriate label that is provided with the kit.
2. Attach cables as indicated below.





Left Side Label

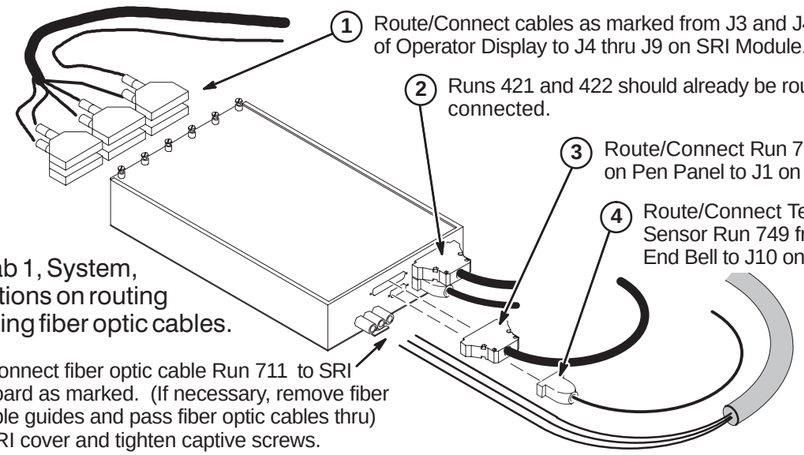
Right Side Label

3. Slide PAC Hanger Bar (2221023) into position.

INSTALLATION PROCEDURES SUMMARY

- ❑ **W1 – Connect Cables to SRI Module**
- ❑ **W2 – Routing of Photo–Plethysmograph Cable**
- ❑ **W3 – Route and Tie–wrap Cables to PAC/SRI Platform**
- ❑ **W4 – Install PAC/SRI Platform under Magnet**

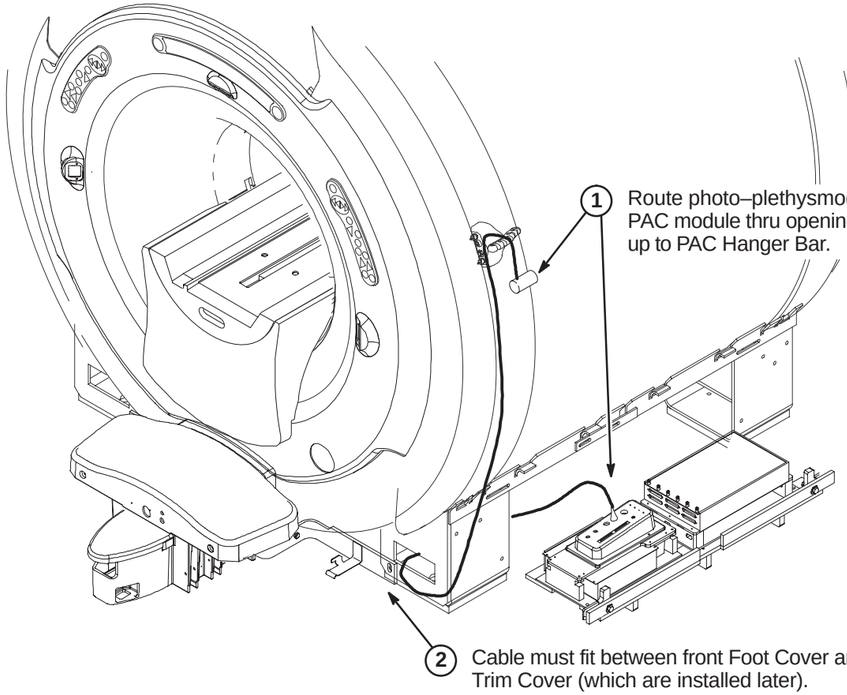
❑ W1 – CONNECT CABLES TO SRI MODULE



1. Route/Connect cables as marked from J3 and J4 of Operator Display to J4 thru J9 on SRI Module.
2. Runs 421 and 422 should already be routed and connected.
3. Route/Connect Run 715 from J14 on Pen Panel to J1 on SRI Module.
4. Route/Connect Temperture Sensor Run 749 from Rear End Bell to J10 on SRI Module
5. Route/Connect fiber optic cable Run 711 to SRI circuit board as marked. (If necessary, remove fiber optic cable guides and pass fiber optic cables thru) Close SRI cover and tighten captive screws.

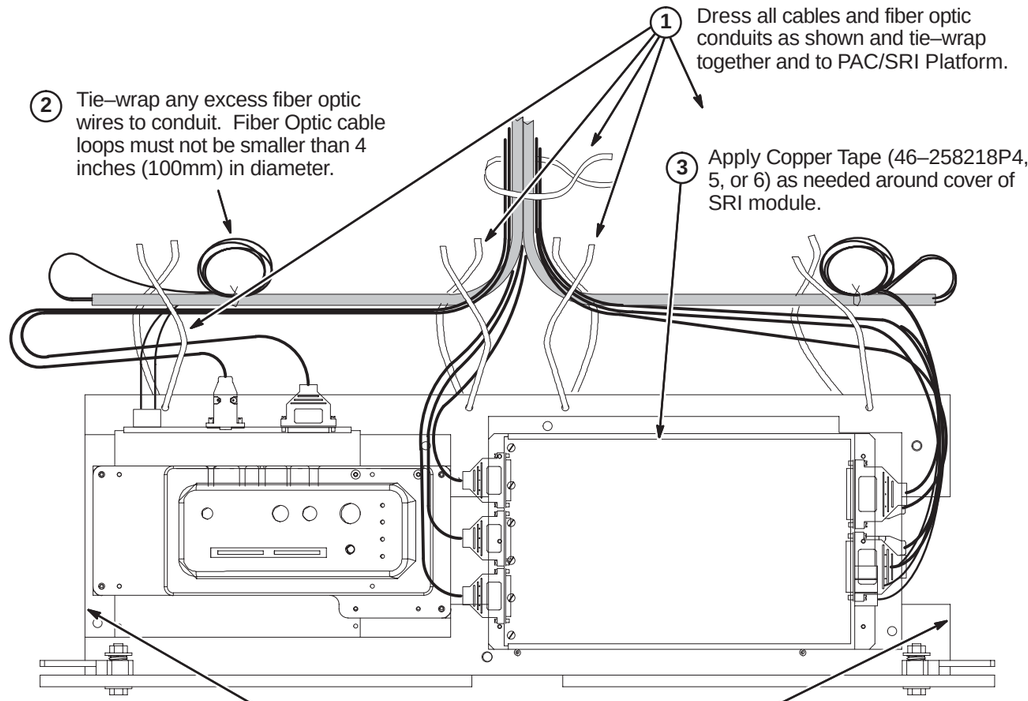
Note:
Refer to Tab 1, System, for instructions on routing and installing fiber optic cables.

❑ W2 – ROUTING OF PHOTO–PLETHYSMOGRAPH CABLE



1. Route photo–plethysmograph cable from PAC module thru opening in front leg and up to PAC Hanger Bar.
2. Cable must fit between front Foot Cover and side Trim Cover (which are installed later).

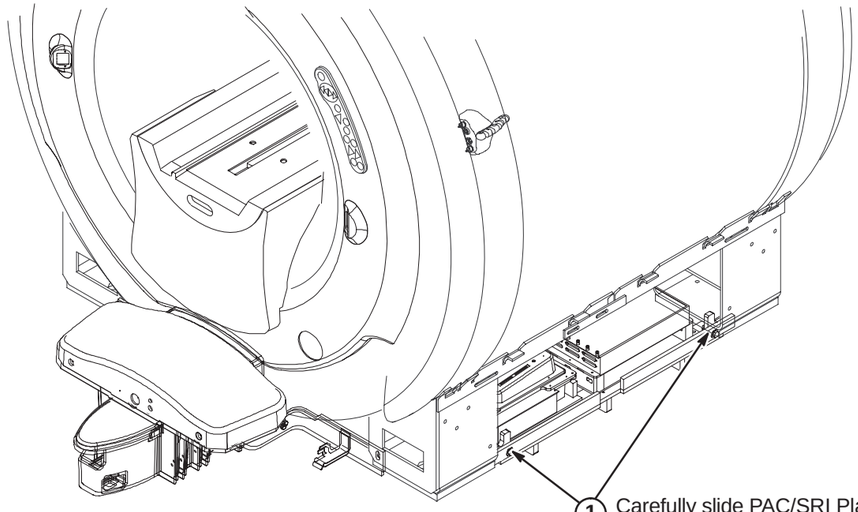
❑ W3 – ROUTE AND TIE–WRAP CABLES TO PAC/SRI PLATFORM



1. Dress all cables and fiber optic conduits as shown and tie–wrap together and to PAC/SRI Platform.
2. Tie–wrap any excess fiber optic wires to conduit. Fiber Optic cable loops must not be smaller than 4 inches (100mm) in diameter.
3. Apply Copper Tape (46–258218P4, 5, or 6) as needed around cover of SRI module.

Note: Keep cables dressed inside edge so unit slides between legs easily for service.

❑ W4 – INSTALL PAC/SRI PLATFORM UNDER MAGNET

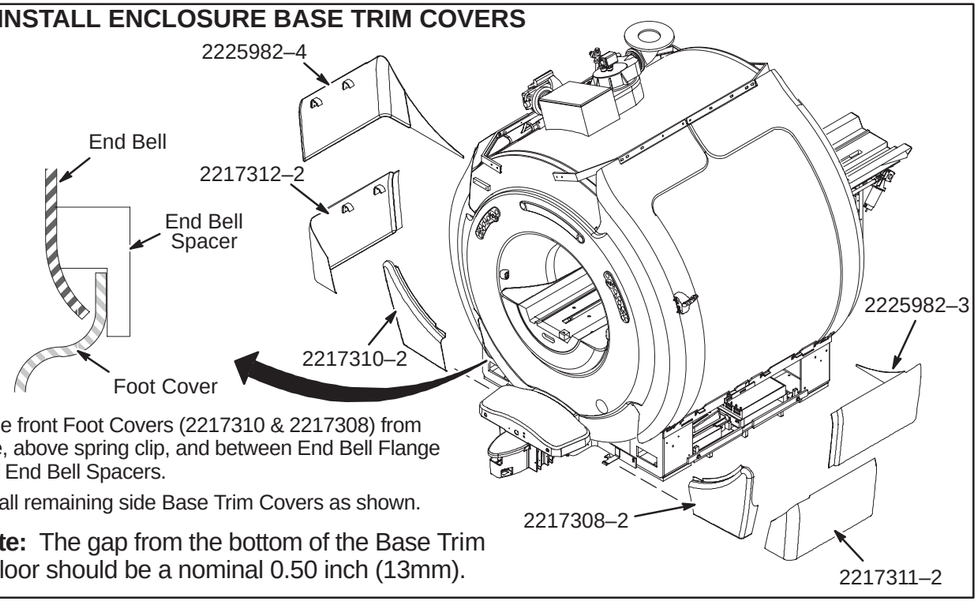


1. Carefully slide PAC/SRI Platform between legs of magnet and lock in place at each end.

INSTALLATION PROCEDURES SUMMARY

- ❑ **X1 – Install Enclosure Base Trim Covers**
- ❑ **X2 – Install Enclosure Top Covers**
- ❑ **X3 – Install Rear Pedestal Covers**
- ❑ **X4 – Install Rating Plates**

❑ X1 – INSTALL ENCLOSURE BASE TRIM COVERS



1. Slide front Foot Covers (2217310 & 2217308) from side, above spring clip, and between End Bell Flange and End Bell Spacers.
2. Install remaining side Base Trim Covers as shown.

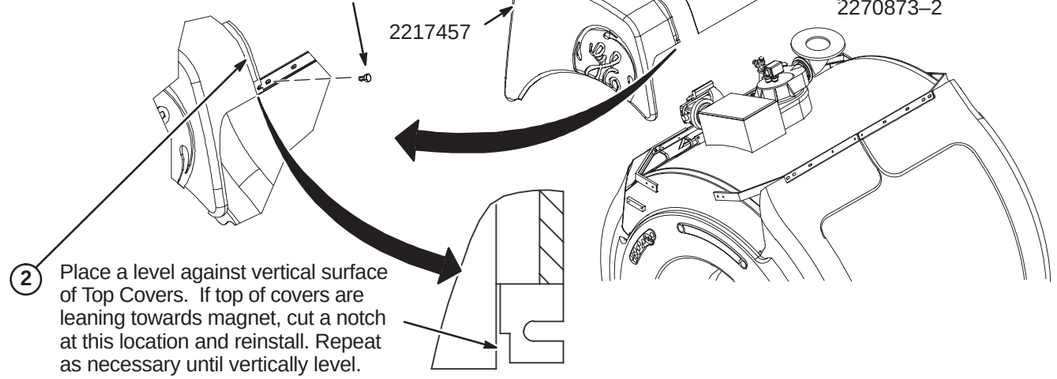
Note: The gap from the bottom of the Base Trim to floor should be a nominal 0.50 inch (13mm).

❑ X2 – INSTALL ENCLOSURE TOP COVERS

Note: All enclosure seams and gaps visible to the operator and patient shall be less than 0.25 inches (6.35mm). This applies to the mating seam of the two Side Top Covers to the Front Top Cover

Gap uniformity along any continuous seam shall be $^{+}/_{-}$ 0.0625 inch (1.59mm)

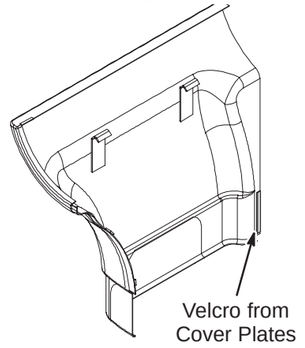
1. Install front (2217457) and rear (2217458) Top Covers as shown using M10 x 25mm Low Profile hex screws and blue Loctite.
2. Install side Top Covers as shown.



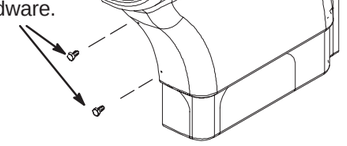
2. Place a level against vertical surface of Top Covers. If top of covers are leaning towards magnet, cut a notch at this location and reinstall. Repeat as necessary until vertically level.

❑ X3 – INSTALL REAR PEDESTAL COVERS

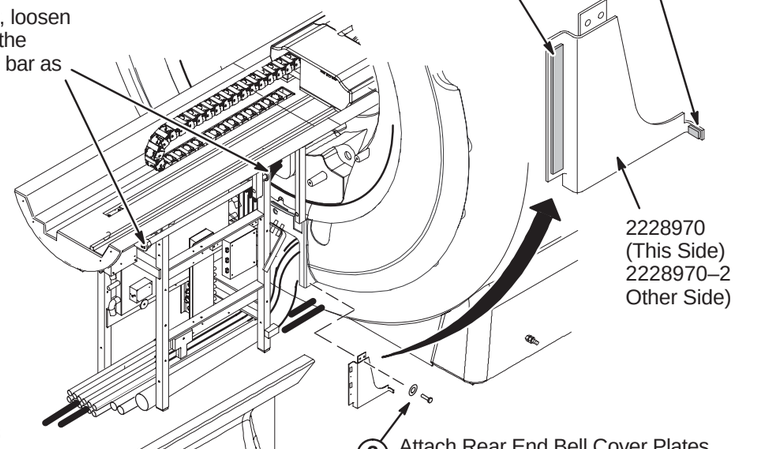
5. Pedestal Covers require an opening to be cut out depending on routing of cables and hoses. Covers are marked in three places (left side, right side, or rear) for cutting.
6. After cutting out appropriate opening, hang covers on Rear Pedestal.
7. If covers need adjustment, loosen the screws at each end of the support bar and reposition bar as necessary.



8. Fasten covers together with furnished hardware.

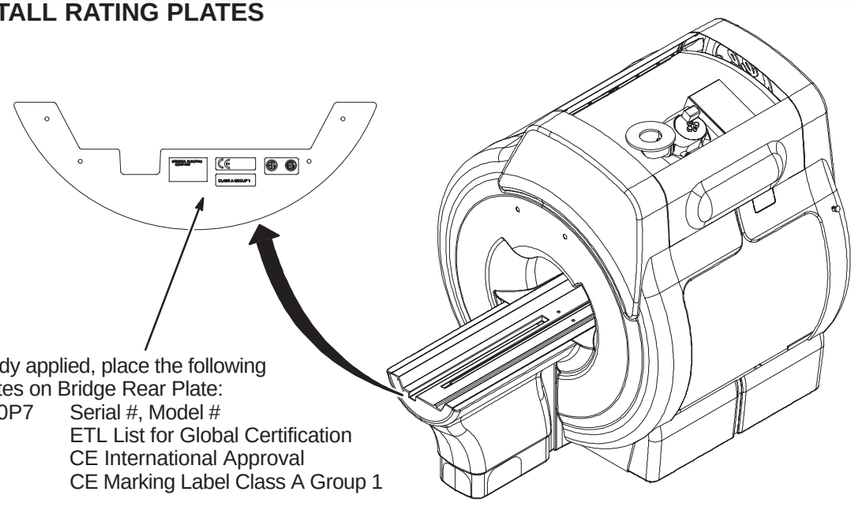


1. Remove mating piece of velcro from Rear End Bell Cover Plates (2228970 & 2228970–2) and attach to Rear Pedestal Covers
2. Remove mating velcro and attach to back side of Arc Covers.



3. Attach Rear End Bell Cover Plates (2228970 & 2228970–2) to both sides of Rear Pedestal with furnished hardware – two M4 washers (2109879) and two M4 x 8mm Pan head screws (2109873–13) for each plate.
4. Install left (2287512) and right (2287511) Rear Bridge Covers. The left cover is installed over the vacuum connection on the end bell.

❑ X4 – INSTALL RATING PLATES



1. If not already applied, place the following Rating Plates on Bridge Rear Plate:

46–302200P7	Serial #, Model #
2142857	ETL List for Global Certification
2117390	CE International Approval
2132620	CE Marking Label Class A Group 1

LIST OF EFFECTIVE PAGES

PAGE	REV	PAGE	REV
1	3	14	3
2	0	15	3
3	0	16	1
4	3	17	2
5	3	18	3
6	0	19	0
7	0	20	2
8	0	21	2
9	1	22	0
10	0	23	3
11	2	24	0
12	0	25	0
13	0	26	0

GENERAL ENCLOSURE NOTES:

- Front, rear, left, and right, as used in this section, are defined as follows: the patient entrance end of the magnet is the front; the opposite end is the rear; left and right are in respect to a person's left and right while facing the patient entrance end of the magnet.

WARNING!

FERROUS MATERIAL HAZARD! PARTS REQUIRED FOR THIS UPGRADE INSTALLATION CONTAIN FERROUS MATERIAL AND WILL BE STRONGLY ATTRACTED TO MAGNET AND MAY BECOME DANGEROUS PROJECTILES.

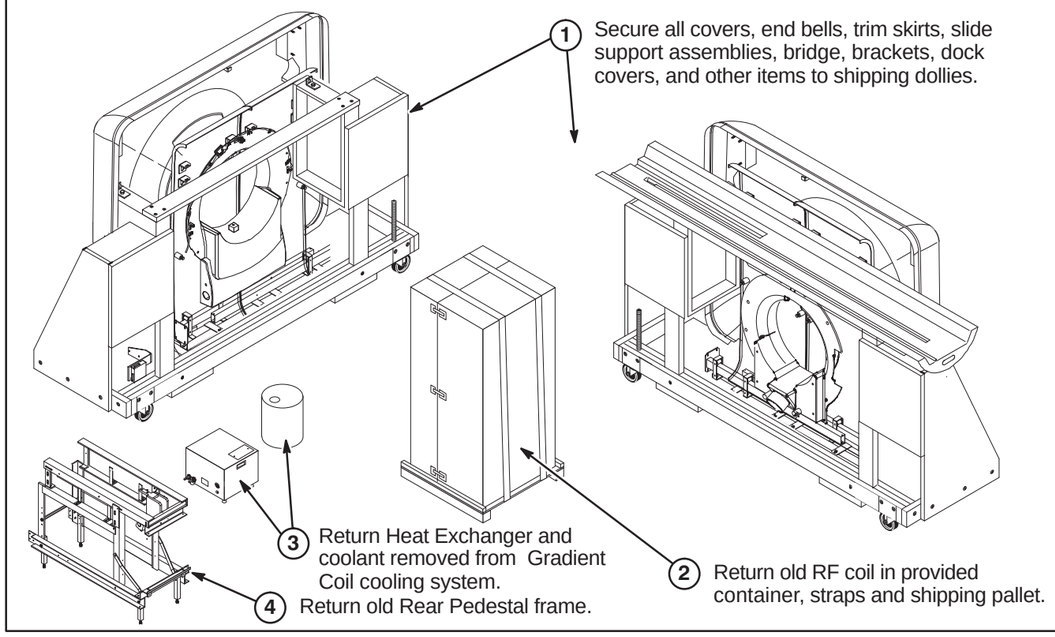
IF MAGNET IS AT FULL FIELD – KEEP ALL FERROUS TOOLS AND MATERIALS AS FAR FROM MAGNET AS POSSIBLE.

INSTALLATION PROCEDURES SUMMARY

- ❑ **A1 – Items to be Returned for Recycling at Completion of Upgrade**
- ❑ **A2 – Enclosure Covers and Dock Removal**
- ❑ **A3 – Disconnect Rear Pedestal Cables**

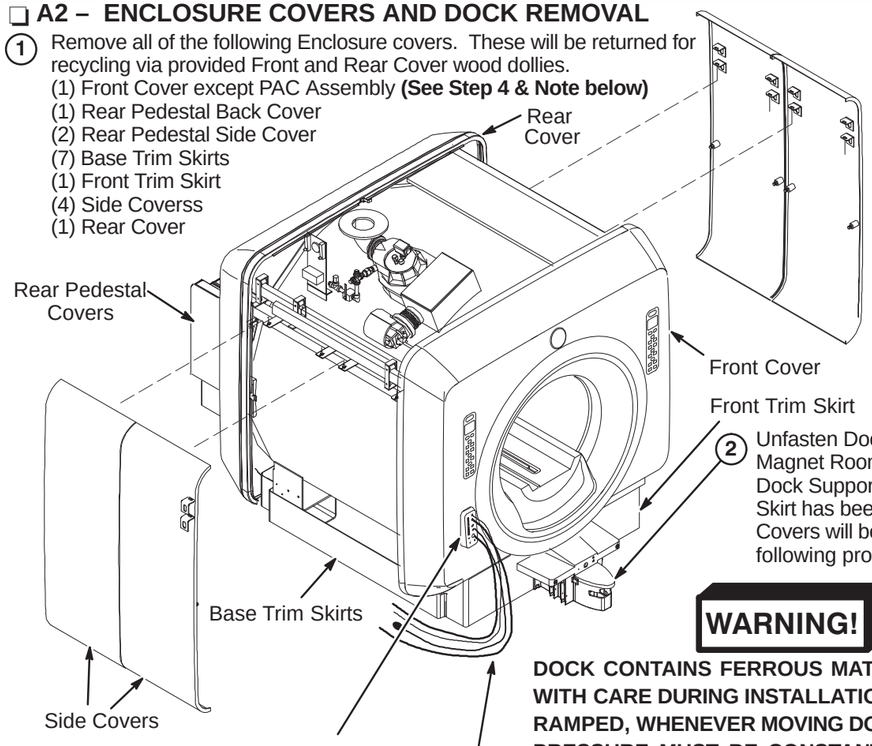
❑ A1 – ITEMS TO BE RETURNED FOR RECYCLING AT COMPLETION OF UPGRADE

Note: All items de–installed during this upgrade are to be returned for recycling. If the two cover shipping dollies are provided, secure as many of the items as possible to them for this purpose. Shown below is an example of how the dollies might look when loaded. (not all items are shown)



❑ A2 – ENCLOSURE COVERS AND DOCK REMOVAL

1. Remove all of the following Enclosure covers. These will be returned for recycling via provided Front and Rear Cover wood dollies.
   (1) Front Cover except PAC Assembly **(See Step 4 & Note below)**
   (1) Rear Pedestal Back Cover
   (2) Rear Pedestal Side Cover
   (7) Base Trim Skirts
   (1) Front Trim Skirt
   (4) Side Coverss
   (1) Rear Cover



2. Unfasten Dock and remove from Magnet Room. Also remove Dock Support after Front Trim Skirt has been removed. Dock Covers will be replaced in a following procedure.

WARNING!

DOCK CONTAINS FERROUS MATERIAL. HANDLE WITH CARE DURING INSTALLATION. IF MAGNET IS RAMPED, WHENEVER MOVING DOCK, DOWNWARD PRESSURE MUST BE CONSTANTLY APPLIED TO THE TOP OF THE DOCK ASSEMBLY BY TWO PEOPLE. DOCK MUST BE MOVED SLOWLY ALONG THE GROUND AND NOT LIFTED VERTICALLY

3. Disconnect and save ECG & Peripheral Gating cables, Respiration Bellows, and Patient Alert Pneumatic Air Tube and Bulb. These will be reused in new Wide–Open enclosure.

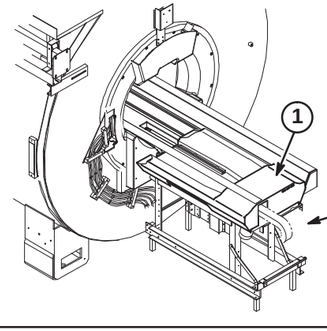
4. Unfasten and save PAC Assembly. It will be upgraded and transferred to new SRI/PAC Platform.

Note: All cables attached to Front Cover to be returned except for Run 385. Disconnect and save. It will be reused in new Wide–Open enclosure.

WARNING!

DO NOT LIFT THE DOCK MORE THAN 2 INCHES (5 CM) OFF THE FLOOR. If the height (to clear the dock anchor) exceeds two inches (5 cm), the magnet must be ramped down prior to removing or installling the dock as there is significant risk of the magnet attracting the dock if it needs to be raised more that 2 inches (5 cm).

❑ A3 – DISCONNECT REAR PEDESTAL CABLES

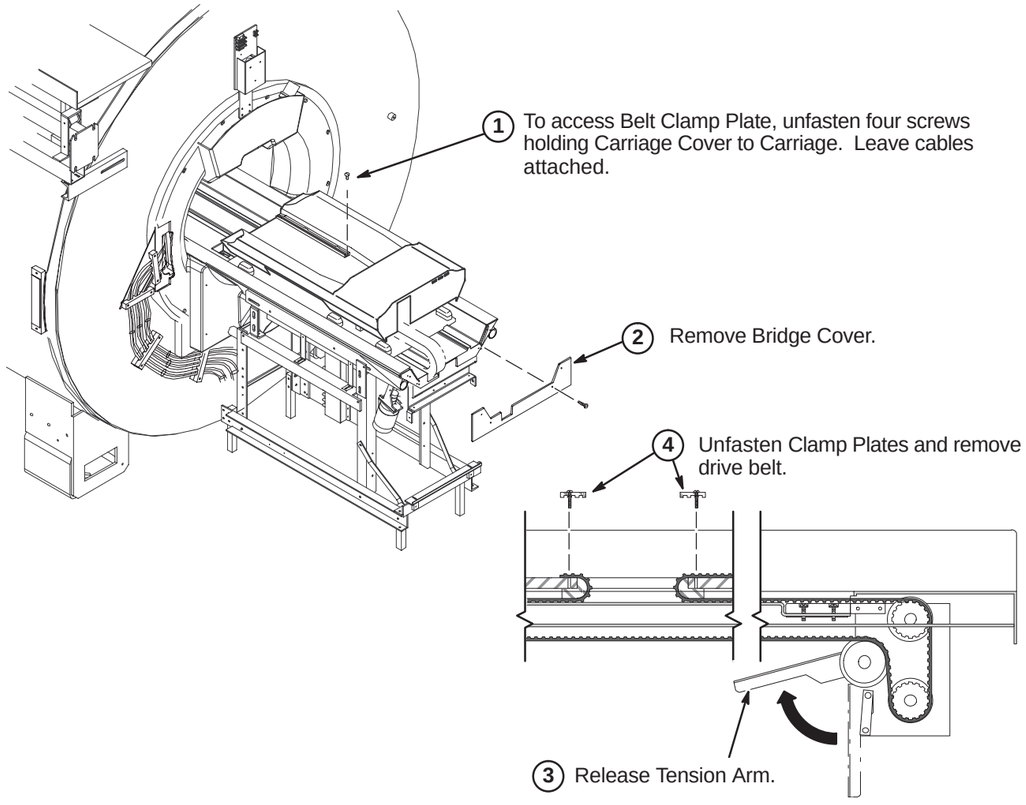


1. Move Carriage to limit of travel at rear of Bridge.
2. Disconnect all cables connected to Rear Pedestal components.

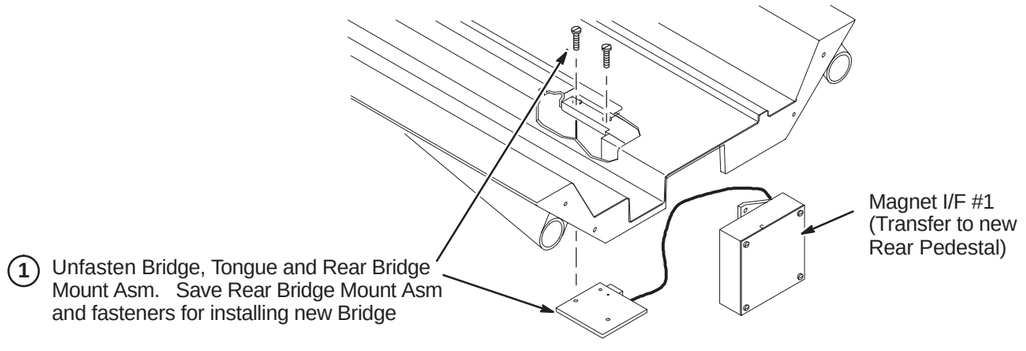
INSTALLATION PROCEDURES SUMMARY

- ❑ **B1 – Remove Drive Belt**
- ❑ **B2 – Unfsten Bridge Mount Assembly**
- ❑ **B3 – Remove Bridge**
- ❑ **B4 – Removing Service Platform and Slide Support Assemblies**

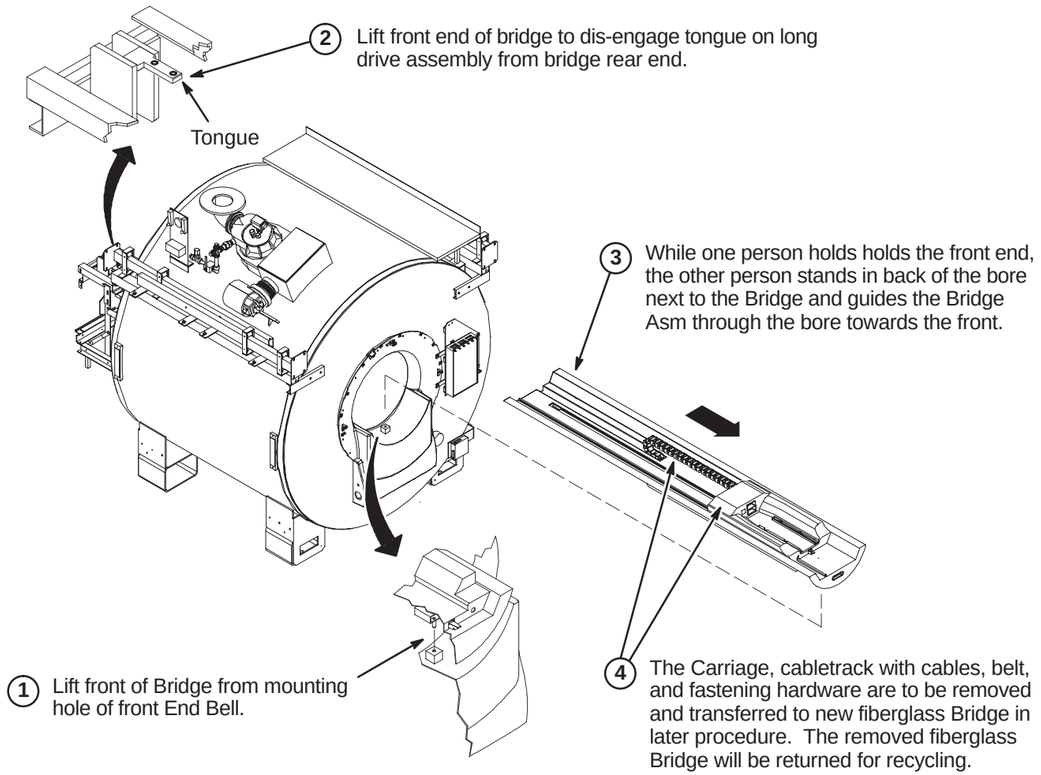
❑ B1 – REMOVE DRIVE BELT



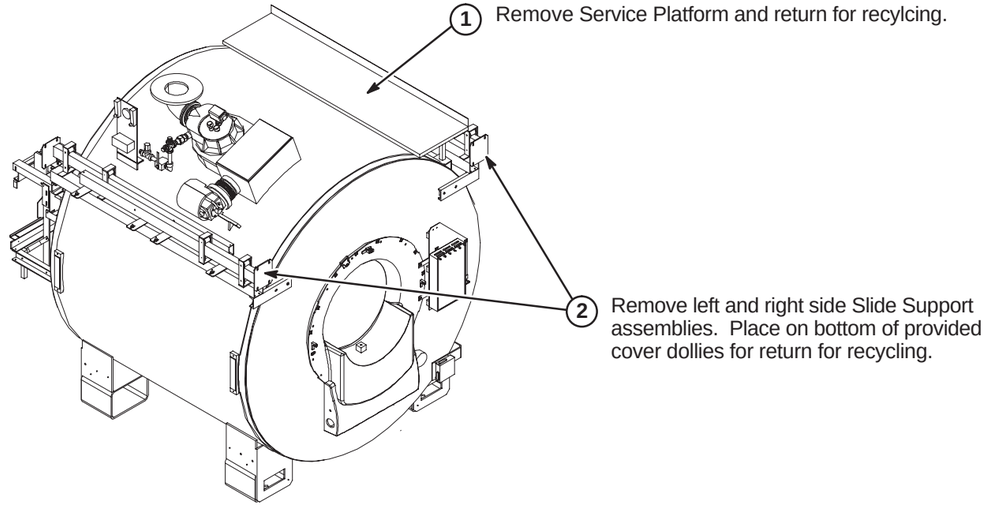
❑ B2 – UNFASTEN BRIDGE MOUNT ASM



❑ B3 – REMOVE BRIDGE



❑ B4 – REMOVING SERVICE PLATFORM AND SLIDE SUPPORT ASSEMBLIES

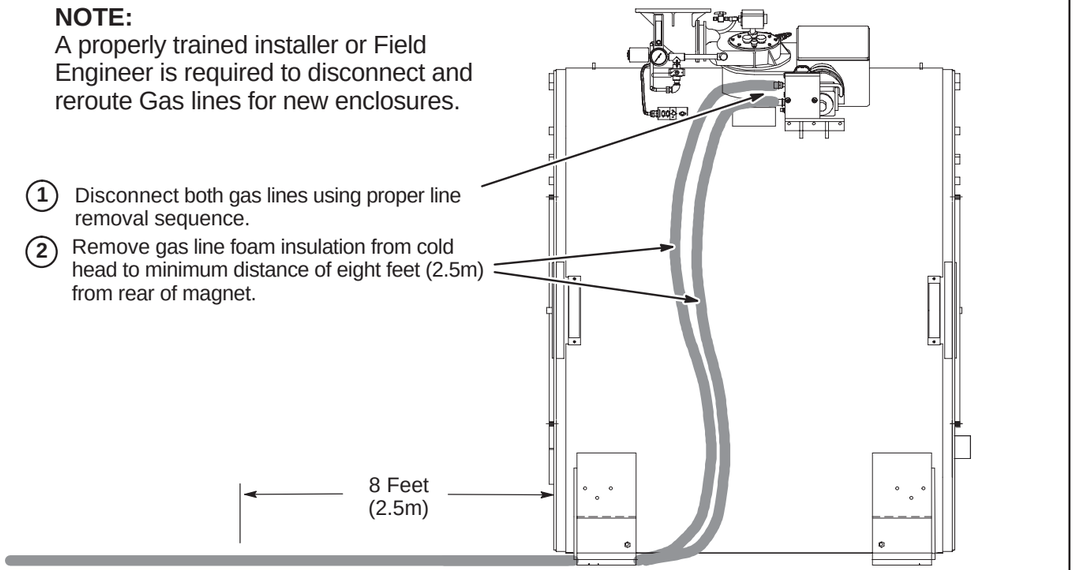


INSTALLATION PROCEDURES SUMMARY

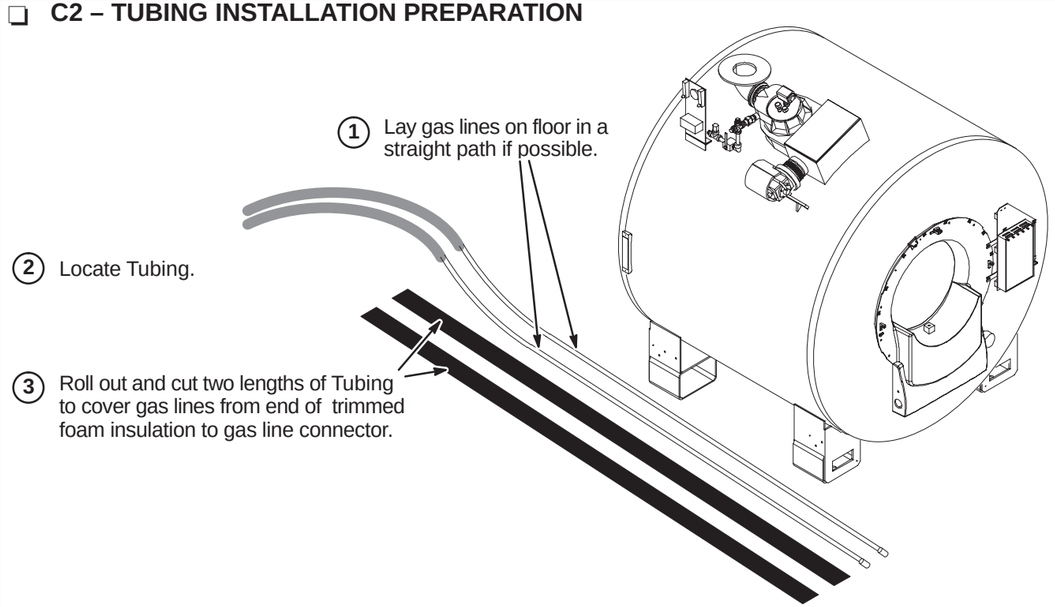
- ❑ **C1 – Remove Gas Line Foam Insulation and Disconnect Gas Lines**
- ❑ **C2 – Tubing Installation Preparation**
- ❑ **C3 – Install Tubing on Gas Lines**
- ❑ **C4 – Connect and Route Gas Lines**

❑ C1 – REMOVE GAS LINE FOAM INSULATION AND DISCONNECT GAS LINES

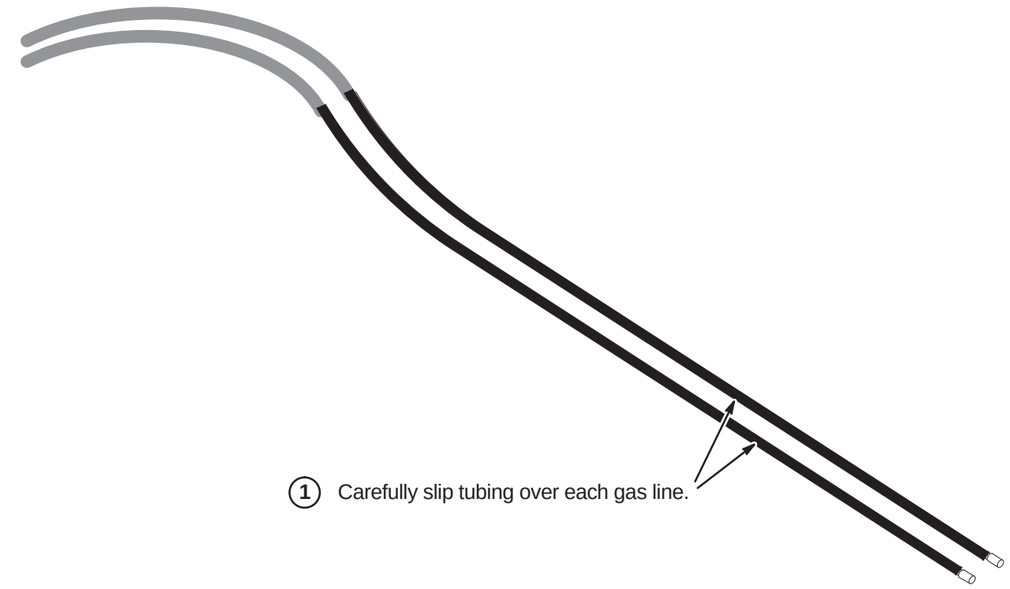
NOTE:
A properly trained installer or Field Engineer is required to disconnect and reroute Gas lines for new enclosures.



❑ C2 – TUBING INSTALLATION PREPARATION

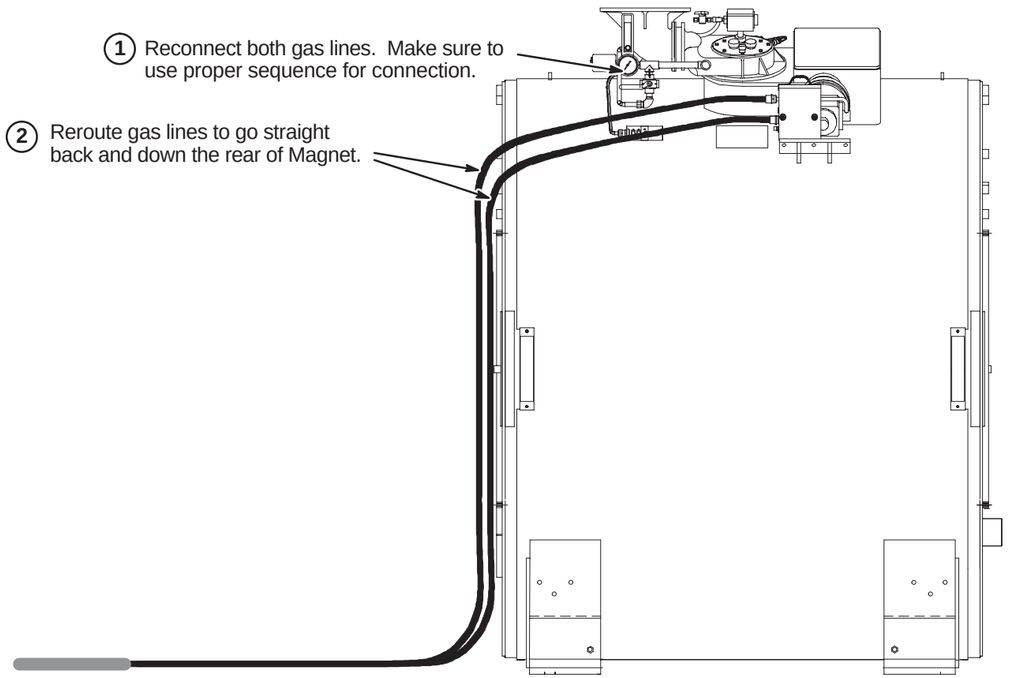


❑ C3 – INSTALL TUBING ON GAS LINES



❑ C4 – CONNECT AND ROUTE GAS LINES

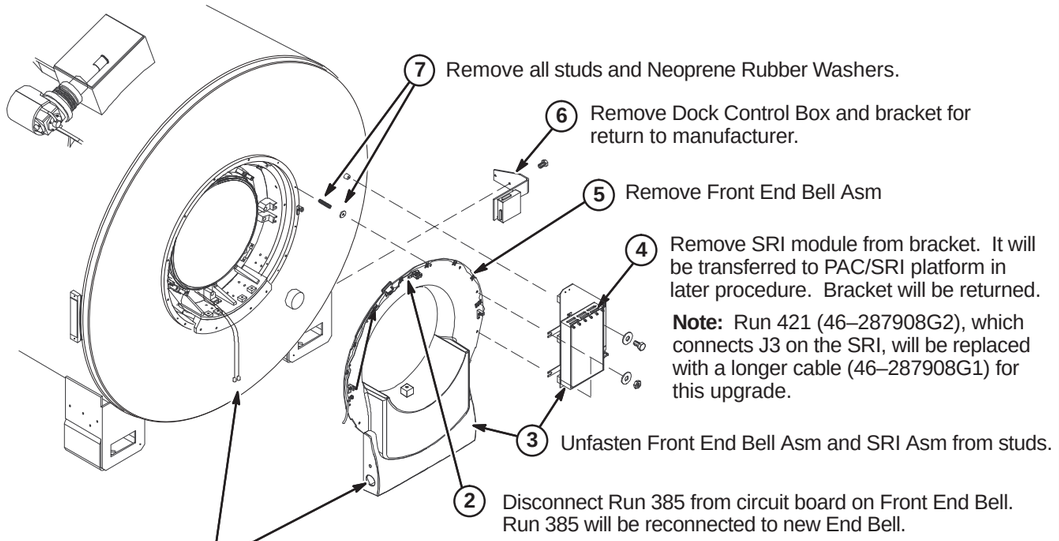
Note: Gas lines will be relocated from former route of down the side and underneath the magnet.



INSTALLATION PROCEDURES SUMMARY

- ❑ **D1 – Remove Front End Bell Asm, SRI, And Dock Control Box**
- ❑ **D2 – Disconnect Air Hoses & Remove Rear Pedestal**
- ❑ **D3 – Remove Bore Light Assembly and Run 749**
- ❑ **D4 – Remove Rear End Bell**
- ❑ **D5 – Remove RF Body Coil**

❑ D1 – REMOVE FRONT END BELL ASM, SRI, AND DOCK CONTROL BOX



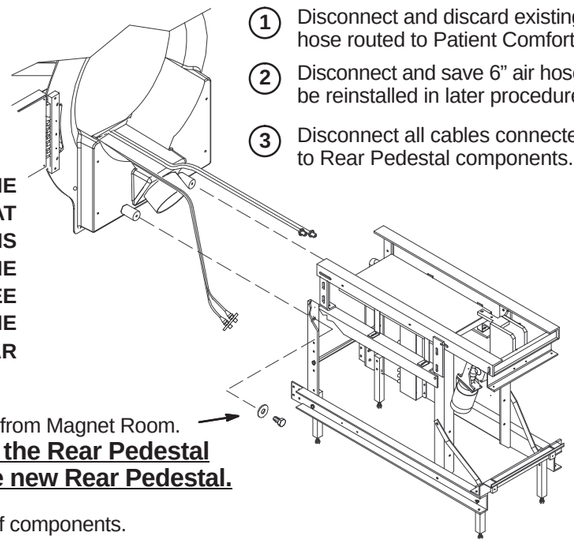
7. Remove all studs and Neoprene Rubber Washers.
6. Remove Dock Control Box and bracket for return to manufacturer.
5. Remove Front End Bell Asm
4. Remove SRI module from bracket. It will be transferred to PAC/SRI platform in later procedure. Bracket will be returned.

   Note: Run 421 (46–287908G2), which connects J3 on the SRI, will be replaced with a longer cable (46–287908G1) for this upgrade.
3. Unfasten Front End Bell Asm and SRI Asm from studs.
2. Disconnect Run 385 from circuit board on Front End Bell. Run 385 will be reconnected to new End Bell.
1. Disconnect Runs 778 and 779 with Bulkhead asm from RF Coil Cables .

❑ D2 – DISCONNECT AIR HOSES & CABLES AND REMOVE REAR PEDESTAL

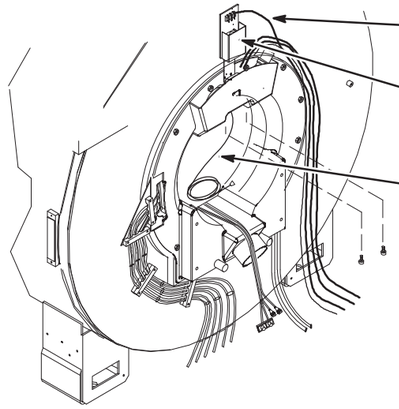
WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR THAT IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.



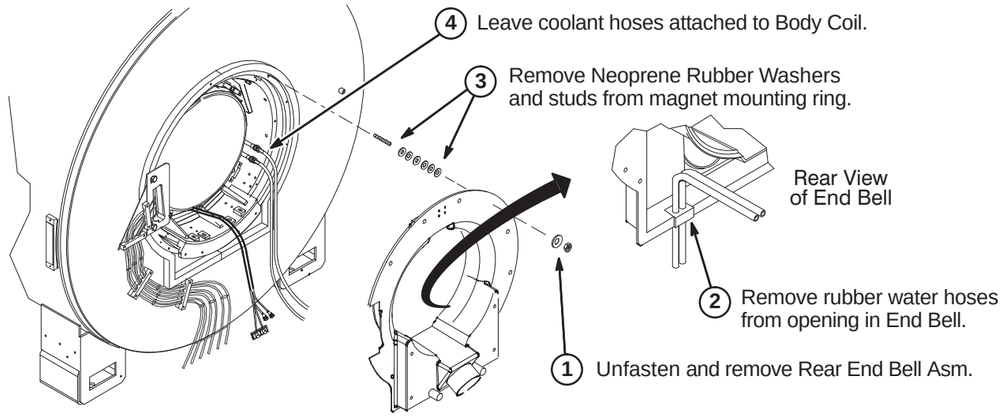
1. Disconnect and discard existing 2” air hose routed to Patient Comfort Module.
2. Disconnect and save 6” air hose. It will be reinstalled in later procedure.
3. Disconnect all cables connected to Rear Pedestal components.
4. Unfasten Rear Pedestal and remove from Magnet Room.
   <u>Many of the componenets of the Rear Pedestal HAVE to be transferred to the new Rear Pedestal.</u>
5. Refer to later procedure for transfer of components.

❑ D3 – REMOVE BORE LIGHT ASSEMBLY AND RUN 749



1. Disconnect Run 300 from Bore Light. Save cable. It can be reused and reconnected to new Bore Light.
2. Remove fiber optic lines from light tubes in bore. Unfasten Bore Light Asm with fiber optic lines and place on cover dolly to return for recycling.
3. Disconnect and remove Run 749, Bore Temperature Sensor, and return with other parts.

❑ D4 – REMOVE REAR END BELL

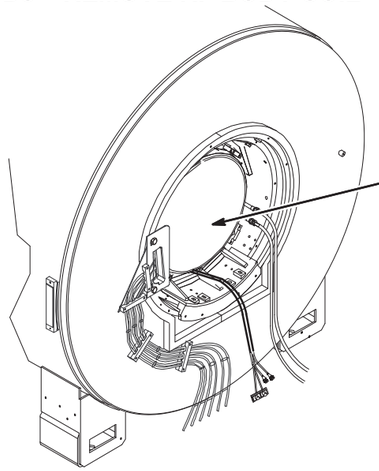


4. Leave coolant hoses attached to Body Coil.
3. Remove Neoprene Rubber Washers and studs from magnet mounting ring.

Rear View of End Bell

2. Remove rubber water hoses from opening in End Bell.
1. Unfasten and remove Rear End Bell Asm.

❑ D5 – REMOVE RF BODY COIL



1. Remove RF Body Coil and return to manufacturer using same container that new RF Body Coil was delivered in.

   Note: Make sure to strap container to pallet.

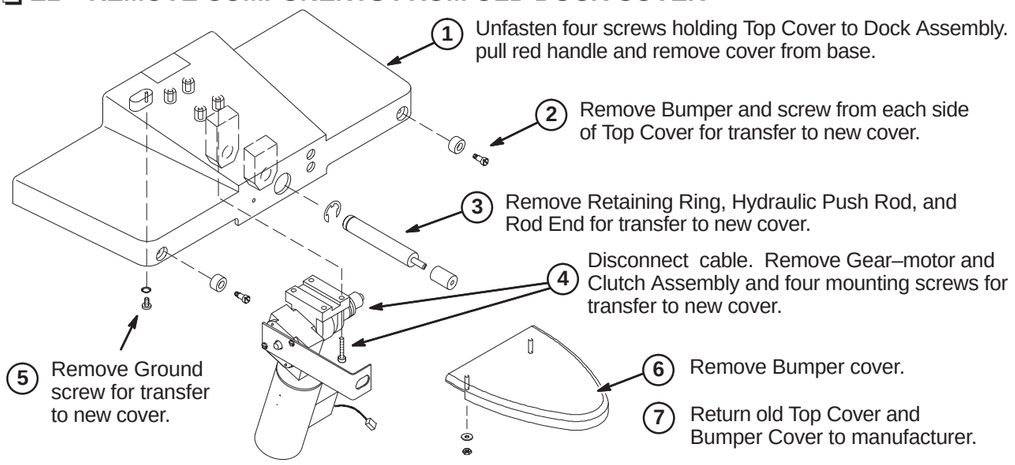
INSTALLATION PROCEDURES SUMMARY

- ❑ **E1 – Remove Components from Old Dock Cover**
- ❑ **E2 – Install Components on New Dock Cover**
- ❑ **E3 – Remove Components from Old Rear Pedestal**
- ❑ **E4 – Install Components on New Rear Pedestal**

WARNING!

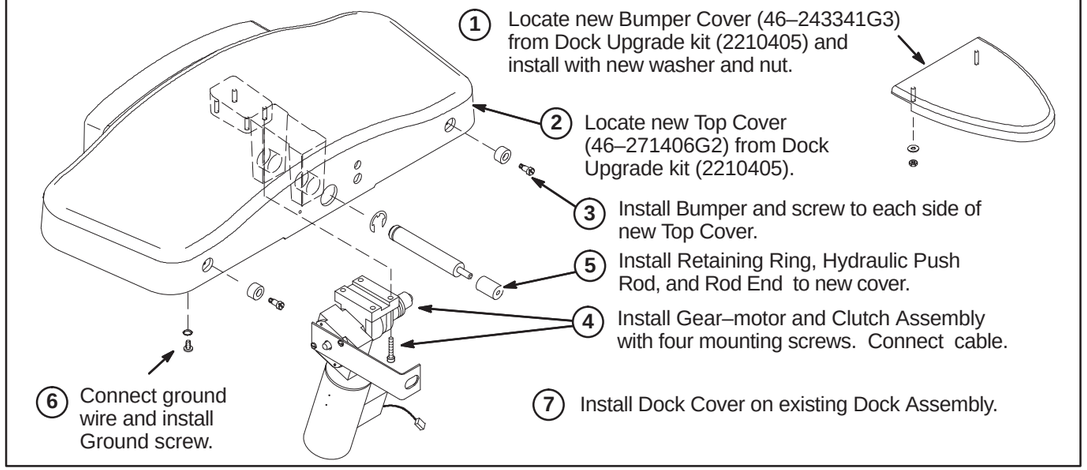
THE DOCK, ESPECIALLY THE GEAR–MOTOR ASSEMBLY, IS HIGHLY FERROUS! Before executing the following two procedures, confirm the Dock is outside of the magnet room.

❑ E1 – REMOVE COMPONENTS FROM OLD DOCK COVER



1. Unfasten four screws holding Top Cover to Dock Assembly. pull red handle and remove cover from base.
2. Remove Bumper and screw from each side of Top Cover for transfer to new cover.
3. Remove Retaining Ring, Hydraulic Push Rod, and Rod End for transfer to new cover.
4. Disconnect cable. Remove Gear–motor and Clutch Assembly and four mounting screws for transfer to new cover.
5. Remove Ground screw for transfer to new cover.
6. Remove Bumper cover.
7. Return old Top Cover and Bumper Cover to manufacturer.

❑ E2 – INSTALL COMPONENTS ON NEW DOCK COVER

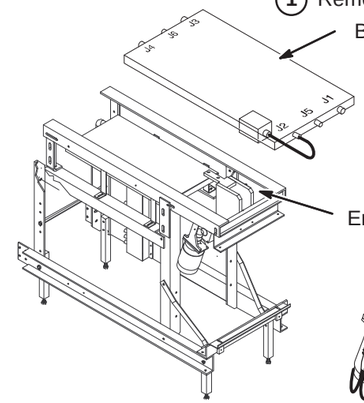


1. Locate new Bumper Cover (46–243341G3) from Dock Upgrade kit (2210405) and install with new washer and nut.
2. Locate new Top Cover (46–271406G2) from Dock Upgrade kit (2210405).
3. Install Bumper and screw to each side of new Top Cover.
4. Install Gear–motor and Clutch Assembly with four mounting screws. Connect cable.
5. Install Retaining Ring, Hydraulic Push Rod, and Rod End to new cover.
6. Connect ground wire and install Ground screw.
7. Install Dock Cover on existing Dock Assembly.

WARNING!

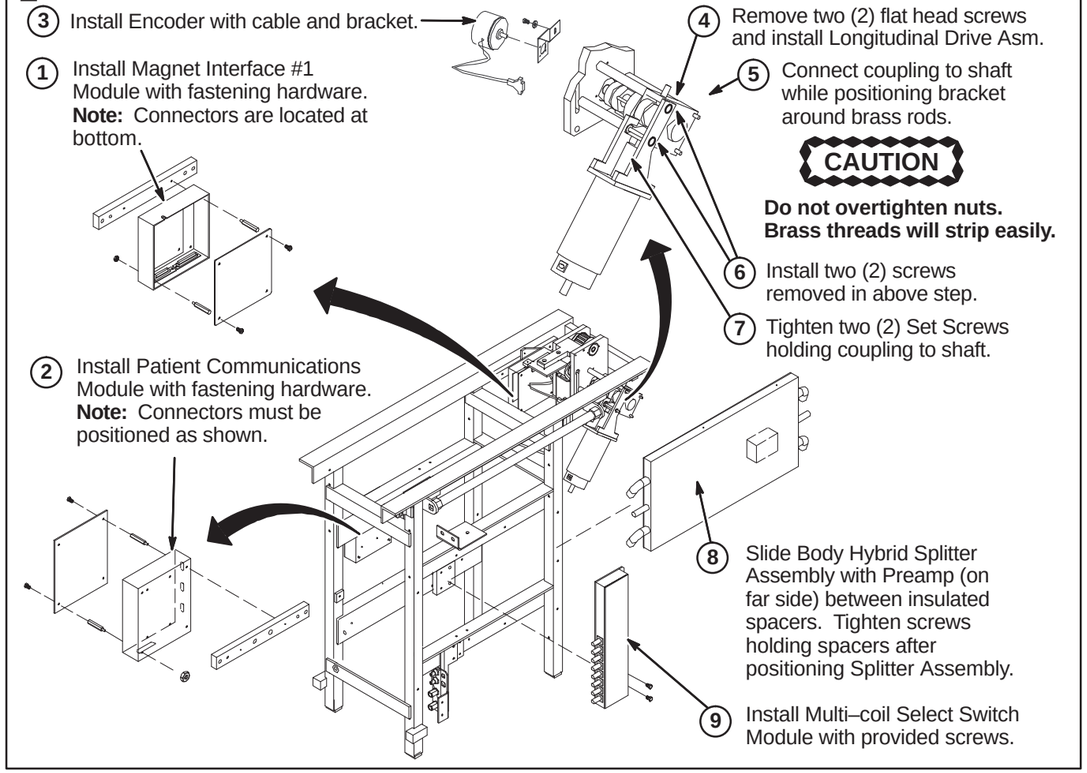
THE LONGITUDINAL DRIVE MOTOR IS HIGHLY FERROUS! Before executing the following two procedures, confirm that the Rear Pedestal is outside of the magnet room.

❑ E3 – REMOVE COMPONENTS FROM OLD REAR PEDESTAL



1. Remove the following parts for transfer to new Rear Pedestal.
   - Body Hybrid Splitter Assembly with Preamp
   - Multi–coil Select Switch Module
   - Patient Communications Module with fastening hardware
   - Encoder with cable and mounting bracket.
   - Magnet Interface #1 Module with fastening hardware
   - Longitudinal Drive Motor with mounting bracket and coupling. Loosen two set screws holding coupling to shaft.

❑ E4 – INSTALL COMPONENTS ON NEW REAR PEDESTAL



3. Install Encoder with cable and bracket.
1. Install Magnet Interface #1 Module with fastening hardware. **Note:** Connectors are located at bottom.
4. Remove two (2) flat head screws and install Longitudinal Drive Asm.
5. Connect coupling to shaft while positioning bracket around brass rods.

CAUTION

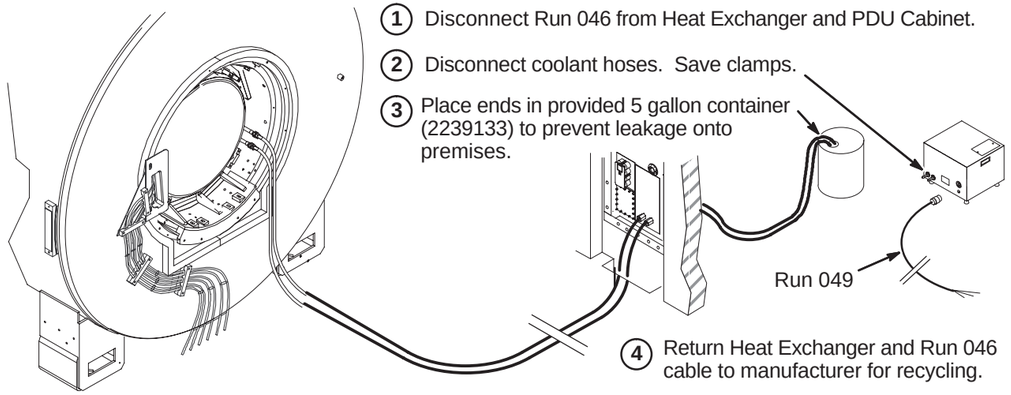
Do not overtighten nuts. Brass threads will strip easily.

6. Install two (2) screws removed in above step.
7. Tighten two (2) Set Screws holding coupling to shaft.
2. Install Patient Communications Module with fastening hardware. **Note:** Connectors must be positioned as shown.
8. Slide Body Hybrid Splitter Assembly with Preamp (on far side) between insulated spacers. Tighten screws holding spacers after positioning Splitter Assembly.
9. Install Multi–coil Select Switch Module with provided screws.

INSTALLATION PROCEDURES SUMMARY

- ❑ **F1 – Disconnect Heat Exchanger**
- ❑ **F2 – Drain Coolant from Coolant Hoses (see Note in procedure)**
- ❑ **F3 – Remove Foam Gasket, Gradient Cable Air Seal, Clamps & Brackets**
- ❑ **F4 – Gradient Coil Upgrade Information**

❑ F1 – DISCONNECT HEAT EXCHANGER

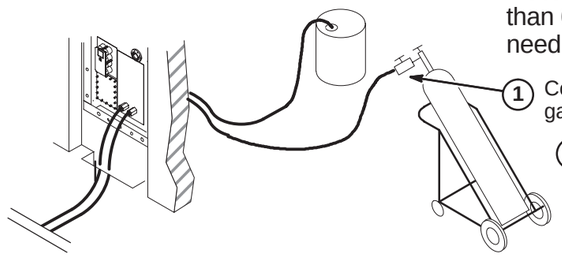


1. Disconnect Run 046 from Heat Exchanger and PDU Cabinet.
2. Disconnect coolant hoses. Save clamps.
3. Place ends in provided 5 gallon container (2239133) to prevent leakage onto premises.

Run 049

4. Return Heat Exchanger and Run 046 cable to manufacturer for recycling.

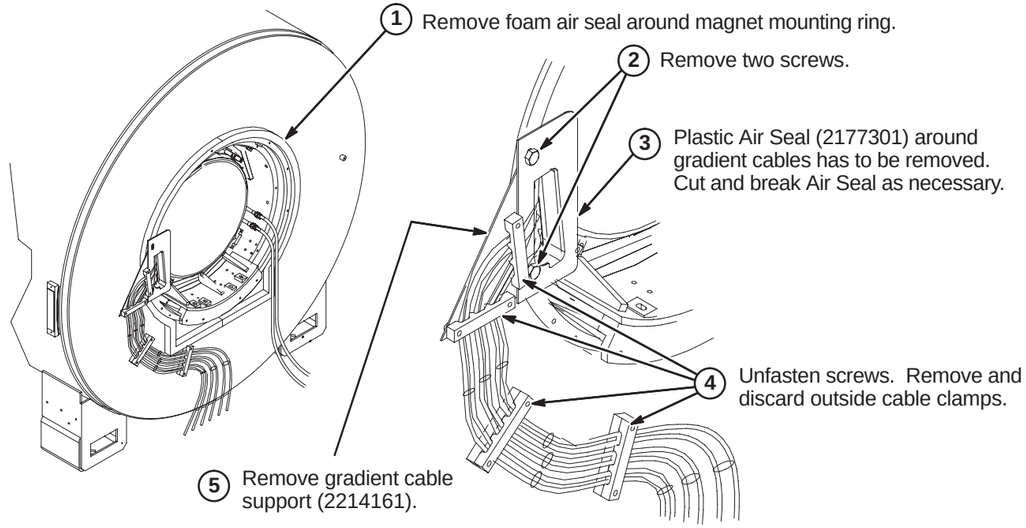
❑ F2 – DRAIN COOLANT FROM COOLANT HOSES



Note: If system has been in operation for less than 6 months, this Procedure (**E2**), does not need to be completed.

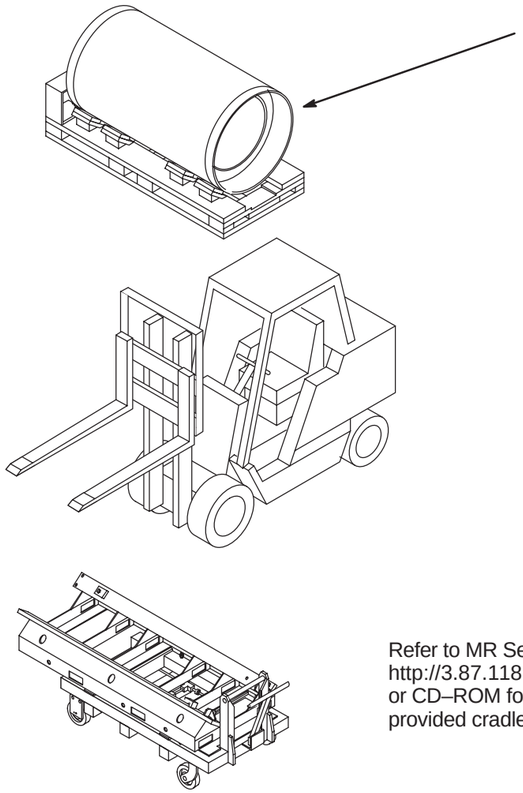
1. Connect one of the hoses to locally obtained nitrogen gas cylinder.
2. Carefully open valve on cylinder and purge coolant from hoses into 5 gallon container.
3. When complete, close and seal 5 gallon container for return for recycling,

❑ F3 – REMOVE FOAM GASKET, GRADIENT CABLE AIR SEAL, CLAMPS & BRACKETS



1. Remove foam air seal around magnet mounting ring.
2. Remove two screws.
3. Plastic Air Seal (2177301) around gradient cables has to be removed. Cut and break Air Seal as necessary.
4. Unfasten screws. Remove and discard outside cable clamps.
5. Remove gradient cable support (2214161).

❑ F4 – GRADIENT COIL UPGRADE INFORMATION



The new Twin*Speed* TRM Body Coil will arrive on site on a wooden pallet only. It will not be on a movable coil cart.

Arrangements should also have been made to:

- Have riggers and/or lift truck on site to unload new TRM coil from delivery truck
- Have coil cart and cradle, 2134817 & 2134810−2, on site to de−install existing BRM or CRM Body Coil
- Have BRM/TRM Insertion Tool, 2164744−3 on site to remove the existing BRM and install the new TRM Body Coil

Refer to Tab 3, BODY COIL, for instructions on :

- Removing existing Body Coil
- Installation of Twin*Speed* End Rings using Ring Alignement Tool, 2299496
- Installation of new TRM Body Coil

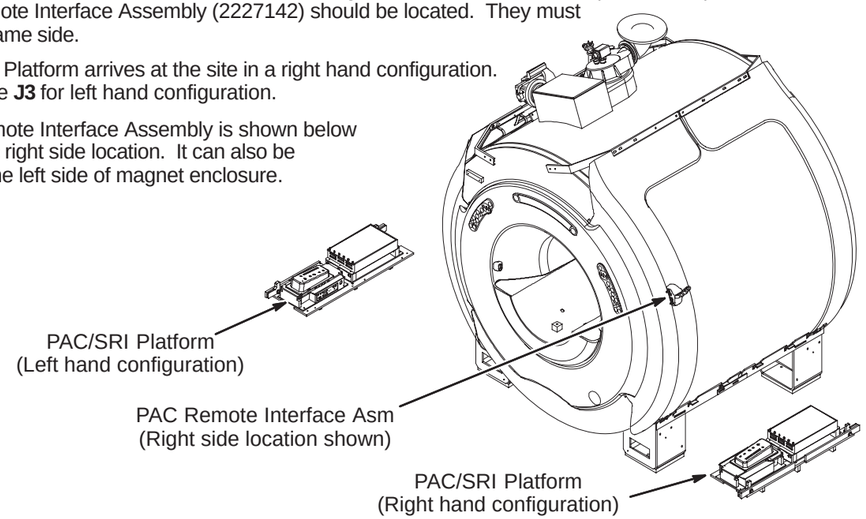
Refer to MR Service Methods Web site at http://3.87.118.28/optec3/common/8xdocs/coils/gc1reala.pdf or CD–ROM for instructions to remove existing Body Coil using provided cradle and coil cart.

INSTALLATION PROCEDURES SUMMARY

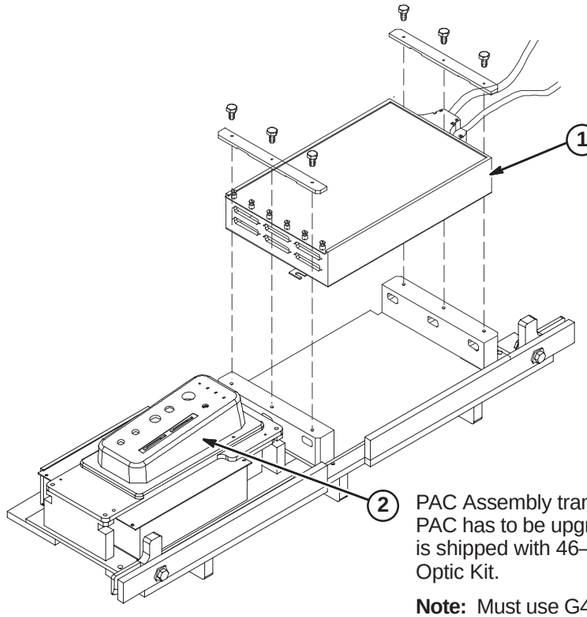
- ❑ **G1 – Determine PAC/SRI Platform and PAC Remote Interface Location**
- ❑ **G2 – Install PAC and SRI Modules on PAC/SRI Platform**
- ❑ **G3 – PAC/SRI Platform Left Hand Configuration (If required)**
- ❑ **G4 – Location of Magnet Ground Cable**

❑ G1 – DETERMINE PAC/SRI PLATFORM AND PAC REMOTE INTERFACE LOCATION

1. Consult with customer to determine which side of magnet the PAC/SRI Platform (2223440–2) and PAC Remote Interface Assembly (2227142) should be located. They must to be on the same side.
2. The PAC/SRI Platform arrives at the site in a right hand configuration. See Procedure **J3** for left hand configuration.
3. The PAC Remote Interface Assembly is shown below installed in the right side location. It can also be mounted on the left side of magnet enclosure.



❑ G2 – INSTALL PAC AND SRI MODULES ON PAC/SRI PLATFORM

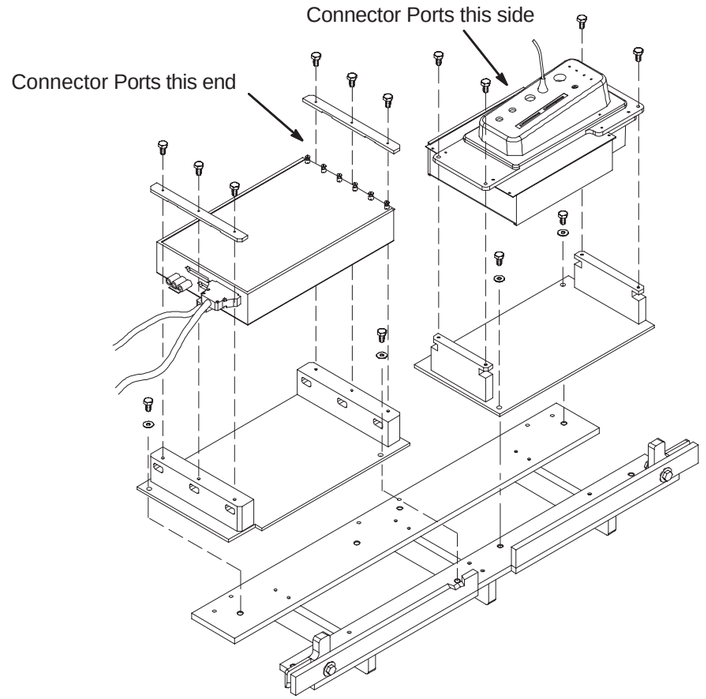


1. Install previously removed SRI Module on PAC/SRI Platform as shown.
2. PAC Assembly transferred from Front Cover. Before installation, PAC has to be upgraded using Direction 2245769. This Direction is shipped with 46–317999G4, Photo–Plethysmograph Fiber Optic Kit.

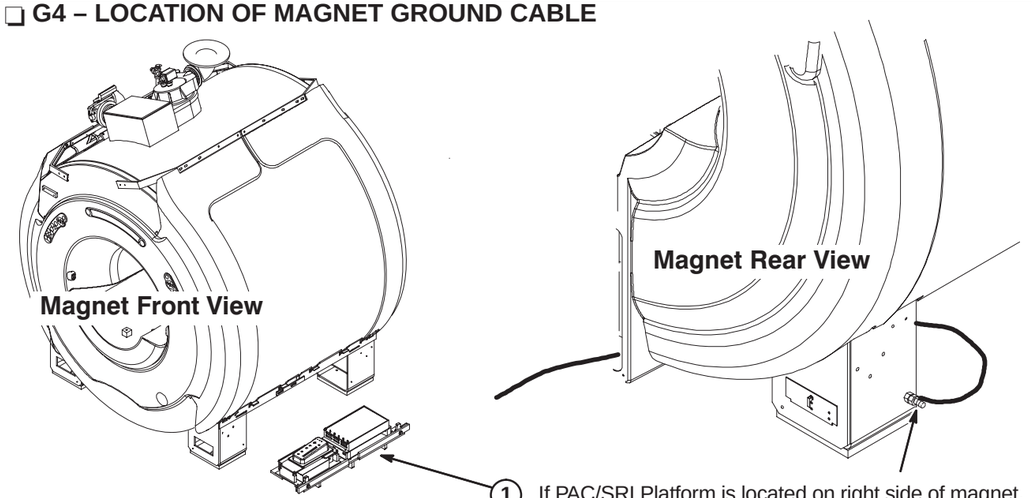
Note: Must use G4 cable because G3 will be too short.

❑ G3 – PAC/SRI PLATFORM LEFT HAND CONFIGURATION (IF REQUIRED)

1. For right hand configuration, reassemble PAC/SRI as shown.



❑ G4 – LOCATION OF MAGNET GROUND CABLE

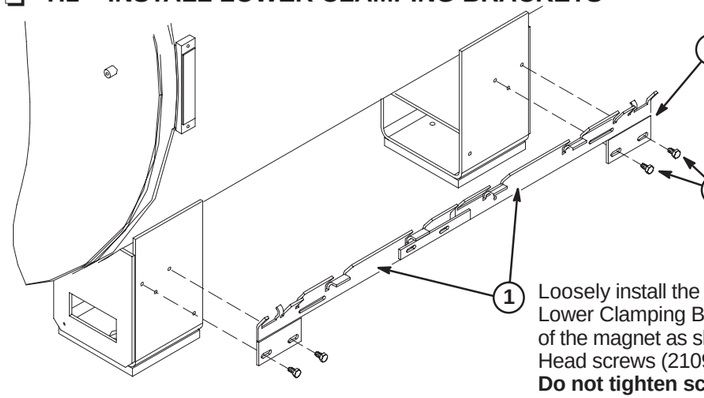


1. If PAC/SRI Platform is located on right side of magnet, then the Magnet ground cable has to be connected to the opposite side rear left leg as shown above.
2. If PAC/SRI Platform is located on left side of magnet, then the Magnet ground cable has to be connected to the opposite side rear right leg.

INSTALLATION PROCEDURES SUMMARY

- ❑ **H1 – Install Lower Clamping Brackets**
- ❑ **H2 – Connect Right Side Top Frame and Wrap Cover**
- ❑ **H3 – Connect Left Side Top and Wrap Cover**
- ❑ **H4 – Install Right and Left Side Frame and Wrap Covers**
- ❑ **H5 – Install Condensation Trough**

❑ H1 – INSTALL LOWER CLAMPING BRACKETS

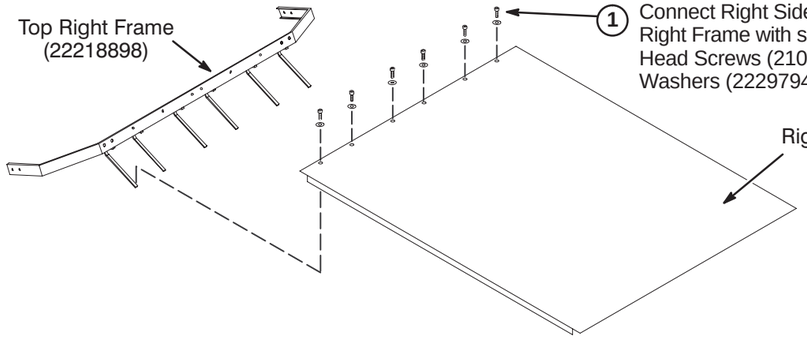


3. Each end of bracket should be initially located about 2 to 3mm past magnet legs.

2. Loosely install at each end of right and left brackets two (2) 1/2 x 3/4 long Hex Head Screws (46–260950P1).

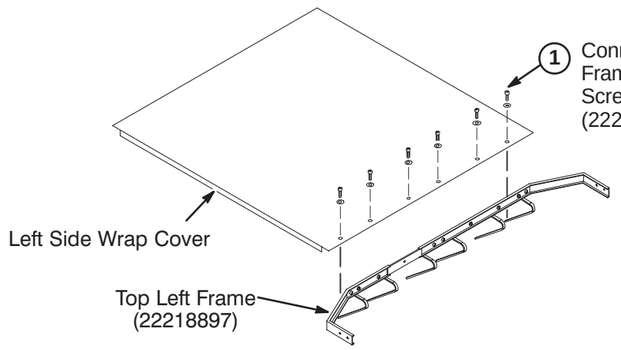
1. Loosely install the Right and Left (2218146–3 & –4) Lower Clamping Bracket Assemblies to each side of the magnet as shown using M10 x 25mm Hex Head screws (2109866–20) and Blue Loctite. **Do not tighten screws.**

❑ H1 – CONNECT RIGHT SIDE TOP FRAME AND WRAP COVER



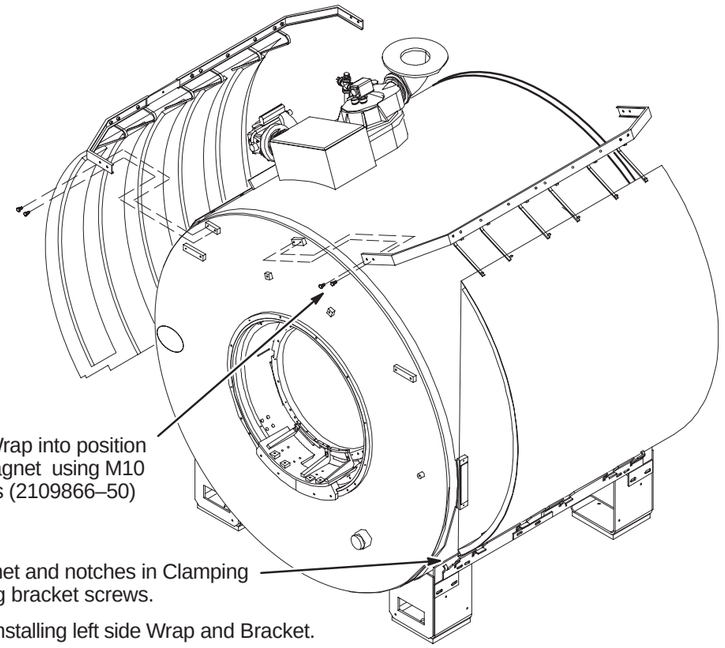
1. Connect Right Side Wrap Cover and Top Right Frame with six (6) M6 x 12mm Button Head Screws (2109872–6), M6 Nylon Washers (2229794), and Blue Loctite.

❑ H3 – CONNECT LEFT SIDE TOP FRAME AND WRAP COVER



1. Connect Left Side Wrap Cover and Top Lefft Frame with six (6) M6 x 12mm Button Head Screws (2109872–6), M6 Nylon Washers (2229794), and Blue Loctite.

❑ H4 – INSTALL RIGHT AND LEFT SIDE FRAME AND WRAP COVERS

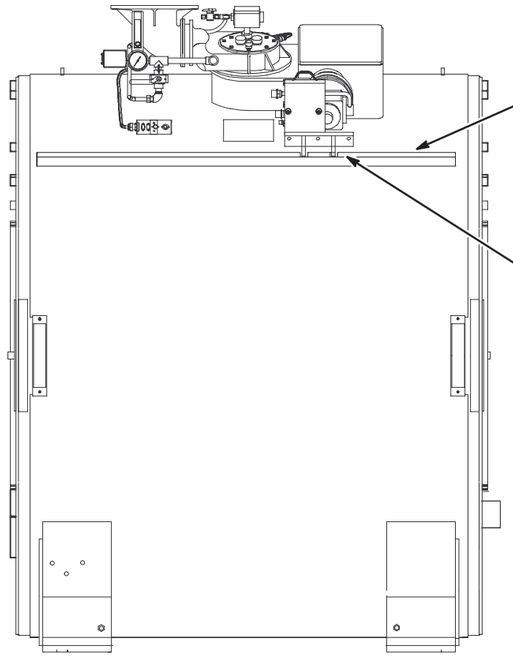


1. Lift right side Frame and Wrap into position as shown and fasten to magnet using M10 x 14mm Hex Head Screws (2109866–50) and Blue Loctite.

2. Slide Wrap between Magnet and notches in Clamping Bracket. Tighten clamping bracket screws.

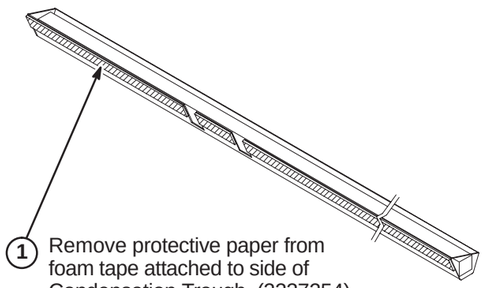
3. Repeat steps 1 and 2 for installing left side Wrap and Bracket.

❑ H5 – INSTALL CONDENSATION TROUGH



3. Along the entire length of the Trough, lay a bead of RTV Silicone Rubber Adhesive (46–170617P1) on top edge nearest the magnet.

2. Install Trough on left side of magnet with slots aligned with cold head support brackets.

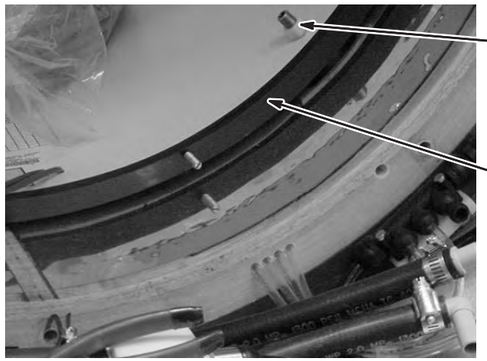


1. Remove protective paper from foam tape attached to side of Condensation Trough (2237254).

INSTALLATION PROCEDURES SUMMARY

- ❑ **I1 – Front End Bell Installation Preparation**
- ❑ **I2 – Position Front End Bell on Studs**

❑ I1 – FRONT END BELL INSTALLATION PREPARATION



1. Make sure RF Body Coil is centered in the gradient coil using the Feeler Guage Tool provided with coil. Adjust as necessary.

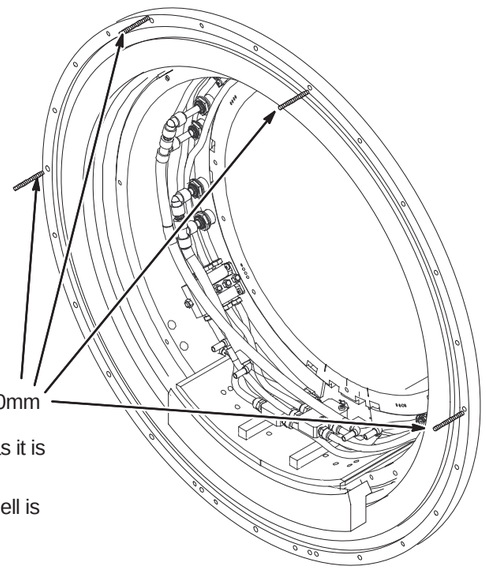
2. Install 6mm RF Tube–End Bell Gasket (2294358–2) onto studs of RF Coil. Make sure gasket is clean. DO NOT APPLY VACUUM GREASE.

Note: Nominal length between Front and Rear Alignment Ring surfaces is about 70–1/16 inch (1780mm).

If length is shorter, a thinner gasket may be required – 4mm gasket (2294358).

If length is longer, a thicker gasket may be required – 9.5mm gasket (2294358–3).

3. Apply Vacuum Grease (2297760) to the entire 3/4 inch diameter O–Ring (2293323) and install in the slot on the aluminum ring. The vacuum grease will hold it in place.

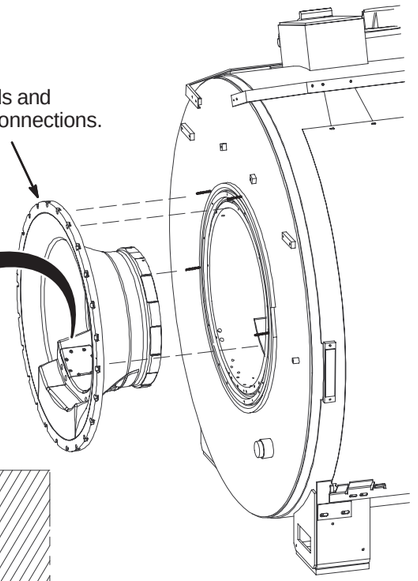


3. From the TRM Coil Insertion Tool Kit, get four M10 x 140mm studs and insert at four positioins on outer bolt circle of aluminum ring. These will be used to support End Bell as it is being installed.

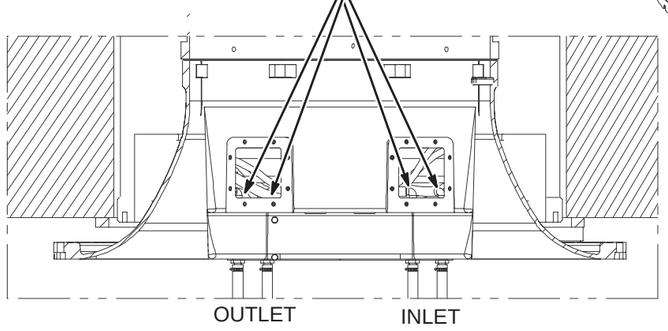
   These must be returned to Insertion Tool Kit after End Bell is installed.

❑ I2 – POSITION FRONT END BELL ON STUDS

1. Hang the Front End Bell in place on studs and remove access covers for the coolant connections.



2. Connect the four coolant hoses to the internal fittings on the End Bell using Safety Clip (2262660–9) on each fitting.
   Note: The hoses must be free of kinks.



Note: The parts in the next steps are obtained from the Water Line Assembly Kit (2295225).

3. Install the End Bell coolant lines:
   – Black hose (2293610–2) to be marked OUTLET
   – Blue hose (2293610–3) to be marked INLET
   – Attach to hose barbs on End Bell using (4) worm drive Hose Clamps (2294010).

4. Connect the 3/4” hose routed from the System Cooling Cabinet to the 3/4” connector using worm drive Hose Clamp (2294010–2).

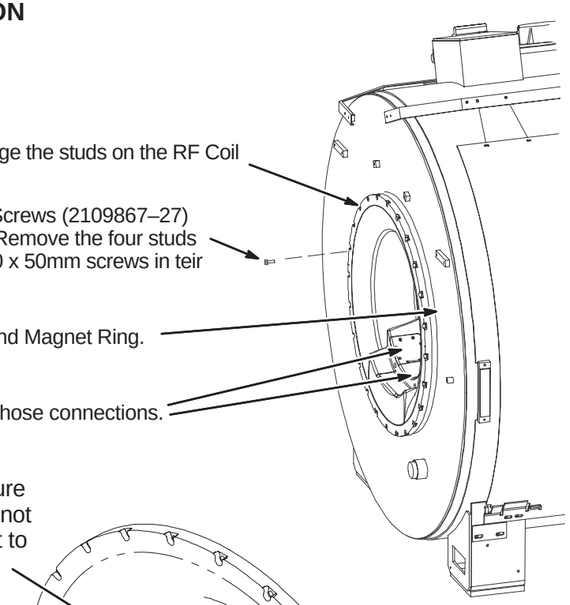
5. Repeat Step 4 to attach Union Tee to INLET hose.

6. Test for leakage by circulating coolant through out system.

INSTALLATION PROCEDURES SUMMARY

- ❑ **J1 – Front End Bell Installation**
- ❑ **J2 – Install Rear End Bell Gaskets and Mounting Studs**
- ❑ **J3 – Install Rear End Bell on Studs**

❑ J1– FRONT END BELL INSTALLATION



1. Push the End Bell inward and align it to engage the studs on the RF Coil
2. Install (24) M10 x 50mm Socket Head Cap Screws (2109867–27) around the perimeter of the Front End Bell. Remove the four studs after End Bell is secured and install thee M10 x 50mm screws in teir place.
3. Tighten to eliminate gap between End Bell and Magnet Ring. SEE **NOTE** BELOW.
4. Re–install the access panels over the water hose connections.

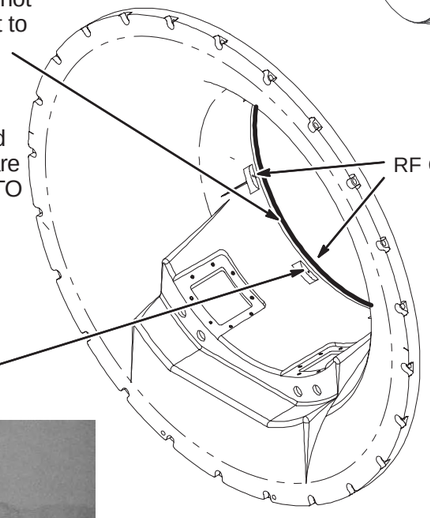
NOTE:
As Front End Bell is being tightened, make sure the RF Coil Gasket installed previously does not expand into the bore. This will make it difficult to install Front Cover Strap (2287881) in a later procedure.

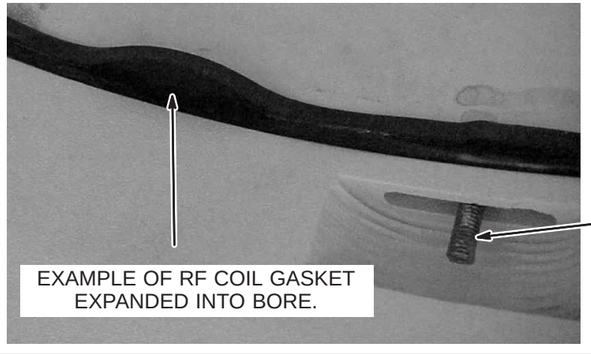
If RF Coil Gasket is too thin or too thick:
– Remove M10 x 50mm screws and slide End Bell away from RF coil so that RF Coil studs are disengaged. END BELL DOES NOT HAVE TO BE COMPLETELY REMOVED.

– If thinner gasket is required, install 4mm gasket (2294358).

– If thicker gasket is required, install 9.5mm gasket (2294358–3).

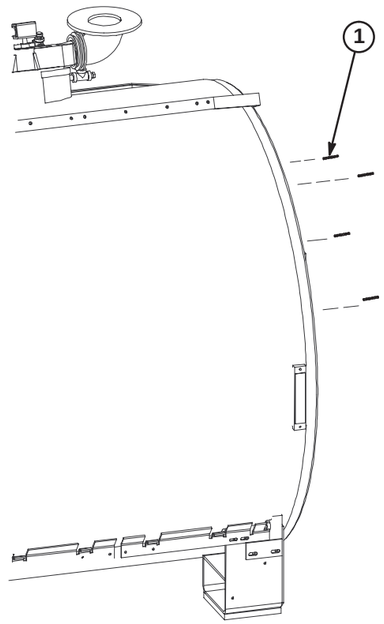
5. Fasten M6 Nylon nuts to each RF stud.





EXAMPLE OF RF COIL GASKET EXPANDED INTO BORE.

❑ J2 – INSTALL REAR END BELL GASKETS AND MOUNTING STUDS



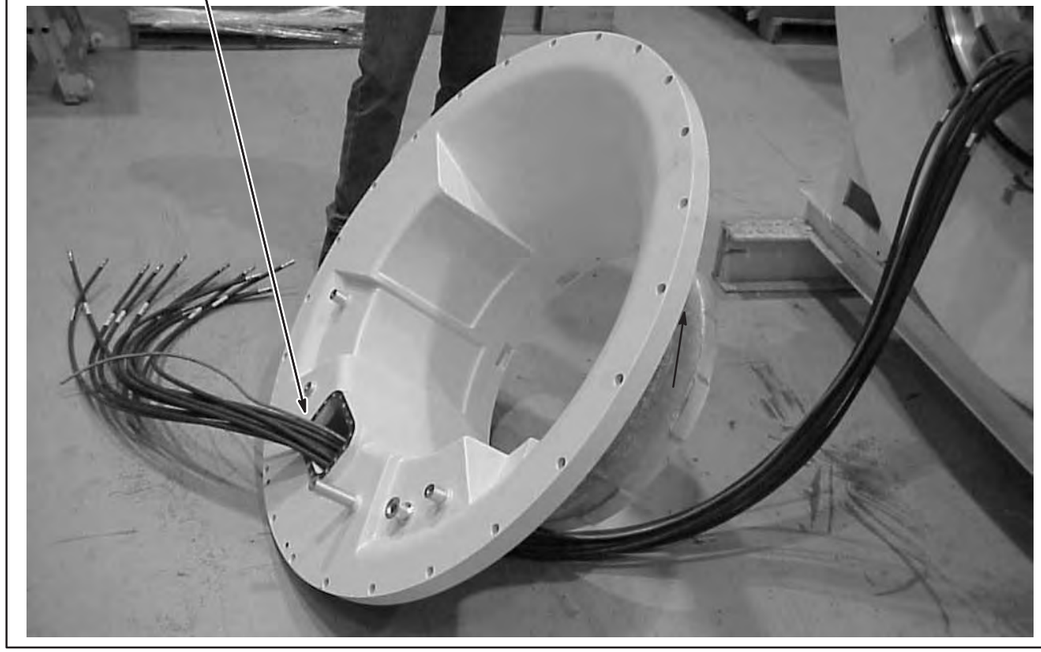
1. From the TRM Coil Insertion Tool Kit, get four M10 x 140mm studs and insert at four positions on outer bolt circle of aluminum ring. These will be used to support End Bell as it is being installed.

   These must be returned to Insertion Tool Kit after End Bell is installed.

2. Install 9.5mm RF Tube–End Bell Gasket (2294358–3) onto studs of RF Coil. Make sure gasket is clean. DO NOT APPLY VACUUM GREASE.
3. Apply Vacuum Grease (2297760) to the entire 3/4 inch diameter O–Ring (2293323) and install in the slot on the aluminum ring. The vacuum grease will hold it in place.

❑ J3 – INSTALL REAR END BELL ON STUDS

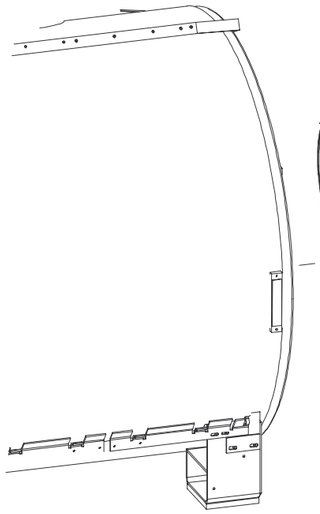
1. Place the Rear End Bell (2284170) at rear of magnet and route gradient cables thru opening.
2. Move End Bell into position, again hanging it on the four studs temporarily.



INSTALLATION PROCEDURES SUMMARY

- ❑ K1 – Rear End Bell Installation
- ❑ K2 – Gradient Block Gasket and Cover Installation
- ❑ K3 – Tightening of Gradient Block Gasket and Cover
- ❑ K4 – Coolant Leak Test
- ❑ K5 – Vacuum Leak Test

❑ K1 – REAR END BELL INSTALLATION



1. Hang the Rear End Bell (2284170) in place on the temporary studs.
2. Push the End Bell inward and align it to engage the studs on the RF Coil
3. Install (24) M10 x 50mm Socket Head Cap Screws (2109867–27) around the perimeter of the Rear End Bell. Remove the four studs after End Bell is secured and install M10 x 50mm screws.
4. Tighten to eliminate gap between End Bell and Magnet Ring. SEE **NOTE** BELOW.

NOTE:
As Rear End Bell is being tightened, make sure the RF Coil Gasket installed previously does not expand into the bore. This will make it difficult to install Rear Cover Strap (2287881–2) in a later procedure.

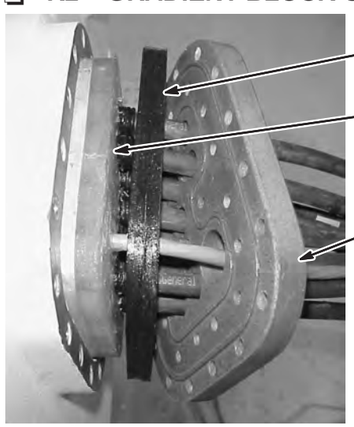
If RF Coil Gasket is too thin or too thick:

– Remove M10 x 50mm screws and slide End Bell away from RF coil so that RF Coil studs are disengaged. END BELL DOES NOT HAVE TO BE COMPLETELY REMOVED.

– If thinner gasket is required, install 4mm gasket (2294358) or 6mm gasket (2294358–2).

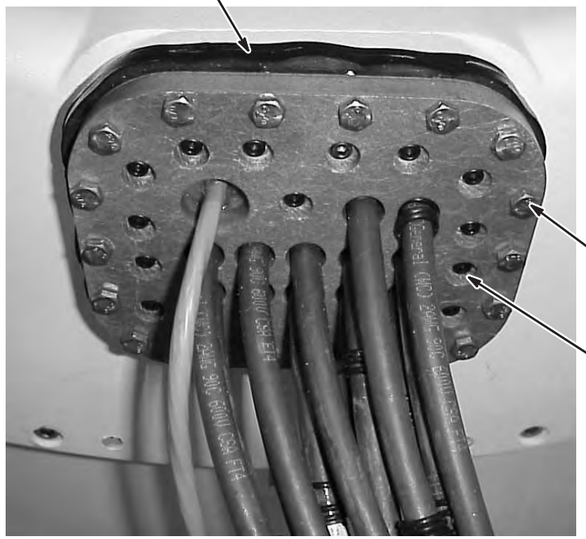
– If thicker gasket is required, add any combination of the remaining 4mm and 6mm gaskets with the existing 9.5mm until correct thickness is produced.

❑ K2 – GRADIENT BLOCK GASKET AND COVER INSTALLATION



1. Install the 12.7mm thick Gradient Block Gasket (2297540–3) over gradient cables.
2. When in place, gasket should stick out just past end of Gradient Block. If adjustment is needed, add 4mm gasket (2297540) and/or 6mm gasket (2297540–2) or replace 12.7mm gasket with 4mm gasket (2297540) and/or 6mm gasket (2297540–2).
3. Thread the gradient cables thru the corresponding holes in the Gradient Block Cover (2285381).
4. Apply Vacuum Grease (2297760) to the sealing surfaces of the cover plate and gasket.

❑ K3 – TIGHTENING OF GRADIENT BLOCK GASKET AND COVER



1. Determine total gasket thickness.
2. Select the gasket thickness from the table below to determine which length of screw to use. Eighteen (18) screws of each length are supplied for this upgrade.

GASKET THICKNESS	SCREW LENGTH	PART NUMBER
4mm	25mm	2109873–27
6mm	25mm	2109873–27
10mm	30mm	2109873–28
12.7mm	35mm	2109873–29
16.7mm	35mm	2109873–29
18.7mm	40mm	2109873–30
22.7mm	50mm	2109873–31

3. After the correct length of screw is determined, insert the selected (18) M6 Pan Head Screws around the Block Cover and start them into the threads.
4. Insert (16) M4 x 25mm Pan Head Screws (2109873–18) in the inner holes of the Block Cover and start them into the threads.
5. Tighten all the inner and outer screws uniformly to compress the gasket and to form a leak–free vacuum seal.

❑ K4 – COOLANT LEAK TEST

Note:
For Fixed sites only; refer to applicable vendor supplied Cooling Cabinet Manual. Manual can also be found on the MR Service Methods CD – ROM: Blowers & Chillers/System Operation

1. Verify Set Point is at 20 degrees C.
2. At front of magnet, remove plexiglass inspection ports and check coolant line connections for leaks. Replace plexiglass when complete.
3. Check for leaks at shut off valves.

Note:
If leak is found, determine source of leak and repair it. **DO NOT ADD MORE COOLANT UNTIL ALL LEAKS ARE FOUND AND REPAIRED.**

❑ K5 – VACUUM LEAK TEST

Note:
Vacuum Grease **must** be applied to all Centering Rings (2293608 & 2293608 – 2).

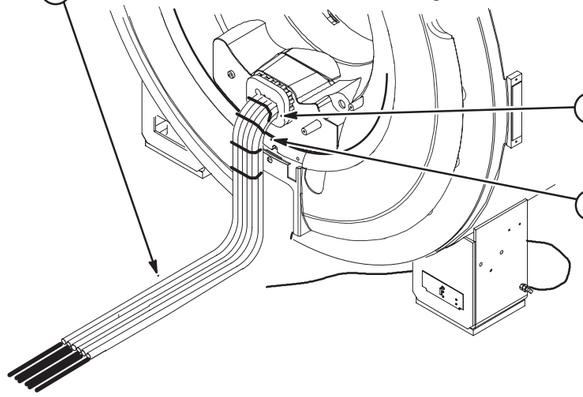
1. Refer to MR Service Methods CD–ROM, Direction 2160623: Twin Accesssry Cabinet and complete Twin*Speed* vacuum system Funtional Checks (tacfca3).
2. To conduct vacuum leak test, refer to MR Service Methods CD–ROM, Direction 2160623: Magnet Enclosures/WideOpen Magnet Enclosures/Troubleshooting/Vacuum Enclosure Toubleshooting (me3tsa1).

INSTALLATION PROCEDURES SUMMARY

- ❑ **L1 – Install Gradient Cable Foam Covers**
- ❑ **L2 – Loosen RF Coil Alignment Set Screws**
- ❑ **L3 – Front Cosmetic Cover Install Preparation**
- ❑ **L4 – Front Cometic Cover Installation**

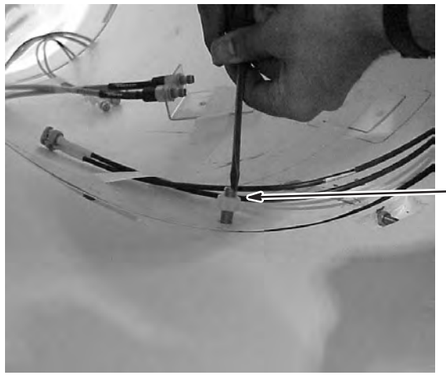
❑ L1 – INSTALL GRADIENT CABLE FOAM COVERS

1. Slide the twelve foam covers onto the gradient cables.

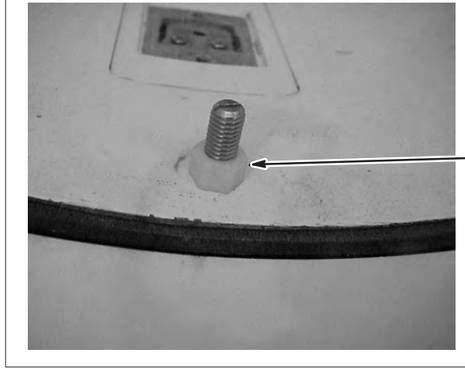


2. Make sure all twelve cable foam covers are installed as close as possible to Rear End Bell.
3. Use Ty–wraps to hold bundle together. Space Ty–wraps every 4 inches until 18 inches above floor.

❑ L2 – LOOSEN RF COIL ALIGNMENT SET SCREWS

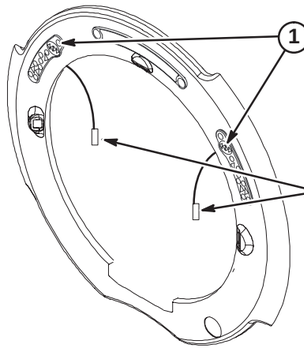


1. Loosen all the set screws that were required for centering the RF Coil within the TRM Coil. **DO NOT REMOVE.**

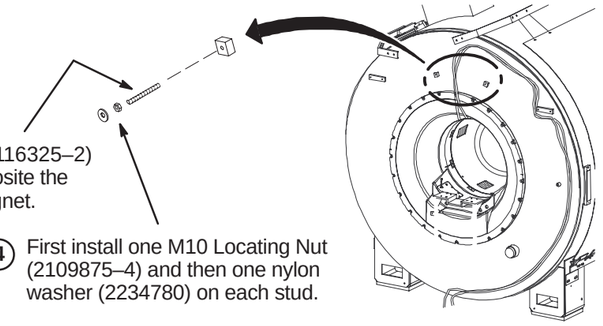


2. Tighten the Nut to lock set screw in place.

❑ L3 – FRONT COSMETIC COVER INSTALL PREPARATION



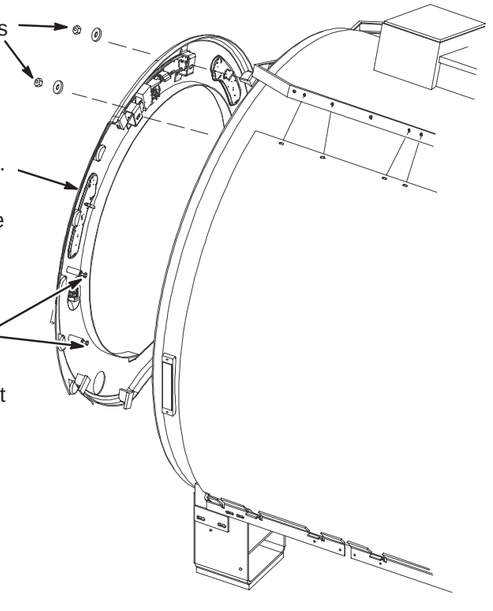
1. Install Left (2215716–3) and Right (2215716–2) Control Panels on Front Cosmetic Cover (2287744) if not already installed.
2. Install Left and Right (2221946) Control Panels on Front Cosmetic Ring. These were transferred from removed WideOpen Front End Bell.



3. Locate two M10 x 65mm Studs (2116325–2) and apply Blue Loctite to end opposite the slot and install into bosses on magnet.
4. First install one M10 Locating Nut (2109875–4) and then one nylon washer (2234780) on each stud.

❑ L4 – FRONT COSMETIC COVER INSTALLATION

4. Put Nylon Washers (2234780) and M10 Locking Nuts (2109875–4) on the mounting studs and tighten.



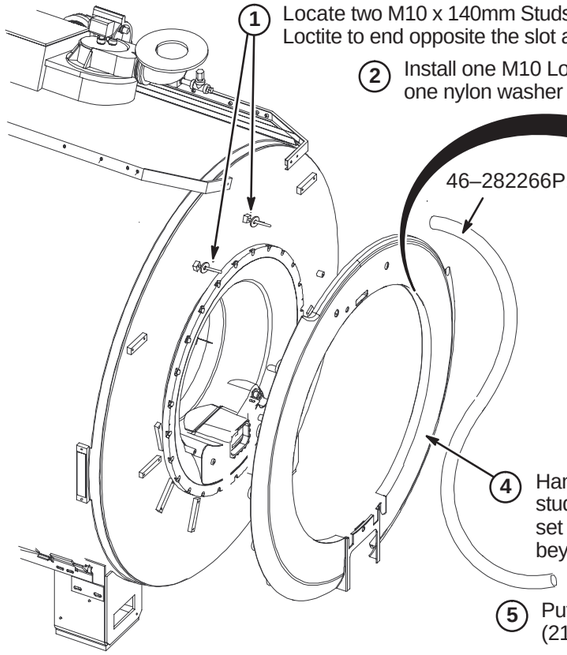
1. Hang the Front Cosmetic Cover on the mounting studs.
2. Adjust the locating nuts installed in previous procedure to set the face of the Cosmetic Cover 12mm (1/2inch) beyond the Front End Bell surface.
3. Set the standoff screws on the back of the Front Cosmetic Cover for the same 12mm (1/2 inch) depth. Tighten the lock nuts.

   Note: Make sure the head of the bolts are hard against the magnet front surface.

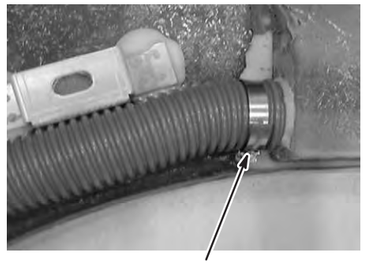
INSTALLATION PROCEDURES SUMMARY

- ❑ **M1 – Install Rear Cosmetic Cover**
- ❑ **M2 – Install Thremal Sensor Cable, Run 749**
- ❑ **M3 – Installation of Front Cover Strap**

❑ M1 – INSTALL REAR COSMETIC COVER

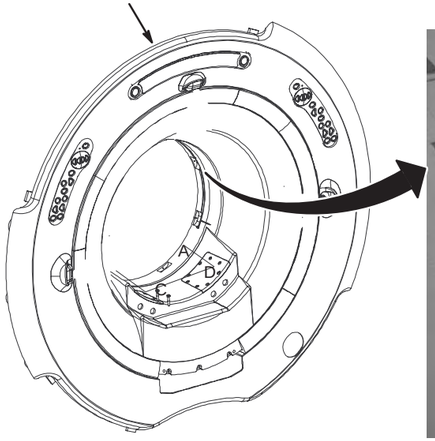


1. Locate two M10 x 140mm Studs (2116325–11) and apply Blue Loctite to end opposite the slot and install into bosses on magnet.
2. Install one M10 Locating Nut (2109875–4) and then one nylon washer (2234780) on each stud.

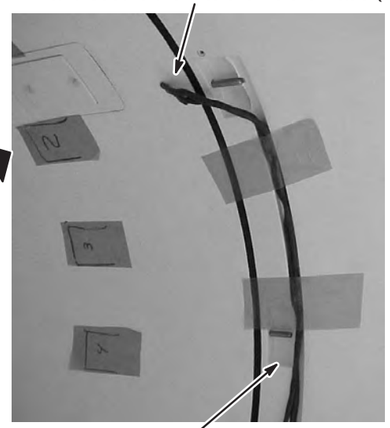


3. Attach 2 inch dia hose (46–282266P18) to Rear Cosmetic Cover (2296182) using Hose Clamp (46–208765P28)
4. Hang the Rear Cosmetic Cover on the mounting studs. Adjust the locating nuts installed in Step 2 to set the face of the Cosmetic Cover 12mm (1/2inch) beyond the Rear End Bell surface.
5. Put Nylon Washer (2234780) and M10 Locking Nut (2109875–4) on each mounting stud and tighten.

❑ M2 – INSTALL THERMAL SENSOR CABLE, RUN 749



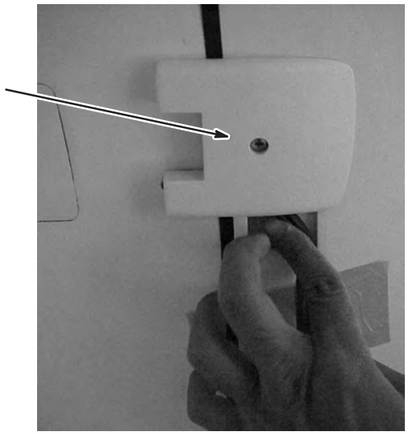
1. Insert the Thermal Sensor Cable, Run 749 (2285729), in the corresponding holes at the top inside surface of the RF Coil and secure them to the Velcro Pads (46–136246P11 & 12)



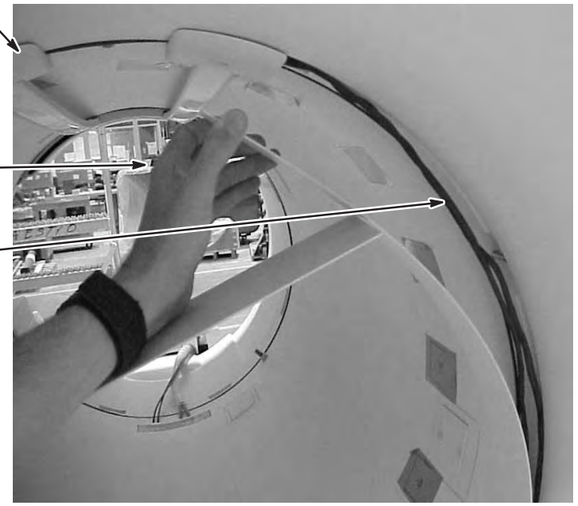
2. Route Sensor Cable in groove.

❑ M3 – INSTALLATION OF FRONT COVER STRAP

1. Retain the end of Sensor Cable by installing the Bore Light End Cap (2303834) using a M6 x 16mm Pan Head Screw (2109873–25).



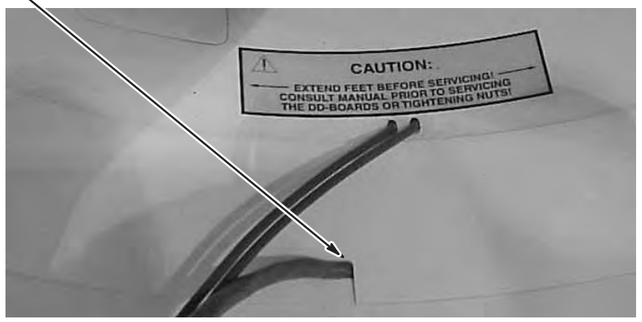
2. Install the second Bore Light End Cap.



3. Install the Front Cover Strap (2287881) over the End Bell gasket capturing the Thermal Cable in the groove.

   Note: Use tape to hold the cable in place temprarily.

4. View at bottom of RF Coil showing Thermal Cable exiting from underneath the Cover Strap



5. Go to Procedures **T3** and **T4** to install Comort Module (2284175) and Bore Lights and Procedure **U1** for installing Rear Cover Strap (2287881–2).
   This must be completed before installing Bridge.

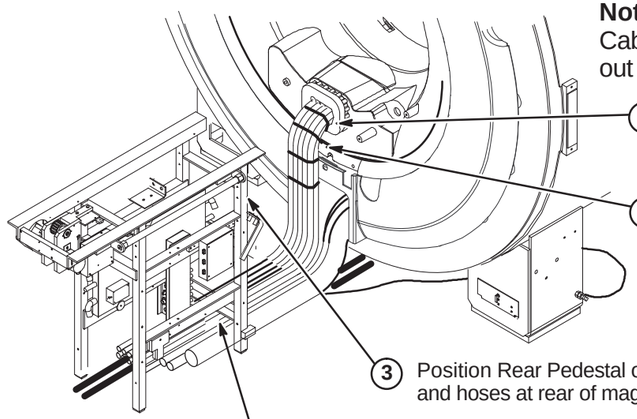
INSTALLATION PROCEDURES SUMMARY

- ❑ **N1 – Preparation of Hoses and Cables Under Rear Pedestal**
- ❑ **N2 – Location of Rear Pedestal**
- ❑ **N3 – Routing and Connecting Gradient Output Cables**
- ❑ **N4 – Route/Connect Runs 257, 262, 743, 744, and 780**

WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR WHICH IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.

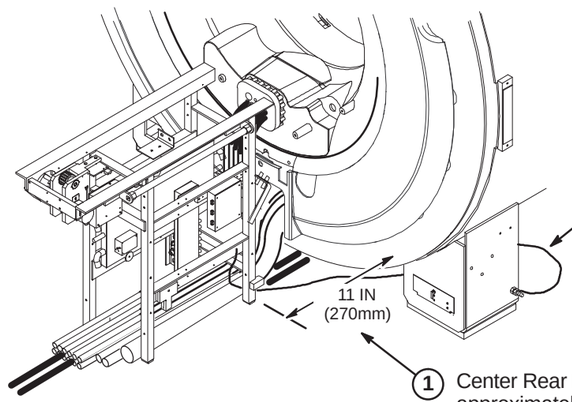
❑ N1 – PREPARATION OF HOSES AND CABLES UNDER REAR PEDESTAL



Note:
Cables and hoses can be routed to exit out of rear or side of Rear Pedestal.

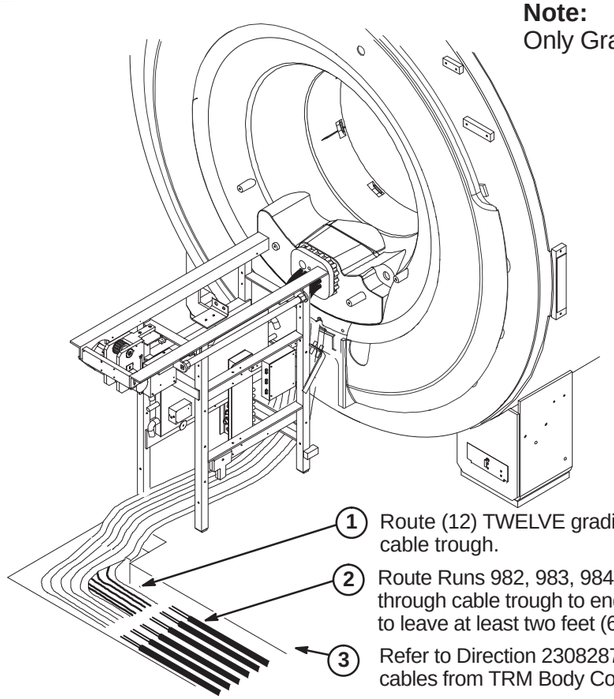
1. Make sure all twelve cable foam covers are installed as close as possible to Rear End Bell.
2. Use Ty–wraps to hold bundle together. Space Ty–wraps every 4 inches until 18 inches above floor.
3. Position Rear Pedestal over cables and hoses at rear of magnet.
4. Make sure all gradient cables, water lines, gas lines, and 2” air hose are routed under cross frame of Rear Pedestal as shown.

❑ N2 – LOCATION OF REAR PEDESTAL



2. Route Ground cable from Rear Pedestal under magnet and connect to same Ground Stud as Magnet ground.
1. Center Rear Pedestal on Rear Endbell and locate approximately 11 inches (270mm) from face of magnet.
3. Route all other cables on top of the above cables and hoses.

❑ N3 – ROUTING AND CONNECTING GRADIENT OUTPUT CABLES



Note:
Only Gradient Cables are shown for clarity.

TRM COIL CABLE LABELS		OUTPUT CABLE LABELS		
WIRE #	LABEL	RUN #	LABEL	WIRE #
1	Z ZM–	982	ZM–	2
2	Z ZM+	982	ZM+	1
3	X WB–	987	WB–	2
4	X WB+	987	WB+	1
5	Y WB+	986	WB+	1
6	Y ZM–	983	ZM–	2
7	Y WB–	986	WB–	2
8	Y ZM+	983	ZM+	1
9	Z WB+	985	WB+	1
10	X ZM–	984	ZM–	2
11	Z WB–	985	WB–	2
12	X ZM+	984	ZM+	1

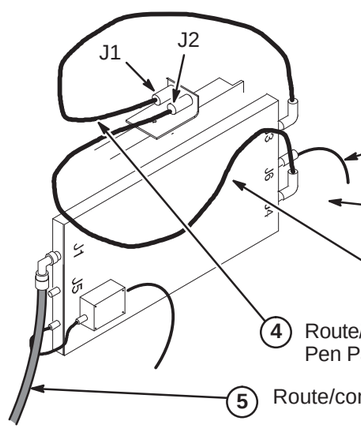
1. Route (12) TWELVE gradient Output Cables from TRM Body Coil to cable trough.
2. Route Runs 982, 983, 984, 985, 986, and 987 from Penetration Panel through cable trough to ends of Body Coil gradient cables. Make sure to leave at least two feet (610mm) of slack before cutting to length.
3. Refer to Direction 2308287 in Tab 1 and table above for connecting Output cables from TRM Body Coil to Runs 982, 983, 984, 985, 986, and 987.

❑ N4 – ROUTE/CONNECT RUNS 257, 262, 743, 744, AND 780

CAUTION

The RF Drive Input cables, Runs 743 and 744, utilize a corregated solid RF shield. If mishandled, the cable can be kinked and subsequently broken.

Also, use care when connecting these cable to the bulkhead connectors J1 and J2 and RF Splitter connectors J3 and J4. Cross threading or inadequate engagement of the center pin can cause arcing and damage the cables.



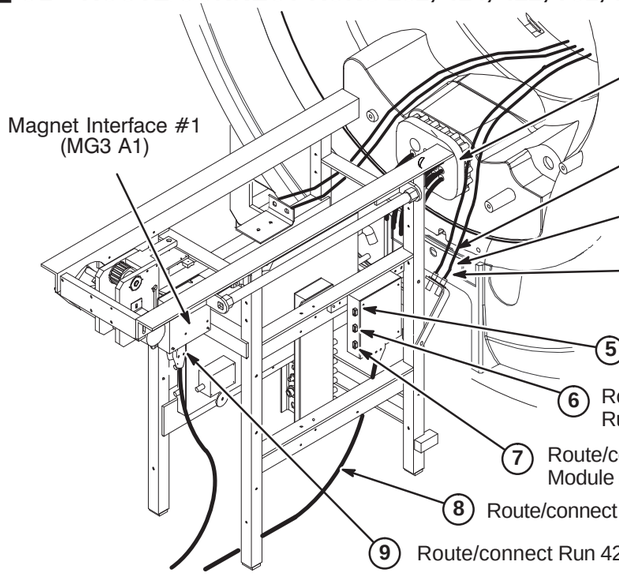
Note: Runs 743 and 744, Body Coil to RF Splitter cable connections may be reversed depending on magnet field polarity. Consult local Field Engineer for proper routing.

1. Route/connect Run 780 from J74 on Pen Panel to J6 on RF Splitter.
2. Route and connect Run 744 from J1 on bracket to J4 on the RF Splitter.
3. Route and connect Run 743 from J2 on the bracket to J3 on the RF Splitter.
4. Route/connect Run 262 from J8 on Pen Panel to Body Coil Preamplifier.
5. Route/connect Heliax® Run 257 to J1 on RF Splitter.

INSTALLATION PROCEDURES SUMMARY

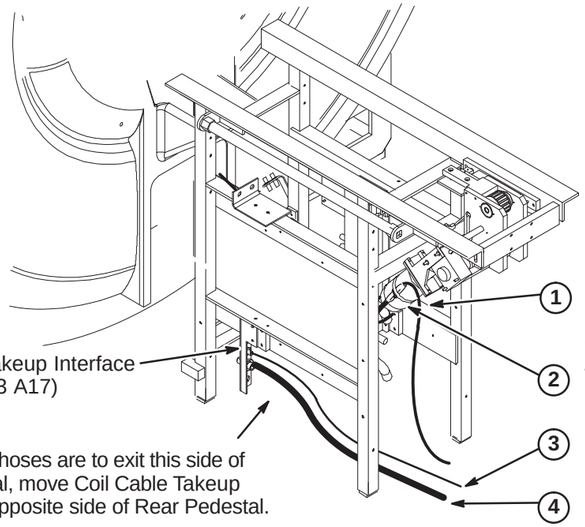
- ❑ **O1 – Route/Connect Runs 282, 414, 422, 781, 782, and Front End Bell Speaker Cable**
- ❑ **O2 – Route/Connect Runs 258, 318, and 700**
- ❑ **O3 – Remove Six Inch Hose Connector Ring from Blower Box**
- ❑ **O4 – Install Blower Box and Route/Connect Air Box**

❑ O1 – ROUTE/CONNECT RUNS 282, 414, 422, 781, 782, & FRONT END BELL CABLE



1. Route I & Q RF Drive Input cables from RF coil and connect as marked to J1 and J2 on bracket.
2. Route and connect RF Bias cables from RF Coil to bracket as marked.
3. Route and connect Run 781 from Bias cable J5 to J75 on the Penetration Panel.
4. Route and connect Run 782 from Bias cable J6 to J76 on the Penetration Panel.
5. Route/connect microphone cable from Carriage Cover to J7.
6. Route/connect Front End Bell microphone cable Run 414 to J9.
7. Route/connect speaker cable from Patient Comfort Module to J8.
8. Route/connect Run 282 from J12 on Pen Panel to J6.
9. Route/connect Run 422 from J2 on SRI to J4 on Magnet Interface #1.

❑ O2 – ROUTE/CONNECT RUNS 258, 318, AND 700



1. Route/connect Run 318 to short cable on Longitudinal Motor Drive (MG3 A7).
2. Ty–wrap cable to motor to prevent movement.
3. Route/connect Run 700 to J2 on Coil Cable Takeup Interface.
4. Route/connect Run 258 to J1 on Coil Cable Takeup Interface.

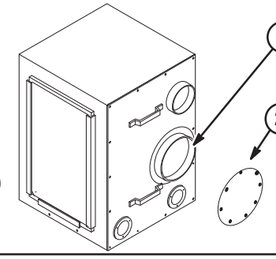
Note:
If cables and hoses are to exit this side of Rear Pedestal, move Coil Cable Takeup Interface to opposite side of Rear Pedestal.

If Interface bracket is moved to other side, connectors on bracket need to be removed, turned end for end, and reinstalled.

❑ Q3 – REMOVE SIX INCH HOSE CONNECTOR RING FROM BLOWER BOX

WARNING!

THE BLOWER BOX IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE BLOWER BOX REQUIRES TWO PEOPLE AND MUST BE OUTSIDE THE 200 GAUSS ZONE. REFER TO THE TABLE IN SECTION 1–1 UPGRADE INTRODUCTION.

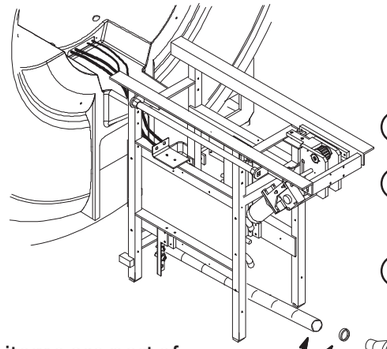


1. Unfasten and save mounting hardware. Remove and discard mounting ring for large air hose.
2. Install Blower Box Cover Plate (2295632) using same fastening hardware .

❑ Q4 – INSTALL BLOWER BOX AND ROUTE/CONNECT AIR HOSE

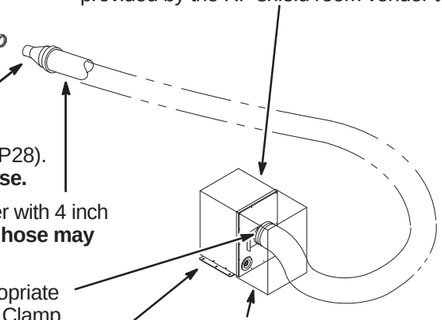
WARNING!

RF SHIELD INTEGRITY MUST BE MAINTAINED FOR MOUNTING BLOWER BOX WITHIN THE MAGNET ROOM



1. Refer to site design (architectural)/customer construction drawings or contact PMI for locating and securing Blower Box (2121199).
2. Check for correct installation of the anchors:
   - Confirm that the anchors are physically secured to the building structure, not to a removable computer floor, raised floor, or false floor.
   - Confirm there are at least four (4) anchors.
   - If any or the anchors appears wobbly or loose, stop the installation and contact the PMI to fix anchoring.
3. Remove any mounting hardware from the anchors. Hoses should face the back of the room
4. Position the blower box on top of 4 or more anchors. Hoses should face th eback of the room.
5. Secure the blower box using the hardware provided by the RF shield room vendor to attach.

Note:
The following items are part of Blower Hose Kit, 2129412–5.



6. Connect 2 inch air hose from Rear End Bell to Reducer (2175143) with 2 inch clamp (46–208765P28). **Do not cut or reduce the length of the 2 inch hose.**
7. Connect 4 inch air hose (46–282666P11) to reducer with 4 inch clamp (46–208765P34). **If necessary, the 4 inch hose may need to be cut to reduce length.**
8. Route 4 inch hose to Blower Cabinet. Trim to appropriate length and attach to vent opening with 4 inch Hose Clamp (46–208765P34).

NOTE: If needed, Blower Hose Cover can be cut and modified.

CAUTION

THE BLOWER BOX CONTAINS FERROUS MATERIAL. The proper mounting of the Blower Box is critical to safety. It MUST be mounted per these instructions

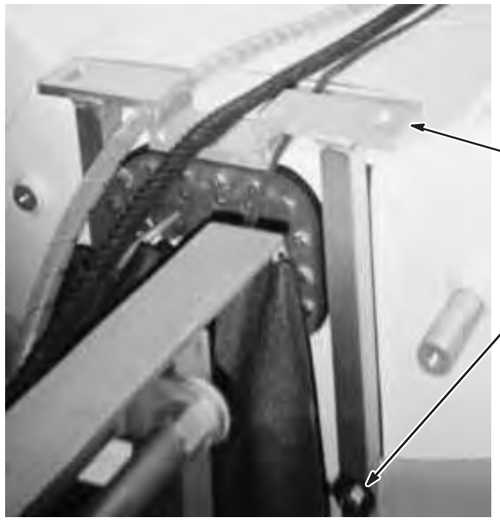
IMPORTANT!

Location of cabinet and type of fastener used for securing Blower Box outside of minimum service area should be specified in the Site Design (architectural/Construction) drawings. If proper mounting area is not specified, contact the Project Manager of Installation (PMI).

INSTALLATION PROCEDURES SUMMARY

- ❑ **P1 – Install Rear Bridge Support on Magnet**
- ❑ **P2 – Install Front Bridge Support onto Bridge**

❑ P1 – INSTALL REAR BRIDGE SUPPORT ON MAGNET



Note: The Rear Bridge Support will be **removed** after the Front and Rear Split Bridge pieces are fastened together.

Rear Bridge Support (2293201)

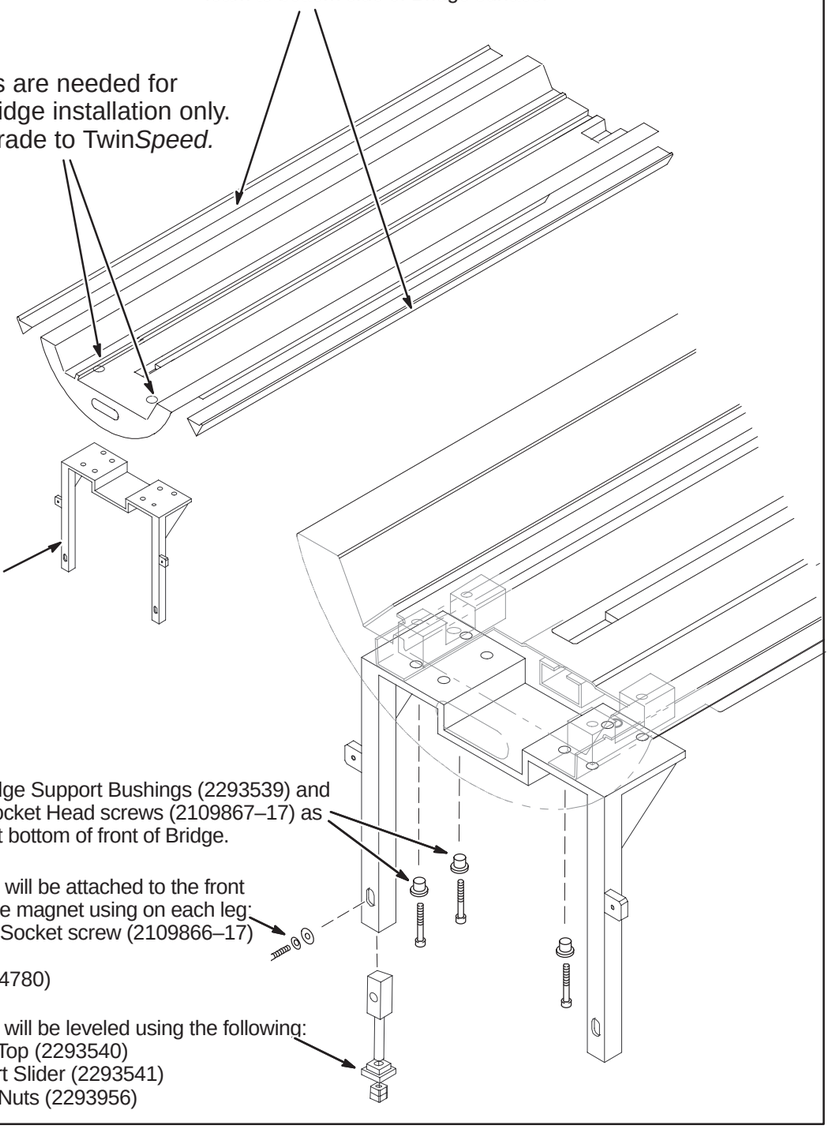
1. Mount Rear Bridge Support to rear alignment ring of magnet using on each leg:
   M10 x 100mm Hex Socket screw (2109866–17)
   Washer (2167321)
   Large Washer (2234780)

2. The Bridge Support will be leveled using the following (Refer to Procedure **P3,** Step 6):
   Twin Support Lock Top (2293540)
   Twin Bridge Support Slider (2293541)
   (2) M10 Nylon Hex Nuts (2293956)

❑ P2 – INSTALL FRONT BRIDGE SUPPORT ONTO BRIDGE

1. Starting at the front of Bridge, attach on each side one of the Twin Bridge Edge Foam 2293538) pieces by removing the cover and applying foam to bottom side of Bridge surface.

Note: Heyco plugs are needed for WideOpen MR/i Bridge installation only. Not for CV/i or upgrade to Twin*Speed.*



2. Move Front Bridge Support Bracket (2293202) to front of Bridge.

3. Install two Twin Bridge Support Bushings (2293539) and M6 x 35mm long Socket Head screws (2109867–17) as shown in opening at bottom of front of Bridge.

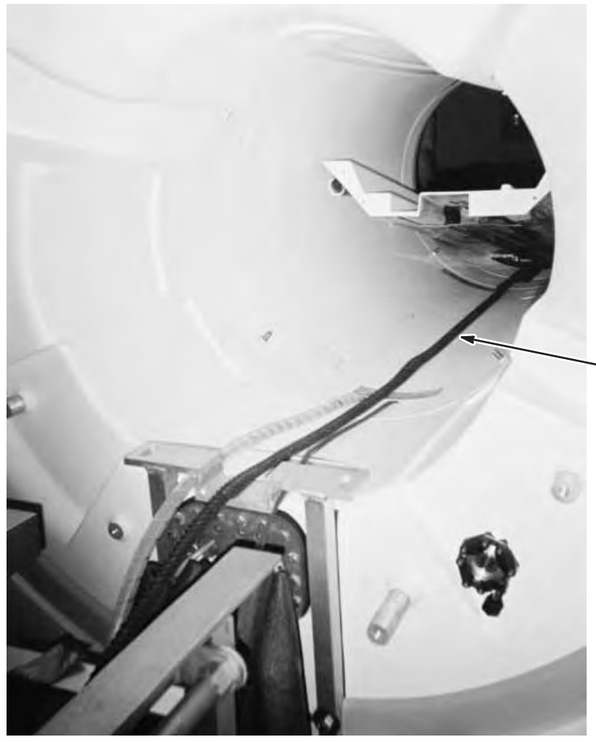
4. The Bridge Support will be attached to the front alignment ring on the magnet using on each leg:
   M10 x 100mm Hex Socket screw (2109866–17)
   Washer (2167321)
   Large Washer (2234780)

5. The Bridge Support will be leveled using the following:
   Twin Support Lock Top (2293540)
   Twin Bridge Support Slider (2293541)
   (2) M10 Nylon Hex Nuts (2293956)

INSTALLATION PROCEDURES SUMMARY

- ❑ Q1 – Installation of Bridge
- ❑ Q2 – Attaching Front of Bridge
- ❑ Q3 – Leveling Front of Bridge

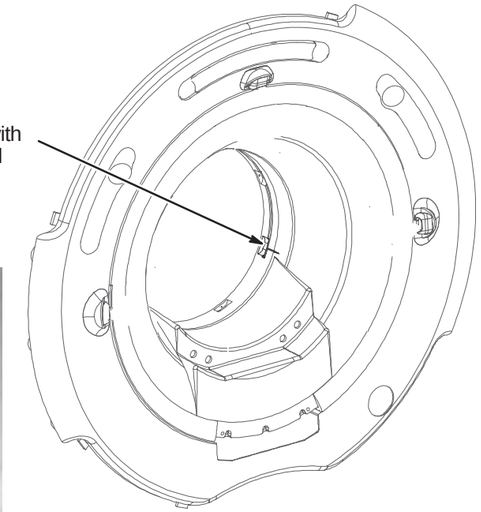
❑ Q1 – INSTALLATION OF BRIDGE



1. Roll out belt prior to installation of Bridge.
2. Guide the Bridge thru the bore to the other end. Lift front end of bridge to engage tongue on long drive assembly into Bridge.

❑ Q3 – ATTACHING FRONT OF BRIDGE

1. Top of front end of Bridge should line up with alignment marks on side of Front End Bell



2. Align the Front Bridge Support screws (2109866–26) and washers (2234780 & 2167321) with the corresponding holes in the End Bell.
3. Snug the screws. Do not overtighten, since adjustments may be needed.

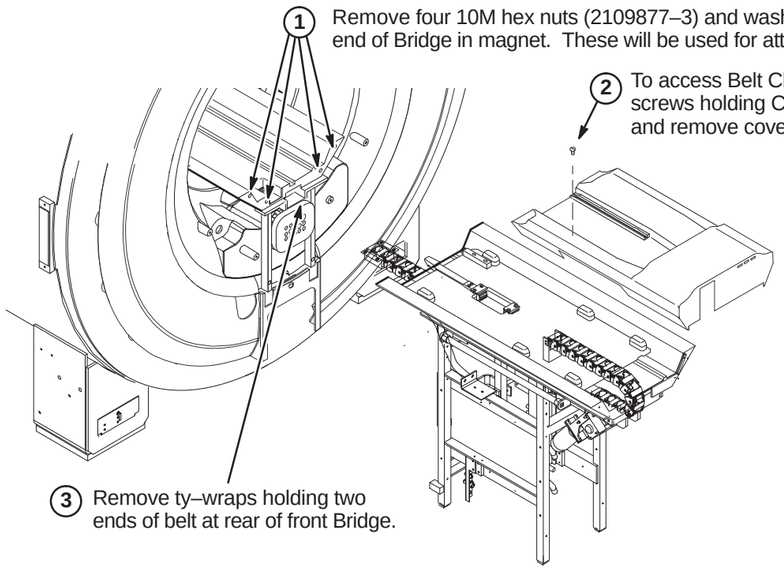
❑ Q3 – LEVELING FRONT OF BRIDGE

1. Put a level across front of Bridge and level it by adjusting right or left slider screws to center the bubble.

INSTALLATION PROCEDURES SUMMARY

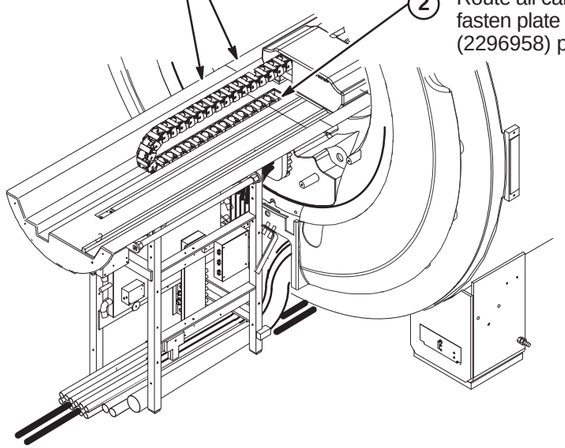
- ❑ R1 – Preparation for Front and Rear Bridge Connection
- ❑ R2 – Connecting Front and REar Bridge
- ❑ R3 – Leveling Bridge
- ❑ R4 – Remove Rear Bridge Support and Bridge Locators
- ❑ R5 – Remove Rear Bridge Plate

❑ R1 – PREPARATION FOR FRONT AND REAR BRIDGE CONNECTION



1. Remove four 10M hex nuts (2109877–3) and washers (2228717–2) from end of Bridge in magnet. These will be used for attaching the Rear Pedestal.
2. To access Belt Clamp Plate, unfasten four screws holding Carriage Cover to Carriage and remove cover. Leave cables attached.
3. Remove ty–wraps holding two ends of belt at rear of front Bridge.

❑ R2 – CONNECTING FRONT TO REAR BRIDGE

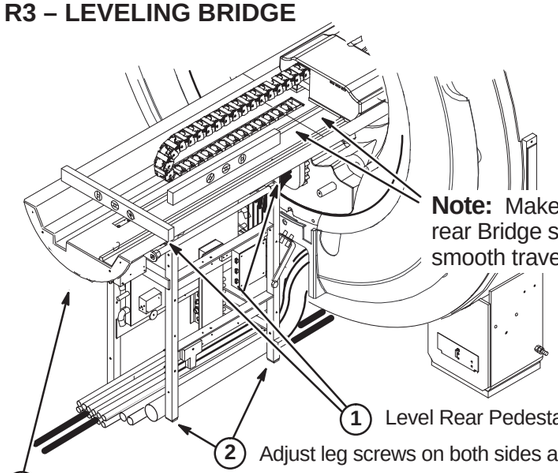


1. Move Rear Pedestal into position and fasten with four nuts and washers that were removed form end of Bridge.
2. Route all cables from Carriage thru opening in Bridge and fasten plate to front Bridge with four 6M X 12M nylon screws (2296958) provided.

WARNING!

THE REAR PEDESTAL HOUSES THE LONGITUDINAL DRIVE MOTOR THAT IS HIGHLY FERROUS! IF MAGNET IS RAMPED, ANY MOVEMENT OF THE REAR PEDESTAL REQUIRES THREE PEOPLE AND MUST MAINTAIN THE LONGITUDINAL DRIVE MOTOR AS FAR FROM THE MAGNET AS POSSIBLE.

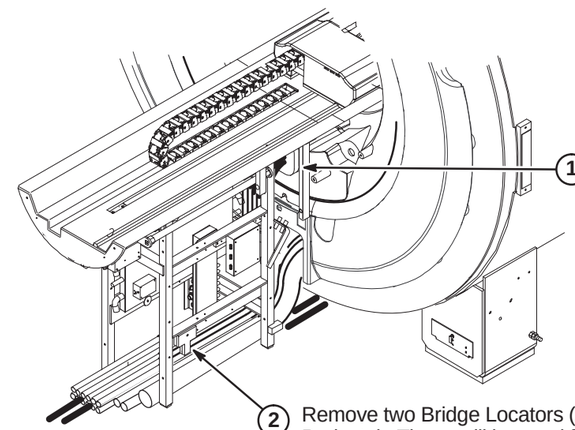
❑ R3 – LEVELING BRIDGE



Note: Make sure that surfaces between front and rear Bridge surfaces are even. This will provide smooth travel for the Carriage Cover wheels.

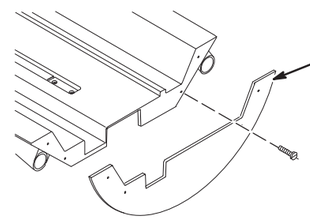
1. Level Rear Pedestal Bridge and tighten Vertical Adjustment Fasteners.
2. Adjust leg screws on both sides as needed to level Rear Pedetal.
3. Make sure that Longitudinal Drive Asm is level.

❑ R4 – REMOVE REAR BRIDGE SUPPORT AND BRIDGE LOCATORS



1. After Bridge is secure and leveled, remove Rear Bridge Support bracket and discard. It is held in place with four screws.
2. Remove two Bridge Locators (2235607) from shipping location on Rear Pedestal. These will be used for slgneing Rear Pedistal to Bridge.

❑ R5 – REMOVE REAR BRIDGE PLATE

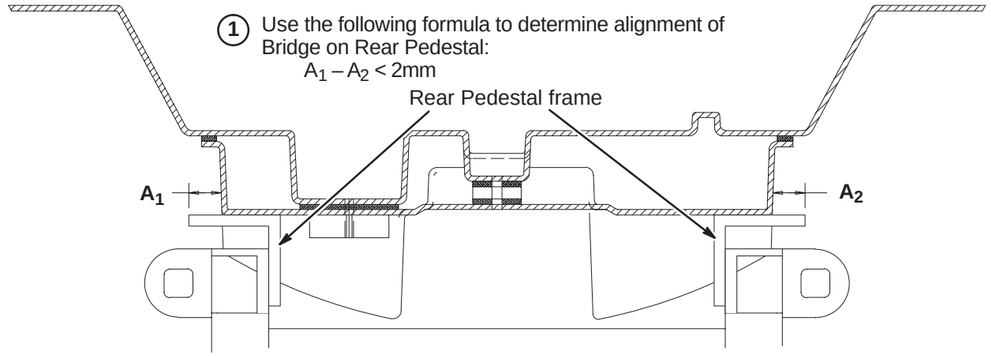


1. Remove Rear Cover from end of bridge before inserting bridge into magnet bore.

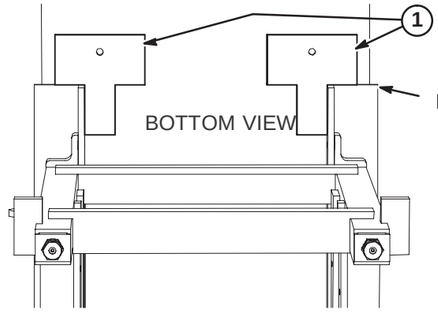
INSTALLATION PROCEDURES SUMMARY

- ❑ **S1 – Aligning Bridge on Rear Pedestal**
- ❑ **S2 – Installing Bridge Locators**
- ❑ **S3 – Routing Drive Belt**
- ❑ **S4 – Final Adjustment of Drive Belt**
- ❑ **S5 – Installation of Sensor Flag**
- ❑ **S6 – Attach Bridge Cover**

❑ S1 – ALIGNING BRIDGE ON REAR PEDESTAL



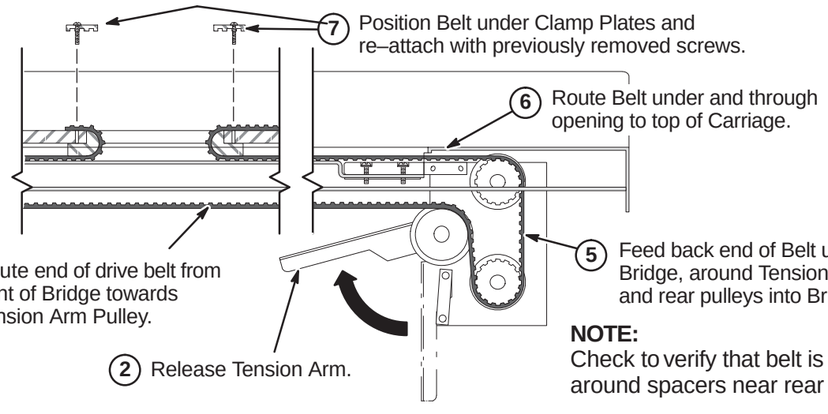
❑ S2 – INSTALLING BRIDGE LOCATORS



1. After Bridge and Rear Pedestal are aligned, peel off protective paper on each Bridge Locator and attach to bottom side of Bridge as shown.

End of Rear Pedestal frame closest to Magnet.

❑ S3 – ROUTING OF DRIVE BELT



7. Position Belt under Clamp Plates and re–attach with previously removed screws.

6. Route Belt under and through opening to top of Carriage.

1. Route end of drive belt from front of Bridge towards Tension Arm Pulley.

5. Feed back end of Belt underneath Bridge, around Tension Arm Pulley and rear pulleys into Bridge.

2. Release Tension Arm.

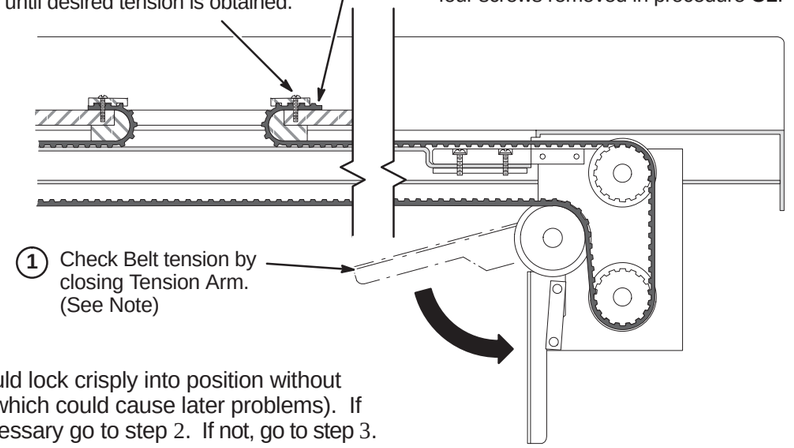
NOTE:
Check to verify that belt is not caught around spacers near rear pulley.

❑ S4 – FINAL ADJUSTMENT OF DRIVE BELT

3. Tighten Clamps and trim excess Belt length.

2. **(IF NECESSARY):** Loosen Clamp and adjust position of Belt one tooth at a time until desired tension is obtained.

4. Fasten Carriage Cover to Carriage with four screws removed in procedure **C1**.



1. Check Belt tension by closing Tension Arm. (See Note)

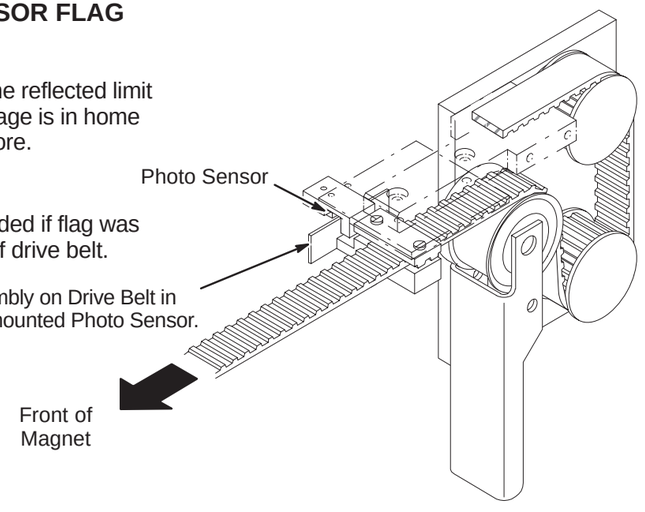
NOTE:
Tension Arm should lock crisply into position without excessive force (which could cause later problems). If adjustment is necessary go to step 2. If not, go to step 3.

❑ S5 – INSTALLATION OF SENSOR FLAG

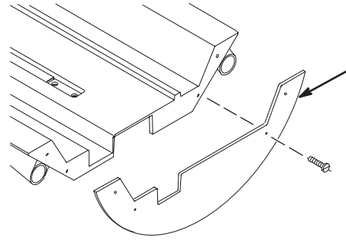
NOTE:
Function of the Flag is to interrupt the reflected limit switch sensor beam when the Carriage is in home position all the way forward in the bore.

NOTE:
The following Step is needed if flag was removed during routing of drive belt.

1. Install Flag Assembly on Drive Belt in line with Bridge mounted Photo Sensor.



❑ S6 – ATTACH BRIDGE COVER



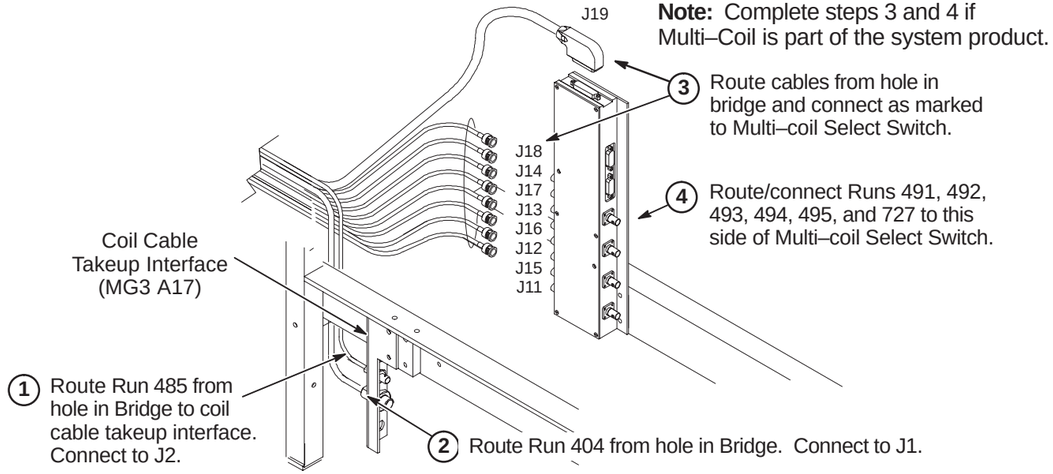
1. Replace previously removed Bridge Cover and fasten with (4) screws to end of Bridge.

Note:
Bridge Cover has enclosure rating plates on it.

INSTALLATION PROCEDURES SUMMARY

- ❑ **T1 – Route/Connect Runs 404, 485 and Multi–coil Cables**
- ❑ **T2 – Route/Connect Vacuum Hose and Elbos**
- ❑ **T3 – Installatin of Comfort Module Clips**
- ❑ **T4 – Installation of Comfort Module**

❑ T1 – ROUTE/CONNECT RUNS 404, 485 AND MULTI–COIL CABLES

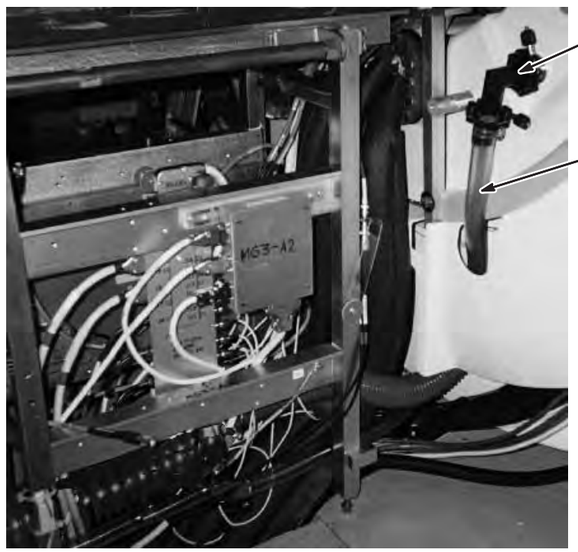


Note: Complete steps 3 and 4 if Multi–Coil is part of the system product.

3. Route cables from hole in bridge and connect as marked to Multi–coil Select Switch.
4. Route/connect Runs 491, 492, 493, 494, 495, and 727 to this side of Multi–coil Select Switch.
1. Route Run 485 from hole in Bridge to coil cable takeup interface. Connect to J2.
2. Route Run 404 from hole in Bridge. Connect to J1.

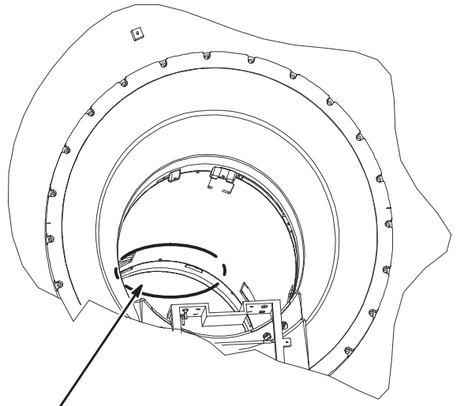
❑ T2 – ROUTE/CONNECT VACUUM HOSE AND ELBOW

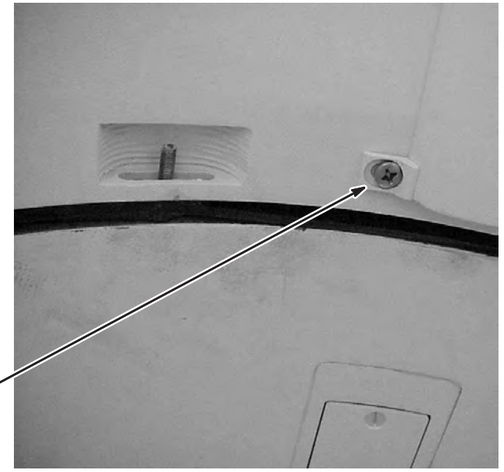
Note:
Vacuum Grease **must** be applied to all Centering Rings (2293608) and outside edge of vacuum connector flanges.



1. Install Elbow (2293609) to End Bell using centering ring (2293608) and chain clamp (2293618–2). Tighten chain clamp to **"finger tight"**.
2. Route vacuum hose (2293607) from Elbow on End Bell, thru Penetration Panel, to connection at rear of TAC Cabinet in Equipment Room. Cut to length.
3. At each end of vacuum hose insert Hose Connector (2293616), apply vacuum grease to ouside edge of connector and fasten with two (2) Clamps (2294010–3).
4. Apply vacuum grease to outside edge of Hose Connector flanges and respective connector flanges on TAC and End Bell.
5. Connect each end of Vacuum Hose using centering ring (2293608) and chain clamp (2293618–2). Tighten chain clamp to **"finger tight"**.

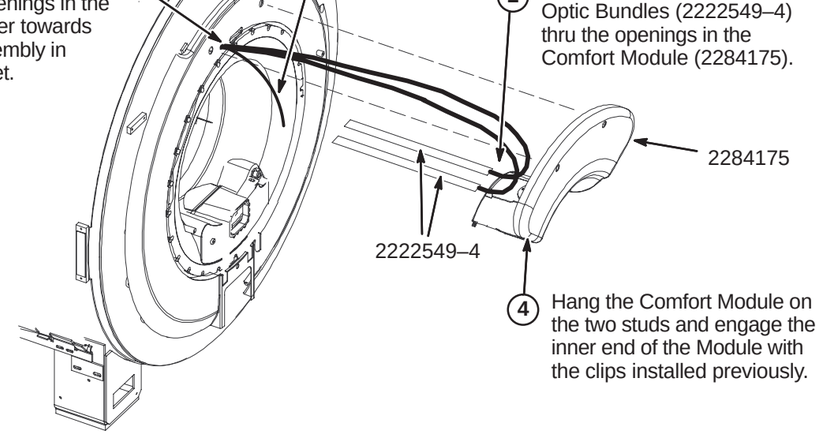
❑ T3 – INSTALLATION OF COMFORT MODULE CLIPS





1. Install the two Comfort Module Clips (2284174) using M6 x 16mm Pan Head Screws in the location at the rear of upper bore indicated above.

❑ T4 – INSTALLATION OF COMFORT MODULE



1. Route Run 869 from Rear Pedestal MG3 A2 J8 thru opening in Rear Cosmetic Cover. Run 869 will be connected to Speaker cable in Comfort Module as it is being installed.
2. Feed the two Bore Light Fiber Optic Bundles (2222549–4) thru the openings in the Comfort Module (2284175).
3. Feed the two Bore Light Fiber Optic Bundles thru the openings in the Rear Cosmetic Cover towards the Bore Lamp Assembly in the leg of the magnet.
4. Hang the Comfort Module on the two studs and engage the inner end of the Module with the clips installed previously.

INSTALLATION PROCEDURES SUMMARY

- ❑ **U1 – Installation of Bore Light Panels and Rear Cover Straps**
- ❑ **U2 – Route/Connect Fiber Optic Bundle to Bore Lamp**
- ❑ **U3 – Install Front and Rear Blue Ring Sections**
- ❑ **U4 – Install Right and Left Side Wraps**

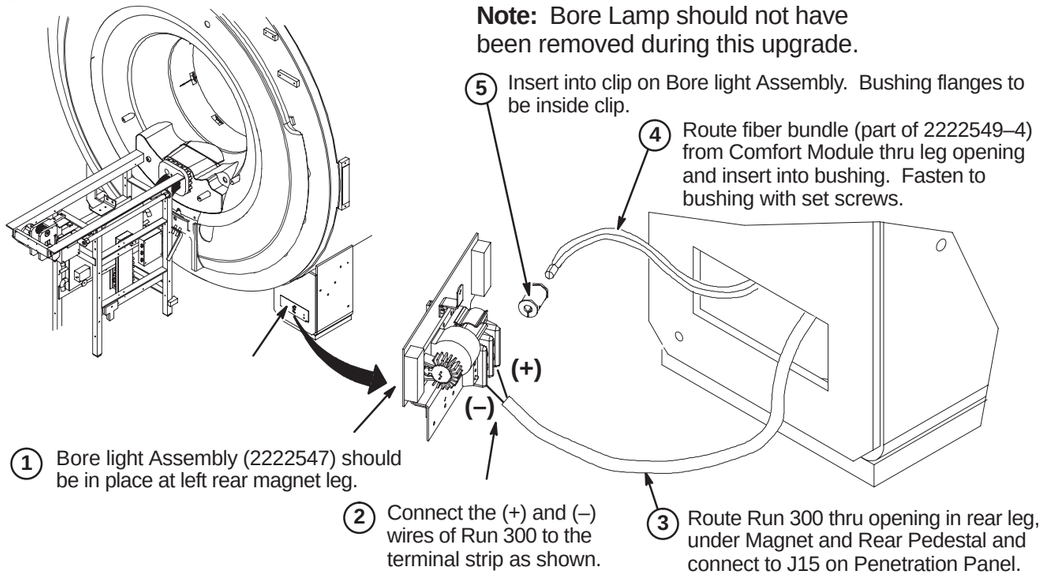
❑ U1 – INSTALLATION OF BORE LIGHT PANELS AND REAR COVER STRAP

1. Bend the Bore Light Panels and slip them into place. Peel off the paper from the double–sided tape and stick the light panels to the bore of the RF Coil.

2. Snap the Rear Cover Strap (2287881–2) over gasket between RF and End Bell.

❑ U2 – ROUTE/CONNECT FIBER OPTIC BUNDLE TO BORE LAMP

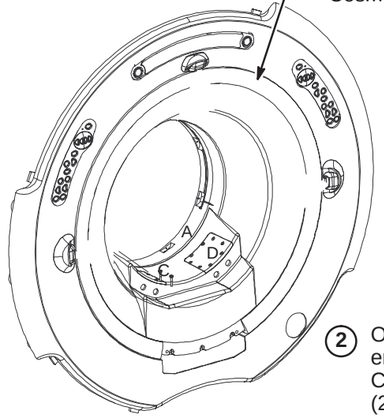
Note: Bore Lamp should not have been removed during this upgrade.



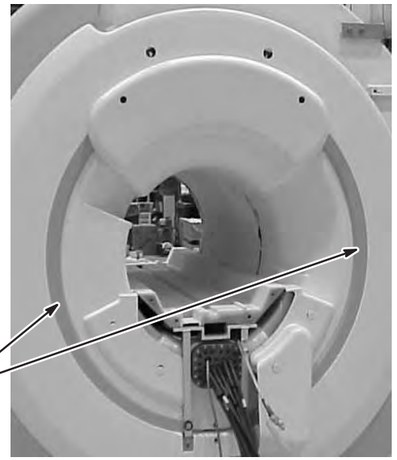
1. Bore light Assembly (2222547) should be in place at left rear magnet leg.
2. Connect the (+) and (–) wires of Run 300 to the terminal strip as shown.
3. Route Run 300 thru opening in rear leg, under Magnet and Rear Pedestal and connect to J15 on Penetration Panel.
4. Route fiber bundle (part of 2222549–4) from Comfort Module thru leg opening and insert into bushing. Fasten to bushing with set screws.
5. Insert into clip on Bore light Assembly. Bushing flanges to be inside clip.

❑ U3 – INSTALL FRONT AND REAR BLUE RING SECTIONS

1. On the front of the magnet enclosure, install front blue Cosmetic Ring (2331842).

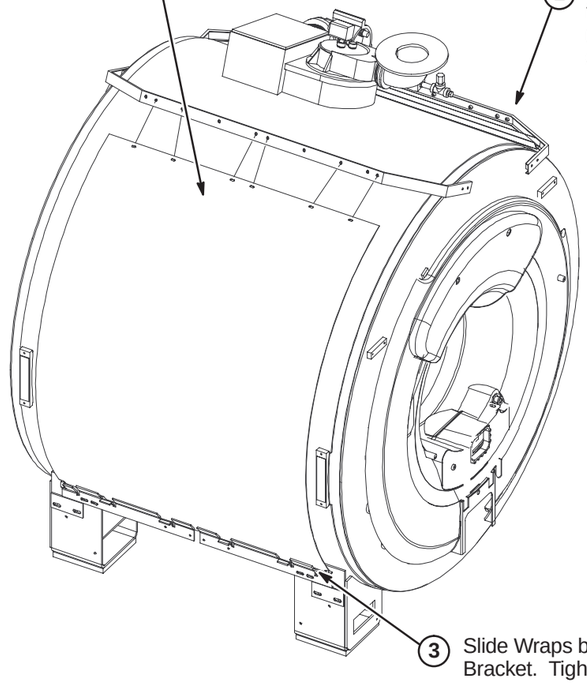


2. On the rear of the magnet enclosure, install two Cosmetic Ring Sections (2331842–2 & 2231842–3).



❑ U4 – INSTALL RIGHT AND LEFT SIDE WRAPS

2. Connect the Right Side Wrap (2217702–2) to frame with (6) M6 x 12mm Button head screws (2109872–6) and M6 Nylon washers (2229794) and blue Loctite.
1. Connect the Left Side Wrap (2217703–2) to frame with (6) M6 x 12mm Button head screws (2109872–6) and M6 Nylon washers (2229794) and blue Loctite.

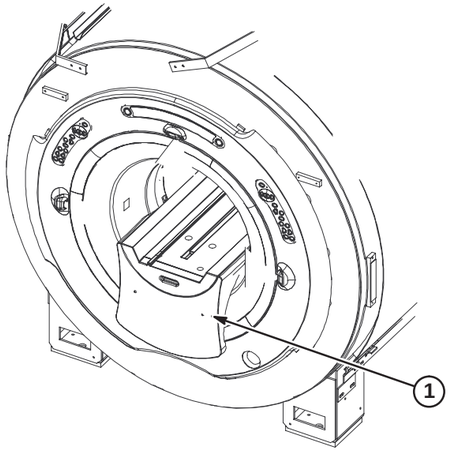


3. Slide Wraps between magnet and notches in Clamping Bracket. Tighten clamping bracket screws.

INSTALLATION PROCEDURES SUMMARY

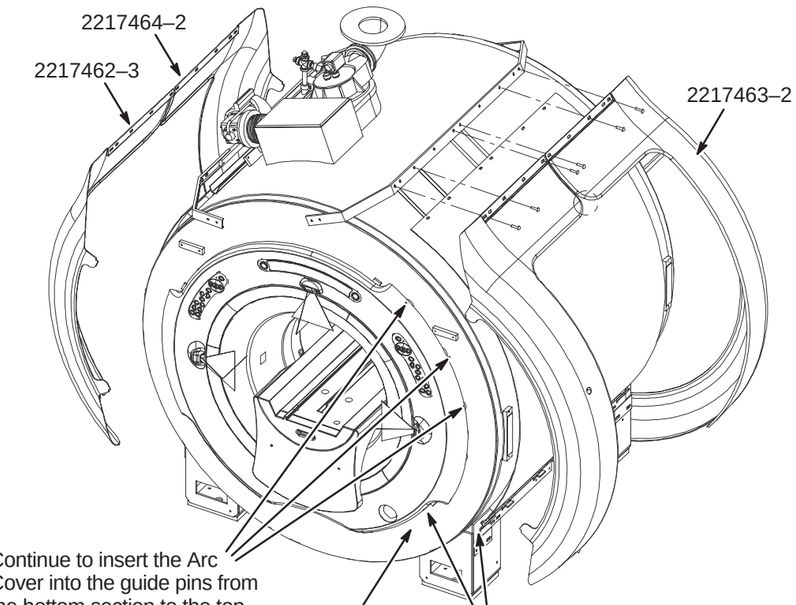
- ❑ V1 – Installation of Front Bridg Cover
- ❑ V2 – Installation of Arc Covers
- ❑ V3 – Fasten Top Arc Cover
- ❑ V4 – Adjust Bottom of Arc Covers
- ❑ V5 – Complete Arc Cover Installation

❑ V1 – INSTALLATION OF FRONT BRIDGE COVER



1. Install the Front Bridge Cover (2287607) with (2) M6 x 16mm Screws (2284368)

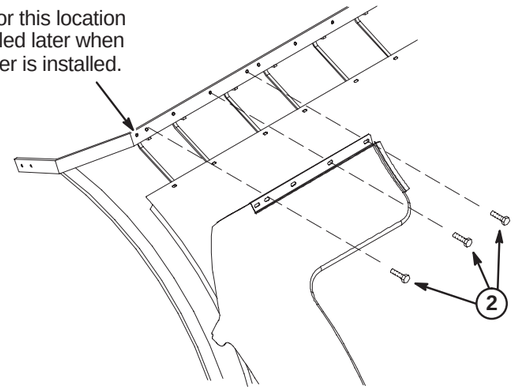
❑ V2 – INSTALLATION OF ARC COVERS



2. Continue to insert the Arc Cover into the guide pins from the bottom section to the top.
3. Make sure the arc rests on the rectangular pin at the bottom of the End Bell.
1. Install Right Front Arc Cover (2217461–3) and insert lower section of the arc between the End Bell and lower guide pin.

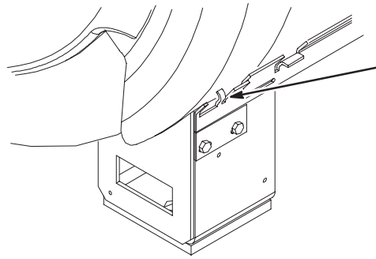
❑ V3 – FASTEN TOP OF ARC COVER

1. The screw for this location will be installed later when the Top Cover is installed.



2. Attach the Arc to the top frame using three (3) M10 x 25mm Hex Head screws (2109866–20) and Blue Loctite.

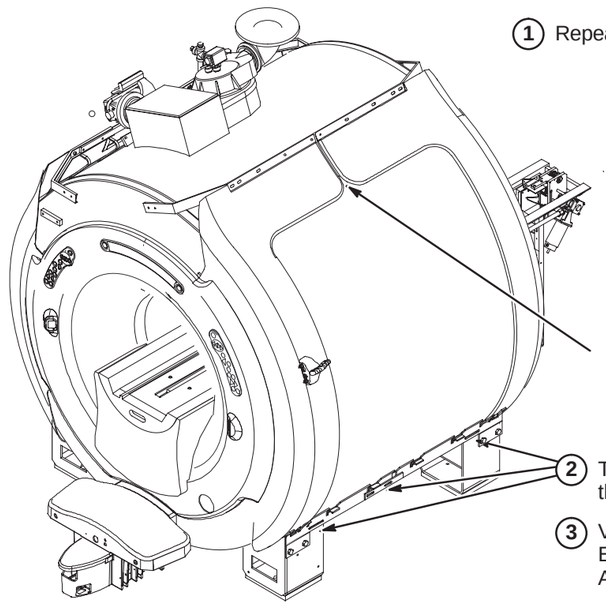
❑ V4 – ADJUST BOTTOM OF ARC COVERS



1. Adjust the bottom rails so that the finger fits into the slot in the bottom of the Arc Cover.

Note: The above process will help pull bottom of Rear End Bell flange closer to the magnet. Adjust Rear End Bell as required to keep distance between flange and magnet equal at top and bottom of End Bell.

❑ V5 – COMPLETE ARC COVER INSTALLATION



1. Repeat process for the other three Arc Covers.

Note: All enclosure seams and gaps visible to the operator and patient shall be less than 0.25 inches (6.35mm). Exceptions can be made where esthetic visual enhancement of the component gap is required by industrial design.

Gap uniformity along any continuos seam shall be $^{+}/_{-}$ 0.0625 inch (1.59mm)

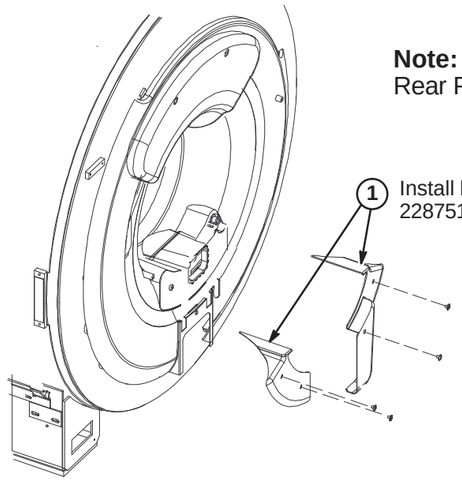
Note: This gap is not included in specification above.

2. Tighten screws in bottom rails. First front rail, then middle connector, then rear of rail.
3. Visually inspect the gap between Arc Cover and End Bell, then the Arc Cover and side Wraps. Adjust as necessary.

INSTALLATION PROCEDURES SUMMARY

- ❑ **W1 – Installation of Rear Bridge Covers**
- ❑ **W2 – Dock Adjustment for Patient Transport Gap**
- ❑ **W3 – Route and Connect Magnet Enclosure Front Area Cables**
- ❑ **W4 – Cable Connection to PAC Module**

❑ W1 – INSTALLATION OF REAR BRIDGE COVERS



Note:
Rear Pedestal and Bridge are not shown for clarity.

1. Install left and right Rear Bridge covers (2287511 & 2287512) using (4) Bridge Cover Screws (2284368).

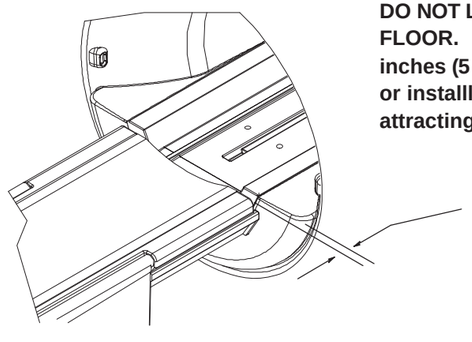
❑ W2 – DOCK ADJUSTMENT FOR PATIENT TRANSPORT GAP

WARNING!

DOCK CONTAINS FERROUS MATERIAL. HANDLE WITH CARE DURING INSTALLATION. IF MAGNET IS RAMPED, WHENEVER MOVING DOCK, DOWNWARD PRESSURE MUST BE CONSTANTLY APPLIED TO THE TOP OF THE DOCK ASSEMBLY BY TWO PEOPLE. DOCK MUST BE MOVED SLOWLY ALONG THE GROUND AND NOT LIFTED VERTICALLY

WARNING!

DO NOT LIFT THE DOCK MORE THAN 2 INCHES (5 CM) OFF THE FLOOR. If the height (to clear the dock anchor) exceeds two inches (5 cm), the magnet must be ramped down prior to removing or installling the dock as there is significant risk of the magnet attracting the dock if it needs to be raised more that 2 inches (5 cm).



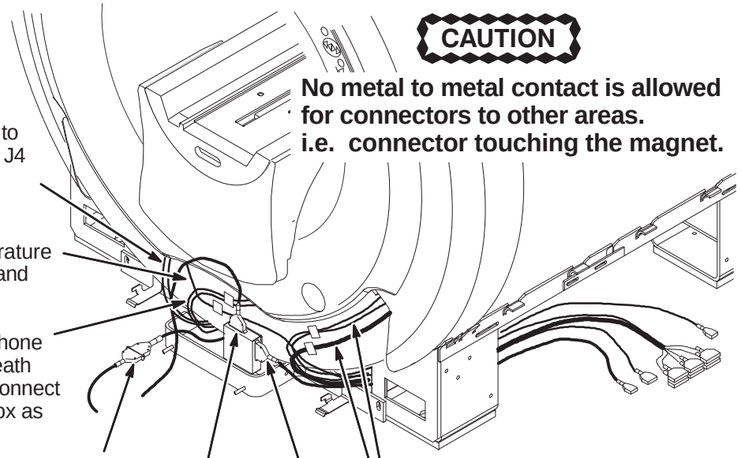
Note:
Gap between Patient Transport front rubber inlay and front of End Bell must be 0.75 Inches ±0.25 (19.0±6.4mm). See Step 1 below.

❑ W3 – ROUTE AND CONNECT MAGNET ENCLOSURE FRONT AREA CABLES

Note:
Dock Assembly not shown for clarity.

CAUTION

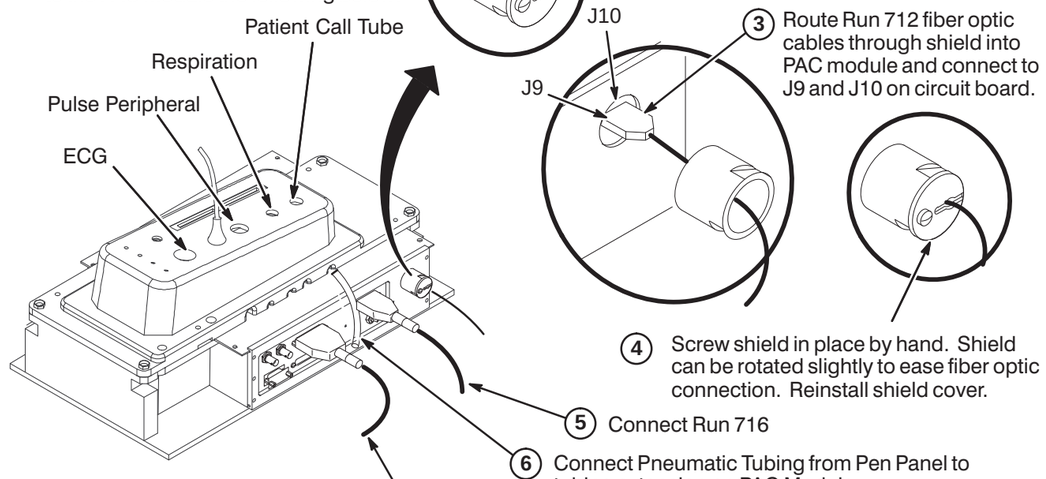
No metal to metal contact is allowed for connectors to other areas. i.e. connector touching the magnet.



1. Route Runs 778 and 779 to front RF Bias cables J3 & J4 and connect as marked.
2. Route Run 749, Bore Temperature Sensor, from Front End Bell and connect ot J10 on SRI.
3. Route Front End Bell Microphone and Speaker cables underneath manet to ReaPedestal and connect to Patient Communication Box as marked.
4. Connect Run 387 to Dock Cable (MG2 A29 P1). If needed to prevent contact with other metal parts, cover connectors with provided velcro jacket or tape.
5. Connect Dock Cable to J2 on Dock Limit Box
6. Route/Connect Run 421 from SRI J3 and connect to J1 on Dock Limit Box.
7. Route cables from Operator Display to area of PAC/SRI Platform and connect as marked to SRI and PAC.

❑ W4 – CABLE CONNECTION TO PAC MODULE

Note:
Refer to Tab 1, System, for instructions on routing and installing fiber optic cables.



1. Connectfrom the Remote PAC Interface to the PAC Module the following below:
2. Remove shield cover by removing one screw and unscrew shield from module.

   Note: Loosen screws and slide module cover open if access to PAC-II board is required to determine correct fiber optic connection.
3. Route Run 712 fiber optic cables through shield into PAC module and connect to J9 and J10 on circuit board.
4. Screw shield in place by hand. Shield can be rotated slightly to ease fiber optic connection. Reinstall shield cover.
5. Connect Run 716
6. Connect Pneumatic Tubing from Pen Panel to tubing extension on PAC Module.
7. Connect cable from J5 on Operator Display to J4 on PAC Module.

INSTALLATION PROCEDURES SUMMARY

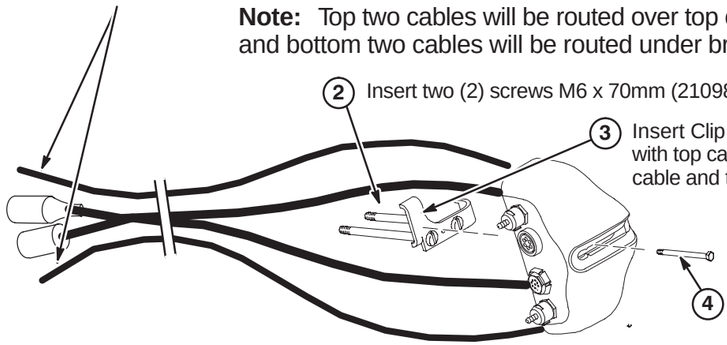
- ❑ **X1 – Prepare Cables and Tubes for Routing**
- ❑ **X2 – Position Remote PAC Interface Mounting Clip**
- ❑ **X3 – Route Remote PAC Interface Cables and Tubes**
- ❑ **X4 – Installing Remote PAC Interface to Arc Cover**
- ❑ **X5 – Install PAC Hanger Bar**

❑ X1 – PREPARE CABLES AND TUBES FOR ROUTING

Note:
Consult with customer for correct location of Remote PAC Interface assembly. It must be on the same side as the PAC/SRI Platform, as positioned in Procedure **A1**

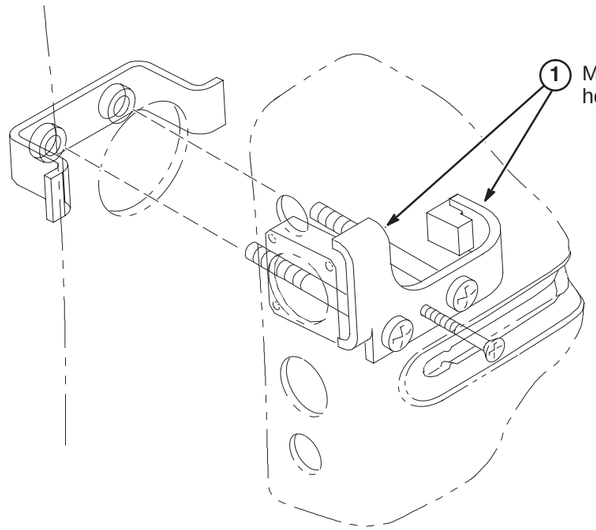
1. Apply tape around end of pneumatic tubes and mark "TOP" to the opposite end of the tube connected to the top connector in the Remote PAC Interface Assembly and "BOTTOM" to the tube connected to the lower connector.

Note: Top two cables will be routed over top of bracket and bottom two cables will be routed under bracket.



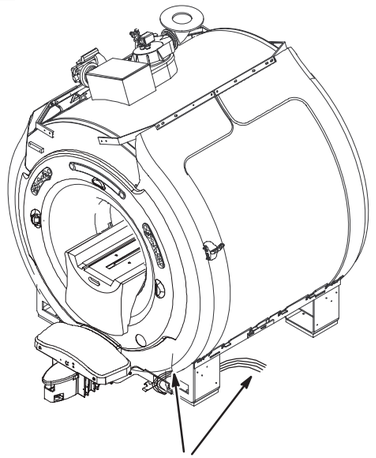
2. Insert two (2) screws M6 x 70mm (2109873–33) screws into Clip (2221023).
3. Insert Clip with screws into shell as shown with top cable and tube above Clip and bottom cable and tube below.
4. Hold in place by inserting provided M4 screw thru slot and turning about 3 or 4 turns into Clip.

❑ X2 – POSITION REMOTE PAC INTERFACE MOUNTING CLIP



1. Make sure each side of clip is mounted behind housing blocks.

❑ X3 – ROUTE REMOTE PAC INTERFACE CABLES AND TUBES

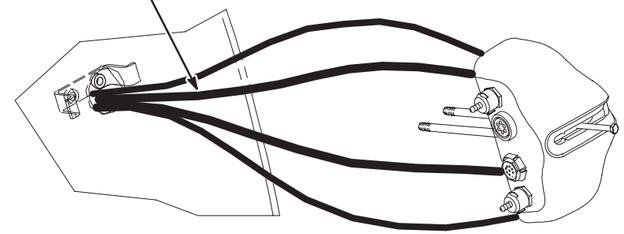


3. Route around foot of magnet to PAC/SRI Platform location.

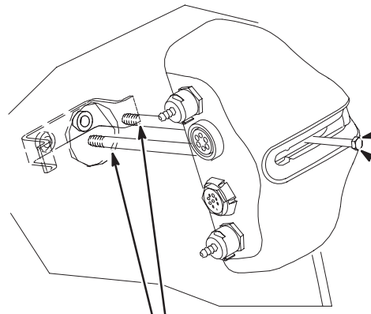
Note: Top two cables will be routed over top of bracket and bottom two cables will be routed under bracket.

Note: Insert cables/tubes separately thru hole and make sure they come out at bottom of arc cover.

1. **Insert ECG Cable first.** Route this thru pre–mounted foam tube (if available) located on inside of Arc cover.
2. Route Peripheral Pulse cable and tubes next.



❑ X4 – INSTALLING REMOTE PAC INTERFACE TO ARC COVER

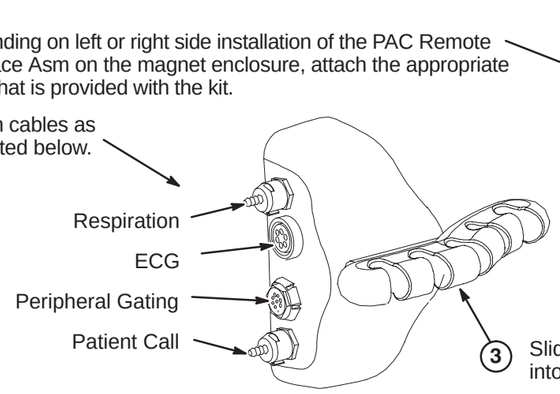


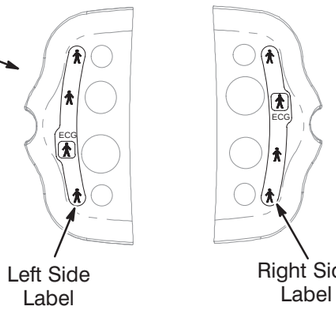
Note:
Routed cables and tubes not shown for clarity.

1. Use M4 screw thru slot to lift and guide small end of Clamp over block inside housing.
3. Remove M4 screw and save for use at at later time since it would be required if Remote PAC Interface Assembly would need to be removed at any time in the future.
   OR
   Turn the M4 screw inward until there is clearance for sliding the PAC Hanger Bar in **T5** into place.
2. Using screwdriver thru housing slot, tighten down the M6 screws to lock housing in place.

❑ X5 – INSTALL PAC HANGER BAR

1. Depending on left or right side installation of the PAC Remote Interface Asm on the magnet enclosure, attach the appropriate label that is provided with the kit.
2. Attach cables as indicated below.



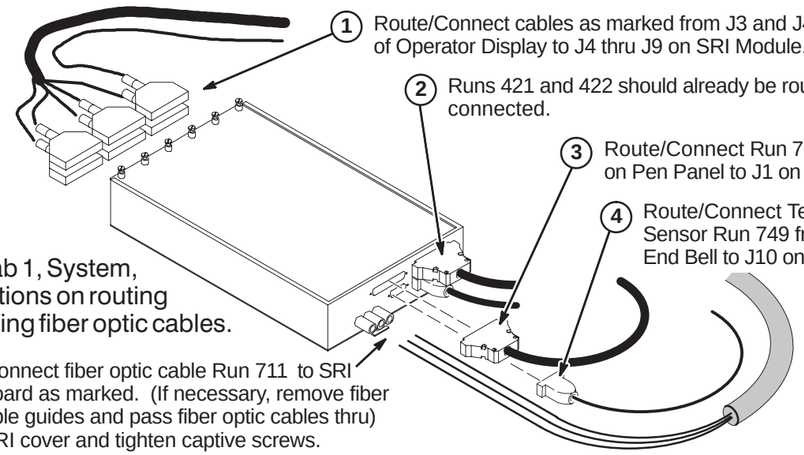


3. Slide PAC Hanger Bar (2221023) into position.

INSTALLATION PROCEDURES SUMMARY

- ❑ **Y1 – Connect Cables to SRI Module**
- ❑ **Y2– Routing of Photo–Plethysmograph Cable**
- ❑ **Y3 – Route and Tie–wrap Cables to PAC/SRI Platform**
- ❑ **Y4 – Install PAC/SRI Platform under Magnet**

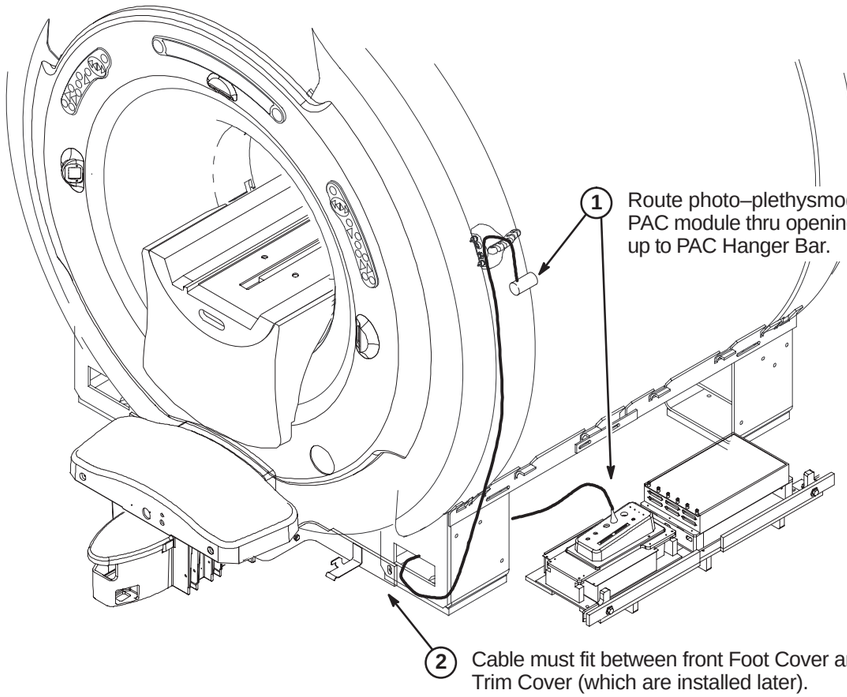
❑ Y1 – CONNECT CABLES TO SRI MODULE



1. Route/Connect cables as marked from J3 and J4 of Operator Display to J4 thru J9 on SRI Module.
2. Runs 421 and 422 should already be routed and connected.
3. Route/Connect Run 715 from J14 on Pen Panel to J1 on SRI Module.
4. Route/Connect Temperture Sensor Run 749 from Rear End Bell to J10 on SRI Module
5. Route/Connect fiber optic cable Run 711 to SRI circuit board as marked. (If necessary, remove fiber optic cable guides and pass fiber optic cables thru) Close SRI cover and tighten captive screws.

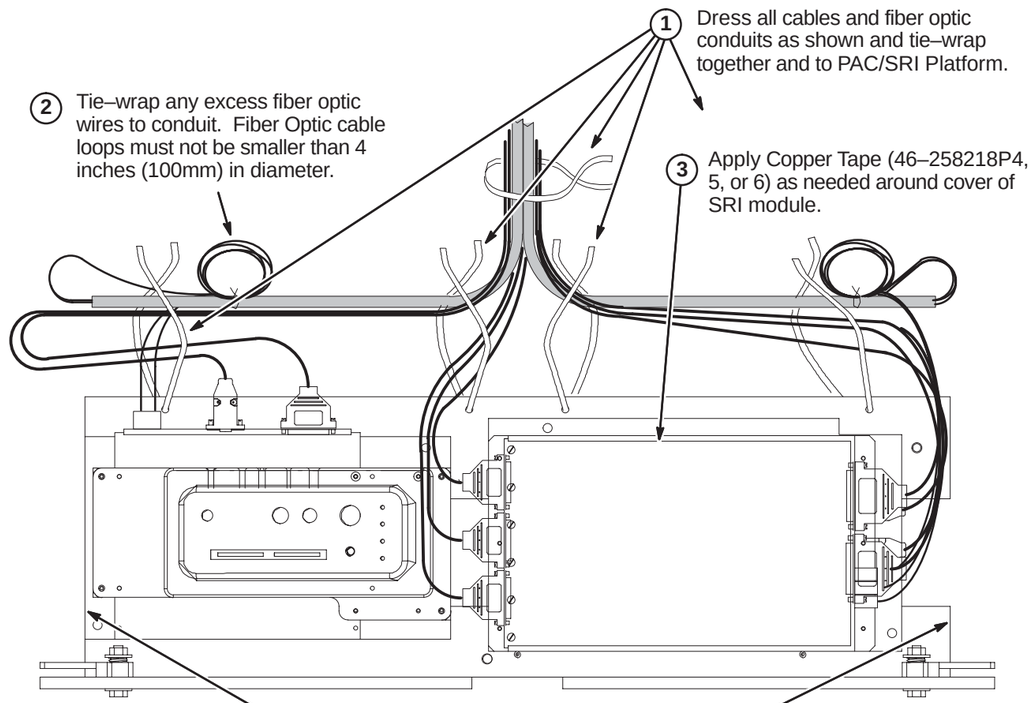
Note:
Refer to Tab 1, System, for instructions on routing and installing fiber optic cables.

❑ Y2 – ROUTING OF PHOTO–PLETHYSMOGRAPH CABLE



1. Route photo–plethysmograph cable from PAC module thru opening in front leg and up to PAC Hanger Bar.
2. Cable must fit between front Foot Cover and side Trim Cover (which are installed later).

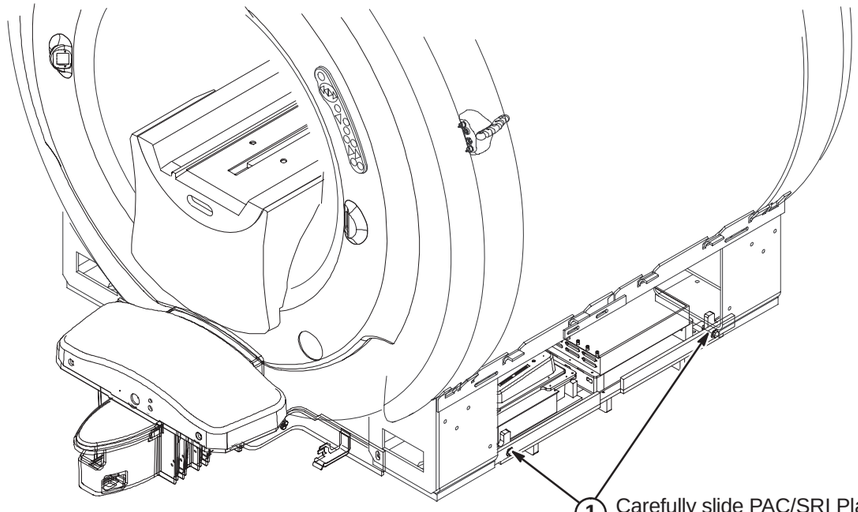
❑ Y3 – ROUTE AND TIE–WRAP CABLES TO PAC/SRI PLATFORM



1. Dress all cables and fiber optic conduits as shown and tie–wrap together and to PAC/SRI Platform.
2. Tie–wrap any excess fiber optic wires to conduit. Fiber Optic cable loops must not be smaller than 4 inches (100mm) in diameter.
3. Apply Copper Tape (46–258218P4, 5, or 6) as needed around cover of SRI module.

Note: Keep cables dressed inside edge so unit slides between legs easily for service.

❑ Y4 – INSTALL PAC/SRI PLATFORM UNDER MAGNET

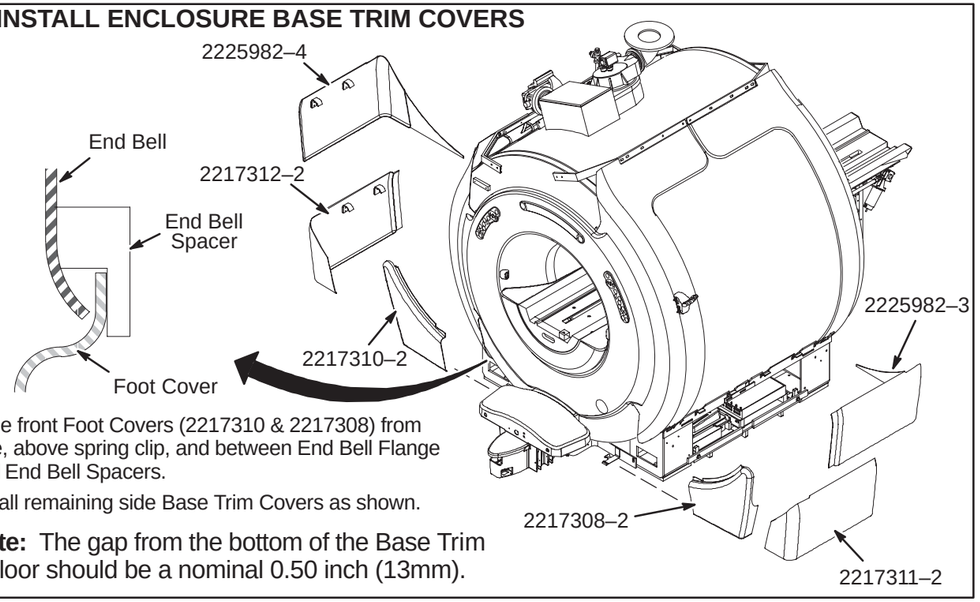


1. Carefully slide PAC/SRI Platform between legs of magnet and lock in place at each end.

INSTALLATION PROCEDURES SUMMARY

- ❑ **Z1 – Install Enclosure Base Trim Covers**
- ❑ **Z2 – Install Enclosure Top Covers**
- ❑ **Z3 – Install Rear Pedestal Covers**
- ❑ **Z4 – Install Rating Plates**

❑ Z1 – INSTALL ENCLOSURE BASE TRIM COVERS



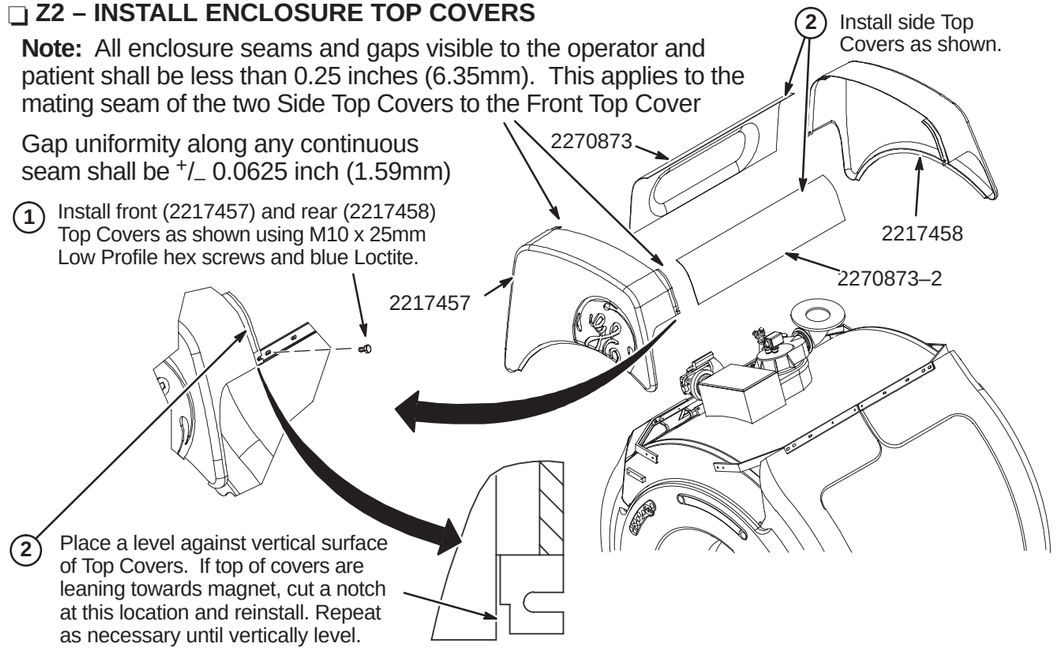
1. Slide front Foot Covers (2217310 & 2217308) from side, above spring clip, and between End Bell Flange and End Bell Spacers.
2. Install remaining side Base Trim Covers as shown.

Note: The gap from the bottom of the Base Trim to floor should be a nominal 0.50 inch (13mm).

❑ Z2 – INSTALL ENCLOSURE TOP COVERS

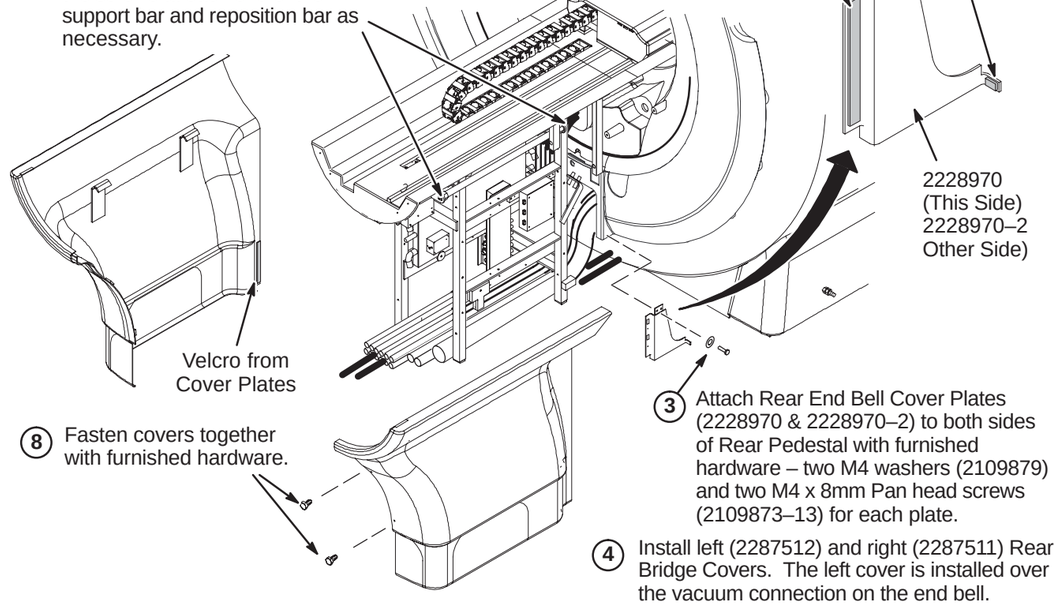
Note: All enclosure seams and gaps visible to the operator and patient shall be less than 0.25 inches (6.35mm). This applies to the mating seam of the two Side Top Covers to the Front Top Cover

Gap uniformity along any continuous seam shall be $^{+}$/_ 0.0625 inch (1.59mm)



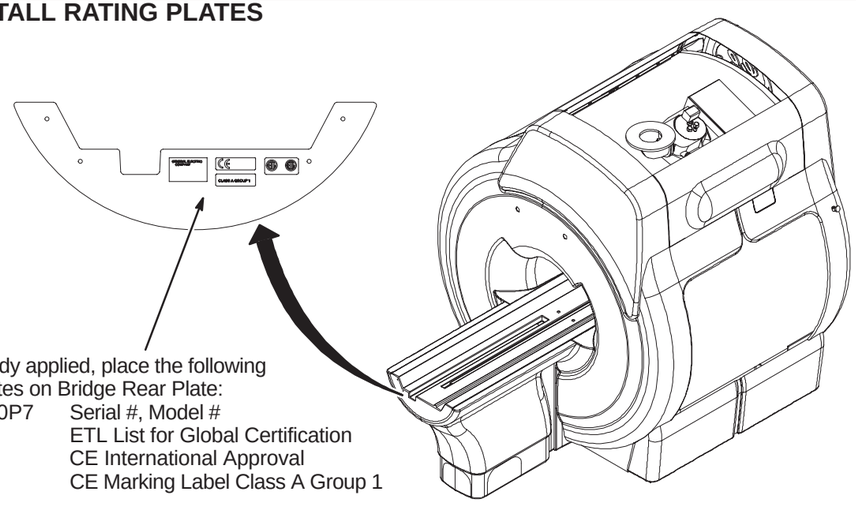
❑ Z3 – INSTALL REAR PEDESTAL COVERS

5. Pedestal Covers require an opening to be cut out depending on routing of cables and hoses. Covers are marked in three places (left side, right side, or rear) for cutting.
6. After cutting out appropriate opening, hang covers on Rear Pedestal.
7. If covers need adjustment, loosen the screws at each end of the support bar and reposition bar as necessary.



4. Install left (2287512) and right (2287511) Rear Bridge Covers. The left cover is installed over the vacuum connection on the end bell.

❑ Z4 – INSTALL RATING PLATES



1. If not already applied, place the following Rating Plates on Bridge Rear Plate:

46–302200P7	Serial #, Model #
2142857	ETL List for Global Certification
2117390	CE International Approval
2132620	CE Marking Label Class A Group 1

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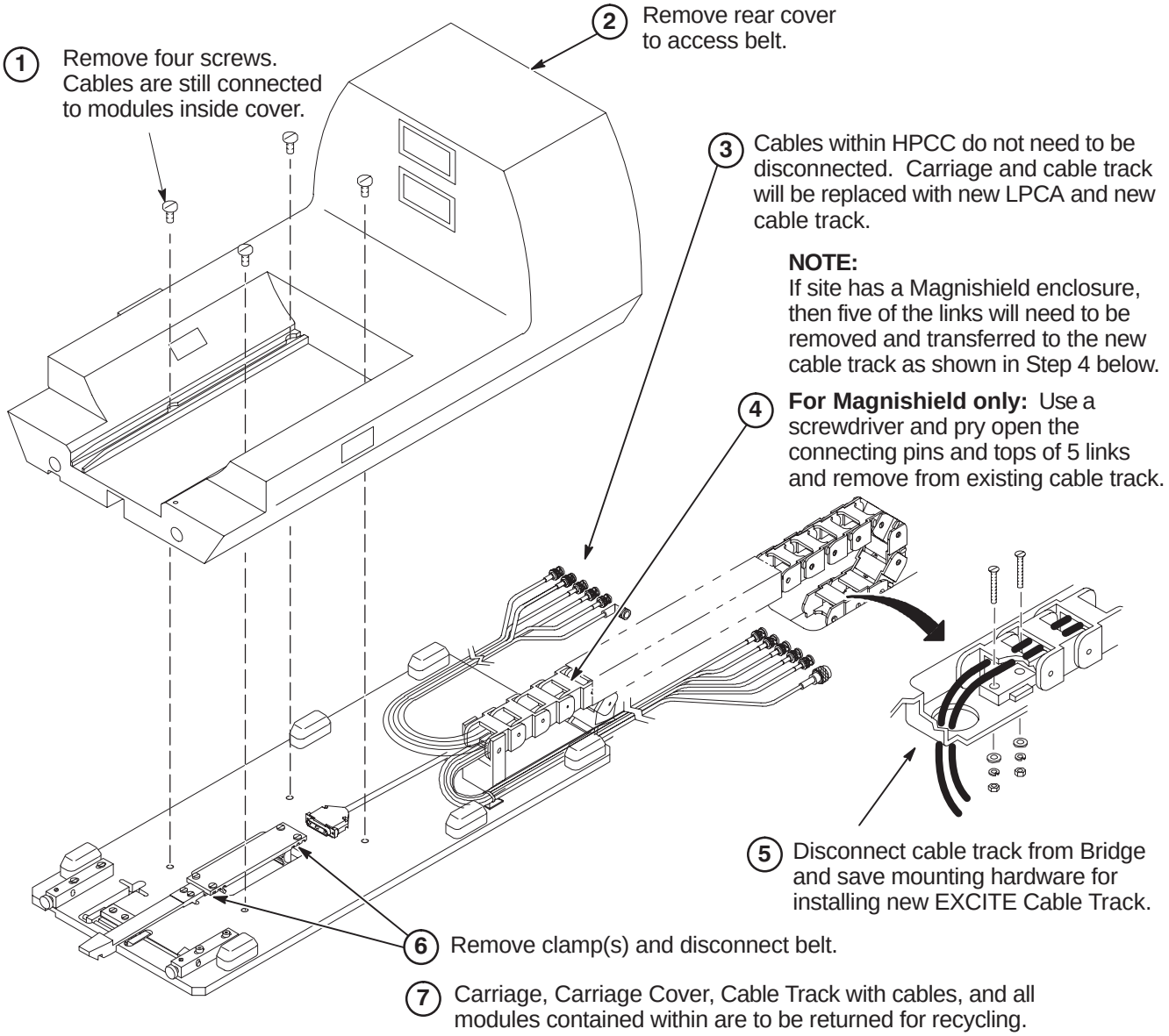
1–1 LPCA (LOW PROFILE CARRIAGE ASSEMBLY)

The site being upgraded may have either a High Profile Carriage Cover or a Low Profile Carriage Cover that will need to be replaced with the new LPCA.

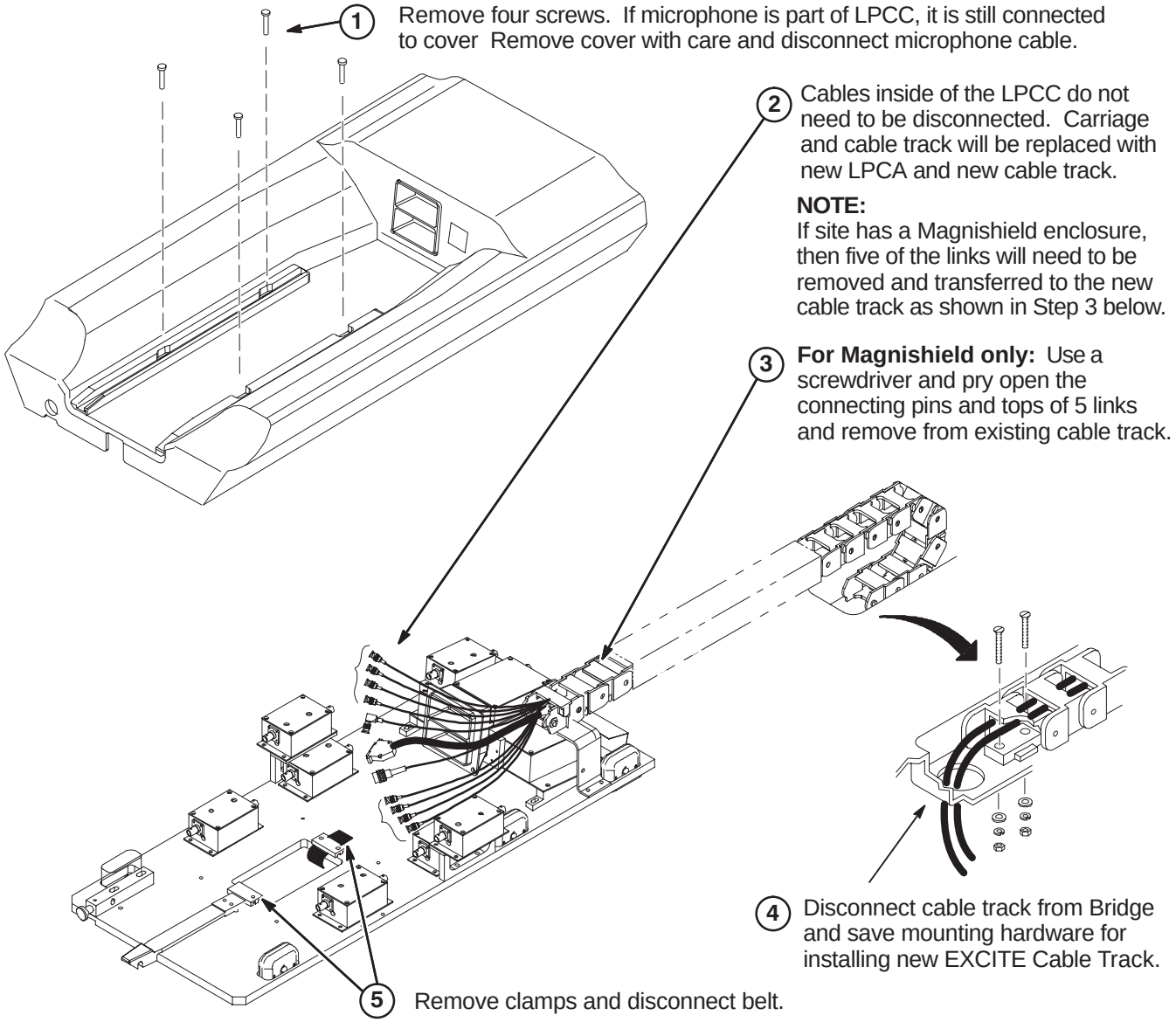
If site has a Magnishield magnet, five of the links from the existing cable track will need to be reused until the upgrade kit is revised to include a 15 link extension rather than 10 link. The instructions for upgrading the existing cable track are found at Procedure D2a.

Refer to sections **1–1–1** or **1–1–2** for the applicable removal procedure.

1–1–1 REMOVE EXISTING HIGH PROFILE CARRIAGE COVER & CABLE TRACK



1–1–2 REMOVE EXISTING LOW PROFILE CARRIAGE COVER & CABLE TRACK

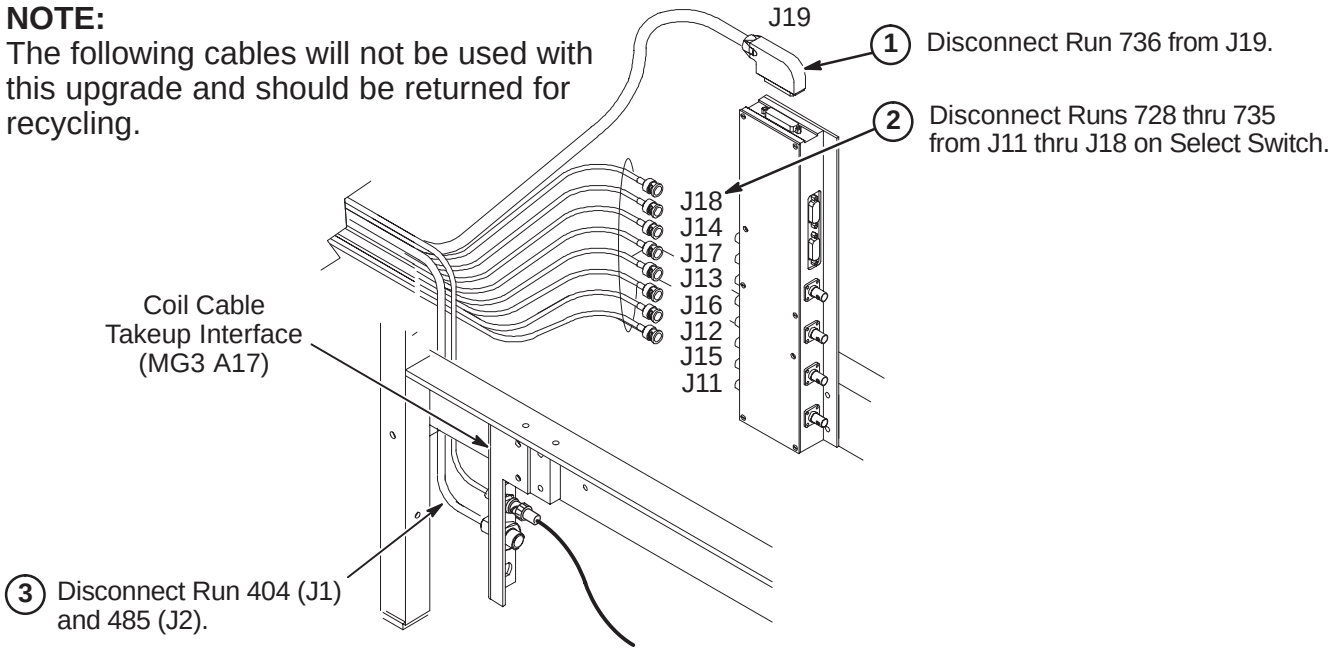


1. Remove four screws. If microphone is part of LPCC, it is still connected to cover Remove cover with care and disconnect microphone cable.
2. Cables inside of the LPCC do not need to be disconnected. Carriage and cable track will be replaced with new LPCA and new cable track.

   NOTE:
   If site has a Magnishield enclosure, then five of the links will need to be removed and transferred to the new cable track as shown in Step 3 below.
3. **For Magnishield only:** Use a screwdriver and pry open the connecting pins and tops of 5 links and remove from existing cable track.
4. Disconnect cable track from Bridge and save mounting hardware for installing new EXCITE Cable Track.
5. Remove clamps and disconnect belt.
6. Remove and return old LPCC & cover, and cable track with cables for recycling.

1–1–3 DISCONNECT CARRIAGE COVER CABLES IN REAR PEDESTAL

NOTE:
The following cables will not be used with this upgrade and should be returned for recycling.

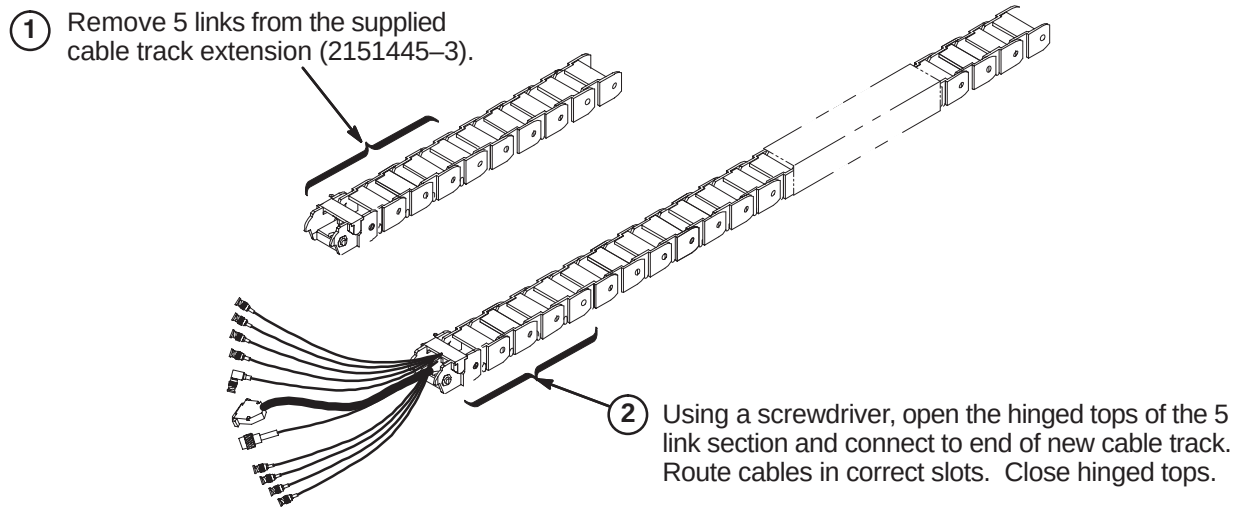


1–1–4 MODIFY CABLE TRACKS FOR S–SERIES AND MAGNISHIELD ENCLOSURES

The S–Series and Magnishield magnet enclosures require longer cable tracks than the provided 35–link track that is part of this upgrade. The S–Series uses a 40–link cable track and the Magnishield uses a 50–link cable track. Modifications are required as follows:

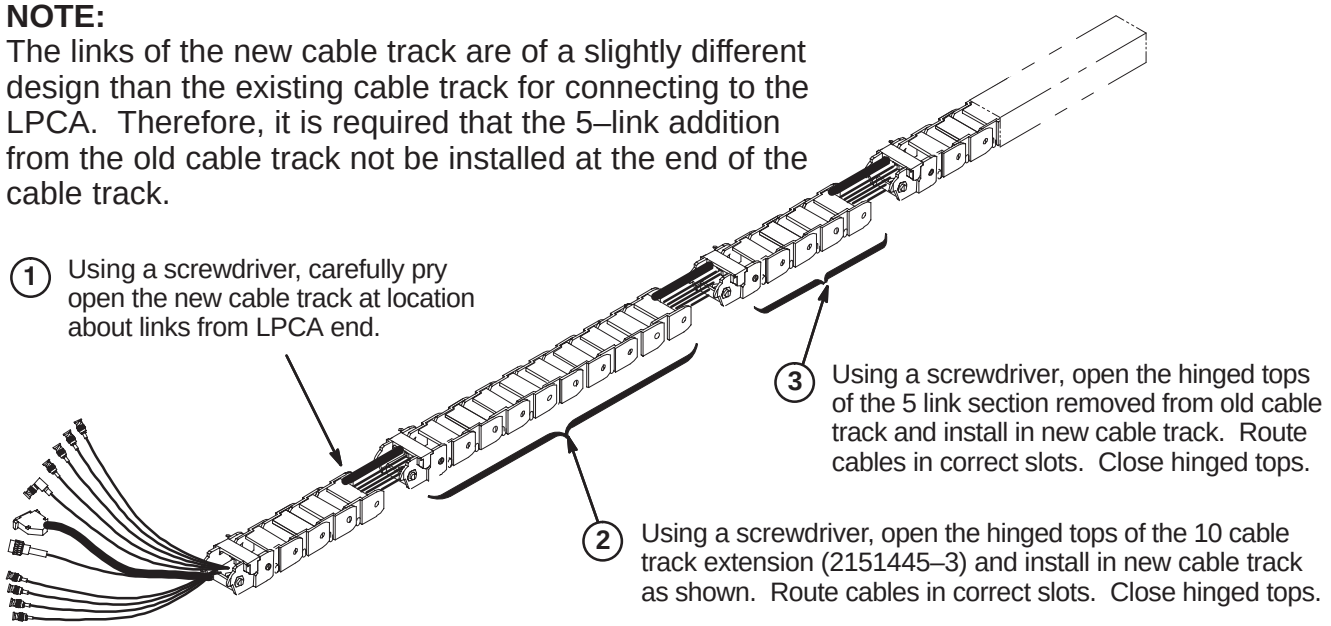
- For the S–Series magnet, five links need to be added to new 35–link cable track supplied with upgrade to extend it to the required 40 links. Ten extra links are provided for this extension. Only five are required. Discard the extra five links that are not used. Refer to section **1–1–4–1**.
- For Magnishield, fifteen links need to be added to the new 35–link cable track to create the requried 50–link track. The ten extra links provided with this upgrade along with 5 links removed from the existing cable track will be required. Refer to section **1–1–4–2**.

1–1–4–1 S–SERIES CABLE TRACK MODIFICATOIN



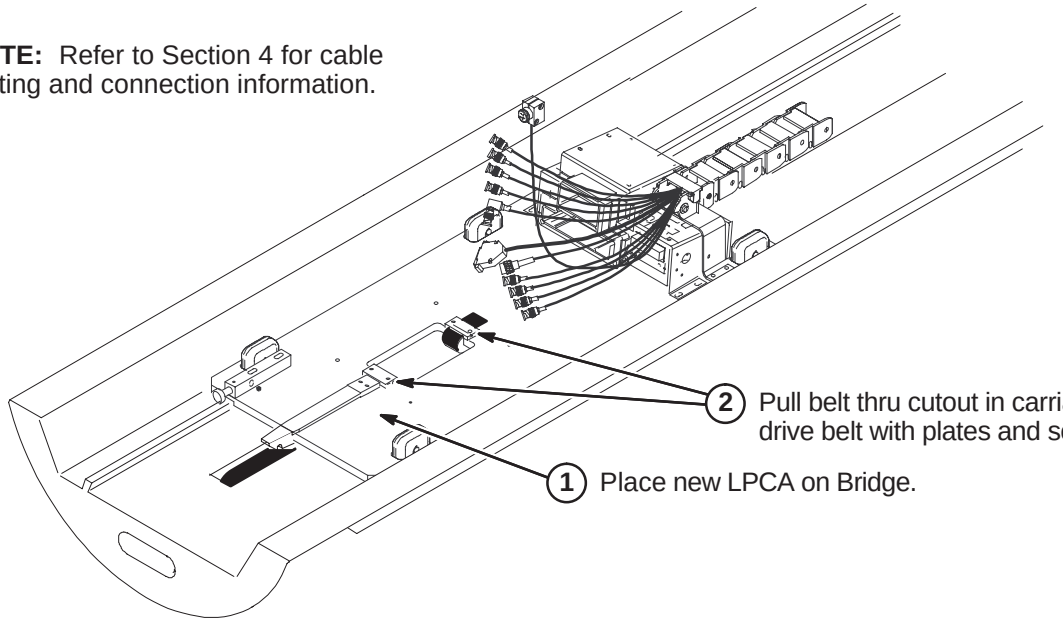
1–1–4–2 MAGNISHIELD CABLE TRACK MODIFICATION

NOTE:
The links of the new cable track are of a slightly different design than the existing cable track for connecting to the LPCA. Therefore, it is required that the 5–link addition from the old cable track not be installed at the end of the cable track.



1–1–5 INSTALL NEW LPCA

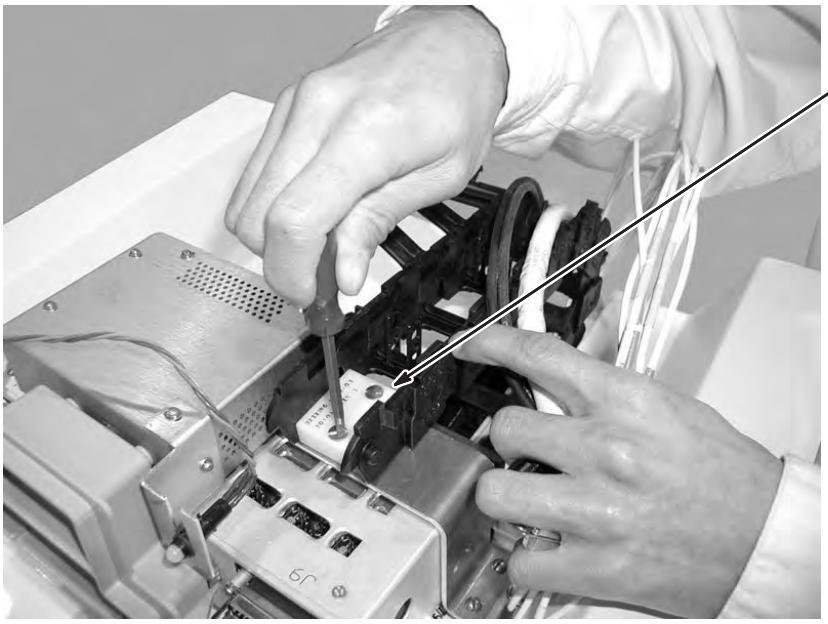
NOTE: Refer to Section 4 for cable routing and connection information.



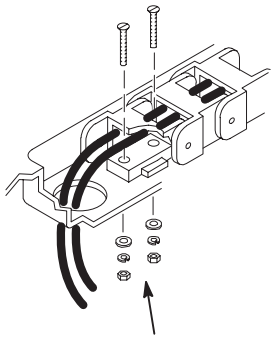
2 Pull belt thru cutout in carriage. Attach drive belt with plates and screws.

1 Place new LPCA on Bridge.

1–1–6 INSTALL CABLE TRACK

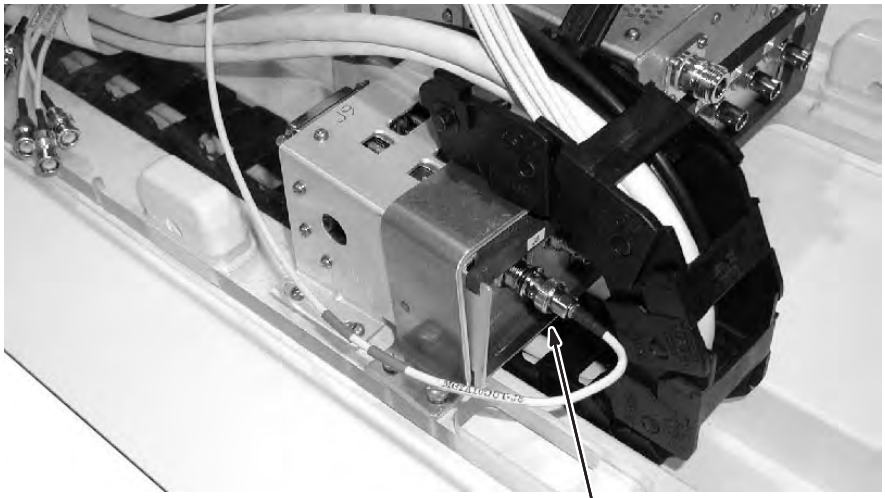


1 Attach cable track to bracket with cable track clamp (46–282169P1) and screws (46–208913P12).



2 Connect other end of cable track to Bridge using existing mounting hardware previously removed.

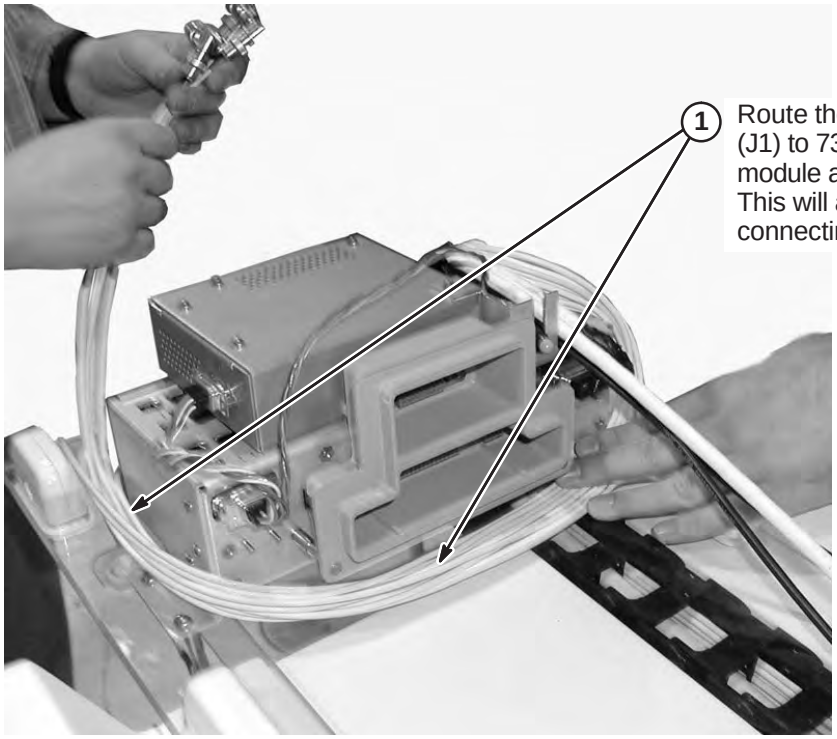
1–1–7 ROUTE/CONNECT RUN RUN 735 TO LPCA



1 Before connecting other cables, route and connect BNC cable RUN 735 to MG2–A16OUT–J8.

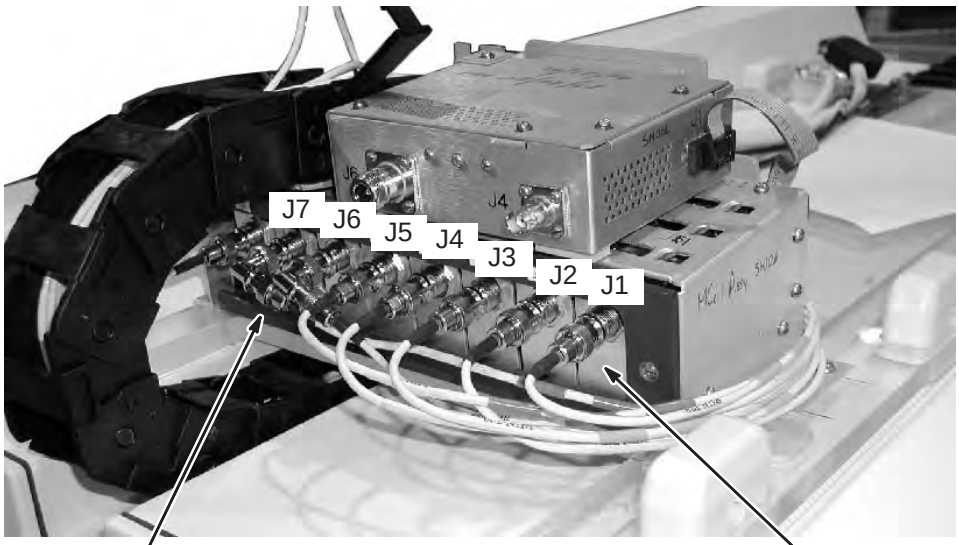
Note that this cable is routed on opposite side of LPCA from other cables.

1–1–8 ROUTE RUNS 728 THRU 734



1 Route the remaining 7 BNC cables, Runs 728 (J1) to 734 (J7), to the rear of the Multi–coil module as shown. Make sure they are snug. This will allow proprer alignment when connecting to module.

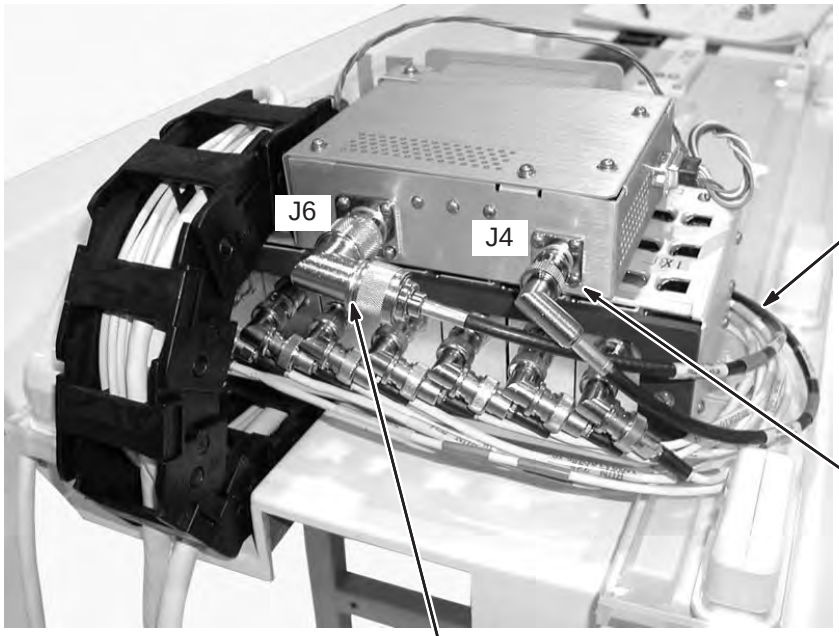
1–1–9 CONNECT RUNS 728 THRU 734



2 Two BNC Right Angle Adaptors (46–233422P1) are required for Runs 733 and 734 connecting to J6 and J7.

1 Connect Runs 728 (J1) to 734 (J7), to the designated ports as shown.

1–1–10 ROUTE/CONNECT RUNS 404 AND 1035

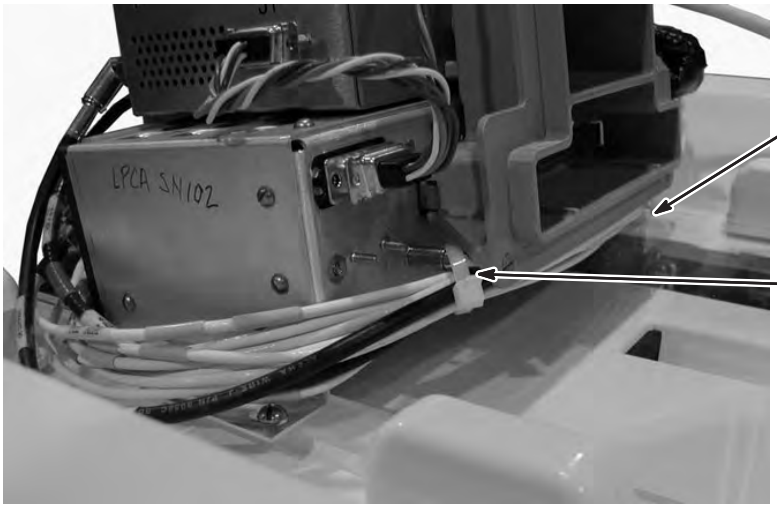


1 Route Runs 404 and 1035 along same path as BNC cables.

2 Connect Run 1035 to J4. If cable does not have right angle connector, install BNC Right Angle Adaptor (46–233422P1) at J4.

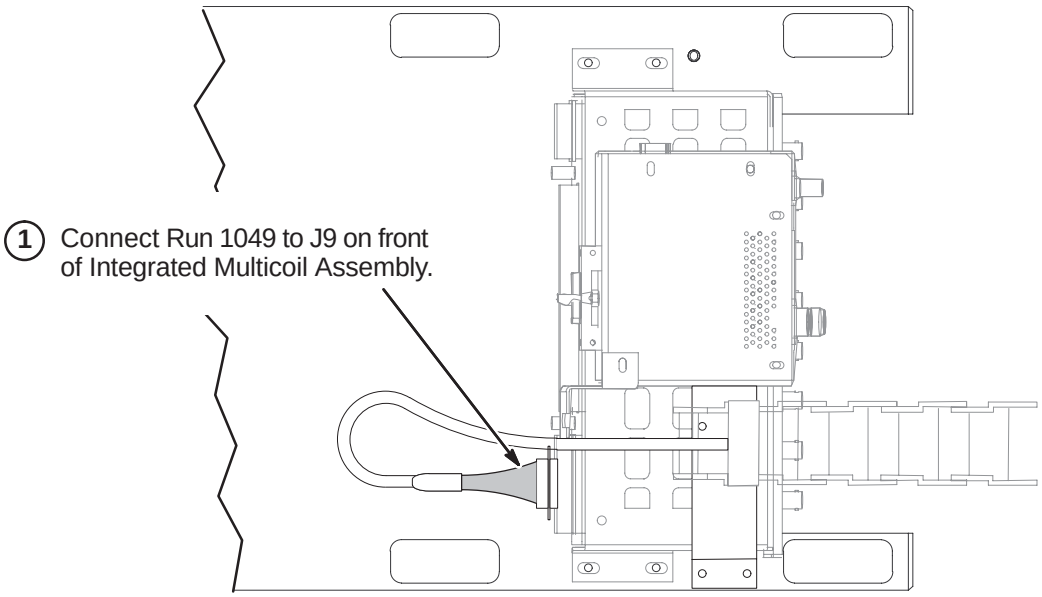
3 Connect Run 404 to J6 on Head TR Module.

1–1–11 SECURE LPCA CABLES IN PLACE



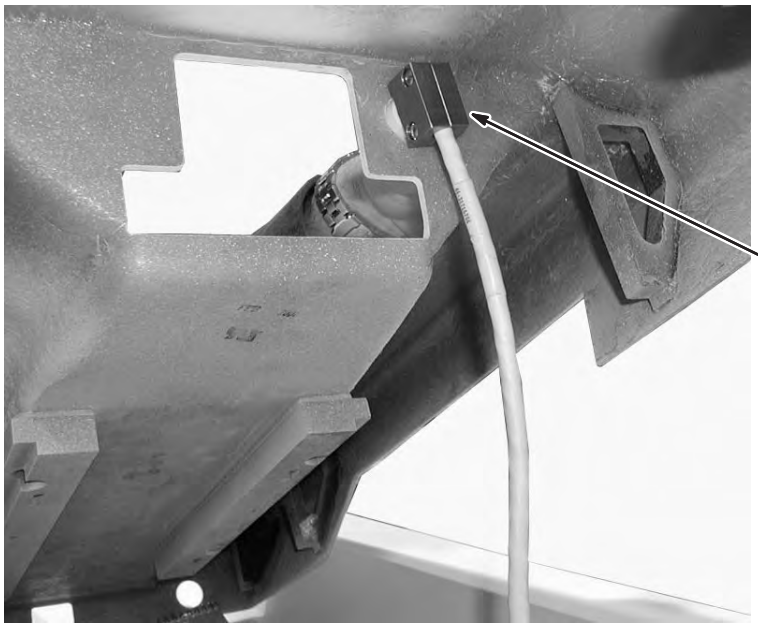
1. Dress cables to remove any slack. If necessary, carefully pull cables from other end of cable track to remove slack.
2. Attach two Ty–wraps at this position.

1–1–12 CONNECT RUN 1049 TO INTEGRATED MULTICOIL ASSEMBLY



1. Connect Run 1049 to J9 on front of Integrated Multicoil Assembly.

1–1–13 ROUTE/CONNECT MICROPHONE CABLE

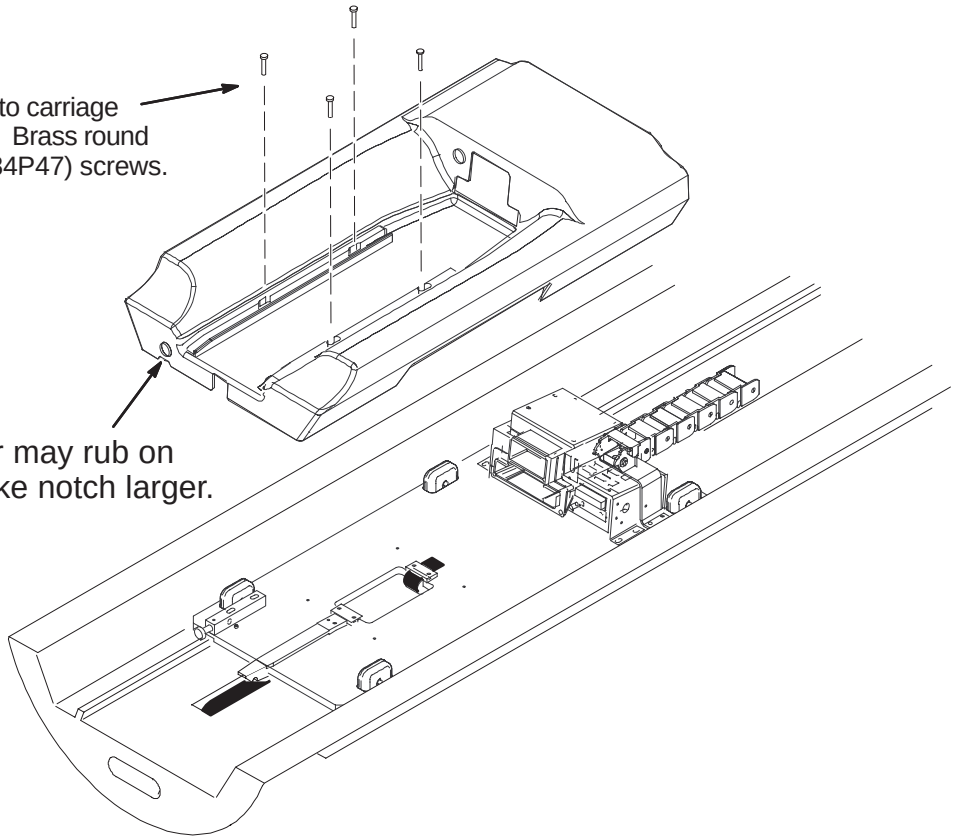


(1) Route and connect Microphone cable to LPCA Cover using:
Cable Clamp (46–317135P1),
6–32 x 5/8 SS Screws (46–208560P111),
Microphone Housing (46–317134P1), and
O–Ring (46–136374P65).

1–1–14 INSTALL LPCA COVER

(1) Install new LPCA cover to carriage using four 10–32 x 1–$^{1}/_{2}$ Brass round head screws (46–220184P47) screws.

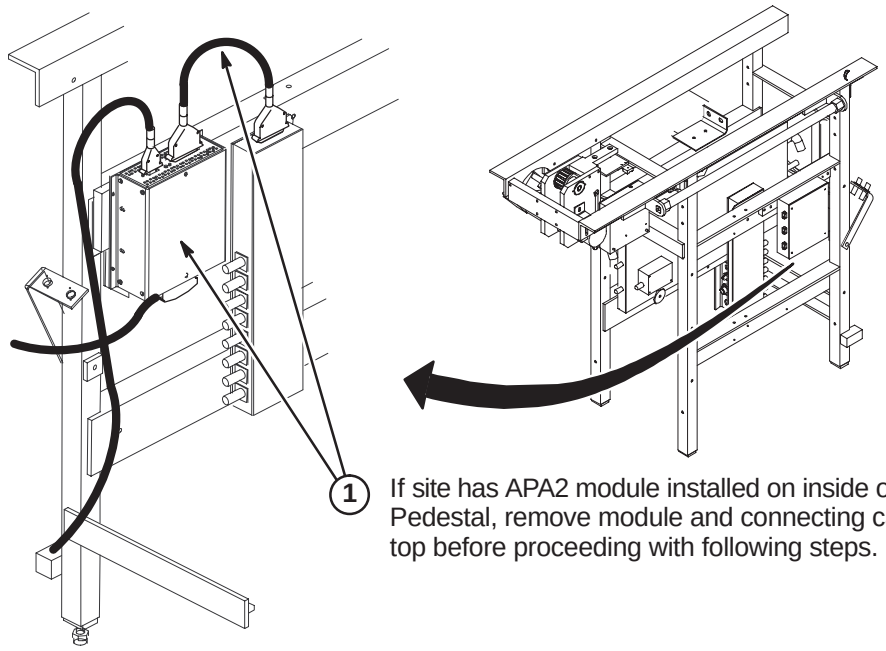
NOTE: Notch in cover may rub on bridge. If needed, make notch larger.



1–2 REAR PEDESTAL

The Rear Pedestal upgrade will include the 8–Channel Switch, Notch Filter, and the UTNS Antenna. The following upgrade instructions cover both the original Horizon and WideOpen style magnet enclosures.

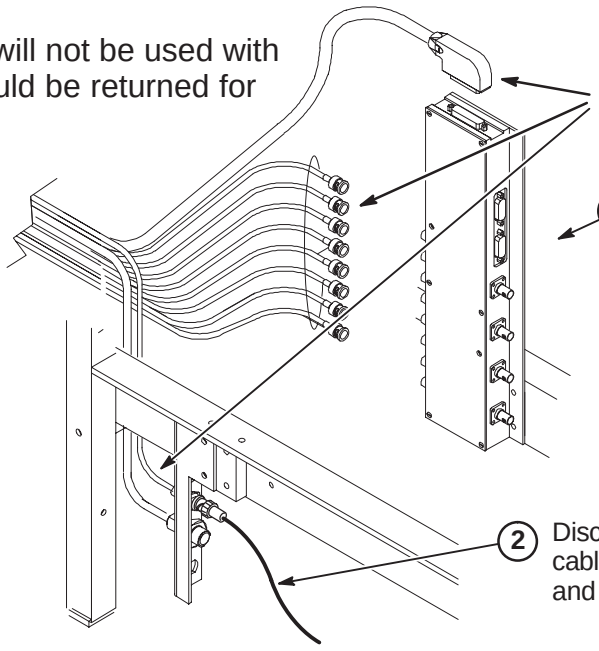
1–2–1 REMOVE APA2 MODULE (If installed)



1 If site has APA2 module installed on inside of Rear Pedestal, remove module and connecting cable on top before proceeding with following steps.

1–2–2 DISCONNECT CABLES IN REAR PEDESTAL

NOTE:
The following cables will not be used with this upgrade and should be returned for recycling.

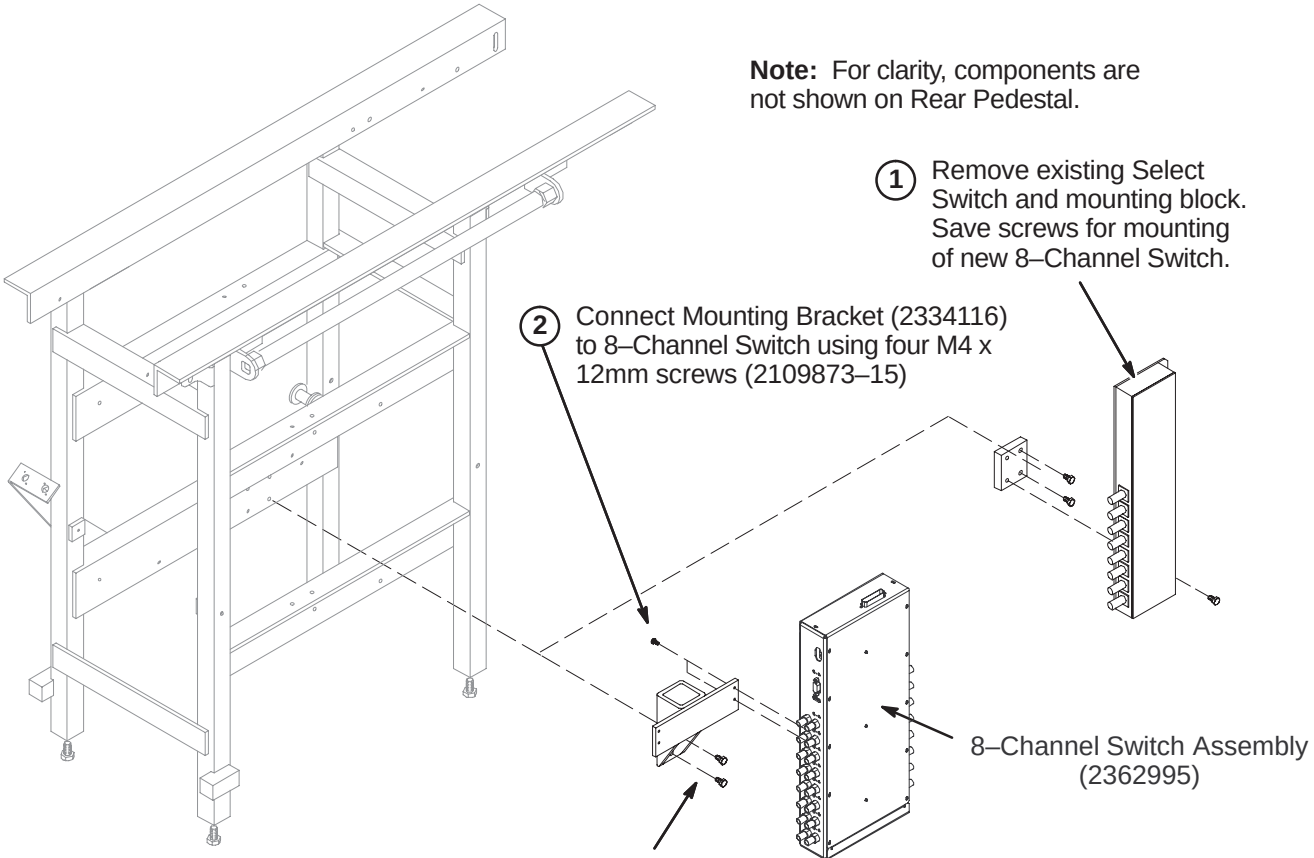


Cables disconnected and removed with old carriage cover assembly.

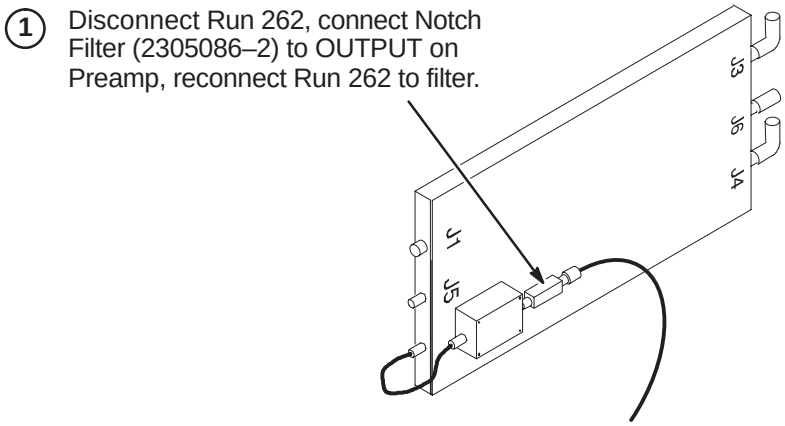
1 Disconnect Runs 491 (J7), 492 (J8), 493 (J9), 494 (J6), 495 (J10) and 727 (J5).

2 Disconnect and remove Run 700. This cable will not be used with this upgrade and should be returned for recycling.

1–2–3 INSTALL 8–CHANNEL SWITCH ASSEMBLY



1–2–4 INSTALL NOTCH FILTER ON HYBRID SPLITTER PREAMP

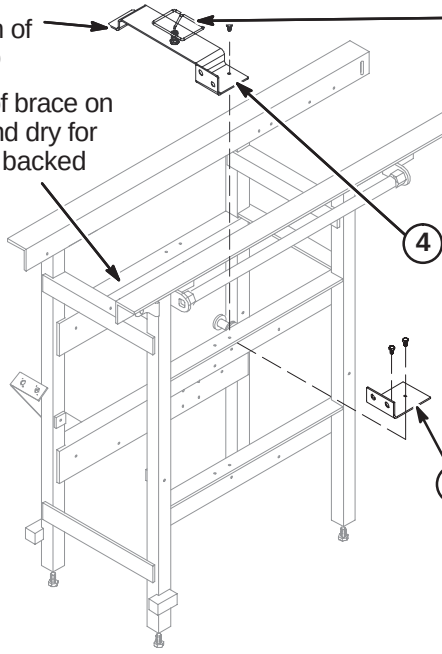


1–2–5 UTNS ANTENNA INSTALLATION

Two mounting brackets are provided for this upgrade. Only one will be installed depending on magnet enclosure.

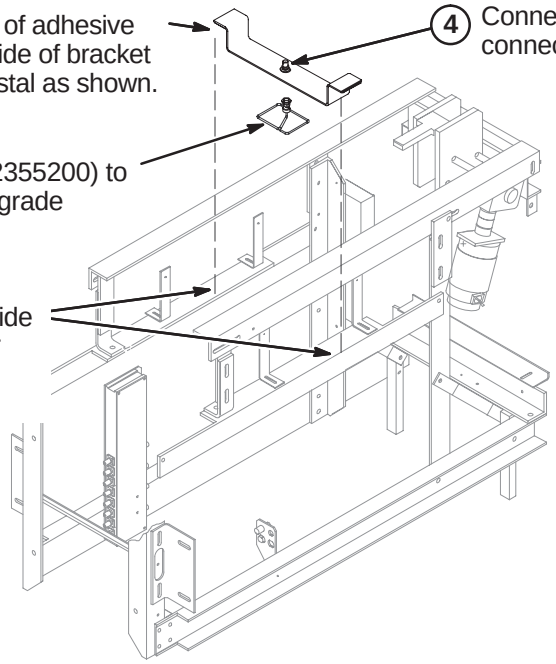
- If site is a WideOpen style enclosure, proceed to section **1–2–5–1** and complete installation.
- If site is a Horizon style (non–WideOpen), proceed to section **1–2–5–2** to complete installation.

1–2–5–1 Install UTNS Antenna IN WideOpen Enclosure

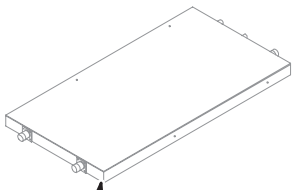


3. Peel of liner from bottom of adhesive backed Velcro
2. Make sure top surface of brace on opposite side is clean and dry for attachment of adhesive backed Velcro.
5. Attach UTNS Antenna (2355200) to bracket.
6. Connect Run 1057 to UTNS Antenna. Reconnect Runs 743 and 744 and RF Coil cables
4. Attach UTNS Antenna Bracket (2384445) to Rear Pedestal using mounting hardware removed in step 1 on this side of Rear Pedestal and Velcro on other side. Install BNC cable connectors.
1. At existing Mounting Bracket, disconnect Runs 743 and 744 and cables from RF Coil. Remove and save BNC cable connectors. Remove and discard bracket. Save mounting hardware for installation of new UTNS Antenna bracket.

1–2–5–2 Install UTNS Antenna in Horizon Style Enclosure

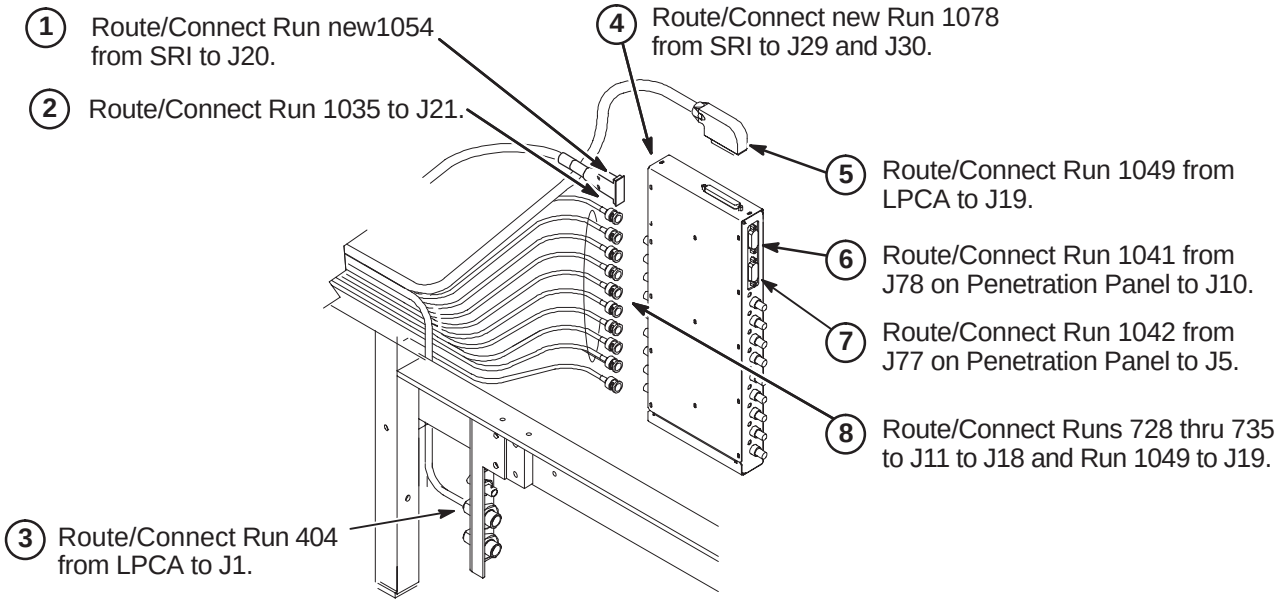


3. Peel of liner from bottom of adhesive backed Velcro on each side of bracket and attach to Rear Pedestal as shown.
4. Connect Run 1057 to UTNS Antenna connector at top of bracket.
2. Attach UTNS Antenna (2355200) to bottom side of UTNS Upgrade bracket (2384700).
1. Make sure top surfaces of side braces are clean and dry for attachment of adhesive backed Velcro.

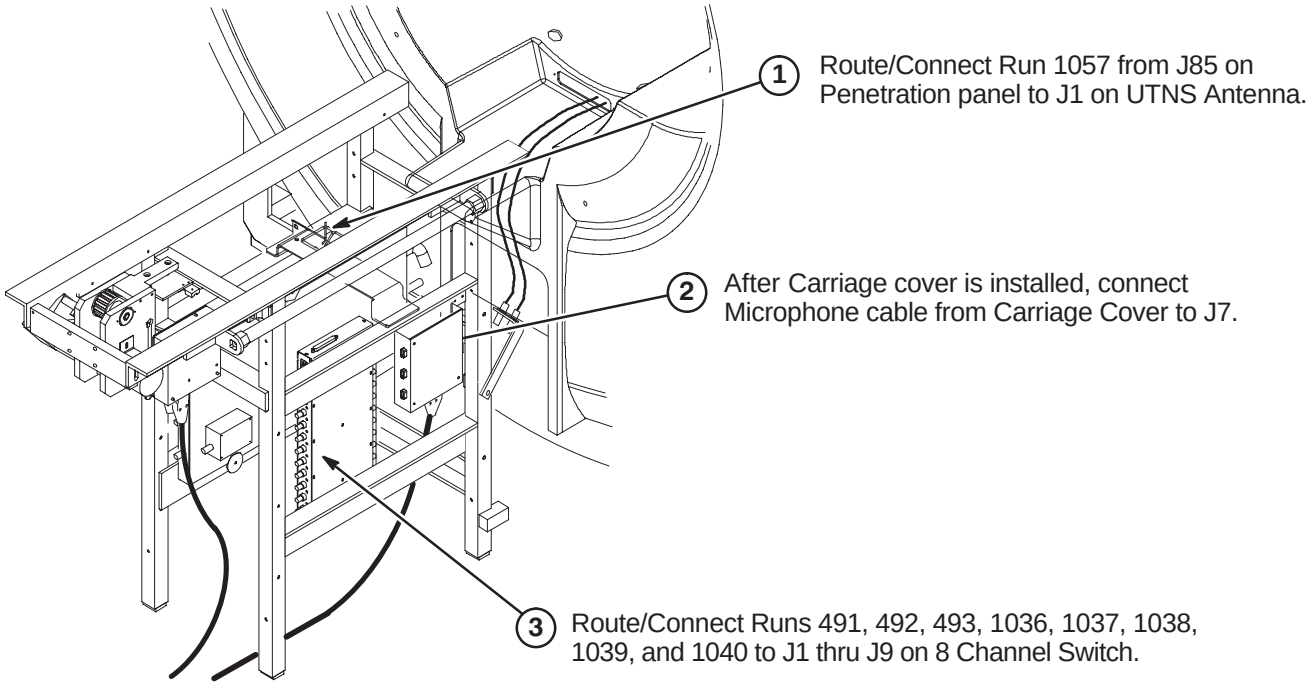


NOTE:
For clarity, Hybrid Splitter not shown in installed position.

1–2–6 CONNECT CABLES FROM LPCA AND SRI TO REAR PEDESTAL

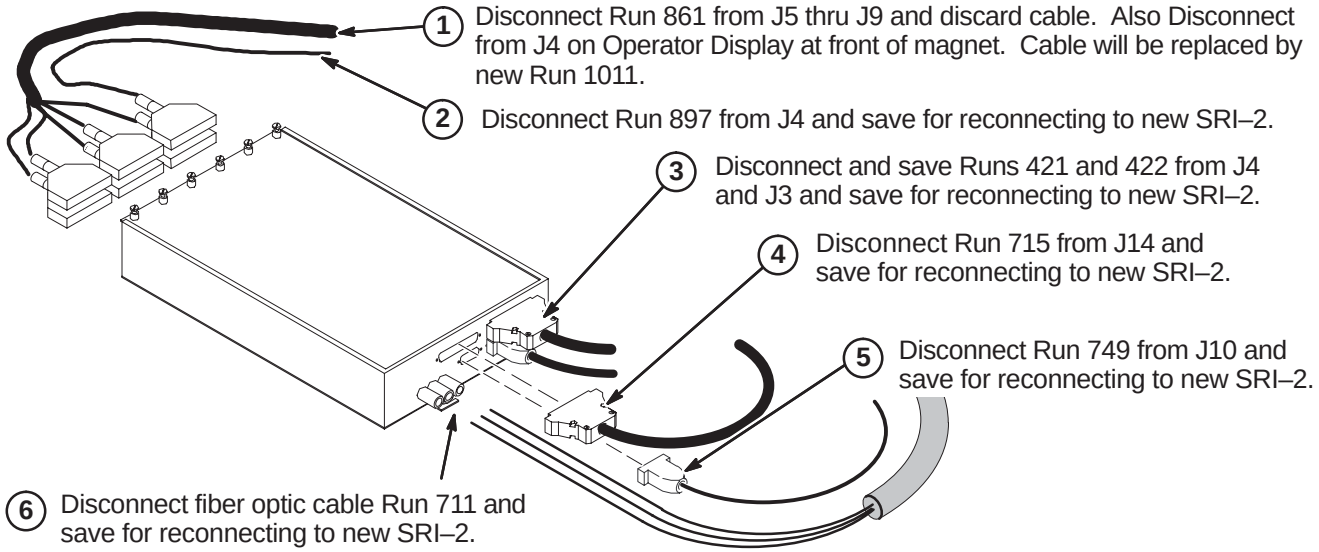


1–2–7 CONNECT REMAINING CABLES AT REAR PEDESTAL



1–3 SRI

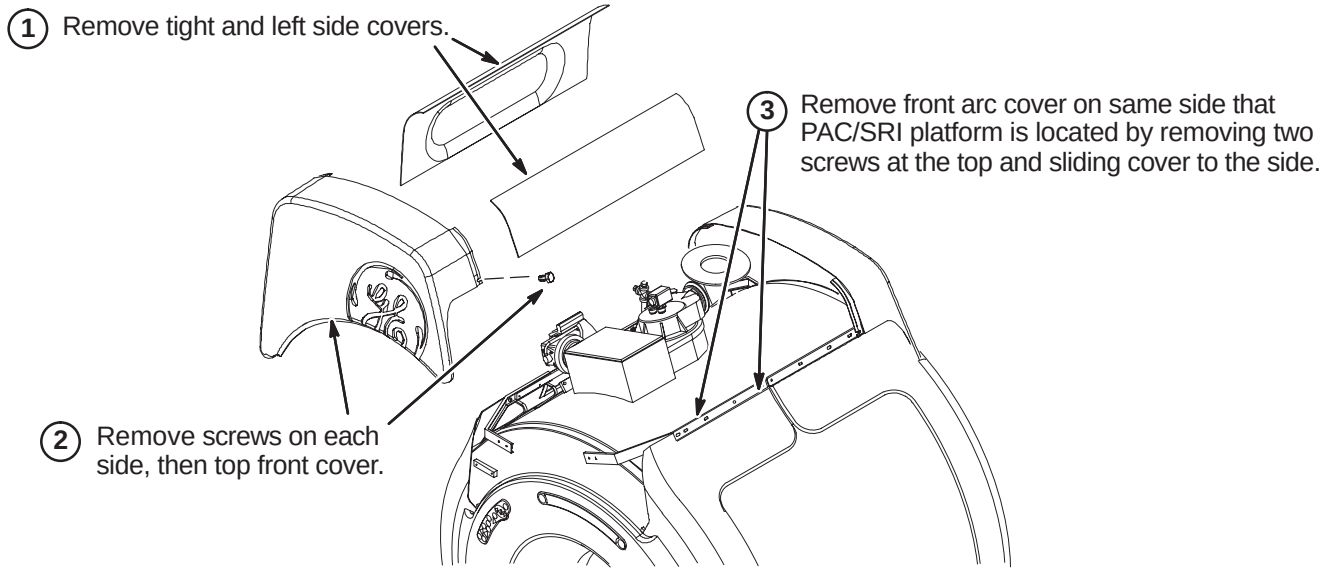
The EXCITE II upgrade provides a new SRI–2 for installation. Existing Run 861 will be replaced by Run 1011 and two new cables will be installed, Runs 1054 and 1078. Remaining cables will be reused. The mounting of the new SRI–2 within the WideOpen, Cx, or S–Series magnet enclosures is shown in the following procedures. It is different for each. The illustration below provides information for all enclosures on the disconnecting of existing cables. Verify that all cables are labeled before disconnecting.



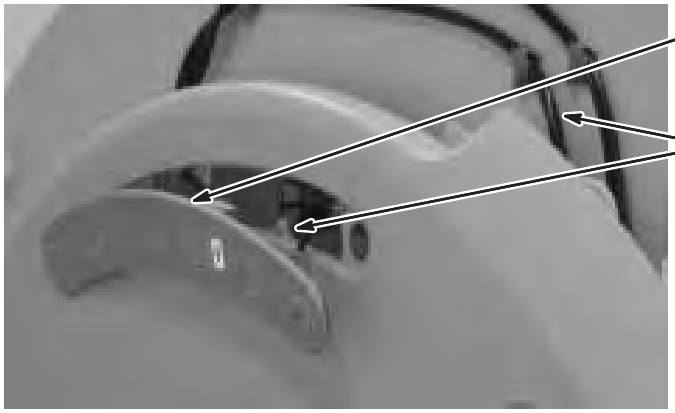
1–3–1 WideOpen ENCLOSURE UPGRADE FOR SRI–2

The following procedures are for upgrading the WideOpen enclosure to SRI–2, located on left or right side.

1–3–1–1 Remove WideOpen Enclosure Covers

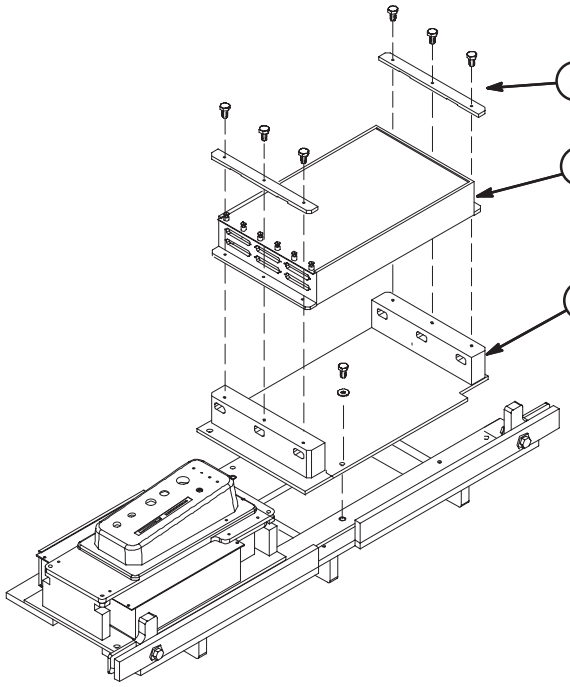


1–3–1–2 Replace Run 861 with Run 1011



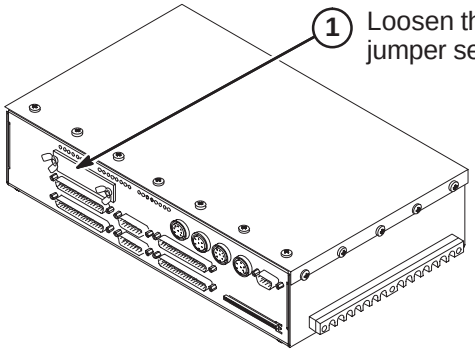
1. Carefully, using a small screwdriver, pry the Operator Display away from the front cover.
2. Disconnect Run 861 from J4 on back of Operator Display and completely remove cable. There are five connections of this cable at the SRI.
3. Route new Run 1011 along same route as Run 861 and connect to J4 on back of Operator Display.
4. Re–install Operator Display, arc cover, top front cover, and top side covers.

1–3–1–3 Remove Existing SRI

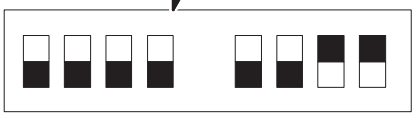


1. Unfasten and remove mounting hardware and clamps.
2. Remove existing SRI module.
3. Unfasten and remove mounting hardware and SRI platform.
4. Return SRI, mounting platform, hardware, and clamps for recycling.

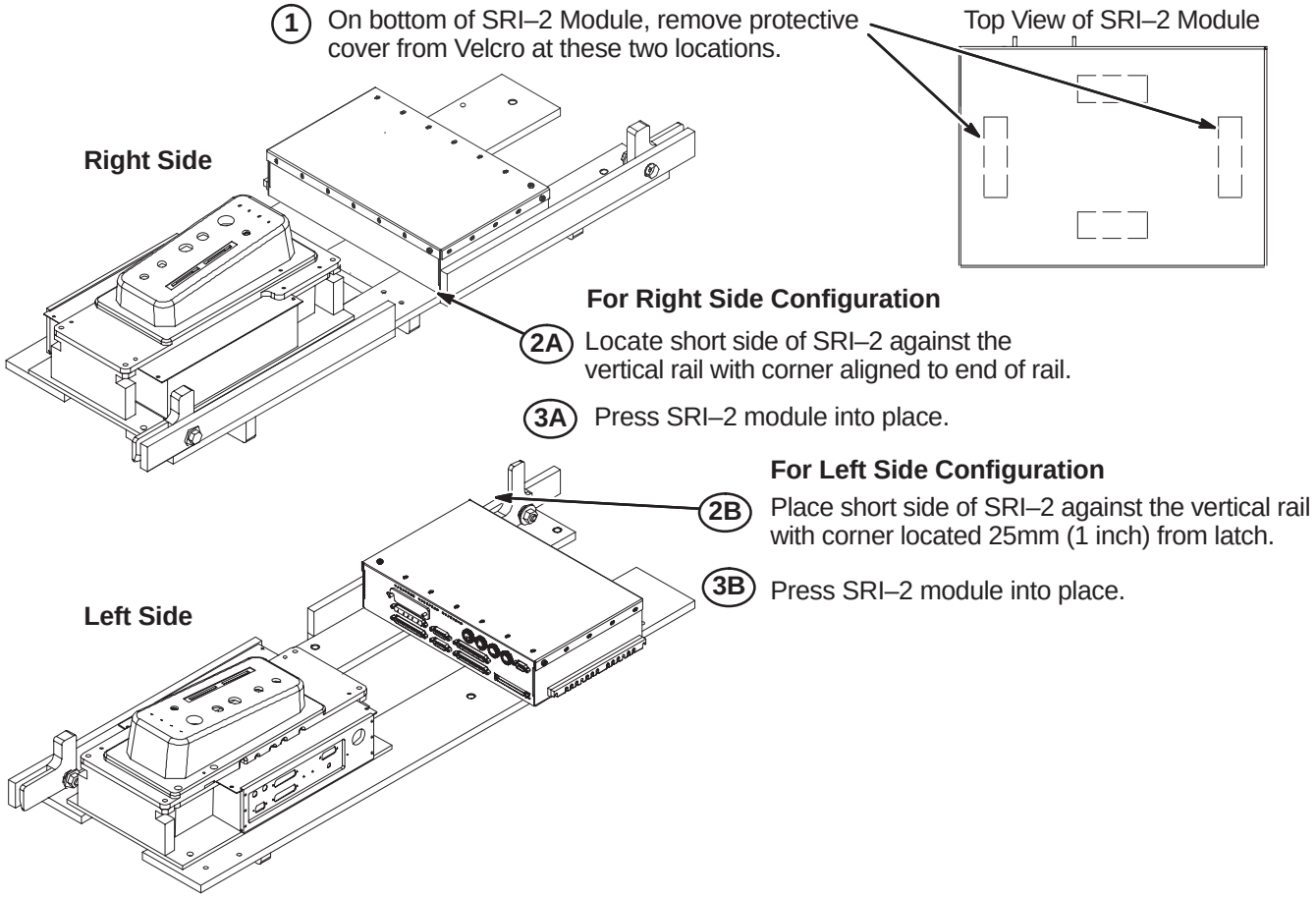
1–3–1–4 Verify Jumper Positions for SRI–2



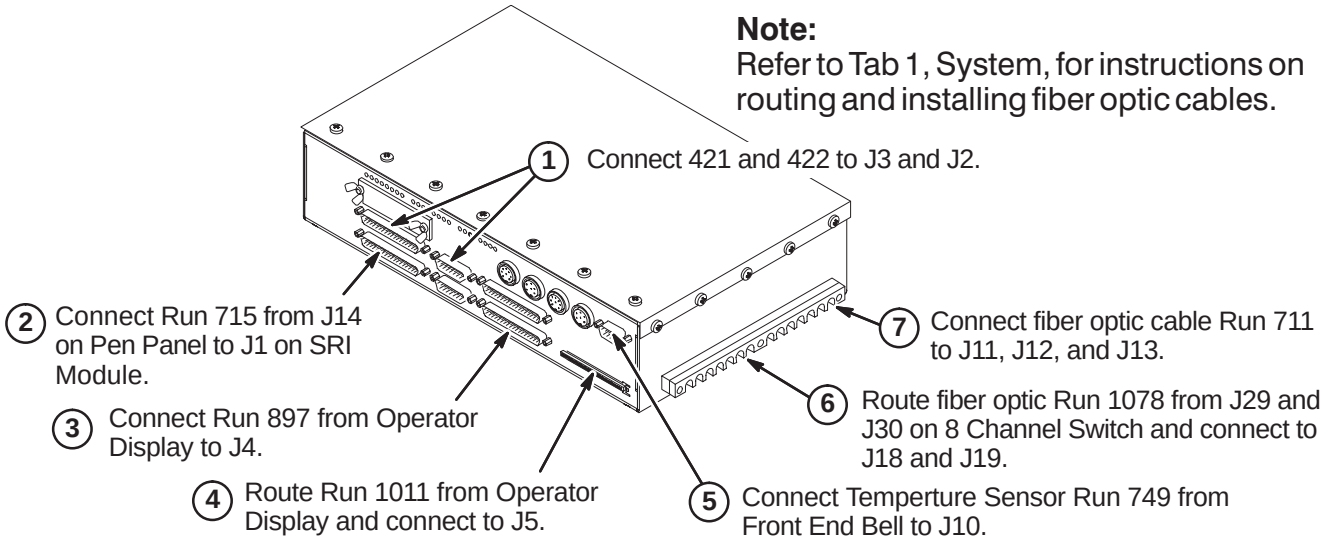
1. Loosen thumb screws and verify jumper settings behind cover.
2. For the eight jumpers, the two jumpers on the right should be in the “ON” or located in the up position. All others should be “OFF” or down.



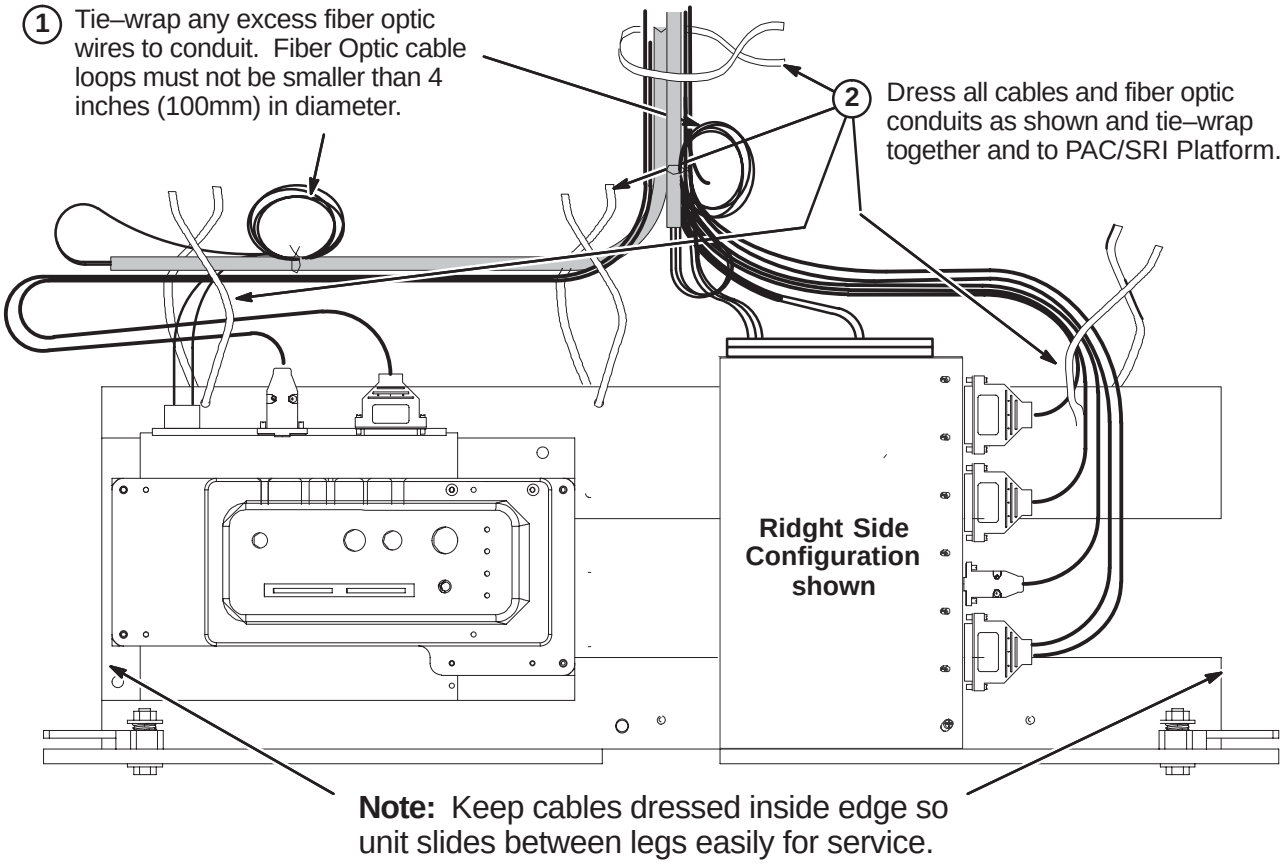
1–3–1–5 Install SRI–2 On Right or Left Side of Enclosure



1–3–1–6 Connect Cables to SRI–2



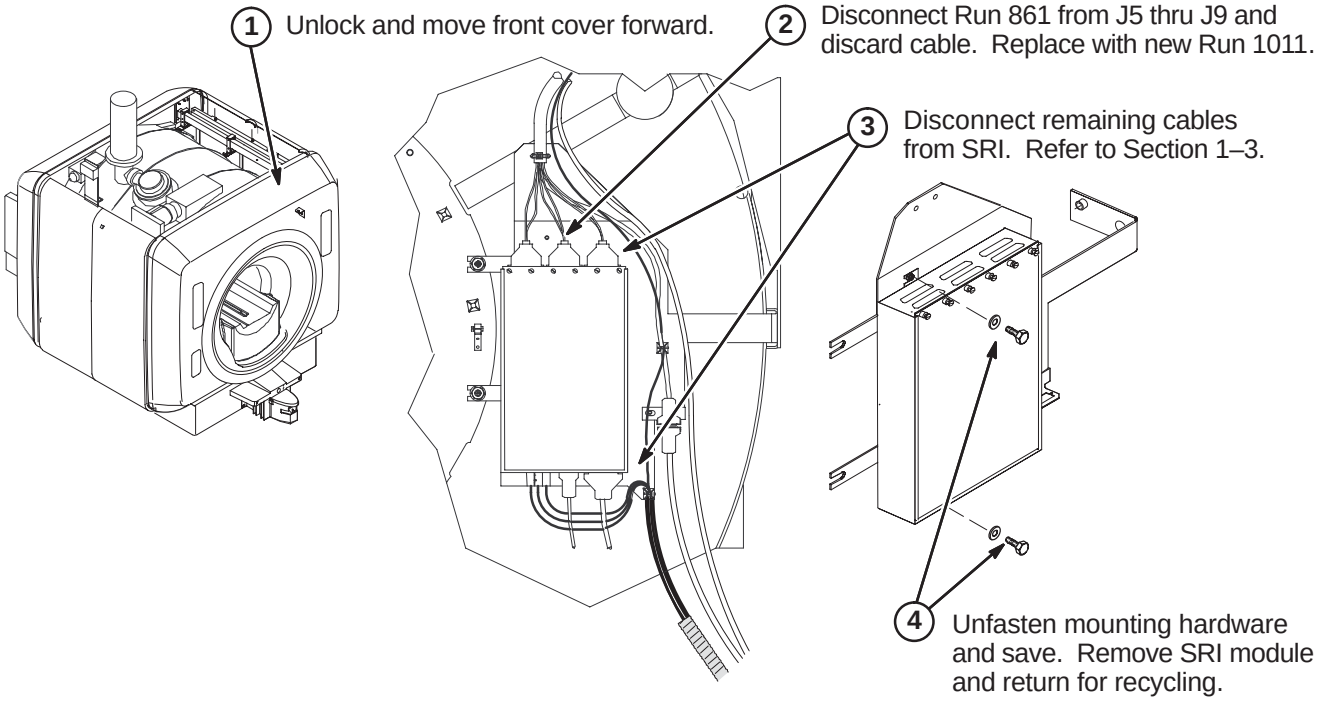
1–3–1–7 Route and Tie–wrap Cables to SRI/PAC Platform



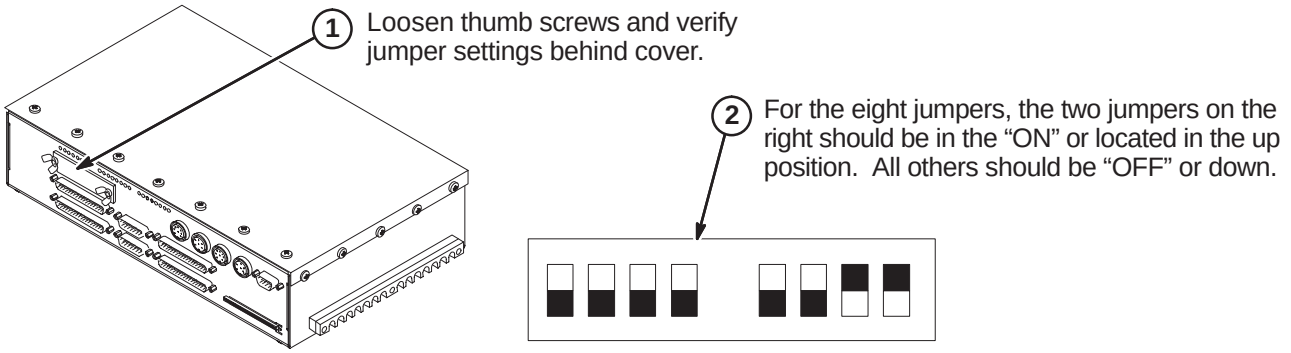
1–3–2 Cx AND LCC HORIZON ENCLOSURE UPGRADE FOR SRI–2

The following procedures are for upgrading the Cx Horizon style enclosure to SRI–2.

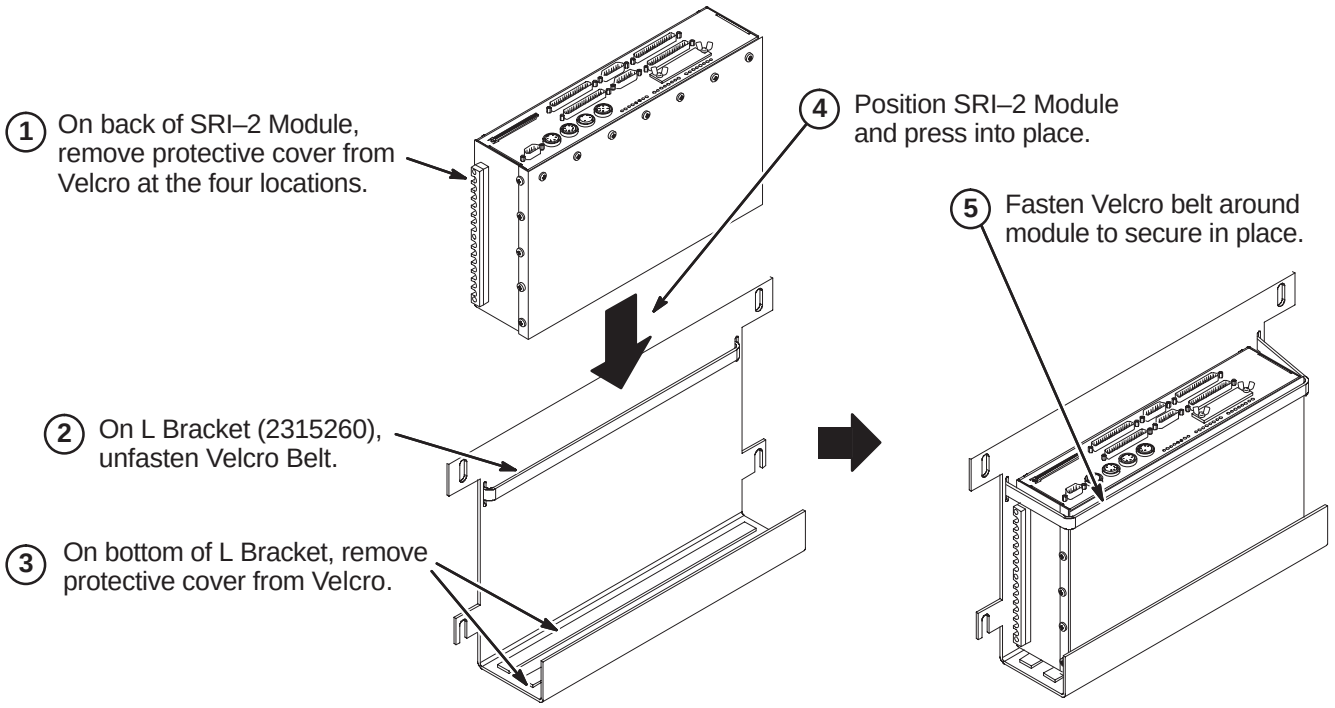
1–3–2–1 Remove Existing SRI Module



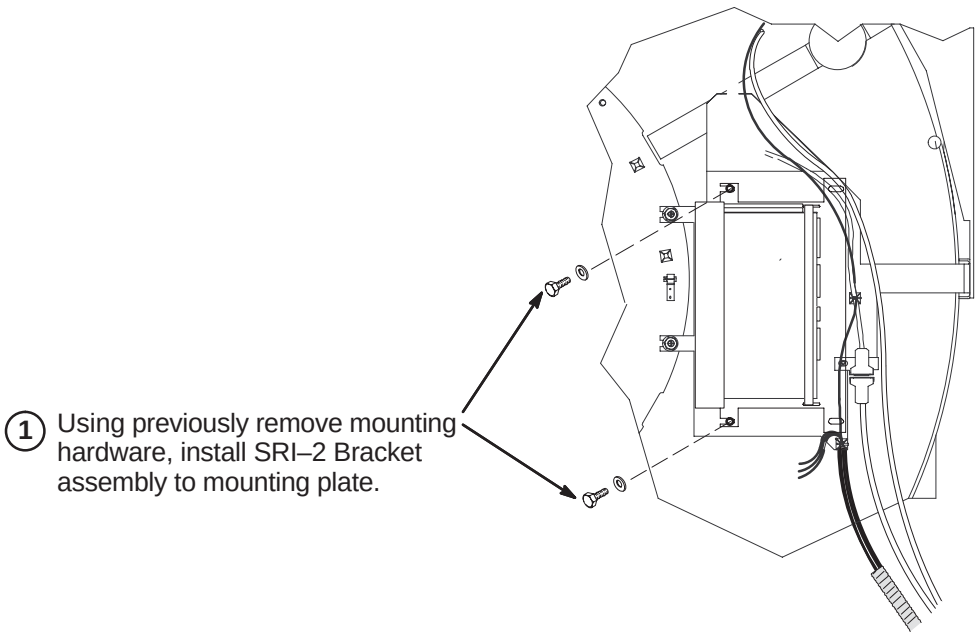
1–3–2–2 Verify Jumper Positions for SRI–2



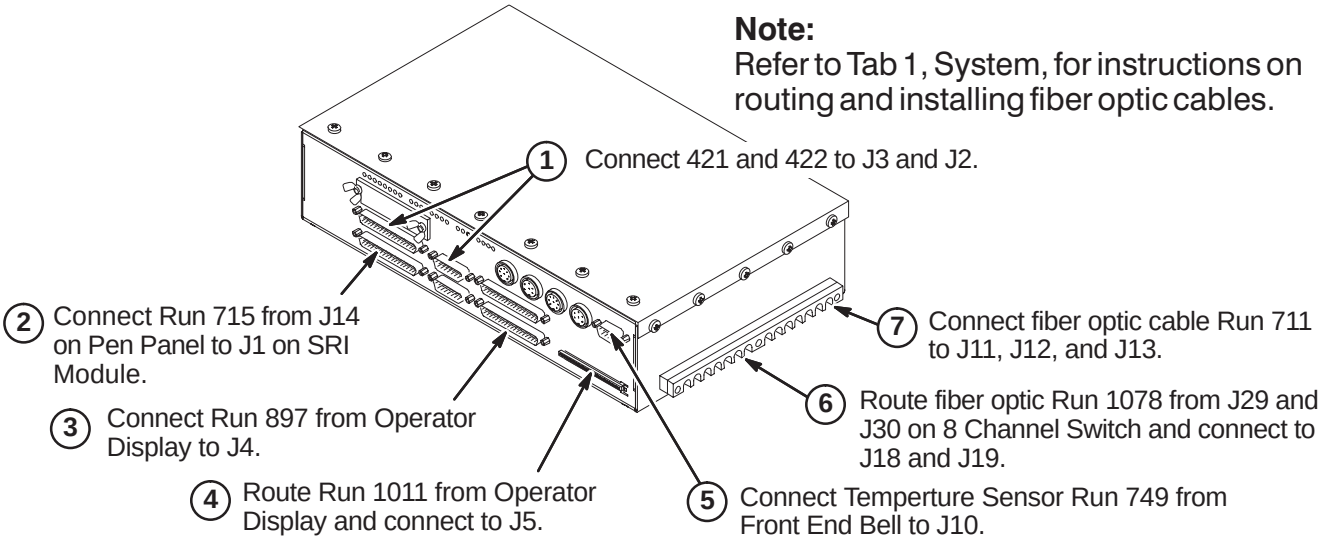
1–3–2–3 Position SRI–2 in L Bracket



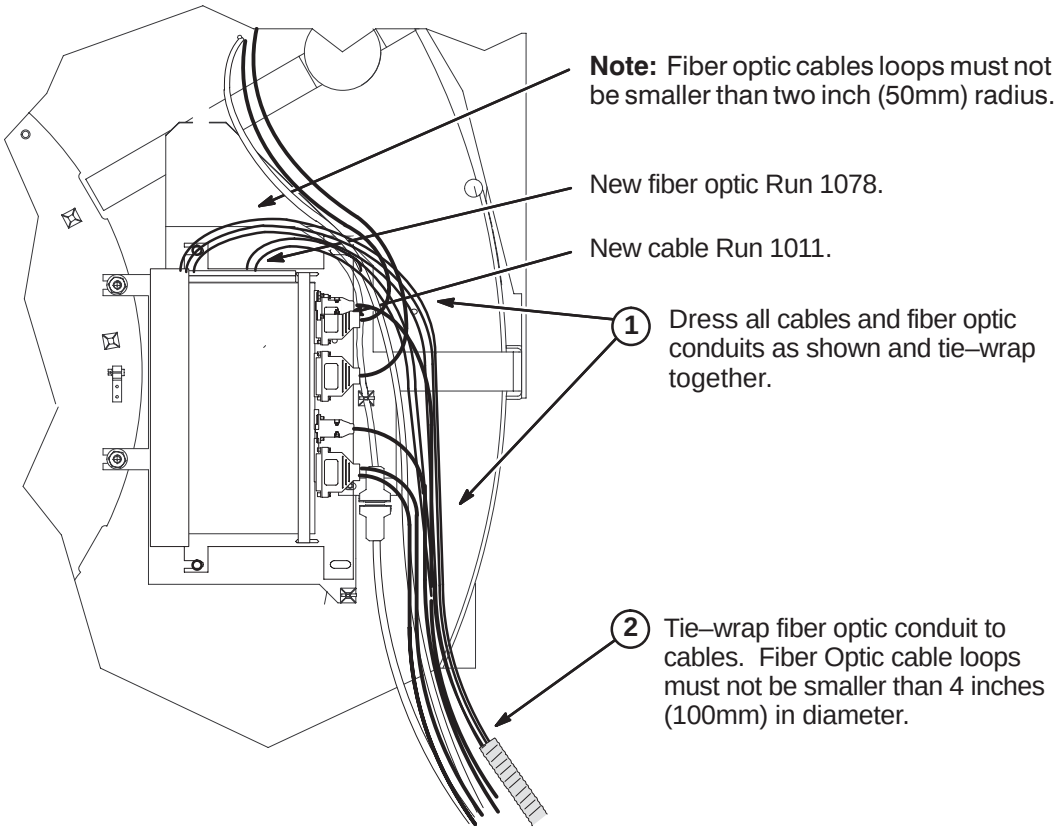
1–3–2–4 Install SRI–2 on Magnet



1–3–2–5 Connect Cables to SRI–2



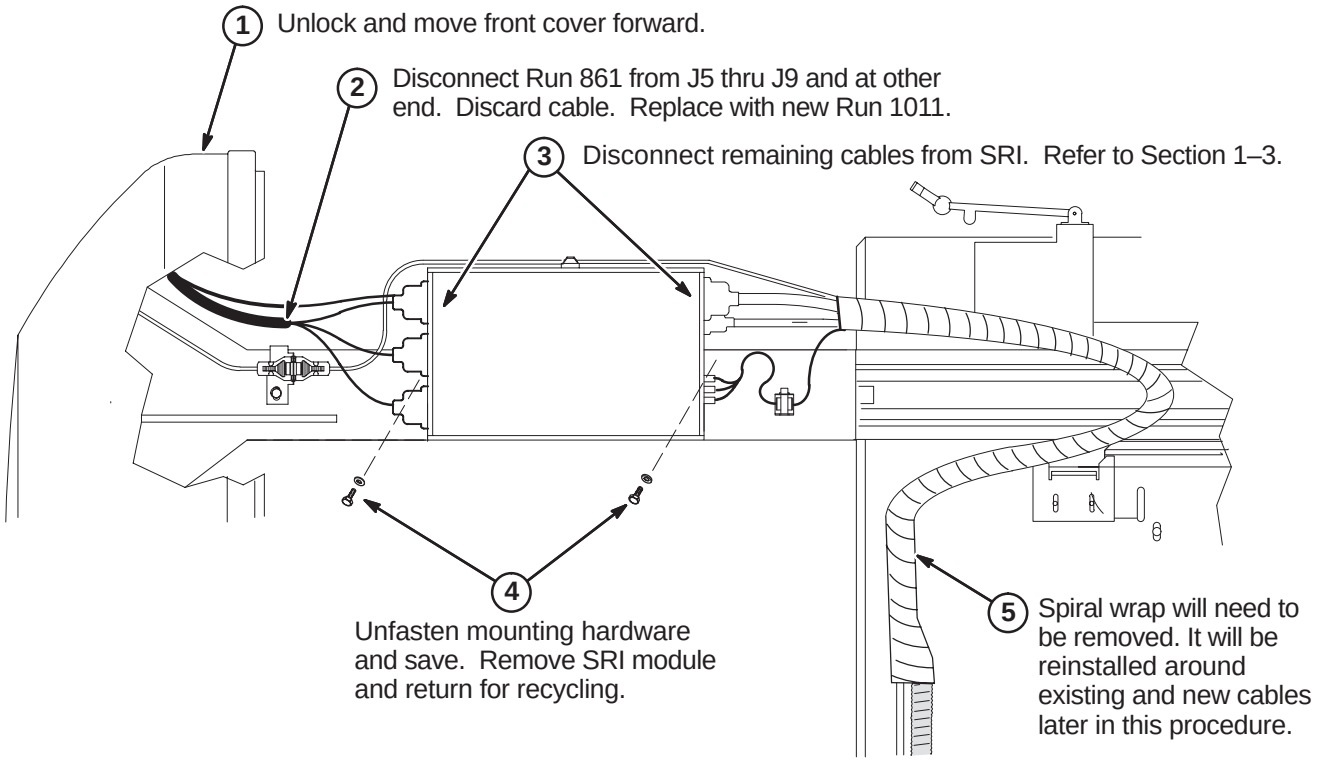
1–3–2–6 Route and Tie–wrap Cables



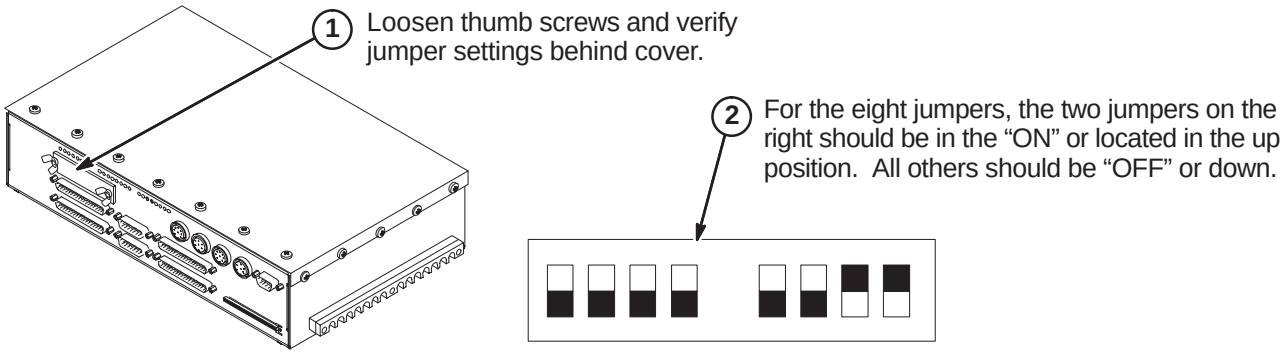
1–3–3 S–SERIES HORIZON ENCLOSURE UPGRADE FOR SRI–2

The following procedures are for upgrading the S–Sseries Horizon style enclosure to SRI–2.

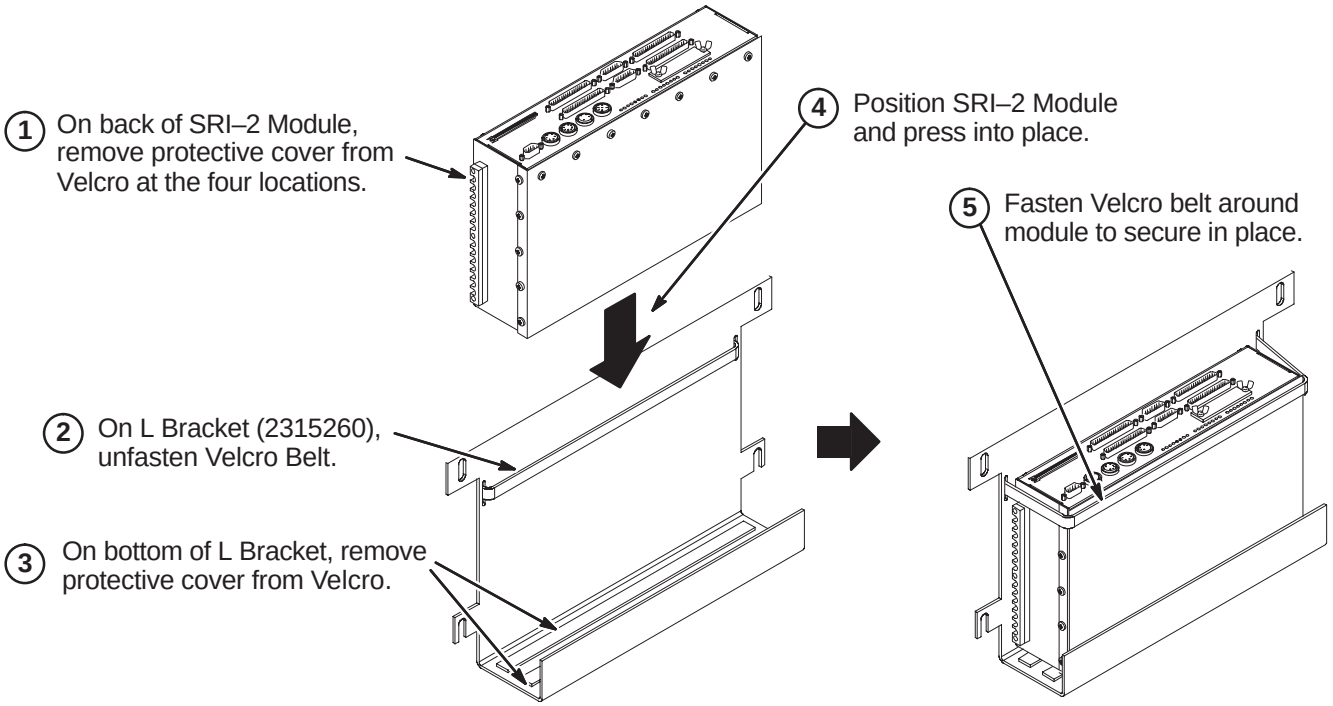
1–3–3–1 Remove Existing SRI Module



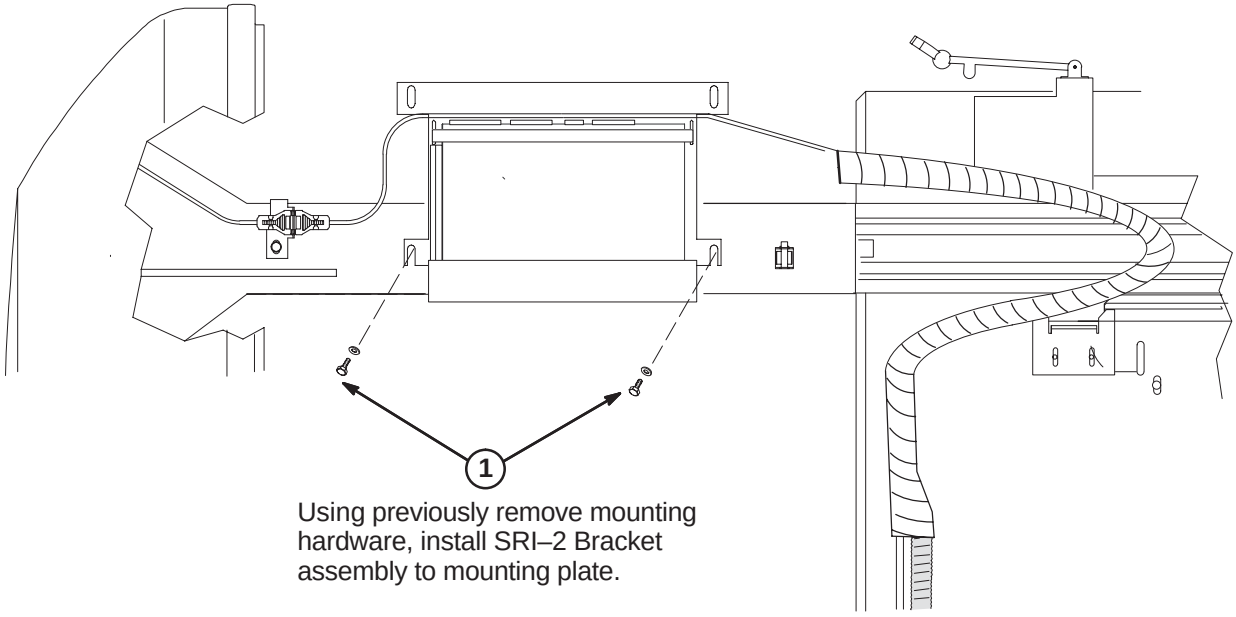
1–3–3–2 Verify Jumper Positions for SRI–2



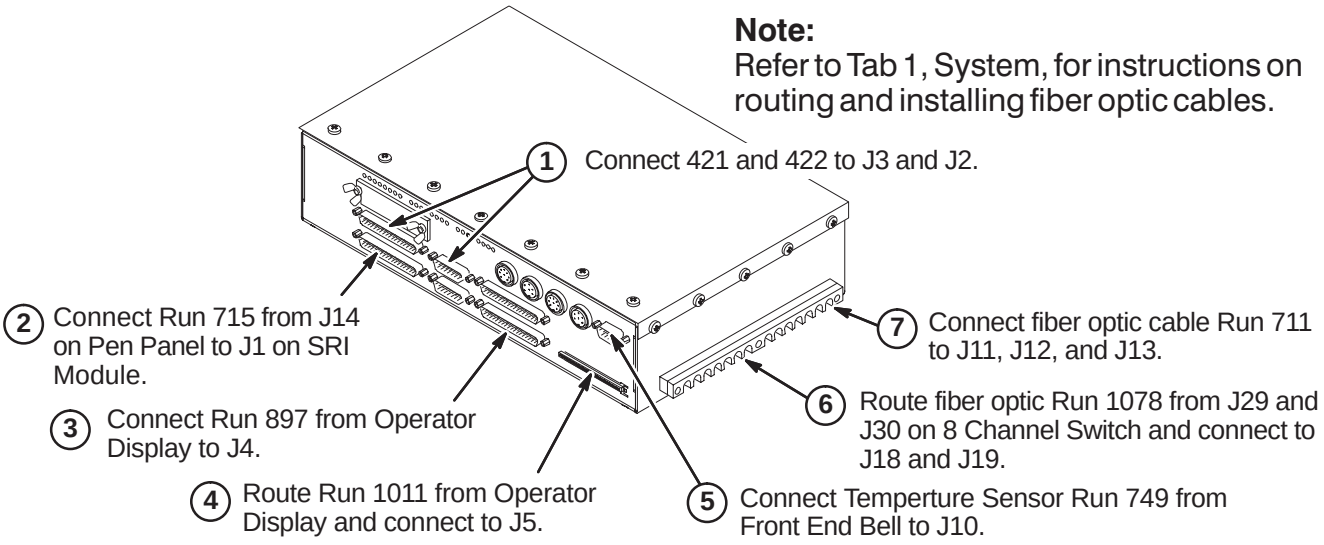
1–3–3–3 Position SRI–2 in L Bracket



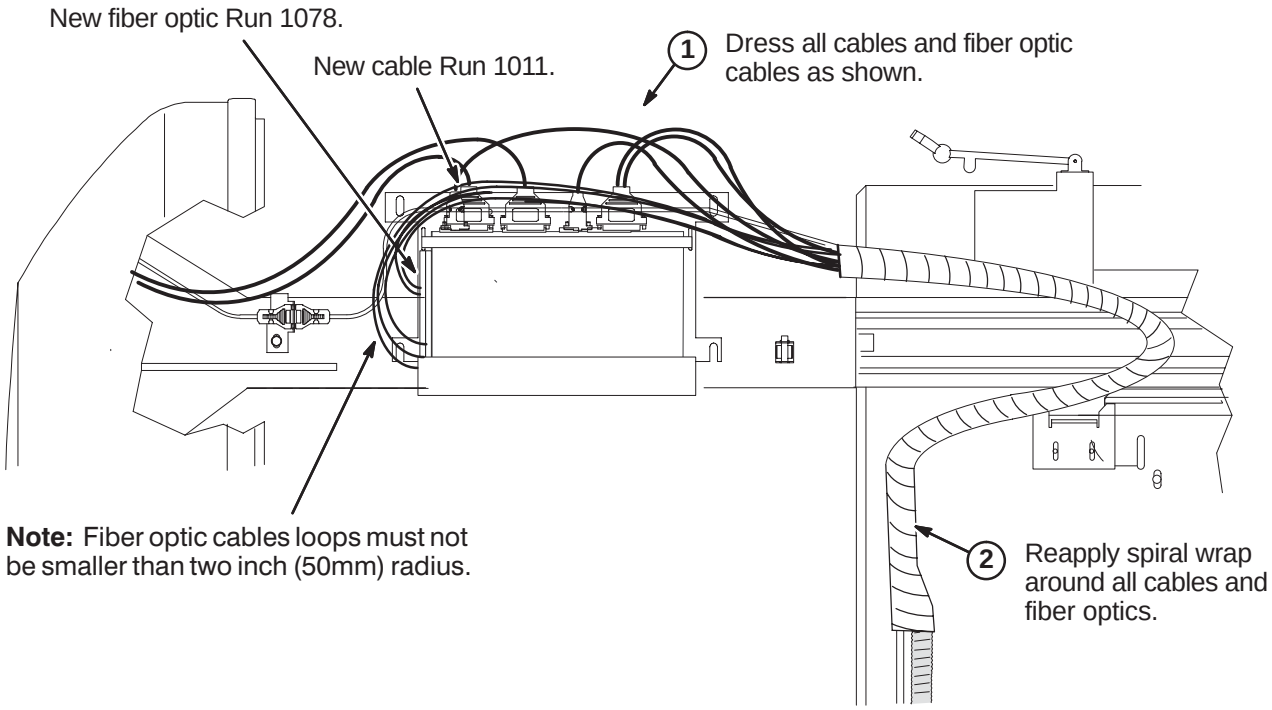
1–3–3–4 Install SRI–2 on Magnet



1–3–3–5 Connect Cables to SRI–2

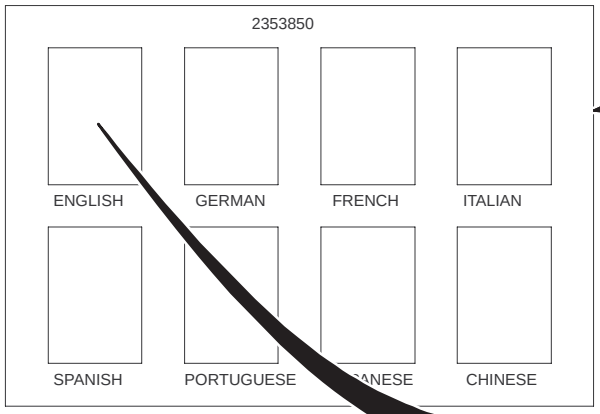


1–3–3–6 Route and Spiral Wrap Cables

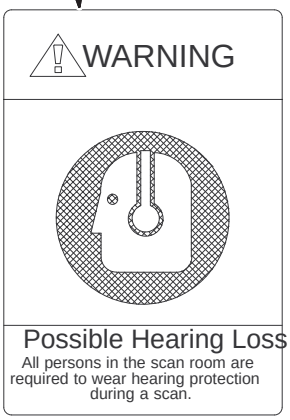


1–4 INSTALLATION OF HEARING LOSS WARNING SIGN

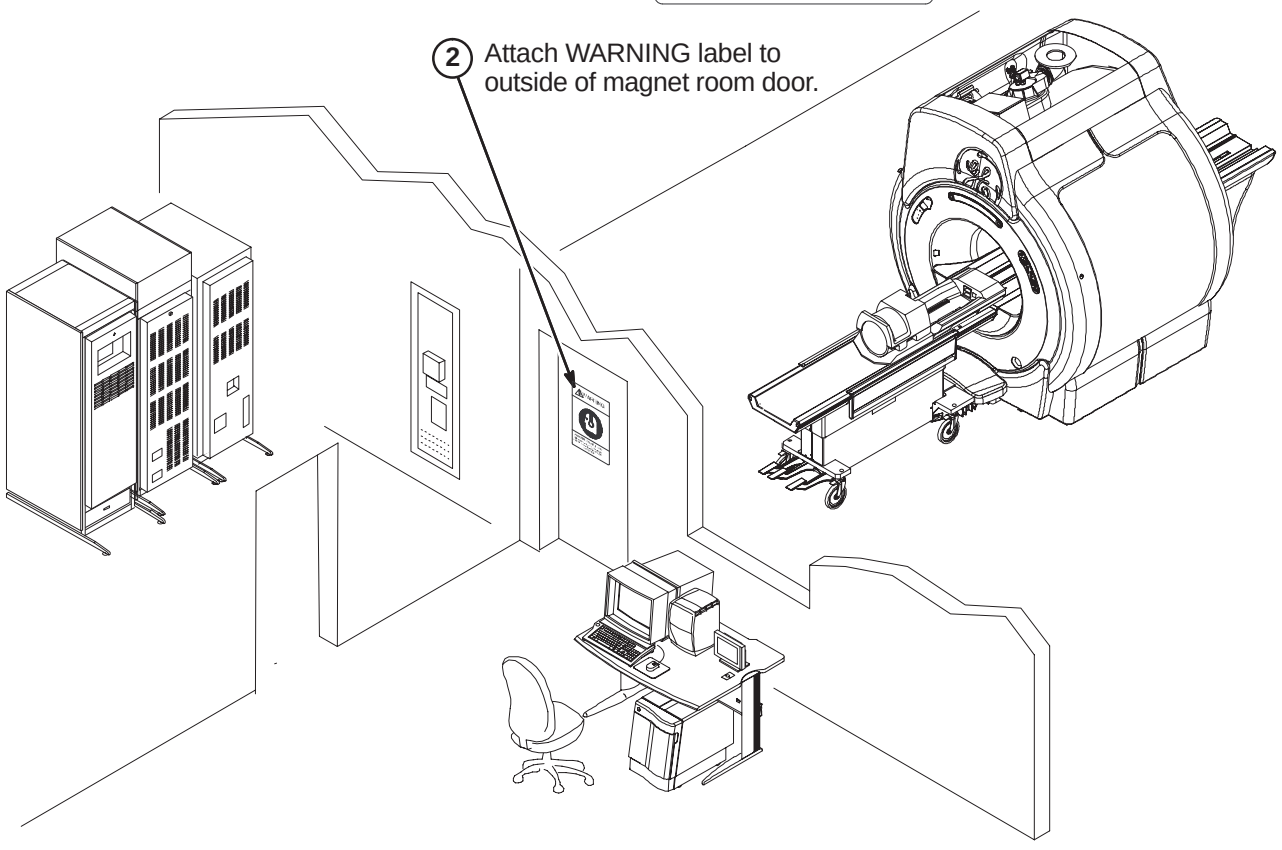
❑ G1 – WARNING SIGN INSTALLATION



1. Remove applicable language warning label from “HEARING PROTECTION REQUIRED” sheet of 8 labels (2353850).



2. Attach WARNING label to outside of magnet room door.



BODY COIL UPGRADE INSTRUCTIONS

1–1 Tab 4, BODY COIL, contains upgrade installation instructions for the following:

Use only the applicable Body Coil Upgrade Installation Instruction Directions

- *DIRECTION 2308632* – Cooling System Installation Instructions
- *DIRECTION 2*316316 – Signa 1.5T Twin*Speed* Interface Ring Alignment
- *DIRECTION 2*326444 – TRM Coil Lifting Procedure
- TRMREA1.DOC – Twin Resonator Module (TRM) Installation

COOLING SYSTEM INSTALLATION

Consult vendor supplied manual, that was delivered with Cooling Cabinet, for Cooling Cabinet installation, start–up, and operating instructions and procedures.

g

GE Medical Systems

Technical Publications

Direction 2316316
Revision 2

TwinSpeed Interface Ring Alignment

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Operating Documentation

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent, have notation **"damage in shipment"** written on **all** copies of the freight or express bill **before** delivery is accepted or "signed for" by a General Electric representative or a hospital receiving agent. Whether noted or concealed, damage **MUST** be reported to the carrier **immediately** upon discovery, or in any event, within **14** days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this **14** day period.

Immediately complete a "Damage Loss Claim Form", available via MS Exchange Mail, after the damage is found.

MS Exchange Path:

Outlook/Public Folder/All Public Folders/Medical Systems/!Global Initiatives/Information Management/Forms/Common Forms/DAMAGE LOSS CLAIM FORM.

Send the completed form to the email address listed in the form.

For more information about the Transportation Claim Procedure, access the GE Medical Systems Intranet and enter the following URL address (case sensitive):

ftp://3.87.40.2/globepro/qualsys/Docs/190016MF.PDF

Rev. 11/15/2000

Direction 2128126 - Language Policy For Service Documentation, Rev 0

W A R N I N G

- **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.**

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ください。

・この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

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。

REVISION HISTORY

REV	DATE	PRIMARY REASON FOR CHANGE
0	Nov. 26, 2001	Initial version of TwinSpeed Alignment Procedure.
1	Feb 18, 2002	Added magnet flange check and procedures to address issues with magnet flange.

PAGE	REV	PAGE	REV	PAGE	REV	PAGE	REV
Title Page	0	Title Page	1	Title Page	2		
Damage in Trans.	-	Damage in Trans.	-	Damage in Trans.	-		
Direction 2128126	0*	Direction 2128126	0*	Direction 2128126	0*		
6 to 32	0	6 to 32	1	6 to 37	2		

* This revision/letter corresponds to the indicated document's revision control system.

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C4 Skewed 37

1- OVERVIEW

A new tool is required to align the TwinSpeed Vacuum Enclosure Interface Rings to each other for TwinSpeed upgrades (new systems are factory aligned). The vacuum end bells are mounted to the interface rings and then the RF coil is mounted to the end bells. The alignment of the interface rings is critical to the performance of the vacuum enclosure. The RF coil alignment to the gradient coils is critical to SNR performance of the system. Since the RF coil in a TwinSpeed system is mounted/supported by the enclosure end bells, the alignment of the RF coil is ultimately determined by the interface ring alignment.

2- REQUIRED TOOLS & EQUIPMENT

The tools listed below that are highlighted in gray are the parts required for the Magnet Interface Rings. The remaining parts are required for the Gradient Isolation Brackets. These parts are needed after the coil is installed in the magnet.

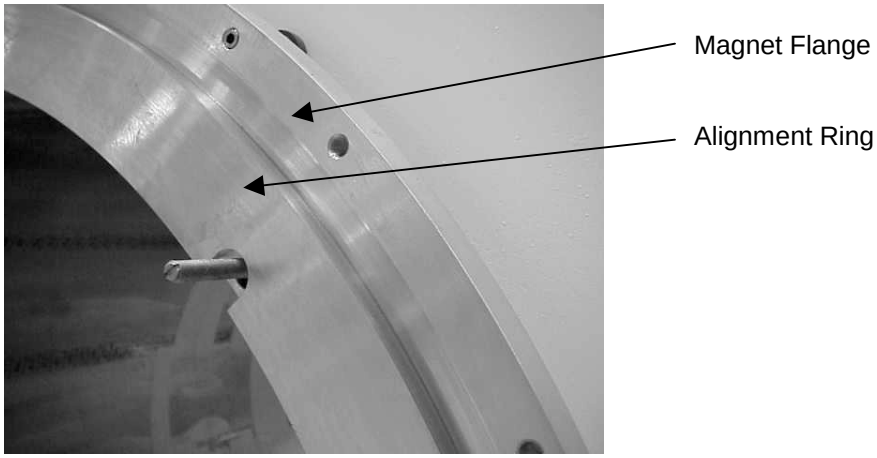
Description	Part Number	Qty.
Twin Centering Tool Kit (Order from Tool Depot) (Kit weighs approx. 78 Lbs./ 39 kg)	2299496	1
TRM LCC Gradient ISO Install Kit	2297692	1
SUPPORT MOUNTING, TRM	2272016	2
SPACER SHIM 1.5MM THK	2238908	2
SPACER SHIM 2.4MM THK	2238908-2	6
SPACER SHIM 16MM THK	2238908-3	2
RUBBER ISOLATION PAD	2241176	2
SCREW SET SCREW 10 MM 25 MM--Grub	2251295	2
SCREW SET SCREW 10 MM 30 MM--Grub	2251295-2	1
MTG PAD, 1/4" THICK NEOPRENE	2131953-5	4
SET SCREW- MTG.PAD	2293535	4
RADIAL SHIM SPACER 1.5MM THK	2293771	4
RADIAL SHIM SPACER 0.8MM THK	2293771-2	8
MAGNET RING	2306226	2
WEDGE RING	2306184	2
O-RING WEDGE RING	2310035	2
MAGNET RING GASKET	2246966	2
SCREW HEXAGON SOCKET 10 MM 25 MM	2109867-23	32
MAGNET RING BRACKET	2284172	1
SCREW PAN HEAD 6 MM 16 MM	2109873-25	2
CAP SCREW HEXAGON HEAD 10 MM X 1.5 X 35 MM	2109866-22	8
VACUUM GREASE MSDS# 8366442	2297760	1
SHOULDER WASHER NYLON	2308141-4	8
SCREW SET SCREW 10 MM 20 MM	2251294	4
RADIAL FOOT PADS	2310334	12

Field Supplied Tools

Disposable Gloves
Masking Tape
Tongue Depressor
Non Magnetic Tool Kit Metric/English
Allen Wrench 8 mm
Rubbing Alcohol
Rags

3- MAGNET FLANGE CHECK

There may be issues with the Magnet Flange that will prevent the O-rings and gaskets that are between Magnet Flange and Alignment Ring from maintaining proper vacuum. It is estimated that 10% of all LCC magnets may have issues that will need to be addressed. To check for Magnet Flange consistency, place the Alignment Ring against the Magnet Flange. See Illustration 3-1. Refer to Appendix C if gaps or protrusions are discovered.

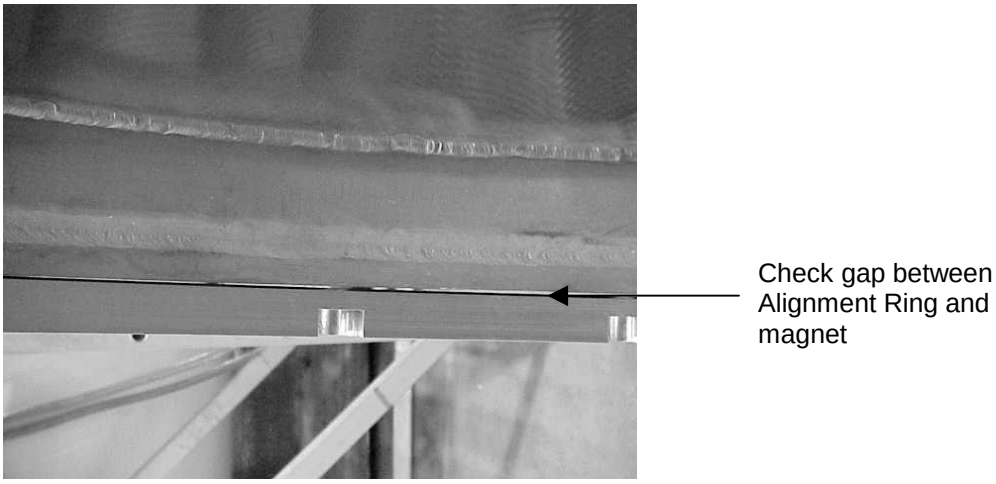


ALIGNMENT RING CHECK
ILLUSTRATION 3-1

Check for the following conditions:

- Protruding magnet weld
- Cavity in the flange
- Bolt pattern on the Magnet Flange does not match bolt pattern on the Alignment Ring
- Skewed Flange

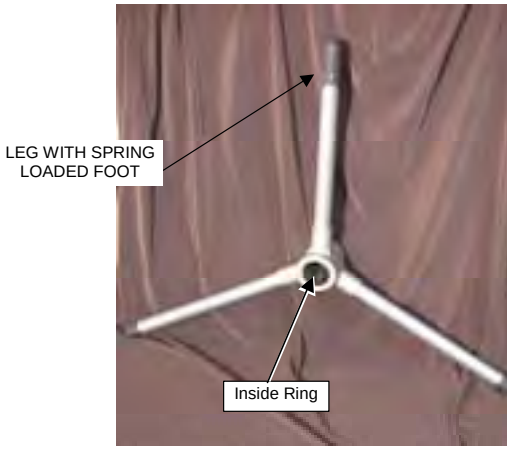
If any of the above conditions are noted, refer to Appendix C for the resolution needed.



GAP CHECK
ILLUSTRATION 3-2

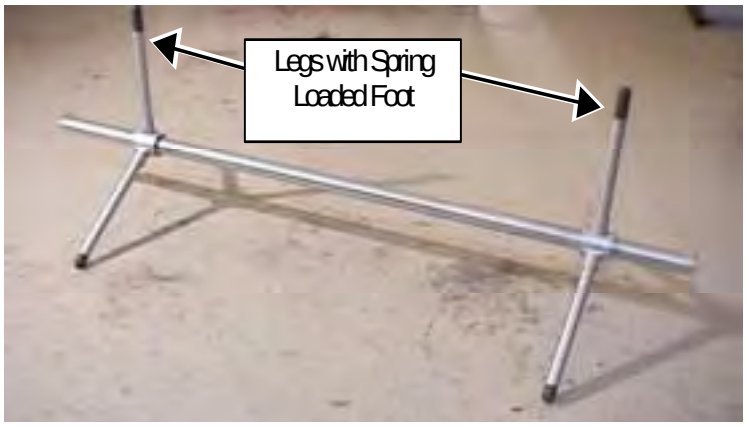
4- TOOL SETUP

1. Open the Twin Centering Tool case and assemble the parts for the two 3-legged spider assemblies as shown in Illustration 4-1. Note: each spider assembly gets one leg with Spring Loaded foot.



SPIDER ASSEMBLY
ILLUSTRATION 4-1

2. Wipe the center shaft and the inside ring of the Spider Assembly.
3. Assemble 3-piece center shaft and slide a spider assembly on at each end. The leg with the spring loaded foot should be pointed up.

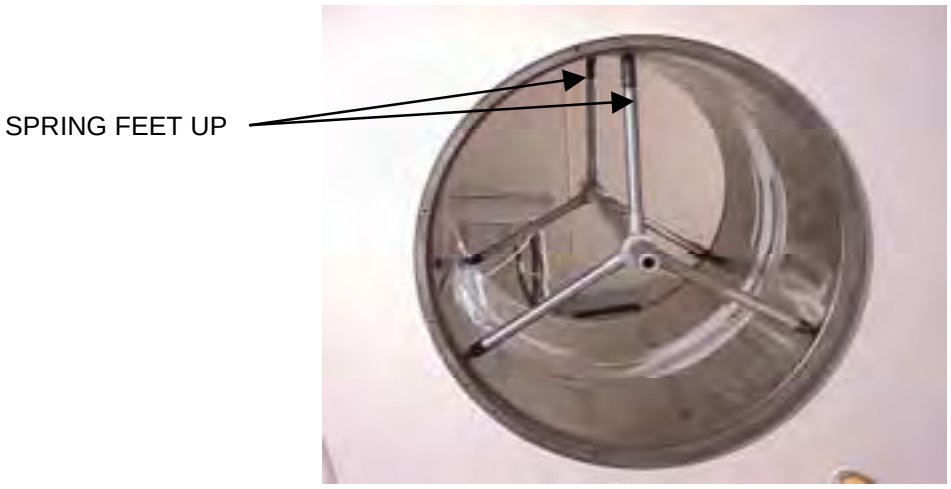


CENTER SHAFT WITH SPIDER ASSEMBLIES
ILLUSTRATION 4-2

4. Insert Center Shaft Assembly into magnet bore being careful not to drag across the passive shims. The legs with the spring loaded foot are pointed up. See Illustration 4-3.
5. After Center Shaft Assembly is in position, rotate the spring loaded foot of each Spider Assembly ¼ turn to activate the spring tension against the top of the magnet bore. *Hint:* Spider Assembly feet must maintain pressure against the magnet bore, outside of the passive shim area.

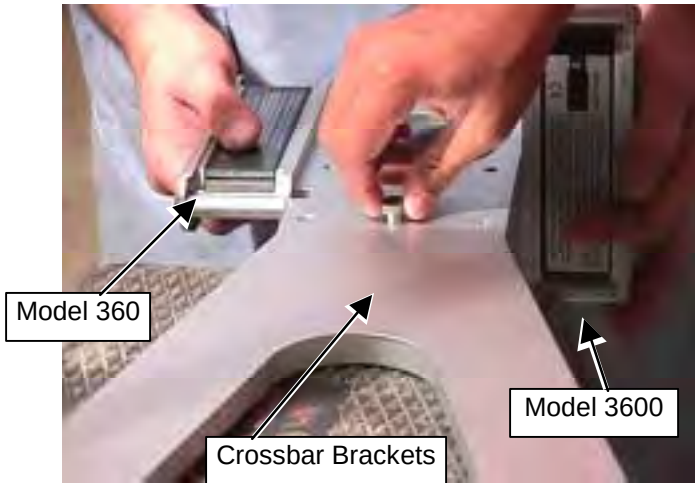
Note

It is important to place the spider assembly as close as possible to the passive shim location markers in the magnet bore and away from the weld seam.



CENTER SHAFT ASSEMBLY IN BORE
ILLUSTRATION 4-3

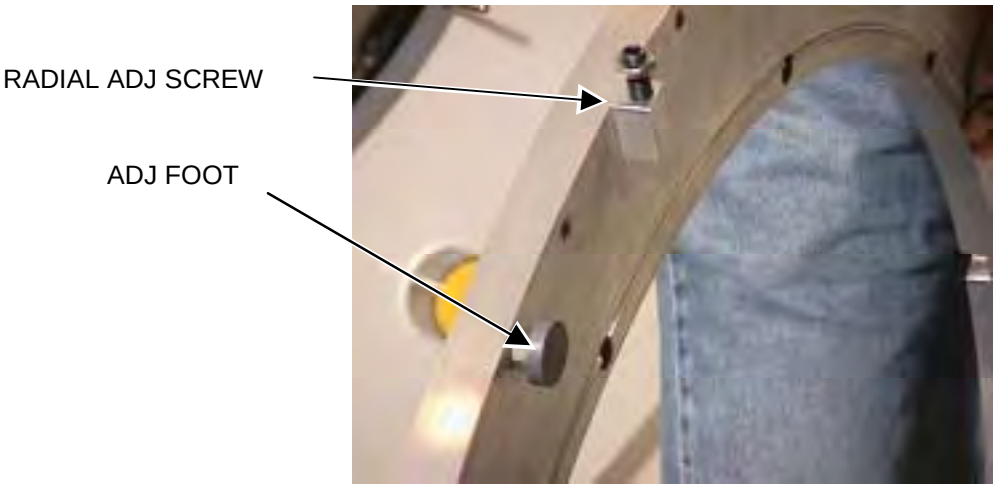
6. Connect the Digital Protractor Assembly to the crossbar brackets using the 6 allen-head capscrews and wrench provided in kit. Tighten snugly. See Illustration 4-4.



ASSEMBLE DIGITAL PROTRACTORS TO BRACKETS
ILLUSTRATION 4-4

7. Make sure the model 3600 protractor is mounted on the top and in line with the axial pipe and the model 360 protractor is mounted below and perpendicular to the axial pipe.
8. Wipe down both sides of the interface ring with alcohol.

9. Inspect magnet interface ring to ensure the adjustment feet and the radial screws are fully retracted. See Illustration 4-5. Note that in early production the foot screws are ferrous.



BACK OF INTERFACE RING – ADJUSTABLE SCREW/FOOT
ILLUSTRATION 4-5

10. Attach theTwin Centering Tool to the front of one of the enclosure interface rings using six 17 mm hex-head screws provided in kit (note: the front of the interface ring is opposite the side with the 4 round feet and the lower protractor readout faces out of the magnet, see Illustration 4-7). Tighten snugly. See Illustration 4-6.

TWIN CENTERING TOOLTO ENCLOSURE INTERFACE RING
ILLUSTRATION 4-6

READ DIRECTION OF LOWER PROTRACTOR
ILLUSTRATION 4-7

5- PREPARATION FOR INTERFACE RING

The Ring Alignment Tool is used to position the Vacuum Enclosure Interface Rings. There are some enclosure parts that must be installed before the interface rings.

1. The first enclosure part to be installed is the Wedge Ring that fits around the magnet's end ring. The Wedge Ring must sit flat against the magnet's end flange. It may be necessary to use non-ferrous tooling to remove any weld globs that inhibit the Wedge ring from sitting flat. See Illustration 5-1 showing removal of weld globs prior to installation of the Wedge Ring.

WARNING!

POSSIBLE PROPERTY DAMAGE AND IMAGE QUALITY ISSUES. THE WELD GLOBS ARE FERROUS MATERIALS AND MUST BE REMOVED FROM THE MAGNET ROOM TO PREVENT POTENTIAL WHITE PIXEL SOURCE.

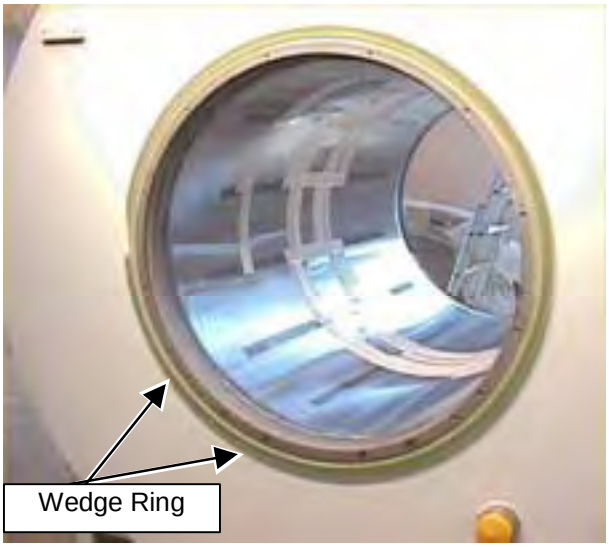
WARNING!

POSSIBLE PERSONAL INJURY. THE WELD GLOBS WILL COME LOOSE AND COULD INJURE EYES. WEAR PERSONAL PROTECTIVE EQUIPMENT SAFETY GLASSES WHILE REMOVING GLOBS.

PREPARATION FOR WEDGE RING
ILLUSTRATION 5-1

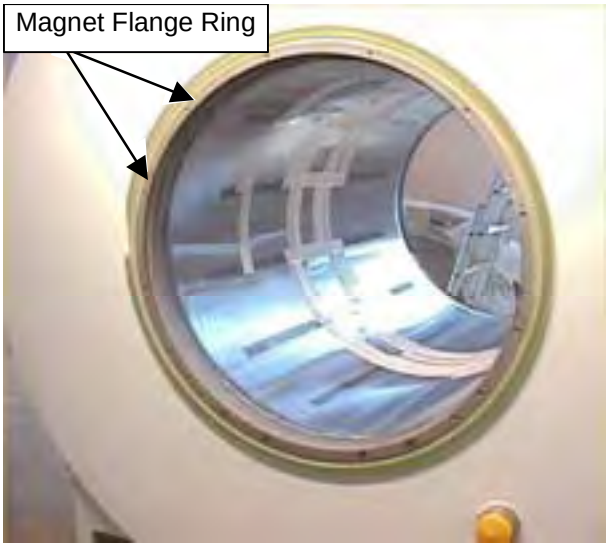
2. Wipe down the magnet end flange and magnet ring with alcohol before installing wedge ring.

3. Install Wedge Ring. See Illustration 5-2. There is a notch in the Wedge Ring. The position of the notch is not relevant for the front of the magnet. There is a weld in the rear of the magnet that will allow you to position the notch over the weld.



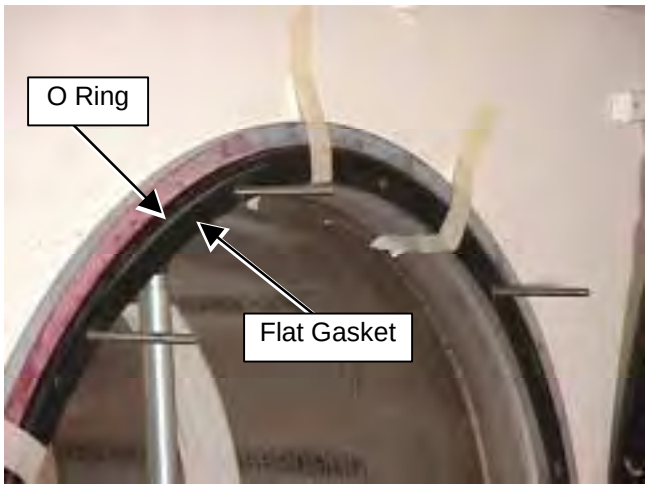
WEDGE RING INSTALLED
ILLUSTRATION 5-2

4. Using disposal gloves apply a thin film of vacuum grease (P/N 2297760) to the face of the magnet flange ring. See Illustration 5-3.



MAGNET FLANGE-RING LOCATION
ILLUSTRATION 5-3

5. Apply vacuum grease to the 6 threaded studs that came with the enclosure and install into threaded holes on magnet ring. See Illustration 5-4. Place 3 studs, as shown, around top half of magnet end ring and 3 around the bottom half.
6. Install flat gasket onto the studs installed in previous step. See Illustration 5-4.
7. Using disposal gloves apply vacuum grease (P/N 2297760) liberally to the round O-ring (5/8" thick), part number 2310035. Then install O-ring around the magnet end ring. See Illustration 5-4.



TAPE FLAT GASKET IN PLACE
ILLUSTRATION 5-4

8. Use masking tape or similar to hold the O-ring into place. See Illustration 5-4.
9. Use a tongue depressor to place vacuum grease on the bottom of the radial screws. See Illustration 5-5.

APPLYING GREASE TO RADIAL SCREWS
ILLUSTRATION 5-5

10. Place the nylon spacers on the end of the radial screw. See Illustration 5-6.

PLACING THE NYLON SPACER
ILLUSTRATION 5-6

11. Place the Interface Ring with the Twin Centering Tool over the studs on magnet end ring. See Illustration 5-7.

BOLT INTERFACE RING TO FRONT OF MAGNET
ILLUSTRATION 5-7

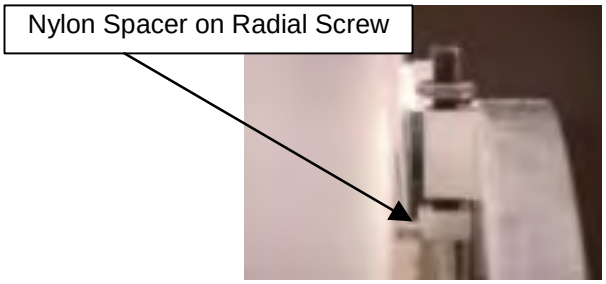
12. Remove the tape holding the flat gasket in place.

Note

In step 13, it may be necessary to use the nut with metal washer on the studs from the Gradient Insertion tool kit to start to tighten the interface ring to the magnet on both the front and rear rings of the magnet.

13. Put vacuum grease on threads before inserting the M10 x 25mm capscrews from the enclosure into the remaining holes around the interface ring. Just start the capscrew threads in the holes, do not tighten beyond that for now. After installing three screws, the threaded rods cam be removed. They will be used when installing the rear Alignment Ring.

14. Inspect inside of magnet interface ring to ensure that the nylon spacers for radial screws are in place. See Illustration 5-8.

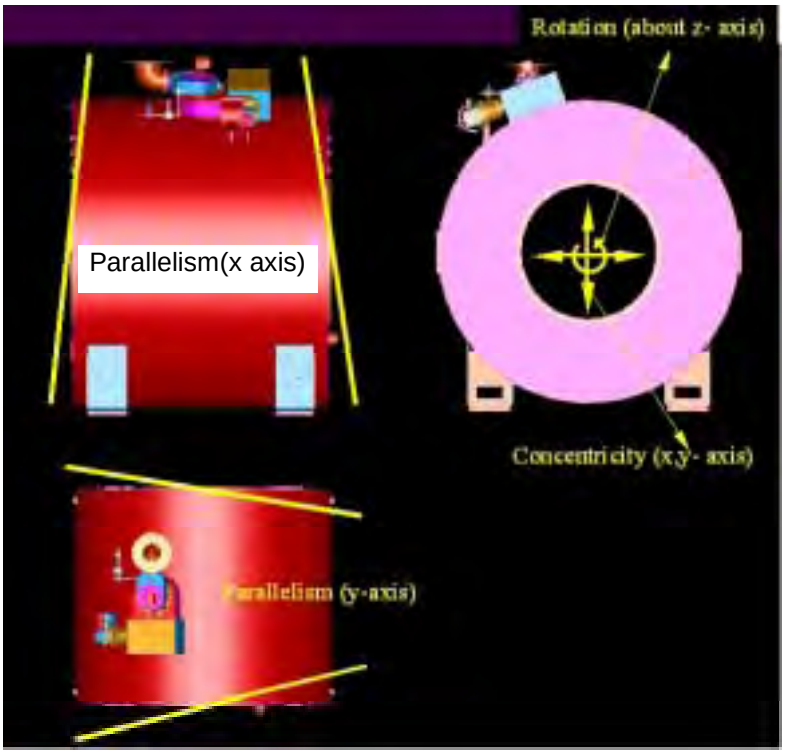


NYLON SPACER IN PLACE
ILLUSTRATION 5-8

15. Verify that the O-ring is in the proper place all around the wedge ring, otherwise damage to the O-ring could occur.

6- ALIGNMENT PROCEDURE

The alignment procedure requires patience and perseverance to be done correctly. The interface ring must be aligned in all physical planes to ensure proper alignment of the RF Coil to the TRM and vacuum system functionality. There are 4 alignment parameters. Concentricity alignment, rotational alignment, parallelism about x-axis and parallelism about y-axis, in the same order. See Illustration 6-1.



ALIGNMENT PARAMETERS
ILLUSTRATION 6-1

The alignments are completed for the front interface ring first and then repeated on the rear interface ring.

6-1 Rotational Alignment

The goal of the rotational alignment is to set the rotational position of the interface ring as close to zero degrees as possible (Note: The magnet should have been leveled at initial magnet installation). The Digital Protractor is used to set the reference.

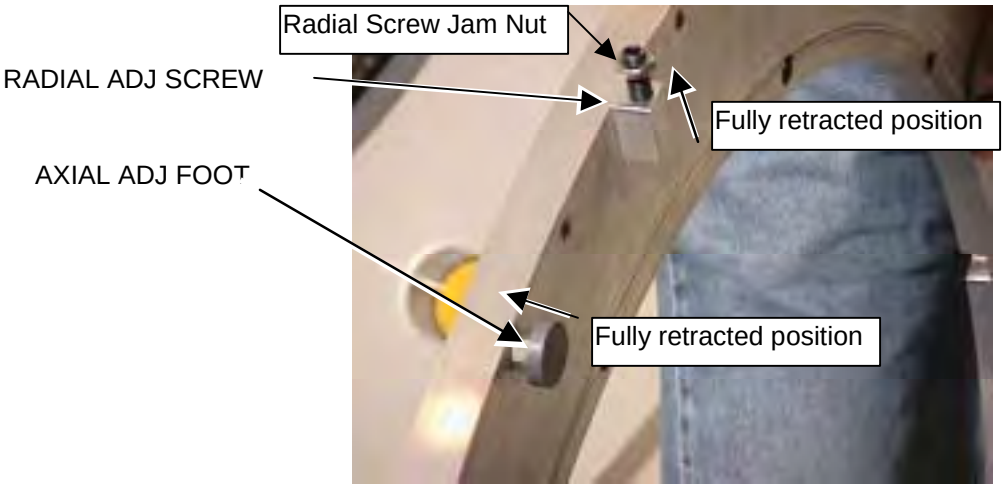
1. Toggle ON/OFF switch on the Digital Protractor and check the reading. The arrow indicates which direction the interface ring must be moved. See Illustration 6-2.

DIGITAL PROTRACTOR
ILLUSTRATION 6-2

2. Manually rotate the ring clockwise or counter clockwise to reach the goal of an alignment reading which is $\leq 0.5^{o}$.
3. Record final measurement.

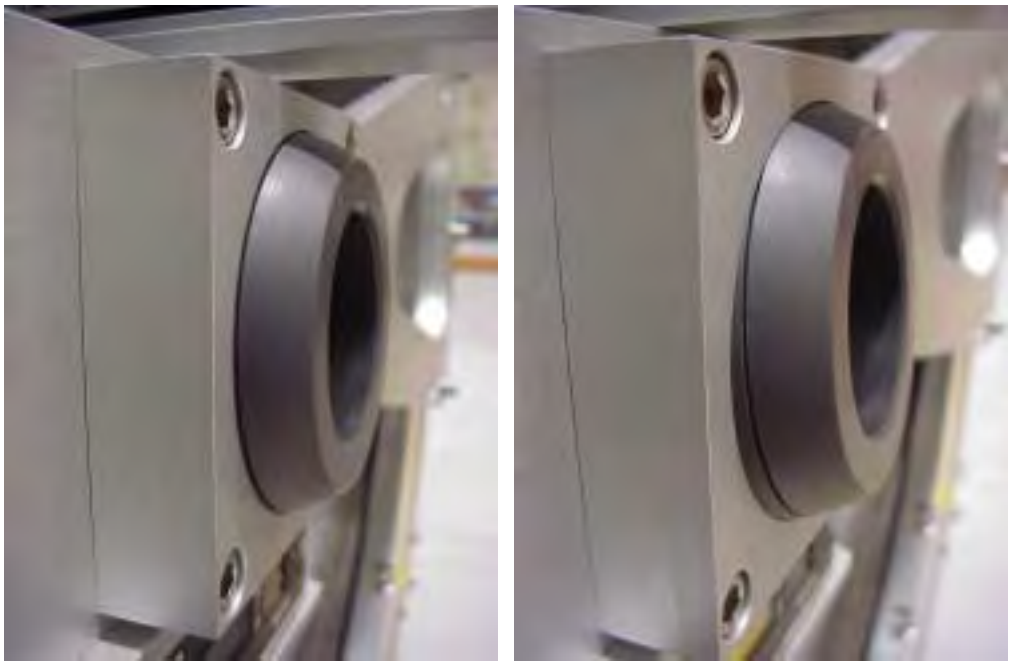
6-2 X-Y Plane Concentric Alignment

The goal of the X-Y plane concentric alignment is to position the interface ring such that the center shaft can be inserted through the pivot ring of the Digital Protractor assembly. See Illustration 6-2 for pivot ring. **Do Not attempt to force the shaft into the pivot ring**; this could damage the pivot ring. The interface ring must be positioned using the radial screws on the interface ring and then the center shaft is inserted **by hand** through the pivot ring. See Illustration 6-3 of the backside of the interface ring.



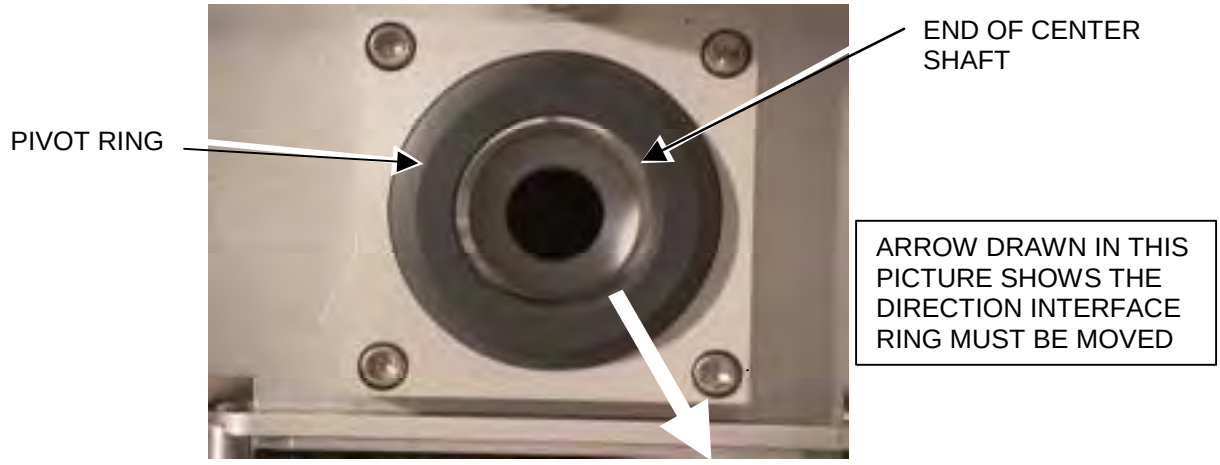
BACK OF INTERFACE RING – ADJUSTABLE SCREW/FOOT
ILLUSTRATION 6-3

1. Position the pivot ring so it is perpendicular to the center shaft assembly, make sure the groove is even or aligned to the face of the plate (see Illustration 6-4). Slide the center shaft close to the pivot ring.



PIVOT RING ALIGNED **PIVOT RING MISALIGNED**
ILLUSTRATION 6-4

2. Look through the hole of the pivot ring to see alignment of center shaft. See Illustration 6-5. Determine direction the interface ring must move to align the center shaft to the pivot ring opening.



VIEW OF CENTER SHAFT THROUGH PIVOT RING
ILLUSTRATION 6-5

3. Use Allen wrench to turn the appropriate radial adjustment screws to move the interface ring into alignment with the center shaft.
4. Continue to make adjustments using the radial adjustment screws until the shaft can be pushed through the pivot ring using only the force of your hand. See Illustration 6-6.

CENTER SHAFT THROUGH PIVOT RING
ILLUSTRATION 6-6

Note

Due to the stack up of tolerances of the passive shim in the magnet bore; it may be necessary to shim the legs of the spider assembly. The 8mm shims work well for this. Then repeat steps 1 – 4 till center shaft moves through pivot ring.

5. Place all radial fingers snug to the wedge.

6. Evenly tighten 16 capscrews a ½ turn using an alternating pattern maintaining a gap of 8mm between the wedge ring and the magnet interface ring. For example picture the magnet ring as the face of a clock, tighten the capscrew at ten o'clock position, followed by the capscrew at 4 o'clock, followed by the capscrew at 7 o'clock …

Note

Use a 8mm allen wrench to check the gap between the wedge ring and the magnet interface ring.

6-3 X & Y-Axis Alignment

The goal of the Y-axis alignment is to adjust the axial position of the interface ring as close to zero degrees as possible using the Axial Digital Protractor.

Note

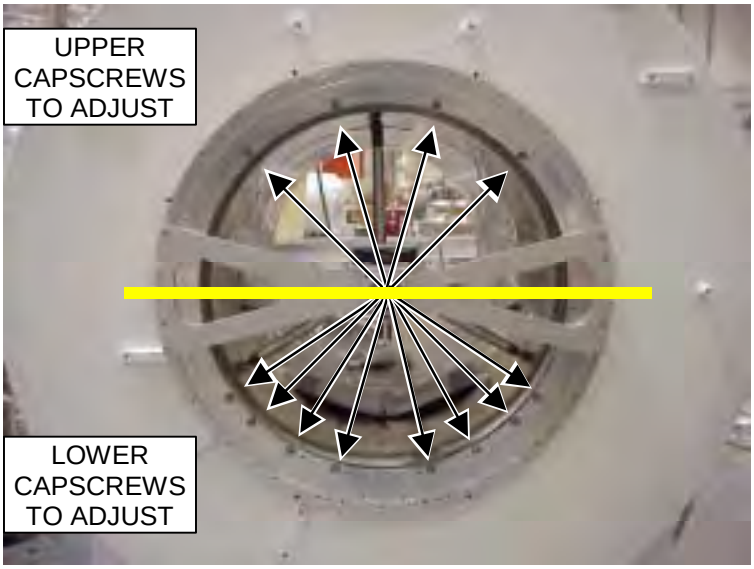
Start with the center shaft slid out of the Pivot Ring completely.

1. Toggle ON/OFF switch on the Axial Digital Protractor and check the reading. The arrow indicates which direction the interface ring must be moved. See Illustration 6-7.

AXIAL DIGITAL PROTRACTOR
ILLUSTRATION 6-7

6-3-1 Y-Axis Alignment

1. Using the directional arrow on the digital protractor, adjust the capscrews on the lower or upper half of the magnet interface ring to reach the goal alignment reading of $\leq 0.5^{o}$. See Illustration 6-8, the solid horizontal line divides the ring into the upper and lower halves.

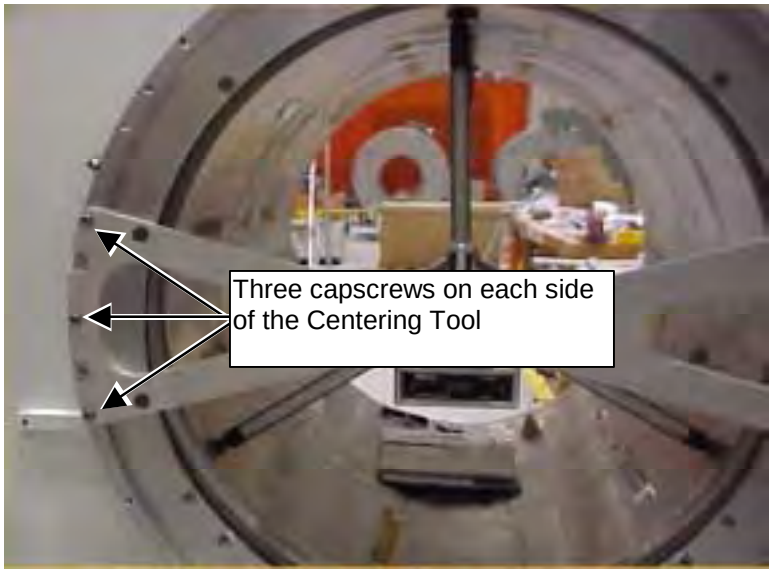


CAPSCREW ADJUSTMENT LOCATIONS
ILLUSTRATION 6-8

2. Record measurement.

6-3-2 X-Axis Alignment

1. Loosen the six (6) screws that hold the centering tool on the interface ring. This is done to remove any distortion caused by over tightening the centering tool. See Illustration 6-9.



SCREW LOCATION
ILLUSTRATION 6-9

2. Use the right angle T-square at the shaft and use the 0.25 mm gauge to make sure the gap does not exceed the gauge. To make the adjustment tighten the capscrews on the left or right side to adjust the gap which aligns the X-axis. See Illustration 6-10.

RIGHT ANGLE T-SQUARE MEASURING X-AXIS ALIGNMENT
ILLUSTRATION 6-10

3. After the axial alignment has met the alignment goal, extend all adjustment feet only finger tight to just make contact with magnet front face, and then lock with nut.
4. Tighten the radial screws evenly and then lock in place with the jam nut. See Illustration 5-9 for examples of radial screw locations.

6-4 Securing Adjustments

1. Check to ensure that the radial screws and axial feet are locked down.
2. Write down the final alignment numbers from the digital protractors.
3. Remove the 6 capscrews that hold the Centering Tool Assembly and install on the rear interface ring.

6-5 Rear Interface Ring Alignment

Repeat sections 4 and 5 for the Rear Interface Ring installation.

APPENDIX A – DIGITAL PROTRACTOR TESTING

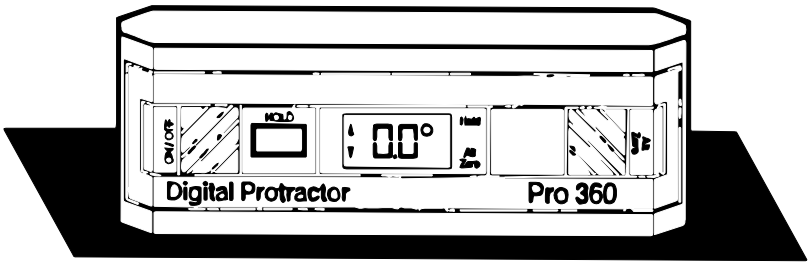
A-1 Recalibration

Like all measurement instruments the Pro 360/3600 must periodically be monitored for accuracy. The Pro 360/3600 should be tested daily with the simple procedure outlined below. If it is found to be out of calibration, it is easily recalibrated on site using Superset® - an eight-step procedure that realigns the unit through its entire 360° range and takes just a couple of minutes to perform. And Superset® doesn't require any special fixtures, tools, or expertise.

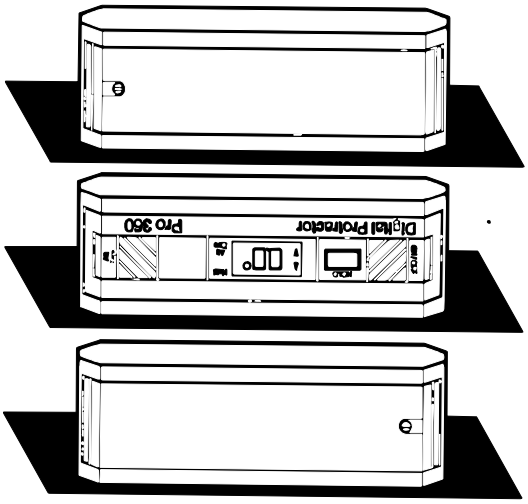
Accuracy Test

Perform this simple test each day before using the Pro 360/3600. Also perform it anytime the Pro 360/3600 has been dropped or is being used in an environment that varies more than 5° C (9° F) from the environment in which it was last calibrated. *If your Pro 360/3600 fails this test, you must recalibrate it using Superset®, before using the unit further to measure angles.*

1. Position the Pro 360/3600 with the display facing you on a clean, flat horizontal surface. It doesn't have to be exactly level. Wait 10 seconds so the unit is completely settled and note the angle on the display.



2. Rotate the unit end-for-end so the display is facing away from you. Be sure to set the Pro 360/3600 in exactly the same spot, and wait 10 seconds before reading the angle that's displayed.



3. Now roll the unit toward you so that the display is facing you, but the lettering on face of the unit is upside down. Wait 10 seconds, and note the angle on the display.
4. Finally, rotate the unit end-for-end so the display is facing away from you (the lettering should still be upside-down). Wait 10 seconds and note the angle on the display.

5. If any of the four measurements varies from any other by more than 0.1°, you must recalibrate (Superset®) your unit before using it further.

Superset®

Superset® recalibrates the Pro 360/3600 through its entire 360° range by electronically recording four horizontal and four vertical settings. It should be performed whenever the accuracy test shows a discrepancy of 0.1° or more.

How to Perform Superset®

1. Turn on the Pro 360/3600 and place it on a flat surface. You can use any horizontal surface within 10° of level and any vertical surface within 10° of plumb to perform Superset®. You must use the same surfaces throughout the entire process.

Note

Each time you reposition the Pro 360/3600 during Superset®, wait a minimum of 10 seconds before pressing the **[HOLD]** button to advance to the next step.

2. Press and hold the [HOLD] and [ALT ZERO] buttons simultaneously. Keep them depressed for approximately three seconds.
3. Release the buttons when the symbol "SUP" appears. A "0" within flashing brackets will then appear. These brackets are composed of four horizontal and four vertical segments.

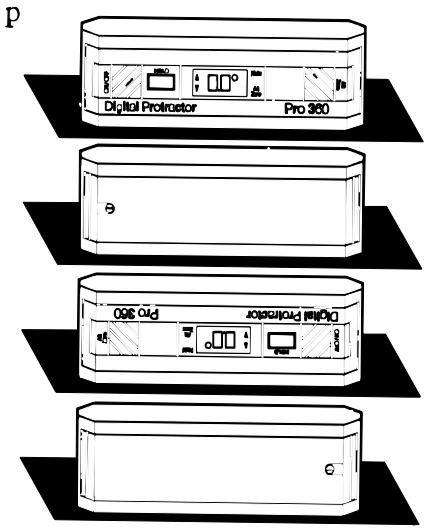
"0" within flashing brackets

Note

As you proceed through the next eight steps (4 – 12) of Superset®, a new segment will hold steady after you complete each step.

Superset® - Horizontal Settings

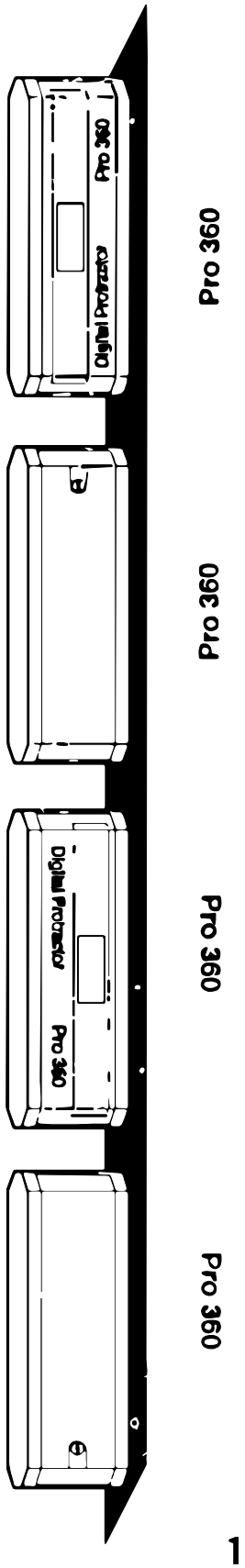
4. The unit faces you and the white lettering on face is right-side up. Align with an edge or line - wait 10 seconds Press [HOLD] button until 1 appears.
5. Rotate the unit so it faces away from you, the lettering should still be right-side up. Align with same edge or line - wait 10 seconds. Press [HOLD] button until 2 appears.



6. Roll the unit so it faces you, the lettering should now be upside-down. Align with same edge or line - wait 10 seconds. Press [HOLD] button until 3 appears.
7. Rotate the unit so it faces away from you, the lettering should still be upside-down. Align with same edge or line - wait 10 seconds. Press [HOLD] button until 4 appears.

Superset® - Vertical Settings

8. Place the unit against vertical surface so it faces you, the lettering on the face (Pro 360, etc.) should read from bottom-to-top. Align with an edge or line - wait 10 seconds. Press [HOLD] button until 5 appears.



1

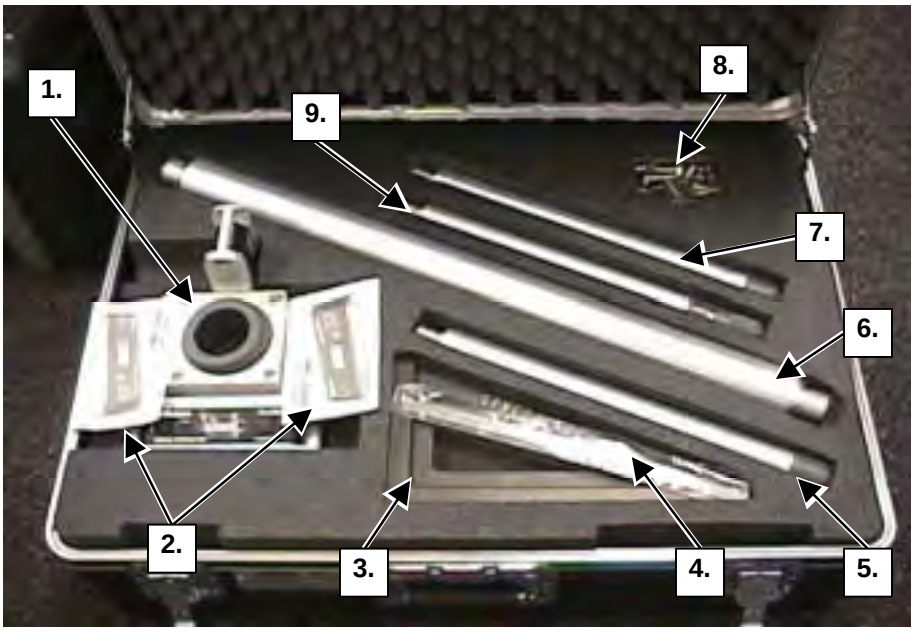
9. Roll the unit so it faces away from you, the lettering should still read from bottom-to-top. Align with same edge or line - wait 10 seconds. Press [HOLD] button until 6 appears.
10. Rotate the unit end-for-end so it faces you, the lettering should now read top-to-bottom. Align with same edge or line - wait 10 seconds. Press [HOLD] button until 7 appears.
11. Roll the unit so it faces away from you, the lettering should still read top-to-bottom. Align with same edge or line - wait 10 seconds. Press [HOLD] button. An 8 will very briefly appear, followed immediately by regular angle measuring.
12. Your Pro 360/3600 has been Superset® back to manufacturer's spec's.

Canceling Superset®

You may cancel Superset® at any time during the process by turning the unit off.

APPENDIX B – TWIN CENTERING TOOL KIT

The Twin Centering Tool Kit is packed in the case as follows.



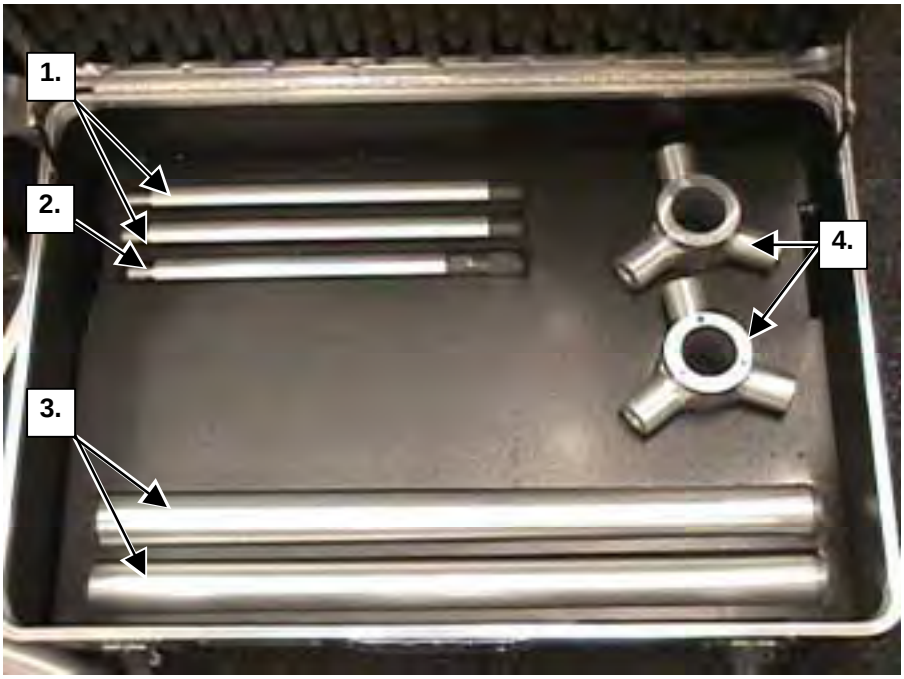
TOP LEVEL OF KIT
ILLUSTRATION B-1

Item No.	Description
1.	Pivot Ring and Digital Protractors
2.	Instruction Manuals for Digital Protractors
3.	Right Angle
4.	.25 mm Feeler Gauge
5.	Leg for Spider Assembly
6.	Center Shaft
7.	Leg for Spider Assembly
8.	Part Box containing: 6 Hex head screws, 17 MM 1 Allen wrench 6 Bolts 6 Washers
9.	Leg for Spider Assembly with Spring loaded Foot

SECOND LEVEL OF KIT
ILLUSTRATION B-2

THIRD LEVEL OF KIT
ILLUSTRATION B-2

Item No.	Description
1.	Cross Bar Assembly
2.	Cross Bar Assembly



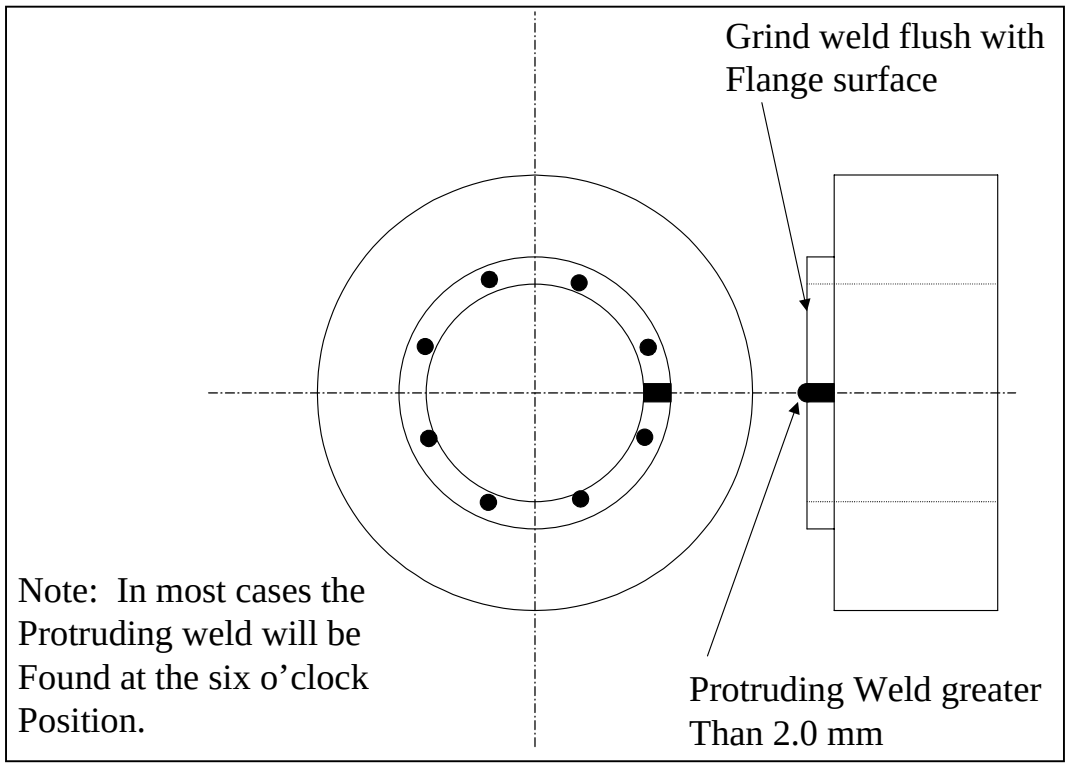
BOTTOM LEVEL OF KIT
ILLUSTRATION B-4

Item No.	Description
1.	Legs for Spider Assembly
2.	Leg for Spider Assembly with Spring loaded Foot
3.	Center Shaft Ends
4.	Spider Assemblies

APPENDIX C – MAGNET FLANGE ISSUES

If any of the following conditions are observed additional actions must be performed to allow proper fit between the Alignment Ring and the magnet flange. Worst case is a protruding magnet weld. The magnet must be ramped down for this situation.

C-1 Protruding Magnet Weld



If the Protruding weld is greater than 2.0mm, you must ramp the magnet down and grind off the weld.

IMPORTANT
Inform the customer that the Upgrade will take longer than expected.

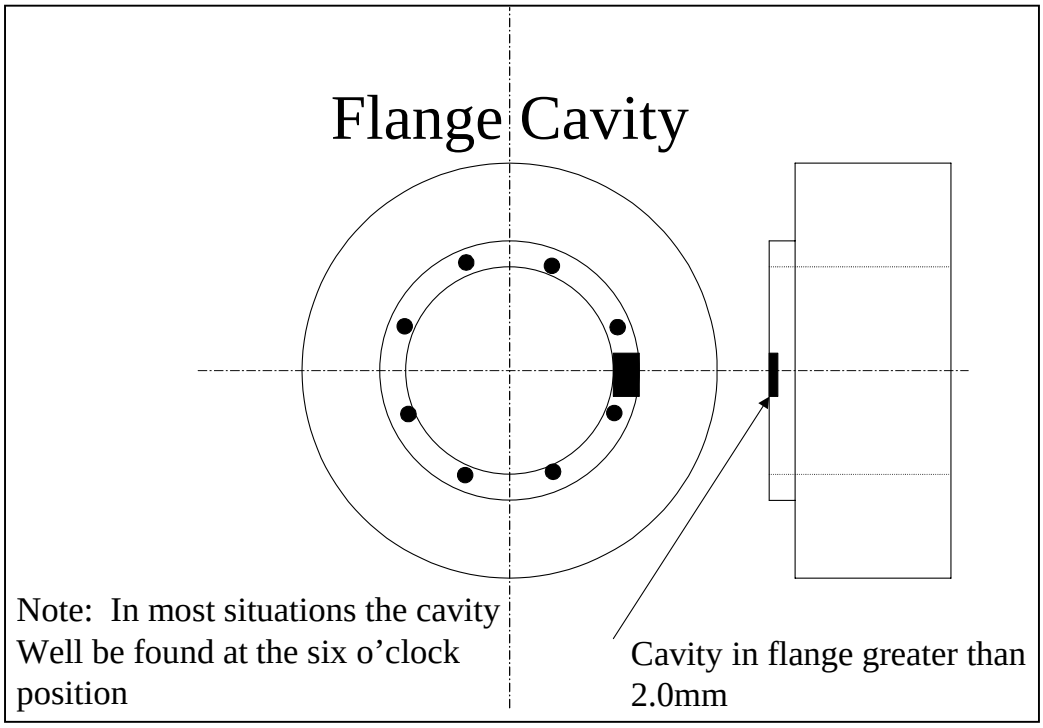
Tools needed:

- Ramp supply, Shim supply and associated equipment needed to ramp magnet.
- Die Grinder/Electric Drill
- Abrasive media for above selected tool
- Shop Vacuum or similar
- Drop Cloth or similar
- Tape
- Rags
- Alcohol

Procedure:

1. Ramp magnet down using standard procedure.
2. Remove the gradient coil from the magnet.
3. Use Tape and Drop Cloth, cover the area around the protruding weld of the magnet.
4. Prior to grinding turn the Shop Vac on to capture the debris from the grinding action.
5. Grind off the weld so the magnet flange surface is flush within .5mm.
6. Remove tape and drop cloth, then clean the magnet with rags and alcohol.
7. Install the TRM gradient coil.
8. Ramp the magnet.
9. Complete the Upgrade.

C-2 Cavity in Magnet Flange



If any Cavity on the Magnet Flange is greater than 2mm, it must be filled in with RTV.

Tools Needed:

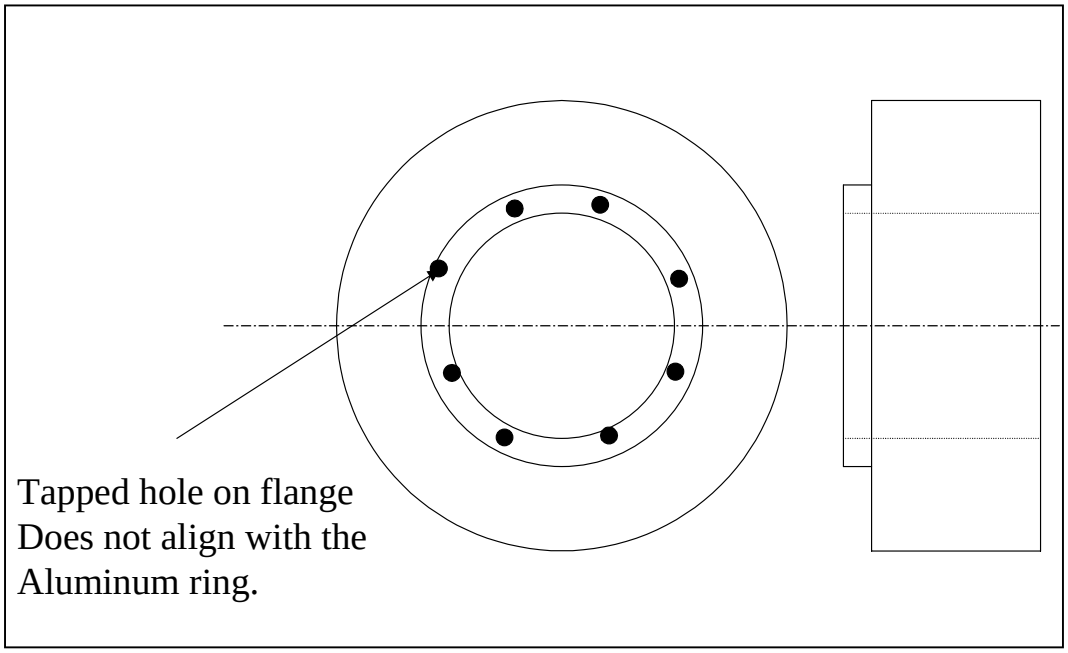
- RTV
- Level or Straight Edge

Procedure:

1. Using a level determine the amount of RTV needed to fill in the cavity.
2. Fill in the cavity with RTV using a straight edge.

IMPORTANT
The RTV must be supported to prevent it from being pulled into the vacuum space.

C-3 Miss-aligned Hole in Magnet Flange



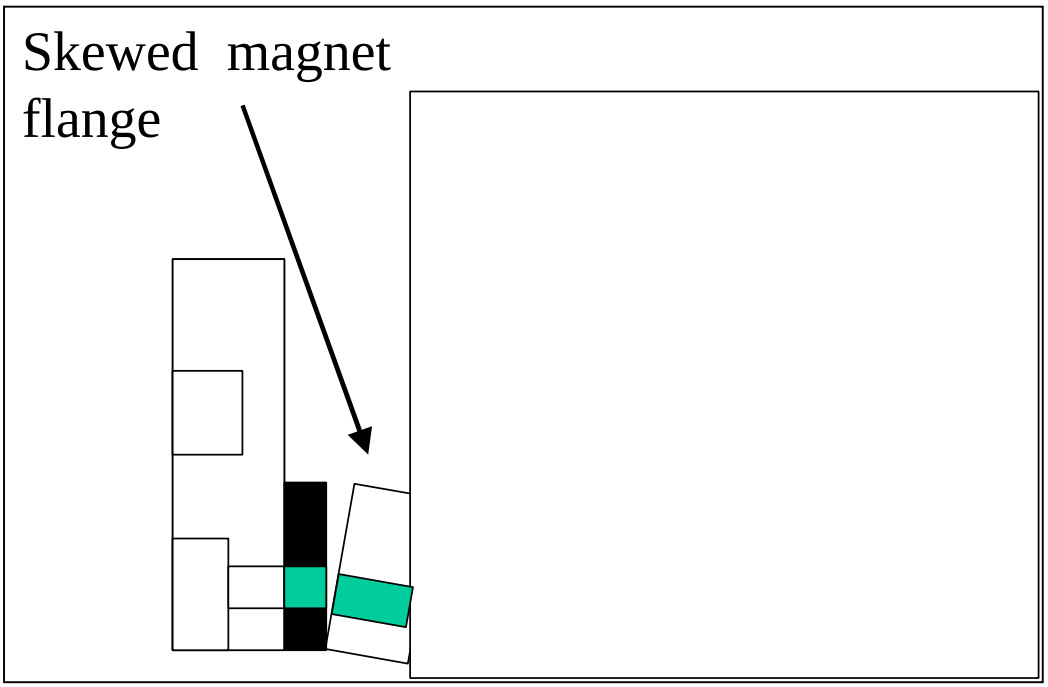
Tools needed:

- RTV

Procedure

1. Remove the plastic bushing in the Aluminum Alignment Ring. Try to install the bolt with the bushing removed. If the bolt can be threaded into the magnet, use Electrical tape to isolate the bolt from the Alignment Ring.
2. One bolt can be left out per flange, provided that the bolt does not support the TRM coil. Downside to this method will be a vacuum leak. The open bolthole must be filled with RTV to avoid a vacuum leak.
3. The Aluminum Alignment Ring may need to be drilled out. Determine new diameter of hole and take alignment ring to a machine shop to be drilled out. Use a non-conductive washer to isolate the Alignment Ring from the bolt.

C4 Skewed Magnet Flange



Tools Needed:

- RTV
- Level or Straight Edge
- Square

Procedure:

1. Using a straight edge or square, determine amount and location of RTV needed on the magnet to produce a flat surface.
2. Apply RTV to the magnet flange to create a parallel surface for mounting of the Alignment Ring.

TRM Coil Rigging Using Forklift/Spreader Beam/Lifting Straps

Overview

The plan for Twin*Speed* upgrades is to ship TRM Coils to the field on wooden shipping skids. This will make it necessary for the field team to work with riggers to remove the coil from the skid and place it on the aluminum service cart. This document provides information on the hardware used to perform the task and also shows the key elements required to perform the task safely.

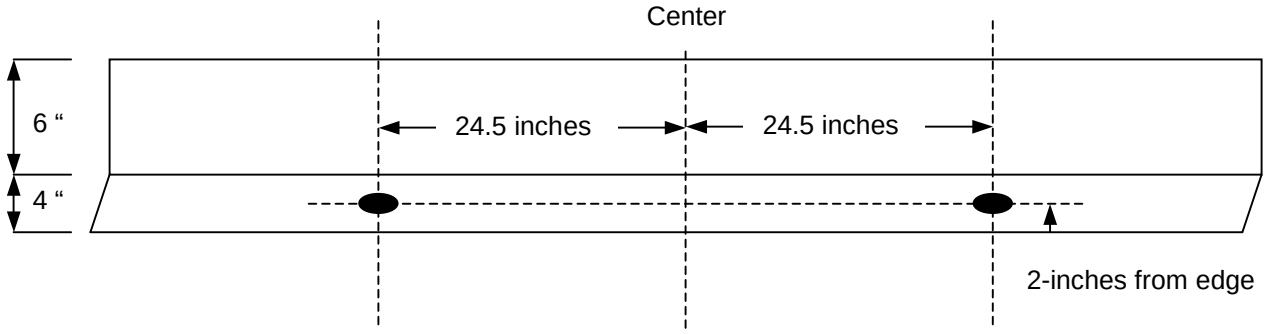
Hardware

Item	Qty	Description
1.	1	Modified - LCC magnet lifting beam – added two holes for attaching eye bolts (use as a spreader beam for vertical lift of the TRM Coil).
2.	1	Forklift (load capacity 4050 lbs with a center of gravity located 30-inches away from the truck with a maximum height of 180-inches).
3.	2	Nylon lift straps, pn 6EE1, twist tapered eye to eye, 12-feet long x 3-inches wide, load capacity – basket lift 6600 lbs, choke lift 2700 lbs.
4.	2	1-inch screw pin anchor shackle.
5.	2	3.5-inch eyebolts with flat washer, lock washer and nut.
6.	2	4-inch C-clamps.

Process

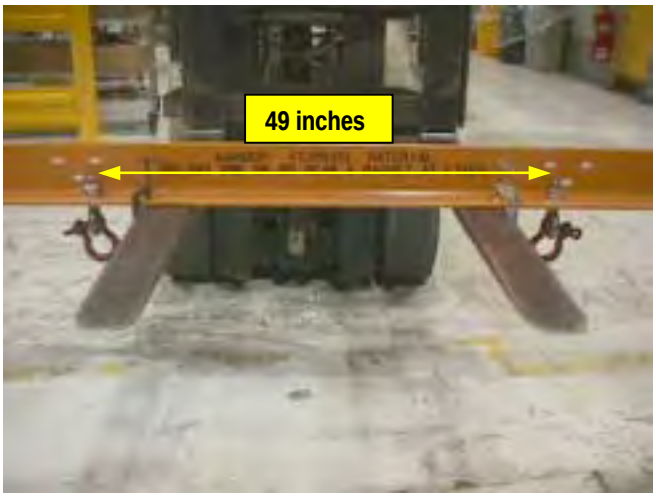
Note: Steps 1 to 4 refer to modifying one of the LCC magnet lifting beams to use as a spreader bar. This would not be required if rigger can provide a spreader bar that will support the 3000 lb. (1363 kg) TRM Coil. The position of the lifting straps on the coil is critical.

Step 1 – Modify one of the LCC magnet lifting beams. Add two-hole locations, 1-1/8 inch diameter on the 4-inch wide side of the angle beam as follows.

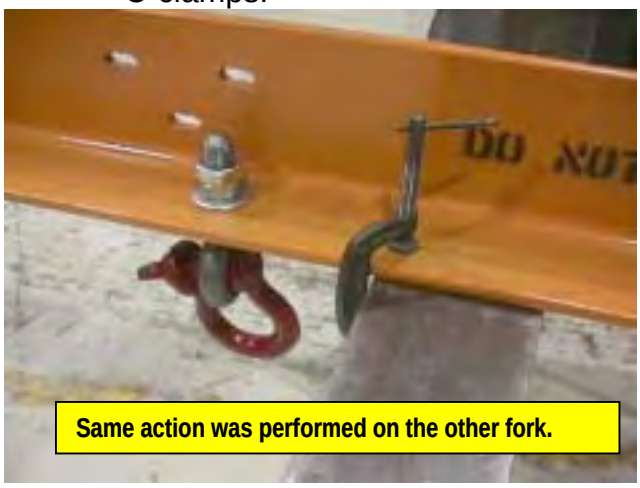


Step 2. Assemble eyebolt and shackle to lifting beam (49 inches on center).

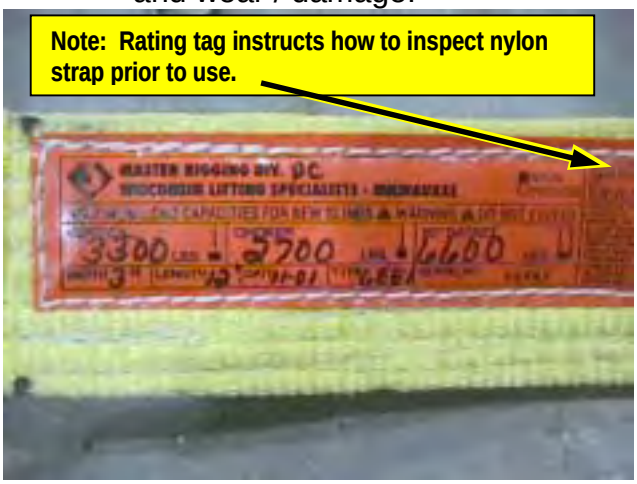
Step 3. Install beam on forks as shown below



Step 4. Secure beam to both forks with C-clamps.



Step 5. Inspect lifting strap for proper rating and wear / damage.



Step 6. Insert lifting straps through pockets on shipping skid.

Step 7. Attach lifting straps to shackles.

Step 8. Vertical lift of coil

A. The TRM coil should be lifted vertically without any sideways movement. Damage could occur to the TRM coil aluminum mylar shield, located under the cardboard wrap, where the straps are pressing against the coil.

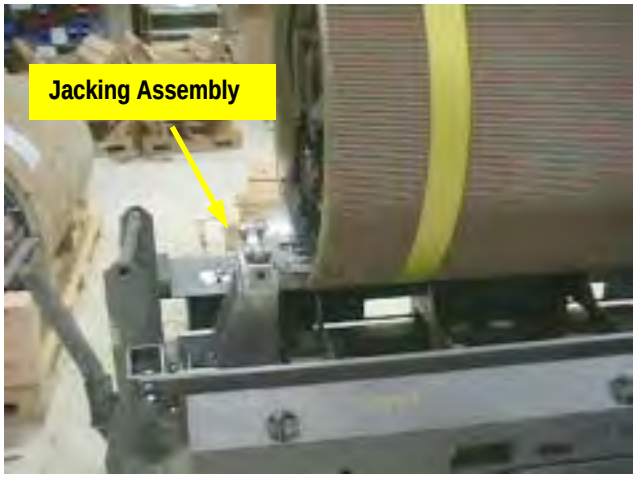
B. Remove the wooden coil cradle.

Note: The distance from the top of the fork to the floor measured 98 inches. This height allowed for the removal of the skid and the installation of the aluminum cart with cradle.

WARNING

The jack on the Tube Jacling Assembly is Ferrous. Personal injury or equipment damage may result if taken too close to the magnet. Keep as far from the magnet as p[ossible when removing from magnet room.

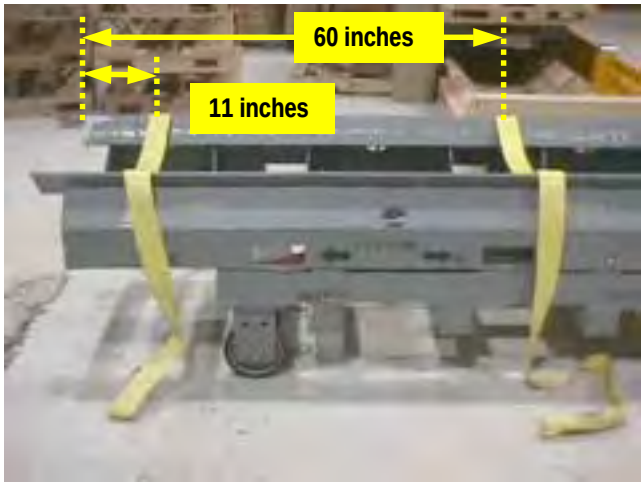
Step 9. Move cart (with jacking assembly installed) under the coil.



Step 10. Align the TRM coil bracket with end of the cradle, this allows enough room for the jack assembly at the other end of the cart.

Step 11. Disconnect straps from the shackles and transport to magnet room.

Note: At this point the cart would be moved to the magnet room where the Gradient Coil Insertion tool hardware is installed onto the coil and the magnet. The straps will be entrapped by the coil and cannot be removed until the coil has been lifted with the insertion tool.

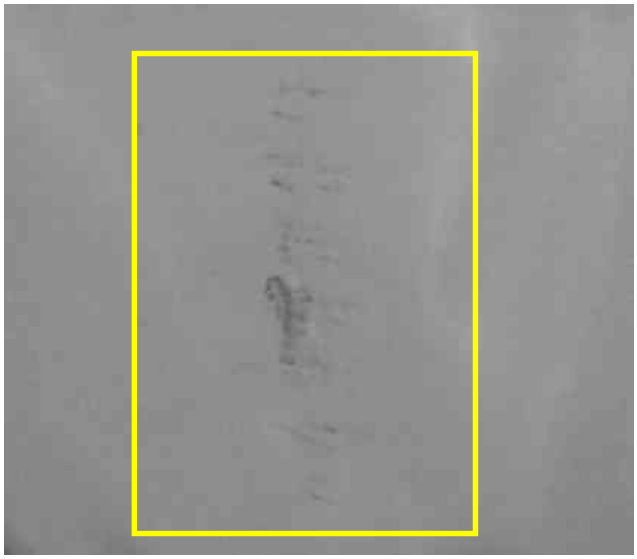


Note: When removing a coil from the magnet it will be necessary to pre-position the straps on the cart before extracting the coil from the magnet bore.

Inspection of Mylar Shield

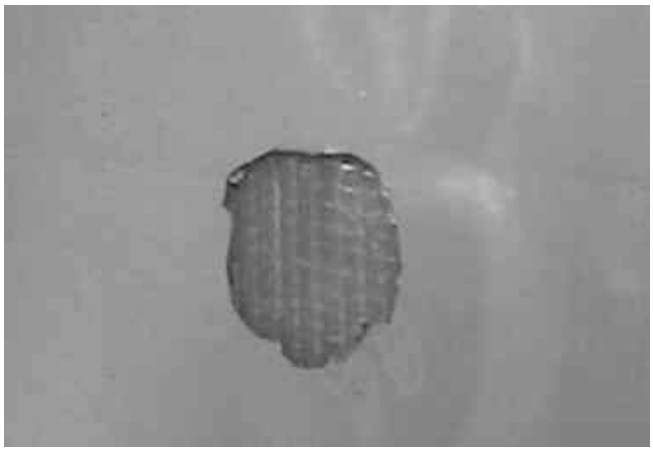
The following steps show a damaged section of shield and a repair process.

Step 1. As soon as the coil is suspended on the pipe and rollers, remove the protective cardboard wrap and inspect the aluminum Mylar shield for damage.



Step 2. Cut out damaged area of Mylar.
Note: Any cuts or punctures in the Mylar could become a spike noise source and must be repaired.

Step 3. Cut out the damaged area in a circle fashion not a square one that would result in sharp corners and cover the exposed area with Teflon tape.



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REVISION HISTORY 39

1- DESCRIPTION

This procedure describes the removal and replacement of the Twin Resonator Module (TRM) in systems **with** LCC, and WideOpen Enclosure Magnets. The TRM uses the BRM-D parts for installation/removal.

2- LIST OF EQUIPMENT & PARTS

Note

There are 2 revisions of Gradient Insertion tools. The original kit (2164744) is used to replace a BRM coil. The upgraded kit (2164744-4) can be used to replace BRM, coils, CRM coils, BRM-D coils, and TRM coils.

Item #	Description	Quantity	Part Number
1.	Gradient Insertion Tool & Lift Kit	1	2164744-4
	Kit contents:		
	Tube Support Plate Assembly	1	2284928
	Male Support Tube Assembly (weighs 80 lbs)	1	2284929
	Female Support Tube Assembly (weighs 60lbs)	1	2284930
	Tube Guide Roller Assembly	2	2164707
	Tube Jacking Assembly	1	2290367
	Crate	1	2172196
	Hex Head cap screws M10 x 80 stainless	10	46-318508P59
	Hex Head cap screws M10 x 25 stainless	4	46-318508P20
	M10 x 120 stainless steel studs	16	2180498
	M10 stainless steel nuts	24	2109875-4
	M10 stainless steel flat washers	24	2109878-4
	Hex Head Cap Screw M10 x 50 stainless	10	46-318508P25
	Washer Plain – Normal 13 mm 24 mm	8	46-328430P8
	Hairpin Cotter, 1/8 Dia Wire, stainless	2	46-252065P118
	Stud stainless, M10 x 65	6	2116325-2
	BRM Roller/Bracket Assemblies	2	2121111
	CRM Roller/Bracket Assemblies	2	2187590
	BRM-D Roller/Bracket Assemblies (Pat. End)	1	2213270
	BRM-D Roller/Bracket Assemblies (Svc. End)	1	2213270-2
	Bolts for BRM Rollers	10	2109866-24
	3/8 x ¾ x 3” Plain Steel Spacer	2	2224994
	3/8 – 16 Steel Nut Wing	8	2224996
	Rope (10 ft long with snap clips)	1	2188986
	BRM Insertion Tool Ident Label	1	2280510
	Gradient Coil Lift Kit	1	2326753
	Stainless Steel Sleeve Spacer	8	2315733
2.	BRM/BRM-D/CRM Cart	1	2134810
3.	Aluminum Cradle	1	2134810-2
4.	Cable Crimper/Stripper Kit	1	2134776
5.	Poron Seal, for air cover	1	2185175
6.	Poron Seal,	4	2181231
7.	Poron Seal	8	2181231-2
8.	Red Loctite # 271	1	46-170686p3
9.	Blue Loctite # 242	1	46-170684p2
10.	Alcohol	1	Field Supplied
11.	Ty-wraps	5	Field Supplied

Item #	Description	Quantity	Part Number
12.	Splice kit	1	2241521

From the TRM LCC Gradient ISO Install Kit 2297692:

SUPPORT MOUNTING, TRM	2	2272016
SPACER SHIM 1.5MM THK	2	2238908
SPACER SHIM 2.4MM THK	6	2238908-2
SPACER SHIM 16MM THK	2	2238908-3
RUBBER ISOLATION PAD	2	2241176
SCREW SET SCREW 10 MM 25 MM--Grub	2	2251295
SCREW SET SCREW 10 MM 30 MM--Grub	1	2251295-2
MTG PAD, 1/4" THICK NEOPRENE	4	2131953-5
SET SCREW- MTG.PAD	4	2293535
RADIAL SHIM SPACER 1.5MM THK	4	2293771
RADIAL SHIM SPACER 0.8MM THK	8	2293771-2

List of Non-Magnetic Tools

1. 3/8 inch T-bar allen wrench
2. 5/16 inch right angle allen wrench
3. 8 mm allen wrench
4. 8 inch adjustable wrench
5. 17 mm open end wrench
6. 10 mm socket
7. 13 mm socket
8. 17 mm socket
9. 19 mm socket
10. 24 mm socket
11. 3/8 inch drive ratchet
12. 1/2 inch drive ratchet
13. 3 inch long extension for 1/2 inch drive
14. 3 Foot Long Level
15. Phillips Head Screwdriver
16. Standard Flat Head Screwdriver

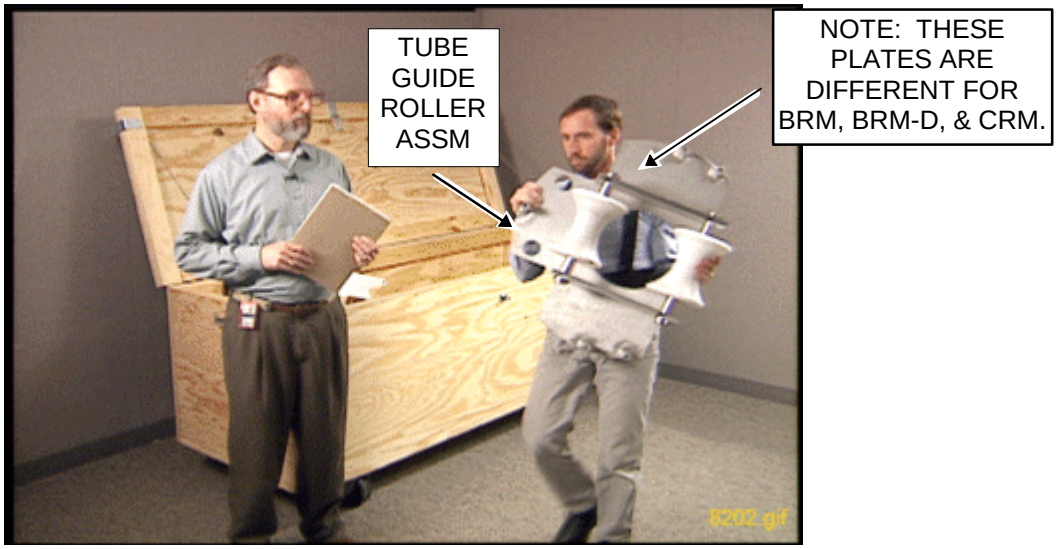
3- REMOVING THE TRM

1. Remove the bridge and the front and rear end bells. See procedures ME2REA11, *Front End Bell Removal*, ME2REA12, *Rear End Bell Removal*, and MEREA13, *Split Bridge Replacements*.

2. Remove the two Tube Guide Roller Assemblies from the crate. You may need to exchange the rollers to the appropriate Plate Assembly; the TRM uses the BRM-D plates. See Illustration 3-1. Install the Patient End Assembled Tube Guide Roller Assembly onto Patient End of the Gradient Coil. See Illustration 3-3. The kit contains 2 M10 x 120 studs. Use these studs at the top-hole location. The stud will support the Tube Guide Roller Assembly and will assist the alignment of the remaining bolts. Use the M10 x 80 bolts supplied in the kit. Tool to use: 17 mm socket and ratchet.

Note

When using the BRM-D Plate Assemblies, the M10 x 120mm studs must be used.



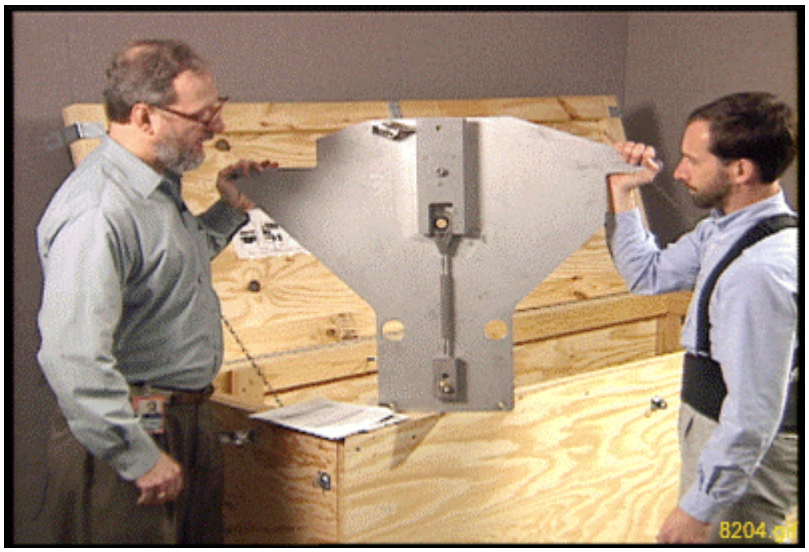
TUBE GUIDE ROLLER ASSEMBLY
ILLUSTRATION 3-1

BRM-D PLATE ASSEMBLY INSTALLED ON PATIENT END
ILLUSTRATION 3-2

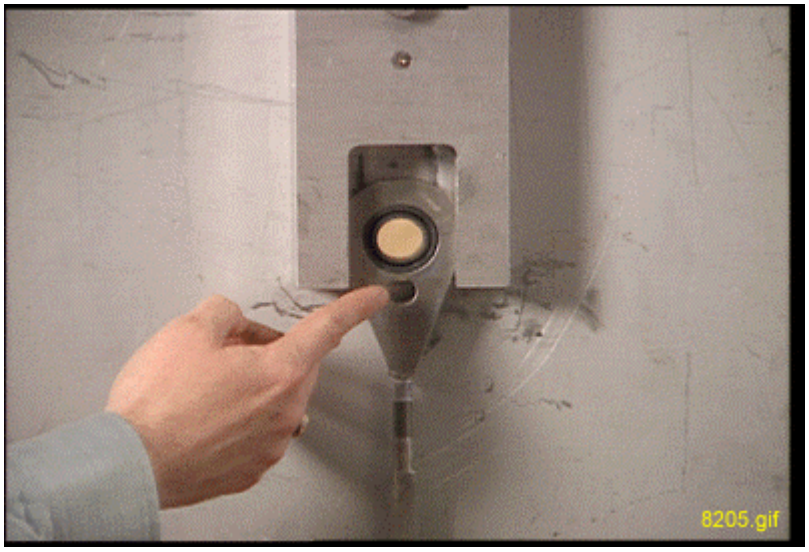
Note

Each assembly requires 4 bolts and 1 stud.

3. Remove the Tube Support Plate Assembly from the crate. See Illustration 3-3. Adjust the alignment bearing for center position as viewed from the side with the round cut out. See Illustration 3-4.



TUBE SUPPORT PLATE ASSEMBLY
ILLUSTRATION 3-3



ALIGNMENT BEARING TO CENTER POSITION
ILLUSTRATION 3-4

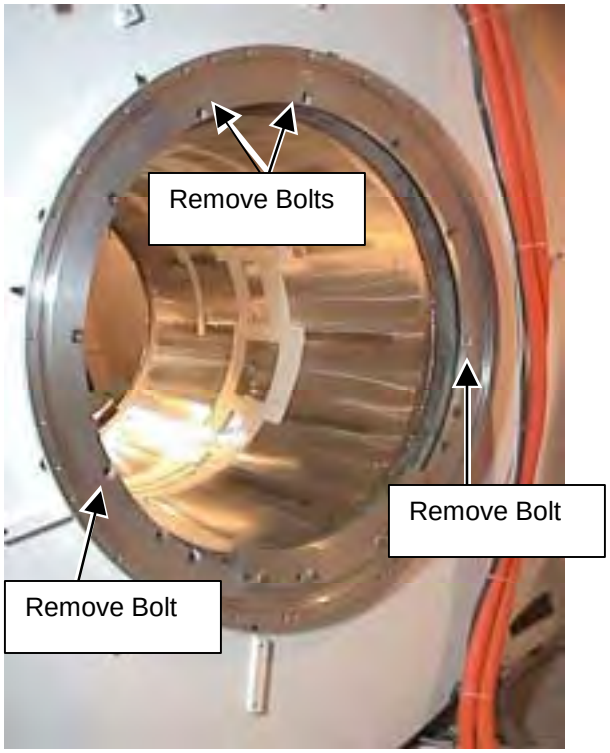
Note

For the vertical adjustment a clockwise rotation results in the alignment bearing moving down. Use an adjustable wrench for the vertical adjustment. For the horizontal adjustment a clockwise rotation results in the alignment bearing moving to the left. Use the 3/8 inch T-bar allen wrench for the horizontal adjustment.

CAUTION

Do NOT use force on any stud or bolt used to secure the insertion tool hardware to the magnet interface ring or Gradient Coil. The potential exists for a stud or bolt to gall the threads on the interface ring or Gradient Coil.

4. Go to the rear of the magnet and Install the Tube Support Plate onto the magnet interface rings by performing the following steps.
   a. Remove screws from the interface ring so the Tube Support Plate can be installed. See Illustration 3-5.



LOCATION OF BOLTS TO BE REMOVED ON REAR OF MAGNET INTERFACE RING
ILLUSTRATION 3-5

b. Install four of the M10 x 60 studs in the interface ring openings as shown in step a, see Illustration 3-6.

PLACEMENT OF STUD ON THE INTERFACE RING
ILLUSTRATION 3-6

c. Place bushing on stud. See Illustration 3-7.

IMPORTANT

YOU MUST USE BUSHINGS, OR DAMAGE COULD OCCUR.

PLACING BUSHING ON STUD
ILLUSTRATION 3-7

d. Tighten the stud that will support the weight of the Tube Support Plate Assembly, see Illustration 3-8.

TIGHTENING STUD
ILLUSTRATION 3-8

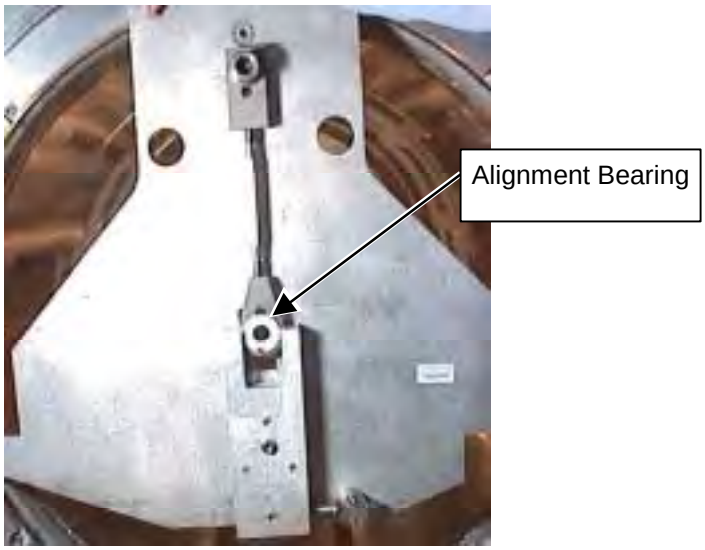
e. Place the Tube Support Plate Assembly from the Rear of the Magnet. See Illustration 3-9.

TUBE SUPPORT PLATE ASSEMBLY ON REAR OF MAGNET
ILLUSTRATION 3-9

f. Place the washer and nut on each stud from the Plate Assembly and secure the plate. See Illustration 3-10.

PLACING WASHER AND NUT ON STUD
ILLUSTRATION 3-10

g. Adjust the alignment bearing for center position as viewed from the side with the square cut out. See Illustration 3-11.



ALIGNMENT BEARING TO CENTER POSITION
ILLUSTRATION 3-11

8. Remove the Male Tube Assembly from the crate and remove the cotter pin from the shaft. Slowly install the tube, shaft end first, through the front Tube Guide Roller Assembly on the patient end and guide the shaft through the alignment bearing that is located on the Tube Support Plate on the Service end of the magnet. View video of tube insertion of the BRM to become familiar with the process.

Note

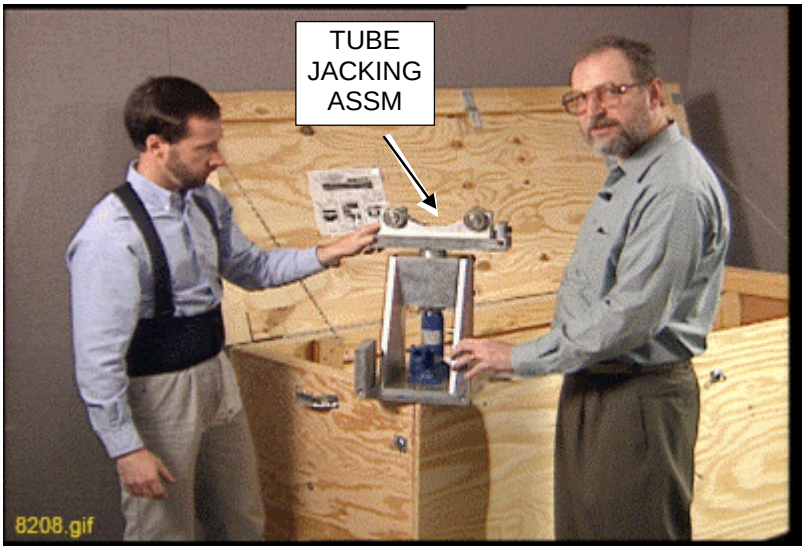
Be very careful not to force the shaft through the alignment bearing. Make vertical or horizontal adjustments to bring the alignment bearing in alignment with the tube shaft.

9. Install the cotter pin after the shaft is in place.

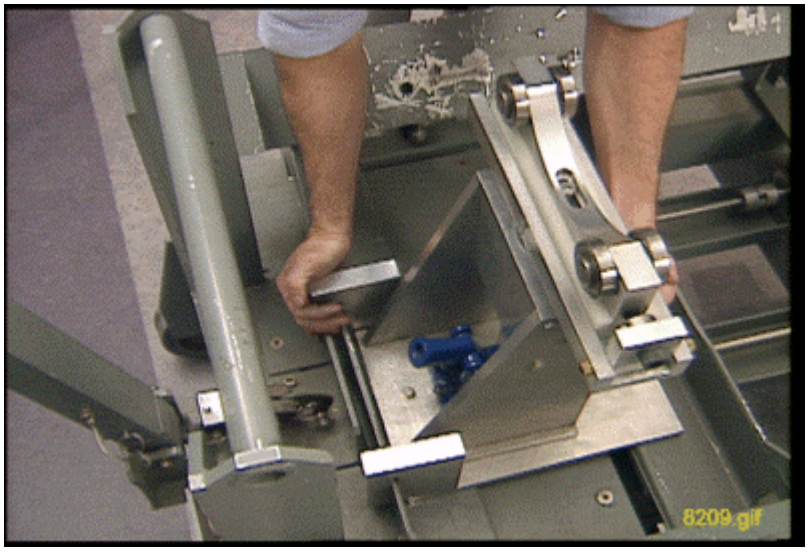
CAUTION

The jack on the Tube Jacking Assembly is ferrous. Personal injury or equipment damage may result if taken too close to the magnet. Always keep the Tube Jacking Assembly mounted and screwed to the aluminum coil cradle when used in the magnet room.

10. Remove the Tube Jacking Assembly from the crate. See Illustration 3-12. Install it onto cradle/cart. Secure with bolt through Tube Jack Assembly Base Plate. See Illustration 3-13.



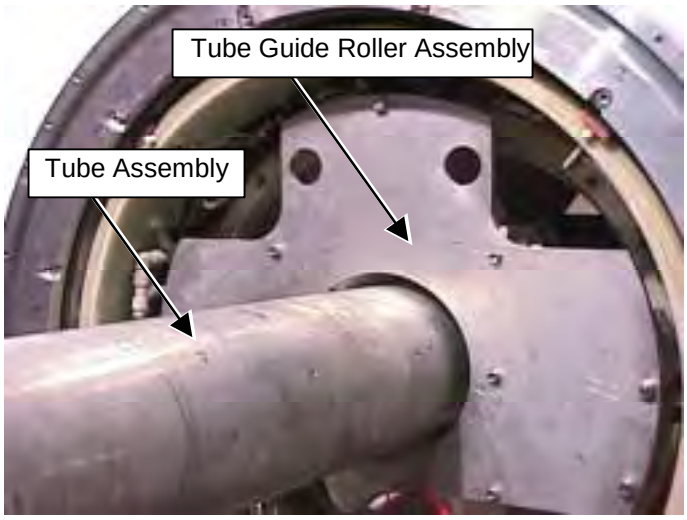
TUBE JACKING ASSEMBLY
ILLUSTRATION 3-12



SECURE TUBE JACKING ASSEMBLY
ILLUSTRATION 3-13

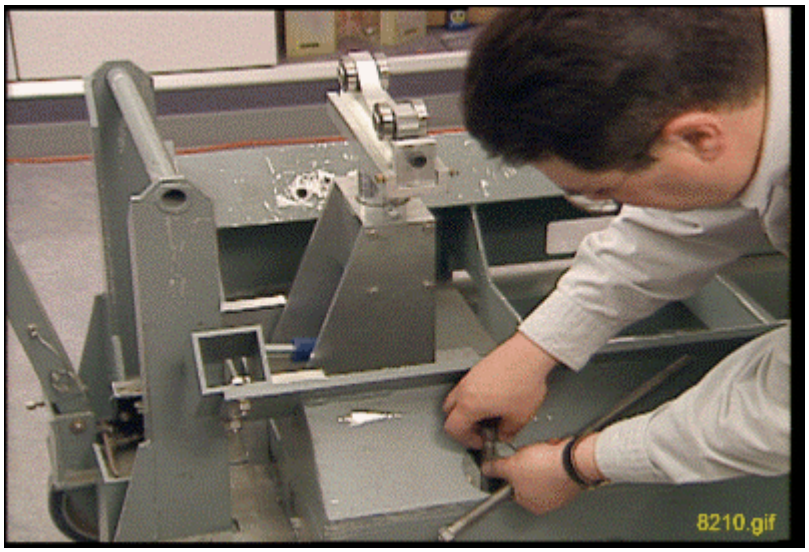
11. Move the empty cradle/cart assembly into the magnet room. Position the cart in front of the magnet and center the cart left/right in respect to the patient bore. Make sure the Tube Jack Assembly is physically centered and the left/right adjustments are at a nominal setting before starting the next step. Use a 5/16 inch right angle allen wrench to tighten the Tube Jack Assembly to the cart.

12. Remove the Female Tube Assembly from the crate. Support the Female Tube Assembly on the Tube Jack Assembly and then thread it onto the Male Tube Assembly. See Illustration 3-14.



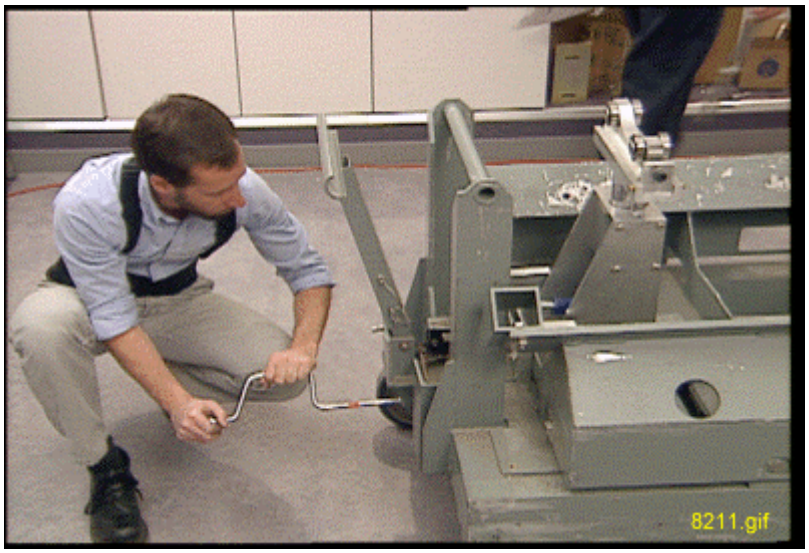
TUBE ASSEMBLY IN THE TUBE GUIDE ROLLER ASSEMBLY
ILLUSTRATION 3-14

13. Remove the Gradient Coil cradle fasteners, two per side, from the cradle. See Illustration 3-15.

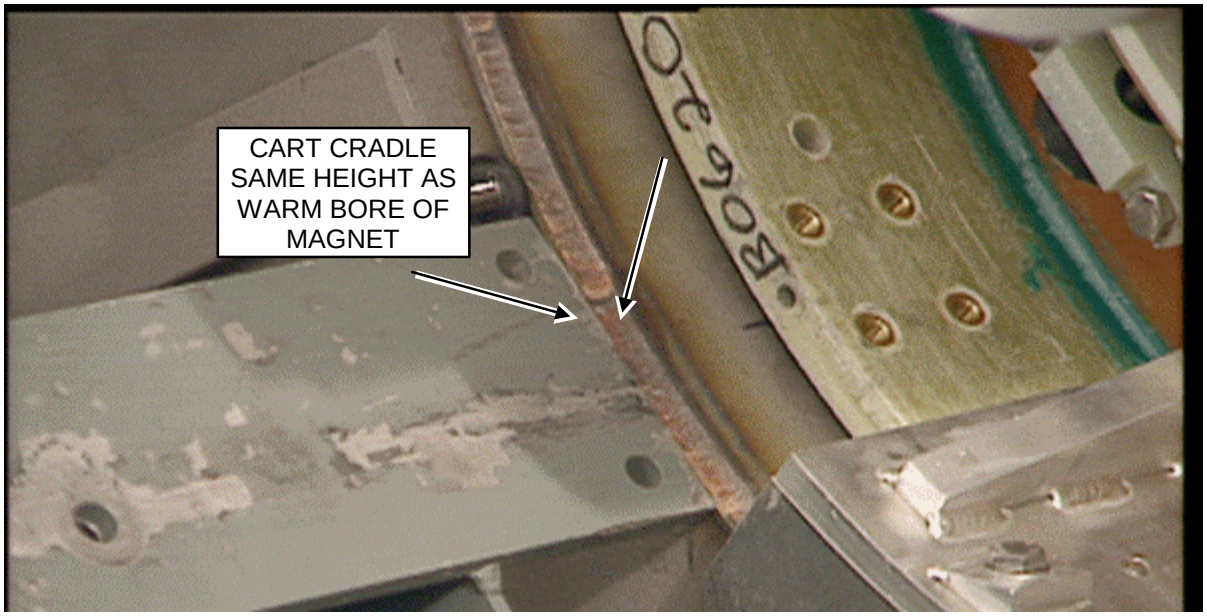


REMOVE GRADIENT COIL CRADLE FASTENERS
ILLUSTRATION 3-15

14. Adjust the height of the cart as shown in Illustration 3-16. Tool to use: 19mm socket. Adjust height so the end of the cradle is the same height as the warm bore of the magnet and flush against the end flange See Illustration 3-17.



ADJUST CART HEIGHT
ILLUSTRATION 3-16



ADJUST CART HEIGHT TO WARM BORE HEIGHT
ILLUSTRATION 3-17

15. Release the hand lever on the cart handle to set the brakes so the cart will not move after the cart is aligned to the magnet bore.

CAUTION

For the next two steps, the coil is still attached to the magnet interface rings of the magnet with the gradient isolation brackets. Do not attempt to raise the coil with the jack. The next two steps prepare the roller assemblies to take the Gradient Coil weight when transferred from the magnet to the rollers. Do not attempt to loosen any of the bracket bolts when the Gradient Coil is supported by the tool. Damage to the bolts will result.

16. Operate the jack to raise the tube and watch for the tube to make contact to the upper roller on the front Tube Guide Roller Assembly.

Note

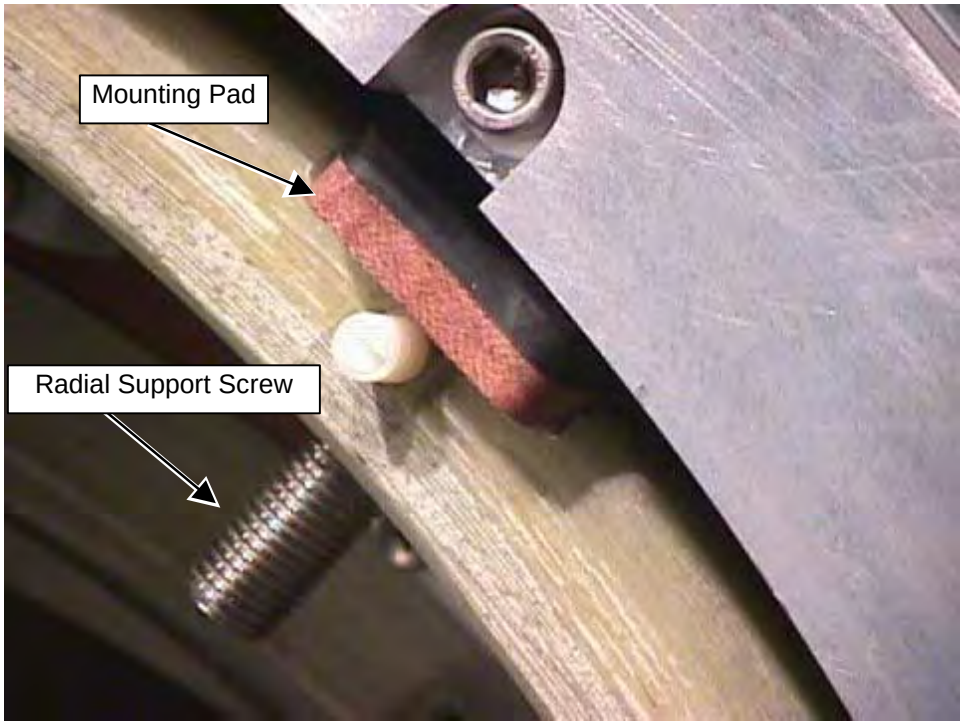
Make sure there is a small amount of resistance to the upward movement of the tube. The top roller should not be able to rotate.

31. Go to the rear of the magnet. Adjust the Alignment Bearing in the vertical direction and watch for the tube to make contact to the upper roller on the rear Tube Guide Roller Assembly. Continue to raise the Alignment Bearing until the back end of the Gradient coil starts to rise off of the cradle.

Note

When this happens the load at the back end of the Gradient coil is transferred from the cradle to the Support Tube and magnet.

32. Back out the two (2) (one on each side) radial supports and remove mounting pads from the upper portion on the front of the coil. See Illustration 3-18.



RADIAL SUPPORT LOCATION
ILLUSTRATION 3-18

21. Remove the Gradient Support Bracket from both ends of the magnet. See Illustration 3-19.

GRADIENT BRACKET SCREW LOCATION
ILLUSTRATION 3-19

22. Remove the Gradient Coil Roller assemblies, quantity 2, from the tool crate. See Illustration 3-20.

GRADIENT COIL ROLLER ASSEMBLIES
ILLUSTRATION 3-20

23. Remove 2 screws that attach the water manifold block to the inner coil face. See Illustration 3-21.

LOCATION OF SCREWS FOR WATER MANIFOLD
ILLUSTRATION 3-21

24. Place roller assemblies on the coil, one on each side of the coil on the Patient end. See Illustration 3-22.

ROLLER ASSEMBLY ON COIL
ILLUSTRATION 3-22

23. Check tube with a level on top of Female Tube Assembly. Make any adjustments with either the jack in the front or the Alignment Bearing in the rear.

24. At the front of the magnet. Operate the jack to raise the tube and watch for the Gradient Coil bracket to raise up off of the end flange bracket. A gap of 1/8 inch or 2 mm is sufficient. Make sure there is no contact with the warm bore or in bore passive shims.

25. Go to the rear of the magnet. Adjust the Alignment Bearing in the vertical direction and watch for the Gradient Coil bracket to raise up off of the end flange bracket. A gap of 1/8 inch or 2 mm is sufficient. Make sure there is no contact with the warm bore or in bore passive shims.

25. Go to the front of the magnet. Verify there is sufficient clearance all around the Gradient Coil for removal onto the cradle and cart.

CAUTION

Make sure the brakes are set on the cart before performing the next step. Personal injury or equipment damage may result if the brakes are not set properly. Make sure to watch and guide all cables attached to the BRM during the removal process. Damage to cables or Gradient Coil may occur if a cable is pinched, cut or snagged.

26. Slowly pull the Gradient Coil forward on the tube and watch the clearance around the coil to make sure it is concentric and level with the bore. This step requires 3 FE's; one in rear to push the coil and guide cables through the bore and two in front to pull on the coil.

CAUTION

Minimize the rotation of the coil on the tube. Damage to the roller assemblies could result.

27. Make sure the roller brackets are in line with the shipping bracket holes on the cradle. This alignment is necessary for installing the shipping blocks later in the procedure.

CAUTION

Watch for tube deflection when adjusting the jacking screws in the next step. Any tube deflection indicates the Gradient Coil is in contact with the warm bore thereby resisting free motion. Personal injury or damage to the tool could result.

28. Slowly lower the jack to allow the Gradient Coil weight to transfer to the Gradient Coil rollers.

CAUTION

The jack on the Tube Jacking Assembly is ferrous. Personal injury or equipment damage may result if taken too close to the magnet. Keep as far away from magnet bore as possible when removing from magnet room.

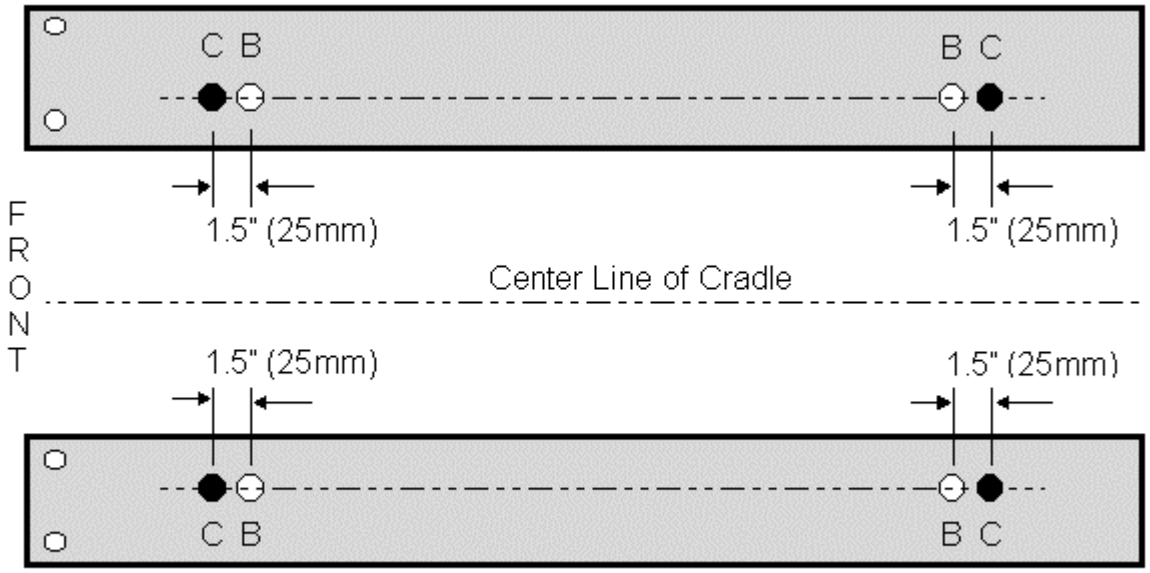
29. Remove the bolt from the Tube Jack Assembly baseplate, remove the jack and take it out of the magnet room. The cradle is now clear to allow the Gradient Coil to move forward on the cart.

30. With 3 FE's pulling from the front, move the Gradient Coil over the cradle so it is centered from front-to-back on the cradle.

Note

It may be necessary to lower the cart to allow the back end of the Gradient Coil to clear the cradle.

31. ***CRITICAL STEP!*** Make sure the shipping bracket holes for the gradient coil will line up with the holes on the cradle of the cart before removing the rollers. See Illustration 3-23. The BRM, BRM-D, and CRM each have unique holes in the cart for shipping, be sure to align the TRM to the "B" holes on the shipping cart. You may have to rotate the Gradient Coil and/or move forward or back on the cradle to align the holes. See Illustration 4-8 for picture of shipping bracket installed.



C = CRM Mounting Holes; B = BRM/BRM-D Mounting Holes

SHIPPING CART BRACKET HOLE LOCATIONS
ILLUSTRATION 3-23

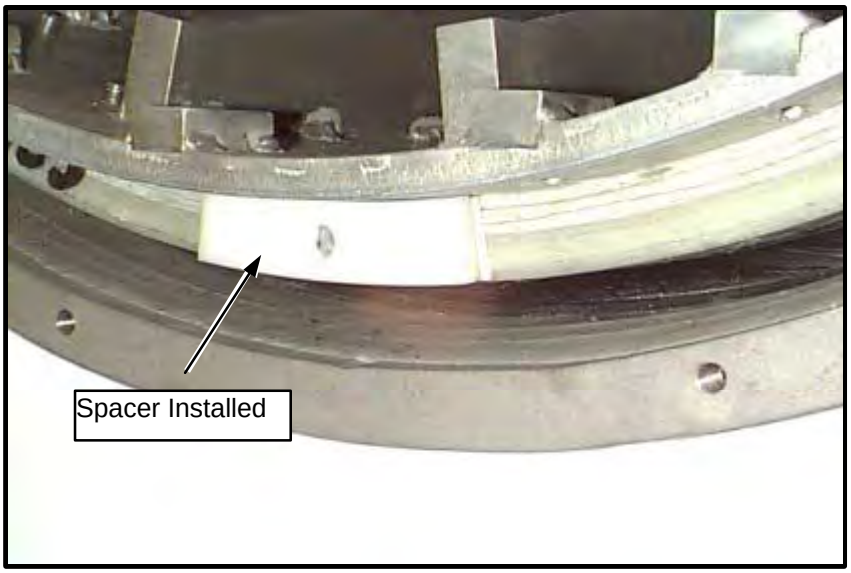
32. Slowly lower the back end of the Gradient Coil onto the cradle by lowering the alignment bearing at the back end of the magnet.

CAUTION

Make sure the weight of the Gradient Coil has transferred from the tube to the cradle/cart before proceeding to the next step. Personal injury or equipment damage may result if the load was not transferred.

33. Adjust the jacking screws on the roller block for wheel removal, remove the rollers and pins then lower adjust the jacking screws to lower the Gradient Coil to the cradle.

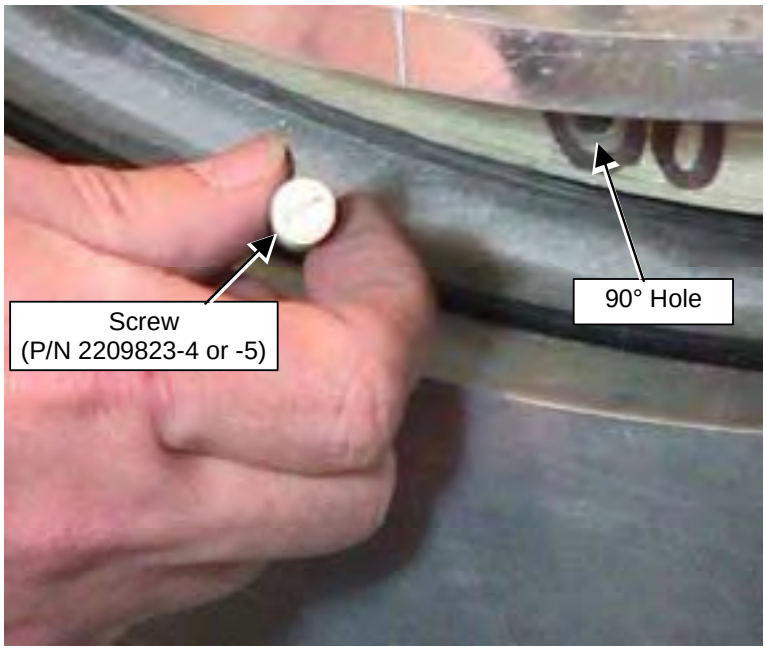
34. Remove the front and rear spacer's on the gradient coil and be careful not to interchange. The front spacer must go on the front location of the replacement coil. See Illustration 3-25 for the location of the spacer.



SPACER LOCATION
ILLUSTRATION 3-25

35. Uninstall 15mm spacer on screw.

36. Uninstall the spacer by removing the screw from the 90° hole. See Illustration 3-26.



UNINSTALLING SCREW FROM 90° HOLE
ILLUSTRATION 3-26

37. Remove the Gradient Coil Roller assemblies. See Illustration 3-27.

ROLLER ASSEMBLY ON COIL
ILLUSTRATION 3-27

32. Replace the 2 screws that attach the water manifold block to the inner coil face. See Illustration 3-28.

LOCATION OF SCREWS FOR WATER MANIFOLD
ILLUSTRATION 3-28

37. Get the rope supplied in the kit and route it under the support tube between the end flange of the magnet and the Gradient coil. Attach the rope the enclosure frame brackets on the cryostat. Adjust the height of the rope so it will provide support for the tube during the disassembly process.

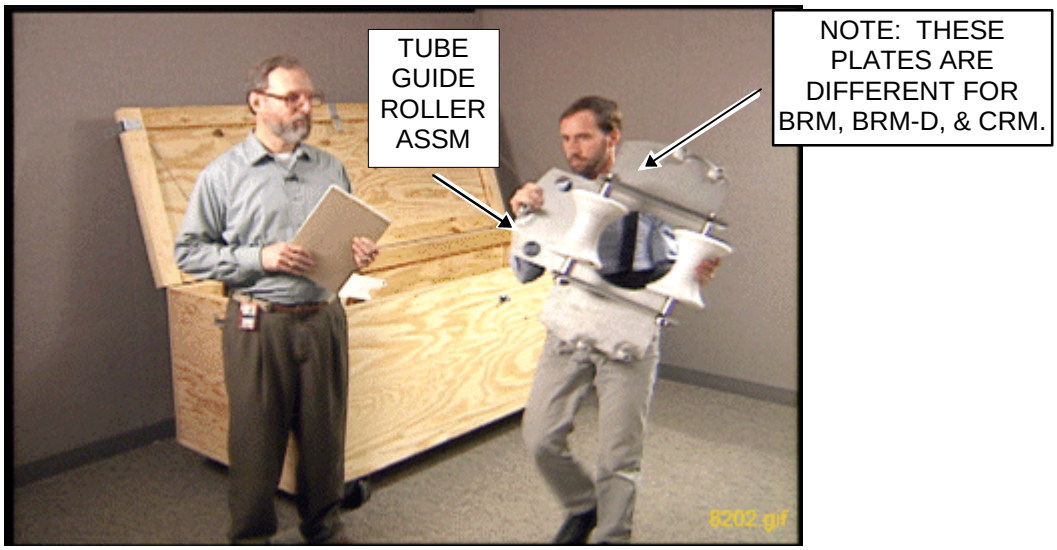
38. The 3 FE's required for this step are positioned as follows: #1 is in the rear of the magnet to remove the cotter pin and to support the tube as it is removed from the Alignment Bearing. #2 is between the coil cart and the magnet, to unthread the tube sections as #1 supports the back part of the section in the bore after the shaft is removed from the Alignment Bearing. #3 is in the front of the coil cart and pulls on the cart after #1 removes the cotter pin; pulling just enough for the shaft of the tube to pull free from the Alignment Bearing.

39. Unthread the tube leaving one section in the bore (supported by the rope and Tube Support Plate Assembly) and leave the other section in the Gradient coil on the cart.

40. Release the brake on the cart and slowly back the cart with the coil out of the room.

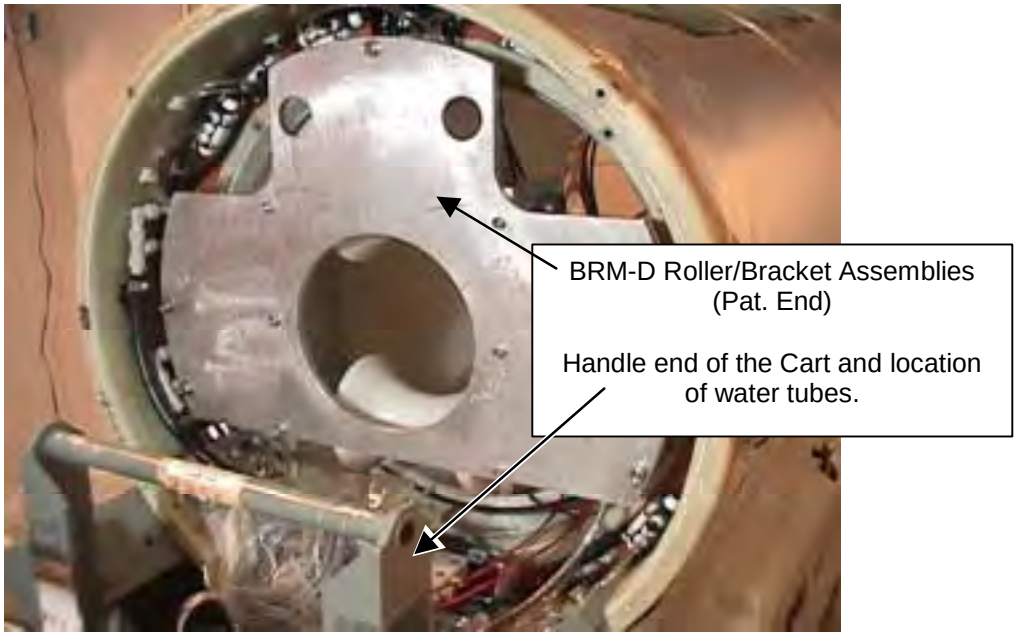
4- INSTALLING THE TRM

1. Remove the two Tube Guide Roller Assemblies from the crate. You may need to exchange the rollers to the BRM-D Plate Assembly. Install one Assembled Tube Guide Roller Assembly onto each end of the Gradient Coil. See Illustration 4-1. The kit contains 16 M10 x 120 studs. Use these studs at the top hole location. The stud will support the Tube Guide Roller Assembly and will assist the alignment of the remaining bolts.



TUBE GUIDE ROLLER ASSEMBLY
ILLUSTRATION 4-1

2. Install the Patient End plate (p/n 2213270) to the coil. See Illustration 4-2.



PATIENT END PLATE ON COIL
ILLUSTRATION 4-2

3. Secure plate, using washer and nut on studs, see Illustration 4-3.

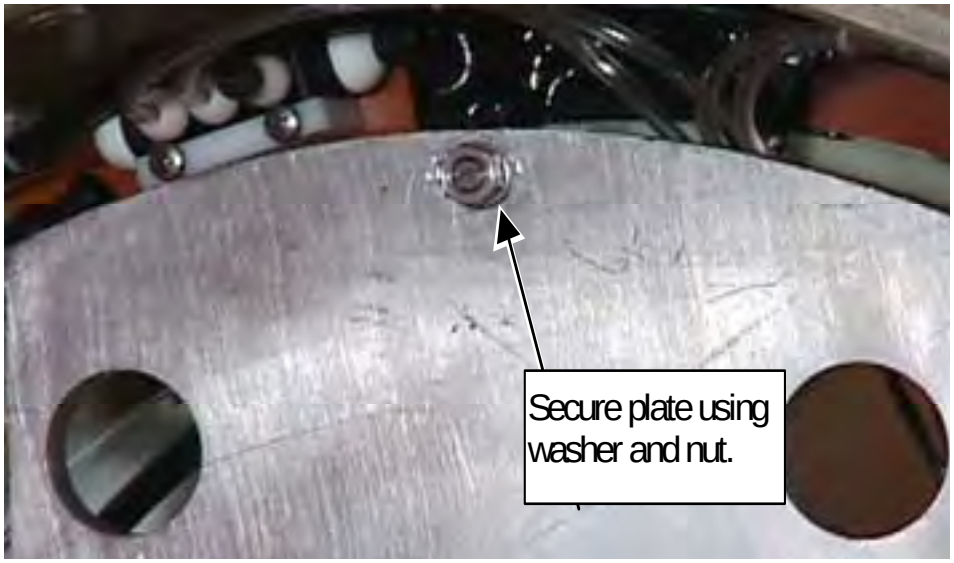
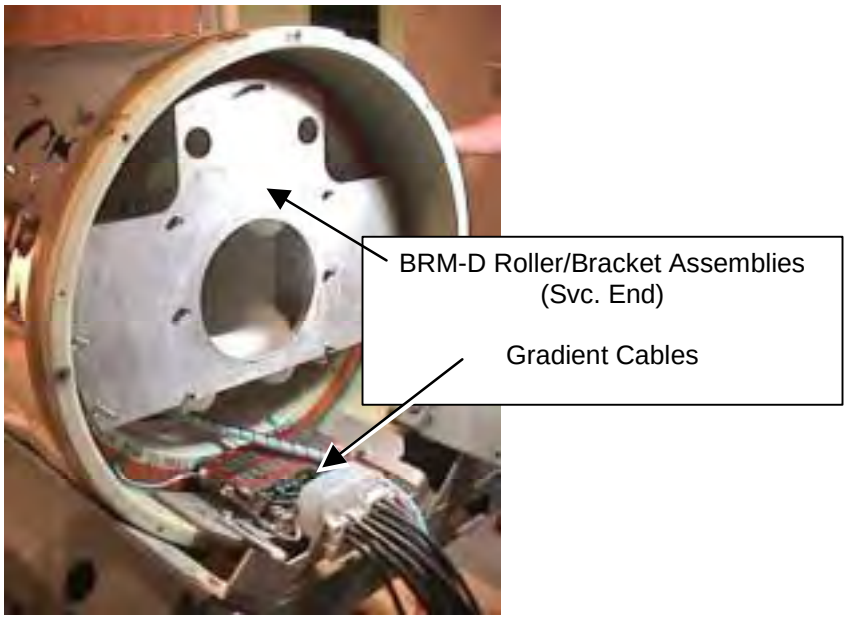


PLATE SECURED TO COIL
ILLUSTRATION 4-3

4. Install the Service End plate (p/n 2213270-2). See Illustration 4-4.



SERVICE END PLATE ON COIL
ILLUSTRATION 4-4

5. Using Alcohol and a clean towel, wipe down the inside of the magnet. See Illustration 4-5.

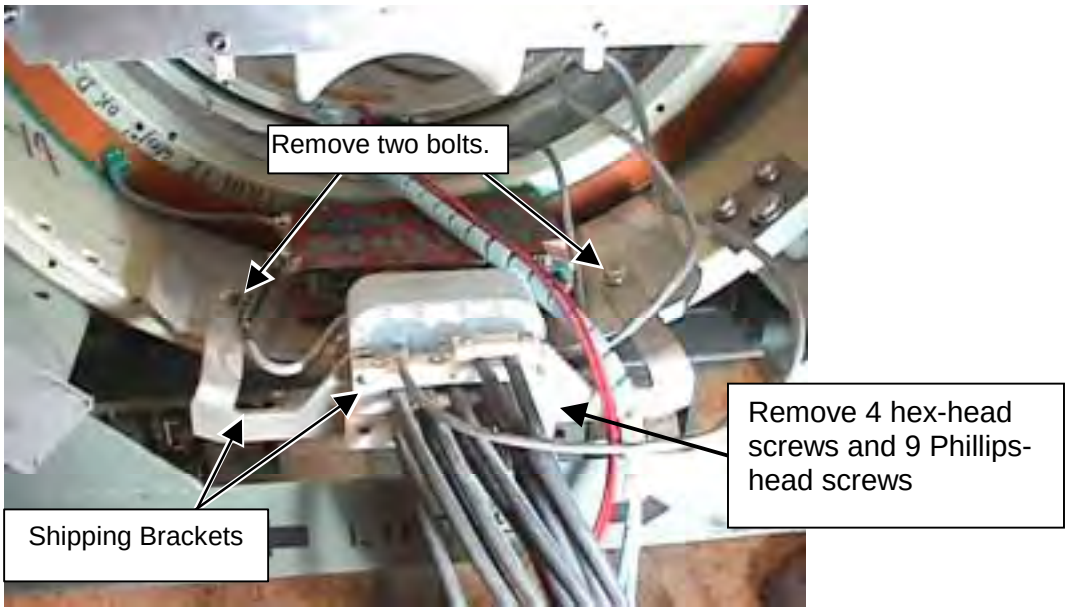
WIPING DOWN INSIDE OF MAGNET
ILLUSTRATION 4-5

6. If Gradient Support bracket is on the front and rear interface rings, remove bracket before installing the coil. The added clearance is needed for pulling the gradient cables through the bore.

WARNING!

POSSIBLE DAMAGE TO GRADIENT CABLE LEADS EXISTS. THE GRADIENT CABLE LEAD CONNECTIONS CAN BREAK EASILY. CAREFULLY REMOVE THE SHIPPING BRACKETS THAT SECURE THE GRADIENT CABLE LEADS.

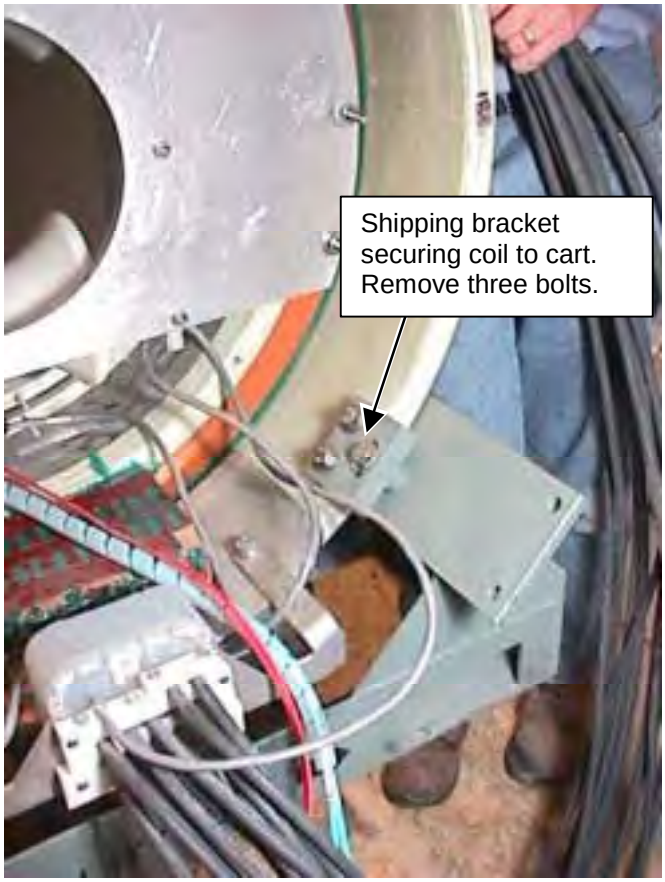
7. On the coil cart, remove the shipping brackets that hold the gradient cable leads in place. See Illustrations 4-6 and 4-7.



LOCATION OF SHIPPING BRACKETS HOLDING GRADIENT CABLES
ILLUSTRATION 4-6

SHIPPING BRACKETS REMOVED
ILLUSTRATION 4-7

8. Remove the shipping bracket that secures the coil to the cart. See Illustration 4-8.



LOCATION OF SHIPPING BRACKET
ILLUSTRATION 4-8

9. Place Male Tube Assembly in magnet and secure to the support plate using the cotter pin.

10. Place the Female Tube Assembly in the coil.

11. Maneuver cart with coil to the front of the magnet.

12. Carefully feed the gradient cables through the bore of the magnet and carefully pull out the back. See Illustration 4-9.

FEEDING GRADIENT COILS THROUGH MAGNET BORE
ILLUSTRATION 4-9

13. Remove shipping bolts from the cart. There are a total of 4 bolts, two on each side. See Illustration 4-10.

REMOVING SHIPPING BOLT FROM CART
ILLUSTRATION 4-10

14. Position the cart in front of the magnet and center the cart left/right in respect to the patient bore. Provide enough room for an FE to stand between the cart and the magnet so the FE can thread the support tube sections together.

15. Release the hand lever on the cart handle to set the brakes so the cart will not move after the cart is aligned to the magnet bore.

16. To properly align the coil, it may be necessary to move the cart up or down. See Illustration 4-11.

ADJUSTING HEIGHT OF CART
ILLUSTRATION 4-11

17. Connect the Tube Assembly. This takes one person at the rear of the magnet to hold the male tube; one person at the patient end of the coil and a person in the middle to make sure the tube connects.

18. Adjust the height of the cart so the end of the Tube is the same height as the Tube in the bore of the magnet.

19. Slowly thread the Tube sections together.

Note

Be very careful not to force the threads. Make vertical or horizontal adjustments, as necessary, to the alignment bearing or cart for an easy fit.

20. Remove the Gradient Coil Roller assemblies, quantity 2, from the tool crate. See Illustration 4-12.

GRADIENT COIL ROLLER ASSEMBLIES
ILLUSTRATION 4-12

21. Remove 2 screws that attach the water manifold block to the inner coil face. See Illustration 4-13.

LOCATION OF SCREWS FOR WATER MANIFOLD
ILLUSTRATION 4-13

22. Place roller assemblies on the coil, one on each side of the coil on the Patient end. See Illustration 4-14.

ROLLER ASSEMBLY ON COIL
ILLUSTRATION 4-14

23. Go to the rear of the magnet. Adjust the Alignment Bearing in the vertical direction and watch for the tube to make contact to the upper roller on the rear Tube Guide Roller Assembly. Continue to raise the Alignment Bearing until the back end of the Gradient coil starts to raise off of the cradle.

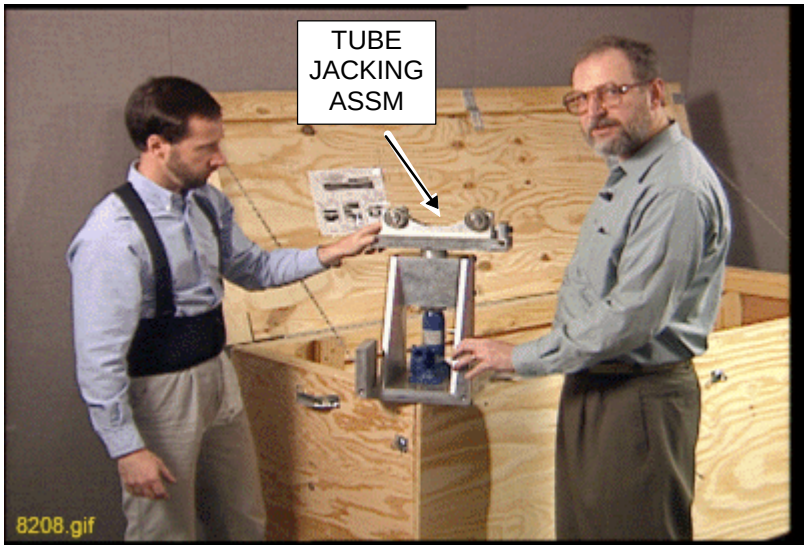
Note

When this happens the load at the back end of the Gradient coil is transferred from the cradle to the Support Tube and magnet.

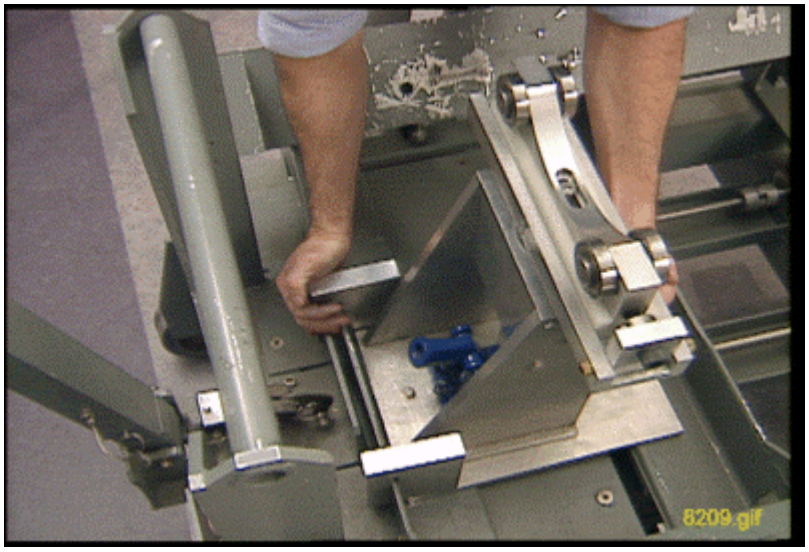
24. Move the rollers on the assemblies to the lowest position.

25. Slowly push the Gradient coil toward the magnet on the rollers until there is enough clearance to install the Tube Jacking assembly.

26. Remove the Tube Jacking Assembly from the crate. See Illustration 4-15. Install it onto cradle/cart. Secure with bolt through Tube Jack Assembly Base Plate. See Illustration 4-16.



TUBE JACKING ASSEMBLY
ILLUSTRATION 4-15



SECURE TUBE JACKING ASSEMBLY
ILLUSTRATION 4-16

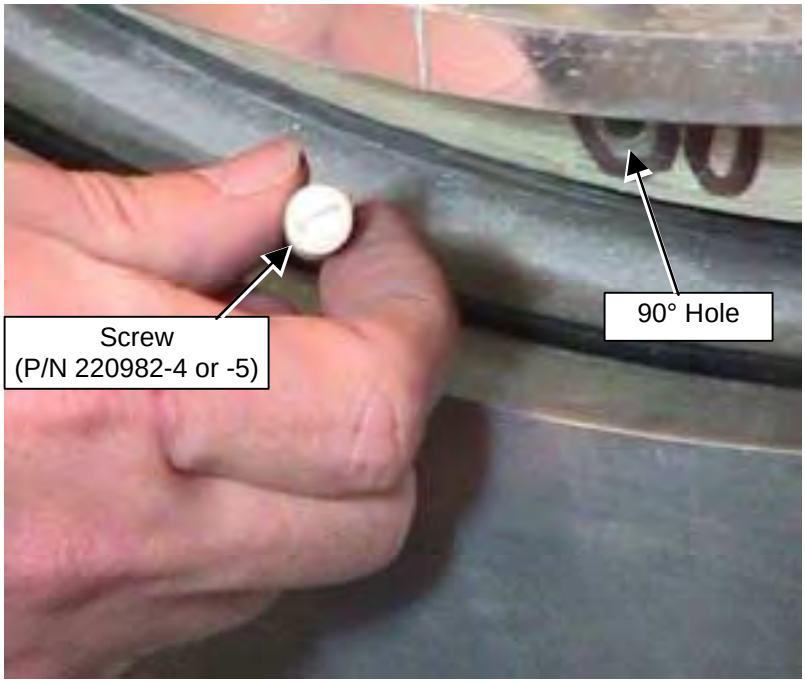
27. Operate the jack to raise the coil to put load on the upper rollers and allow for the removal of the Gradient coil Roller assemblies.

28. Remove the Gradient coil Roller Assemblies and return these parts to the shipping case.

29. Check for proper clearance around the TRM assembly in respect to the magnet bore opening. Make adjustments to the jack and alignment bearing to produce a fit that is symmetrical and level to the bore in front and back.

30. Slowly push the Gradient coil into the magnet bore and watch the clearance at both ends. Carefully pull the gradient coils through the rear of the magnet. Continue to install until the Gradient coil is centered from front to back within the warm bore.

31. At front end of Gradient Coil, install 16 mm spacer (2238908-3) with Cheesehead screw (2209823-4) at the 90° hole. See Illustration 4-17.



INSTALLING SCREW INTO 90° HOLE
ILLUSTRATION 4-17

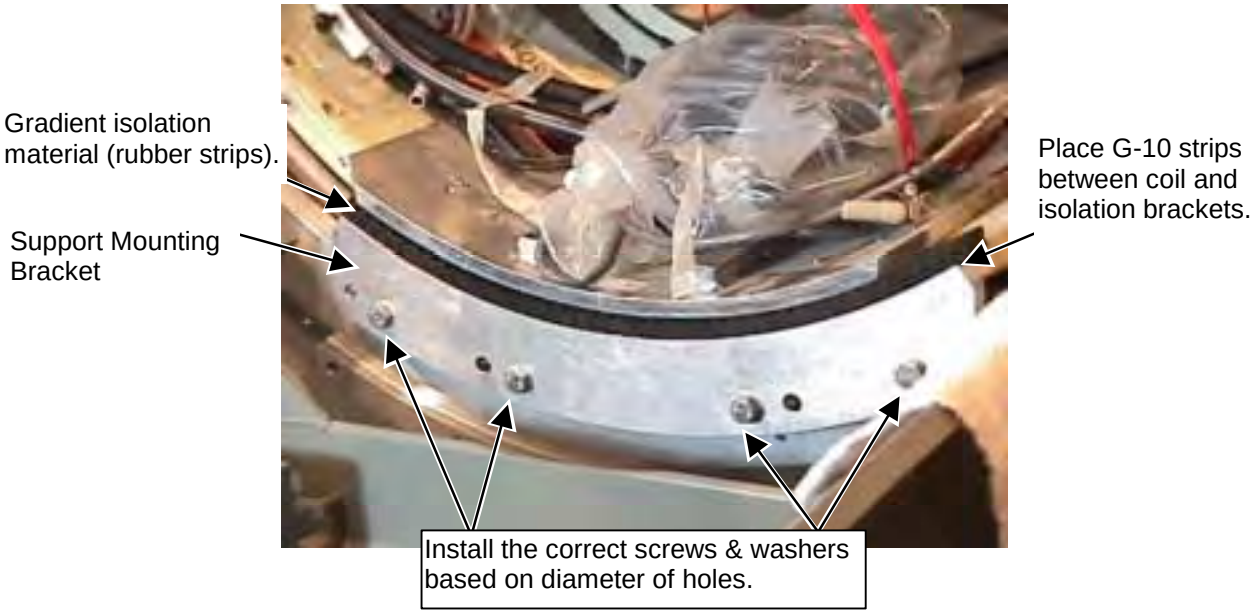
32. At the rear end of the Gradient Coil, fill axial gap between coil and support with shims, using the thickest shim last, (2238908, -2, -3, and/or –4) as required. Then fasten in place with proper length screw (2209823-4 or –5).

Note

For Support Mounting Brackets that have 14 mm diameter holes, the nylon shoulder washers (22308141-4) must be used with the M10 hex head bolts. **For Support Mounting Brackets with 10.5mm diameter holes**, the plain stainless steel washers (2184009) should be used in place of the nylon shoulder washers.

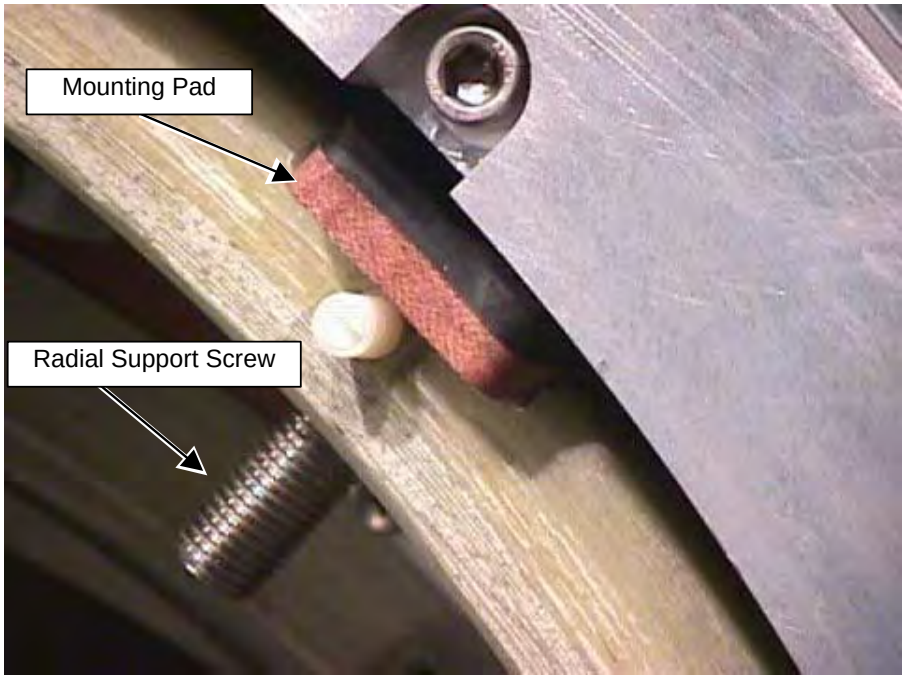
33. When the coil is centered in the Z direction, install the gradient isolation support mounting bracket. Based on the diameter of the holes use the correct hardware that is called out in the Note above. See Illustration 4-18 for location.

34. Once the support mounting brackets are in place, install the gradient isolation material, (black rubber strips) between the coil and the support. You must use two interlocked strips per side. Use the supplied (fiberglass) G-10 strips (2293771 and/or –2 as needed) to center the coil in the Y direction. By measuring the gap between the gradient coil and the magnet warm bore. The difference must be less than 2mm. See Illustration 4-18.



INSTALLING ISOLATION MATERIAL
ILLUSTRATION 4-18

35. Install the four Radial Supports between the TRM coil and the magnet warm bore (located at 10 & 2 O'clock). See Illustration 4-19. First, tighten the Radial Support Screw until the Mounting Pad is secure to the magnet warm bore. Then tighten the Radial Support Screw an additional ½ turn. Then install the plastic setscrew to prevent the Radial Support Screw from loosening.



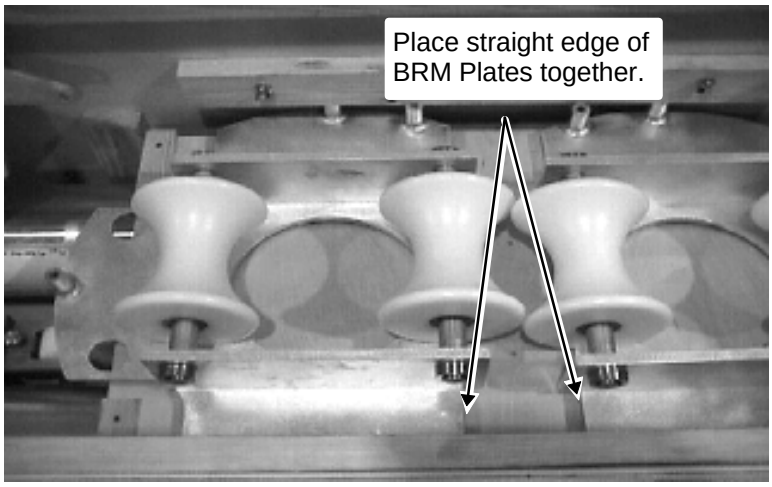
INSTALLING RADIAL SUPPORTS
ILLUSTRATION 4-19

36. Replace the 2 screws that attach the water manifold block to the inner coil face. See Illustration 4-20.

LOCATION OF SCREWS FOR WATER MANIFOLD
ILLUSTRATION 4-20

5- RETURNING PLATES TO GRADIENT INSERTION TOOL KIT

1. BRM plates with the rollers attached (spacers pointing up) are placed in the crate. See Illustration 5-1.

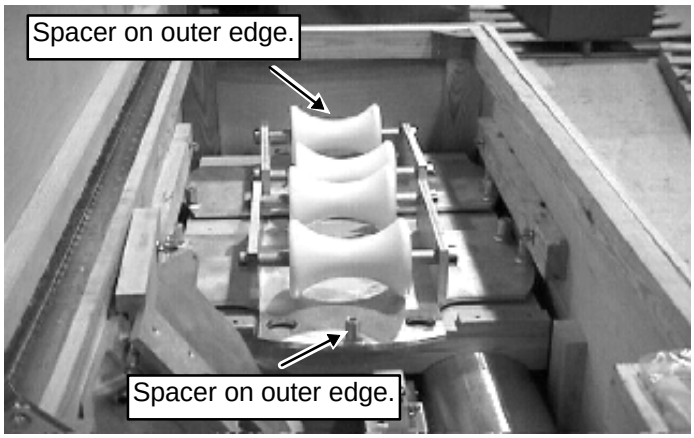


PLACEMENT OF BRM PLATES
ILLUSTRATION 5-1

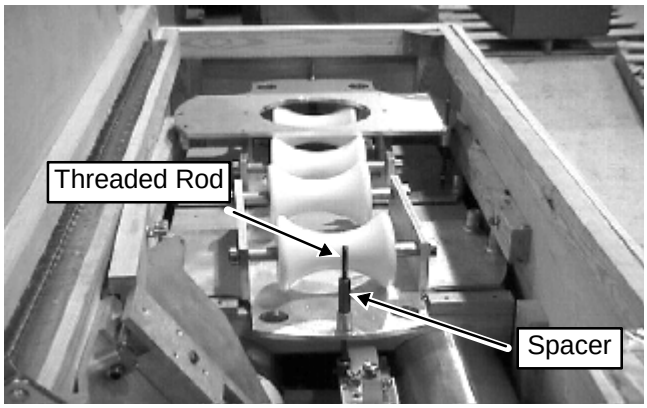
2. Install threaded rod through spacer on the outer edge of the BRM plate (see Illustration 5-2) and secure with washer and nut on bottom of BRM plate (see Illustration 5-3).

Note

Slide threaded rod with washer and nut attached on end through the bottom of the spacer.



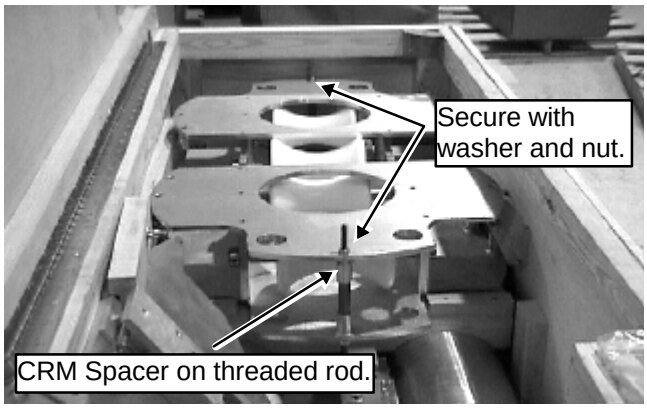
BRM PLATE SPACER LOCATIONS
ILLUSTRATION 5-2



THREADED ROD AND SPACER ATTACHED TO BRM PLATE
ILLUSTRATION 5-3

3. Install spacer on both threaded rods. See Illustration 5-3.

4. Install CRM plates (labeled *55cm Plate*) onto BRM plates and rollers by placing CRM spacer on the threaded rod. See Illustration 5-4.



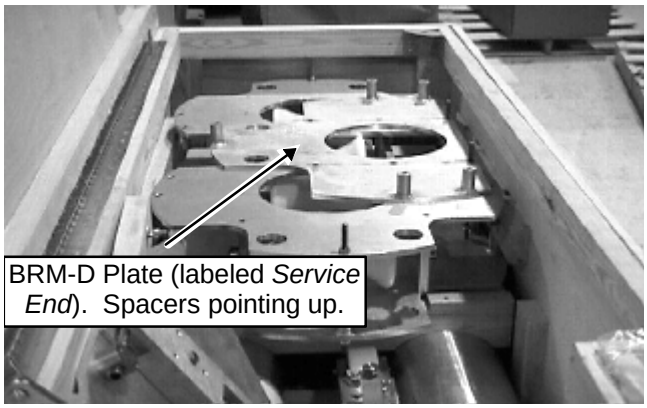
PLACEMENT OF CRM PLATES
ILLUSTRATION 5-4

5. Place washer and nut on threaded rod and tighten to secure plates on both ends. See Illustration 5-4.

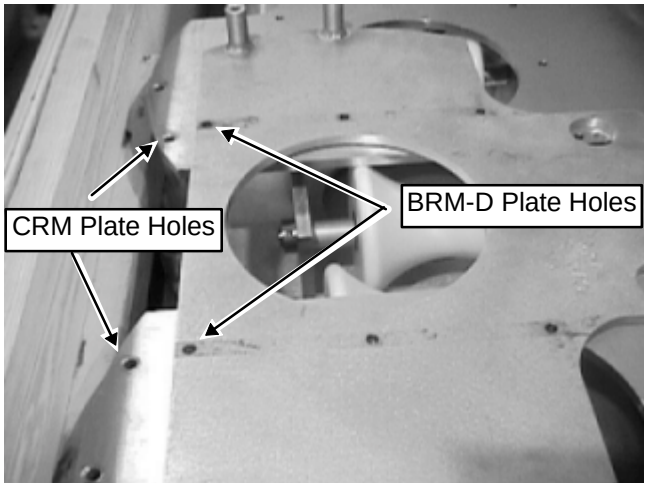
6. Place BRM-D plate labeled *Service End* on CRM plates (see Illustration 5-5). Line up holes on BRM-D plate and CRM plates (see Illustration 5-6).

Note

BRM-D Plate labeled *Service End* has the short spacers.



PLACEMENT OF BRM-D (SERVICE END) PLATE
ILLUSTRATION 5-5

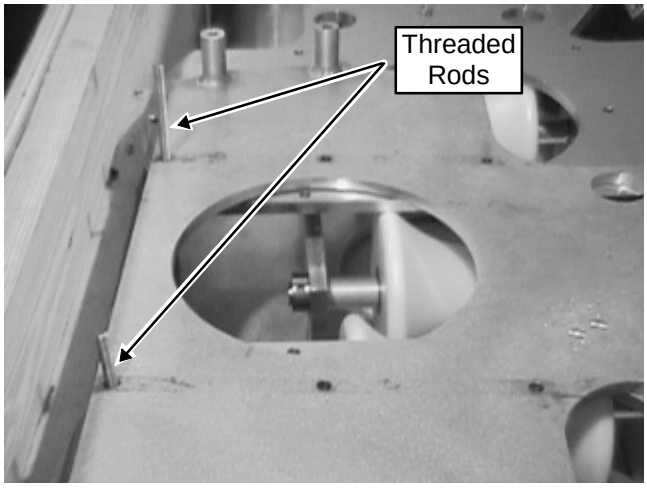


BRM-D PLATE ALIGNMENT
ILLUSTRATION 5-6

7. Move BRM-D plate to wall of crate with holes in Illustration 5-6 aligned.

8. Put washer and nut on one end of both threaded rods.

9. Underneath the CRM plates slide the threaded rods through the aligned holes of the CRM and BRM-D plates. See Illustration 5-7.

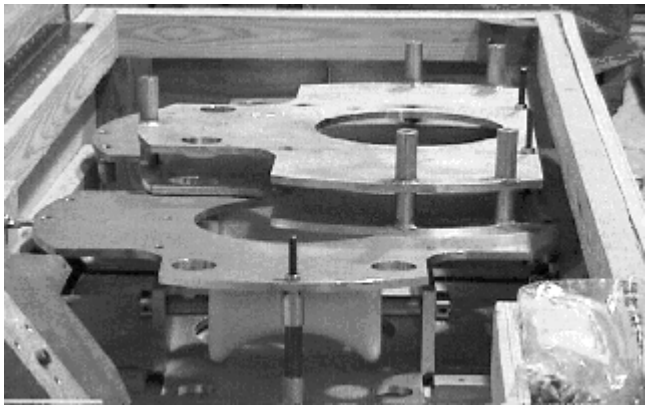


PLACEMENT OF THREADED RODS IN CRM & BRM-D PLATES
ILLUSTRATION 5-7

Note

Allow the threaded rods to rest on the BRM plates while performing next step.

10. Place the BRM-D plate, labeled *Patient End*, on top of the *Service End* BRM-D plate. Threaded rods will go through the same holes as on the *Service End* BRM-D plate. See Illustration 5-8.



PLACEMENT OF THE PATIENT END BRM-D PLATE
ILLUSTRATION 5-8

11. Place washers and nuts on the threaded rods and secure both ends of rods to plates. Verify all threaded rods are fastened securely so plates do not move during shipping.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
A	Nov. 2, 2001	K. Keshena	Preliminary version.
0	Dec. 11, 2001	K. Keshena	Initial release.
1	June 12, 2002	K. Keshena	Updated section 2- List of Equipment & Parts and included the gradient isolation brackets in the remove and replace sections.

PENETRATION PANEL INSTALLATION INSTRUCTIONS

1–1 Tab 4, Penetration Panel, contains installation instructions for the following:

- *DIRECTION 2308634* – Signa 1.5T Twin*Speed* Penetration Panel Installation Instructions
- *DIRECTION 2318792* – Signa 1.5T Twin*Speed* Penetration Panel Upgrade Instructions
- *DIRECTION 2403003* – Signa EXCITE II Penetration Panel Upgrade

Use only the applicable Penetration Panel Installation Instruction Directions

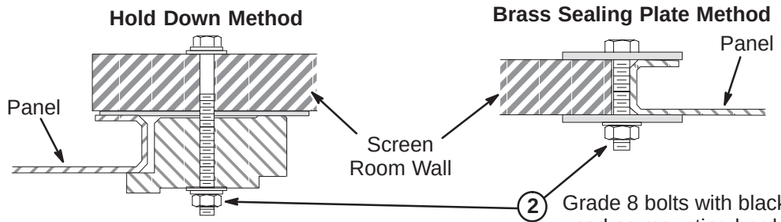
SIGNA Twin*Speed* PENETRATION PANEL INSTALLATION

INSTALLATION STEPS SUMMARY

- ❑ **A – Remove Blank Panel/Prepare Screen Room Opening Surface**
- ❑ **B – Install Penetration Panel**
- ❑ **C – Install Penetration Panel Stand–Off Hardware**
- ❑ **D – Install Penetration Panel Covers**

❑ A – REMOVE BLANK PANEL/PREPARE SCREEN ROOM OPENING SURFACE

1. If still in place, remove vendor supplied blank panel. Save mounting hardware of either method shown below for installation of Penetration Panel.



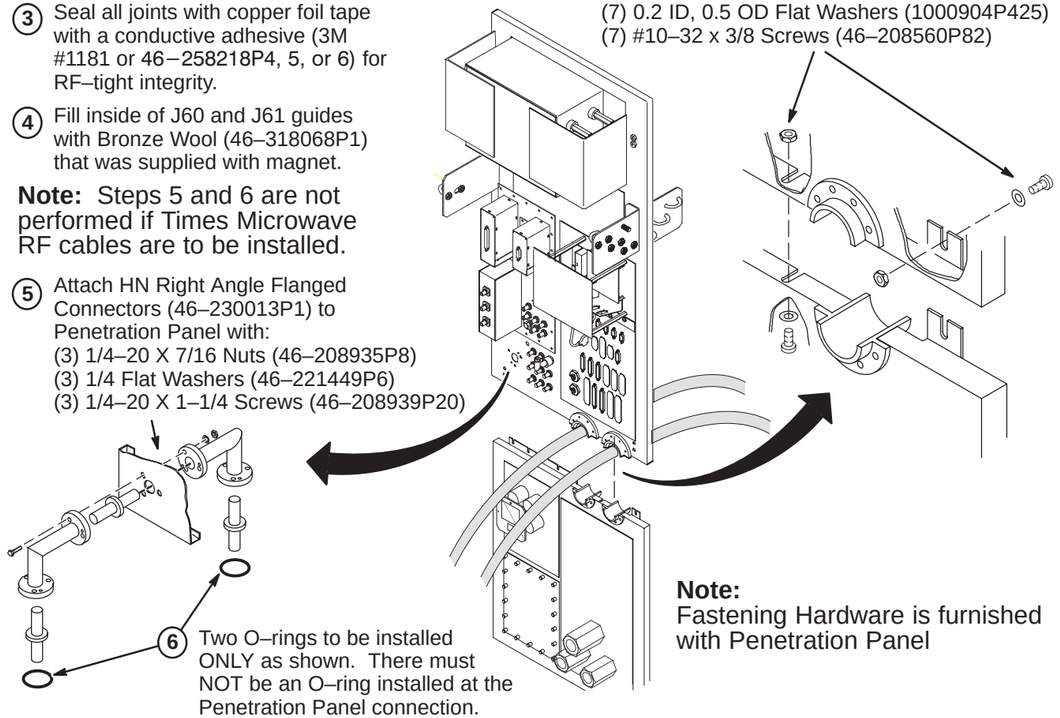
2. Grade 8 bolts with black oxide coating should be used as mounting hardware. Tighten to torque of 20 lb–ft (1.5 to 2 turns after lock washer flattens).
3. To insure good conductivity, use a fine sandpaper or scouring pad to clean surface of screen room wall which will be in contact with Penetration Panel. **Do not sand surface of Penetration Panel as it is coated.**

❑ B – INSTALL PENETRATION PANEL

1. Assemble Penetration Panel around helium lines (Runs 621 and 622) using:
   (7) #10–32 Nylock Lock Nuts (46–208937P6)
   (7) 0.2 ID, 0.5 OD Flat Washers (1000904P425)
   (7) #10–32 x 3/8 Screws (46–208560P82)
2. Install Penetration Panel using same method and hardware for mounting of blank panel above.
3. Seal all joints with copper foil tape with a conductive adhesive (3M #1181 or 46–258218P4, 5, or 6) for RF–tight integrity.
4. Fill inside of J60 and J61 guides with Bronze Wool (46–318068P1) that was supplied with magnet.

Note: Steps 5 and 6 are not performed if Times Microwave RF cables are to be installed.

5. Attach HN Right Angle Flanged Connectors (46–230013P1) to Penetration Panel with:
   (3) 1/4–20 X 7/16 Nuts (46–208935P8)
   (3) 1/4 Flat Washers (46–221449P6)
   (3) 1/4–20 X 1–1/4 Screws (46–208939P20)



6. Two O–rings to be installed ONLY as shown. There must NOT be an O–ring installed at the Penetration Panel connection.

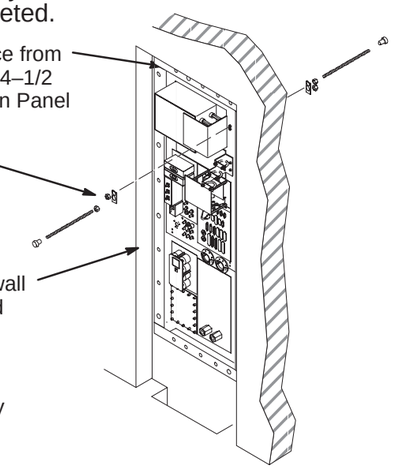
Note:
Fastening Hardware is furnished with Penetration Panel

❑ C – INSTALL PENETRATION PANEL STAND–OFF HARDWARE

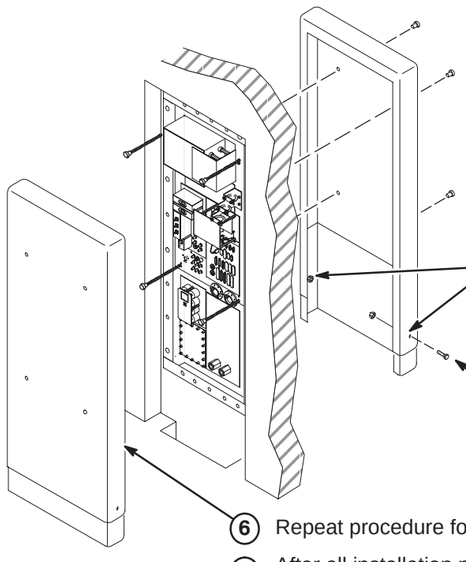
Note: The Penetration Panel Floor plate that is supplied with the cover kit is to be installed prior to routing and connecting cables to Penetration Panel. Refer to Installation Drawing furnished with the Cover Kit.

Note: The Penetration Panel Cover can be installed only after all connections and System installation has been completed.

1. Verify that cover will enclose finished wall opening. The distance from the top of Penetration Panel to wall opening must be less than 4–1/2 inches (114mm). If not, new mounting stud holes in Penetration Panel may be required.
2. Place (8) Reinforcing Plates (46–301211P1) over each hole pair on both sides of Penetration Panel and attach using:
   (16) 5/16–18 x 9/16 Brass Nut (46–208935P9)
   (8) 5/16–18 x 18 inch Threaded Rod (46–301213P2)
   (8) 5/16–18 x 1 inch Barrel Nut (46–301212P1)
3. Measure distance from face of Pen Panel to equipment room wall surface. Add six inches (152mm) to obtain length threaded rod should extend from panel.
4. Repeat step 3 procedure for exam room cover.
5. Adjust threaded rods with attached barrel nuts to the previously calculated dimensions from steps 3 and 4. Secure to panel by tightening brass nuts on both sides of Penetration Panel.



❑ D – INSTALL PENETRATION PANEL COVERS



1. Remove all barrel nuts.
2. In the Magnet room, temporarily install Top (46–306936P1) and Bottom (46–306964P1) Cover assembly on threaded rods and secure with four barrel nuts.
3. Adjust position of bottom cover section and mark two lower fastener holes.
4. Remove covers and drill hole in lower cover at each mark.
5. Attach top and bottom covers with furnished 10–32 nuts and screws.
6. Repeat procedure for Equipment room cover.
7. After all installation procedures are completed in Magnet and Equipment rooms, install assembled covers on threaded rods and secure with four barrel nuts.

SIGNA 1.5T Twin*Speed* PENETRATION PANEL UPGRADE INSTRUCTIONS

INSTALLATION STEPS SUMMARY

- ❑ **A – Remove Obsolete Penetration Panel Components**
- ❑ **B – Drill Mounting Holes for New Gradient Cable Brackets**
- ❑ **C – Install New Twin*Speed* Components**

❑ A – REMOVE OBSOLETE PENETRATION PANEL COMPONENTS

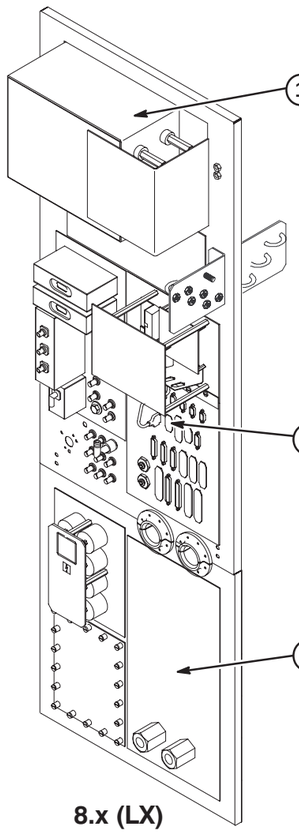
CAUTION: All cable connections MUST BE LABELLED before disconnect.

- Customer may have added connections for options to Penetration Panel which are not labelled but must be reconnected on new panel.
- If the site has a Patient Alert Extender Box mounted on or near the Panel, re–install on new Penetration Panel.

(1) If still in place, remove existing Penetration Panel. Install new Penetration Panel using the same mounting hardware of either method shown below. Apply copper tape (46–258218P4, 5, or 6) to seam between Panel and wall.

NOTE: **If old system is Signa Advantage 4.x, 5.x, or Horizon 5.x**: New Penetration Panel will be installed. Return old panel for recycling.

If existing Panel is Signa Horizon LX (8.x):
Remove and return for recycling the following:



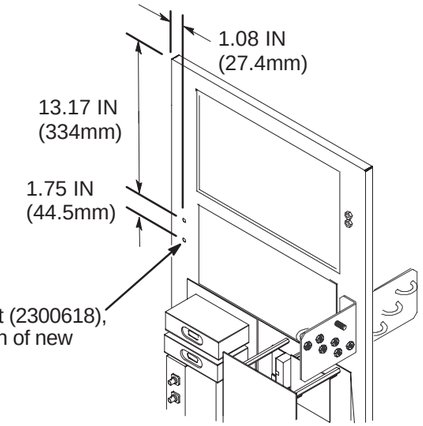
(1) Remove Gradient Filter assembly. Retain mounting screws for installing new Twin*Speed* Gradient Filter.

(2) Remove 9–pin Panel Opening Cover from J52.

(3) Remove Wave Guide Plate Assembly. Retain mounting screws for installing new Twin*Speed* Gradient Filter.

8.x (LX)

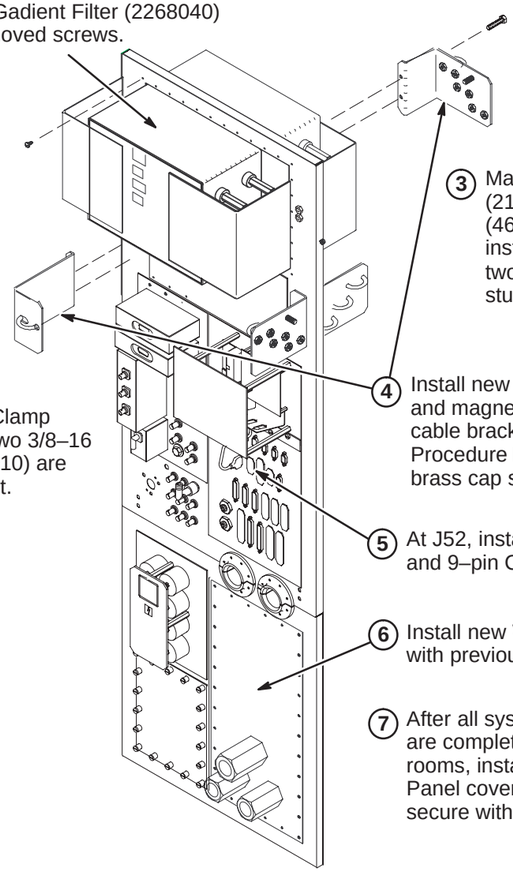
❑ B – DRILL MOUNTING HOLES FOR NEW GRADIENT CABLE BRACKETS



(1) Using provided 23/64 inch dia. drill bit (2300618), mark and drill two holes for installation of new gradient cable brackets.

❑ C – INSTALL NEW Twin*Speed* COMPONENTS

(1) Install Twin*Speed* Gadient Filter (2268040) with previously removed screws.



(2) Make sure Cable Clamp (2113244–2) and two 3/8–16 Nuts (46–208935P10) are installed on bracket.

(3) Make sure three Cable Clamps (2113244–2) with two 3/8–16 Nuts (46–208935P10) each are installed on bracket. Make sure twon Nuts are installed on ground stud.

(4) Install new equipment room (2295631) and magnet room (2295630) gradient cable brackets in holes drilled in Procedure **B** using two 3/8–18 x 5/8 brass cap screws (46–208939P16) .

(5) At J52, install RFI Gasket (46–221754P1) and 9–pin Connector (46–271920P1).

(6) Install new Wave Guide Plate (2295629) with previously removed screws.

(7) After all system installation procedures are completed in Equipment and Magnet rooms, install assembled Penetration Panel covers on threaded rods and secure with four barrel nuts each.

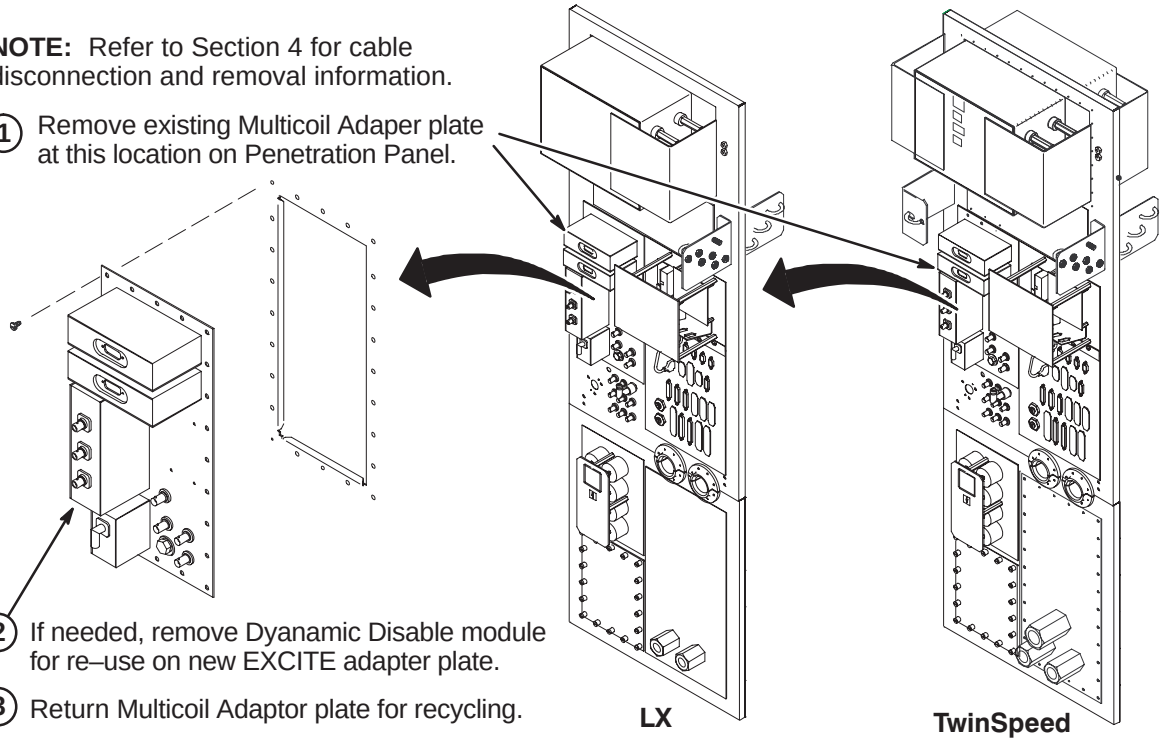
1–1 REMOVE OBSOLETE MULTICOIL PLATE FROM PENETRATION PANEL

CAUTION: All cable connections MUST BE LABELED before disconnect.

- Customer may have added connections for options to Penetration Panel which are not labelled but must be reconnected on new panel.

NOTE: Refer to Section 4 for cable disconnection and removal information.

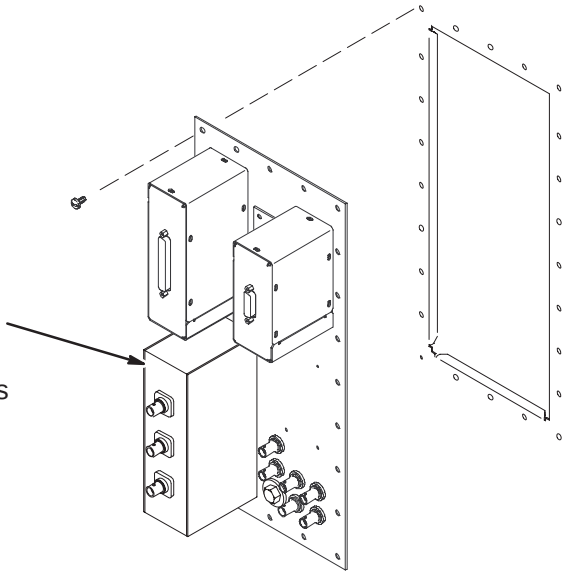
1. Remove existing Multicoil Adaper plate at this location on Penetration Panel.
2. If needed, remove Dyanamic Disable module for re–use on new EXCITE adapter plate.
3. Return Multicoil Adaptor plate for recycling.



1–2 INSTALL NEW EXCITE ADAPTER PLATE ON PENETRATION PANEL

NOTE: Refer to Section 4 for cable routing and connection information.

1. If needed, install previously removed Dynamic Disable module on new EXCITE adapter plate.
2. Install new Excite Adapter plate using fasteners removed in previous step.
3. Reconnect existing cables and connect new cables to Penetration Panel.



SYSTEM CABINET INSTALLATION INSTRUCTIONS

1–1 Tab 8, System Cabinet, contains installation instructions for the following:

- *DIRECTION* 2170004 – Signa 8.x/9.x System Cabinet Installation Instructions
- *DIRECTION 2*318805 – Signa 1.5T Twin*Speed* System Cabinet Upgrade Instructions
- *DIRECTION 2*402879 – Signa EXCITE II Upgrade System Cabinet Installation Instructions

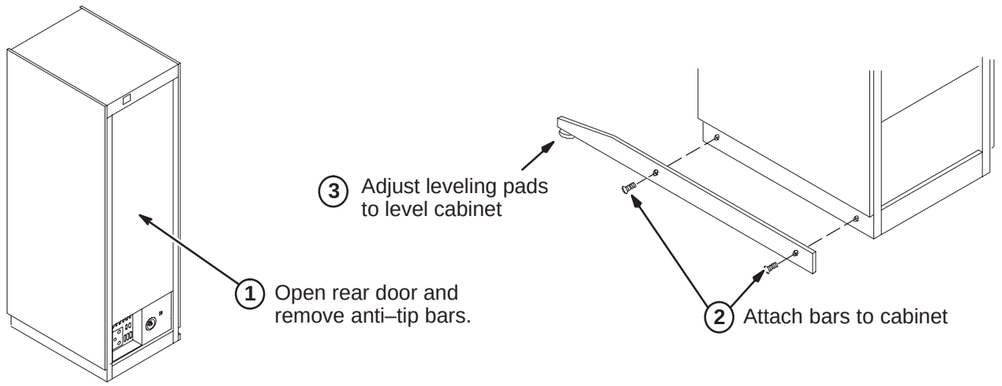
Use only the applicable System Cabinet Upgrade Installation Instruction Directions

INSTALLATION STEPS SUMMARY

- ❑ A – Position/Secure System Cabinet
- ❑ B – Install Magnet Monitoring Cables
- ❑ C – Connect Fiber Optic Runs 708, 710, 711/712, and 836 to I/F Panel
- ❑ D – Route/Connect Fiber Optic Runs 836 to BIT3 Module
- ❑ E – Route/Connect Fiber Optic Runs 708, 710, and 711/712 to Tyme II
- ❑ F – Connect Power, Ground, and Data Cables
- ❑ G – Install InSite "SYSTEMS" Cabinet Magnet

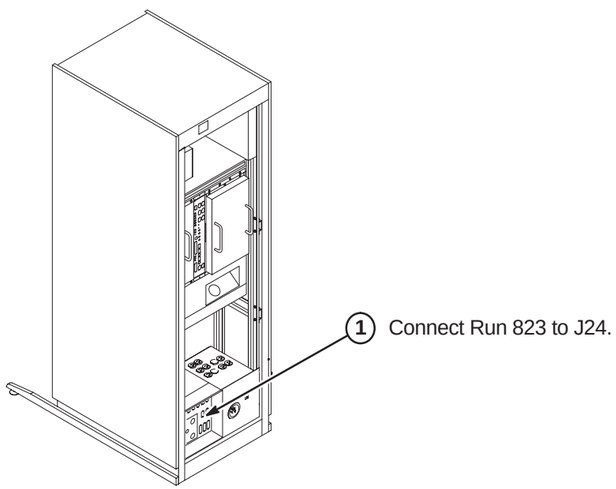
❑ A – POSITION/SECURE SYSTEM CABINET

Comply with UL requirements by either installing anti tip legs (see illustration below) or securing the cabinet to the floor with local supplied brackets and floor anchors.



❑ B – INSTALL MAGNET MONITORING CABLES

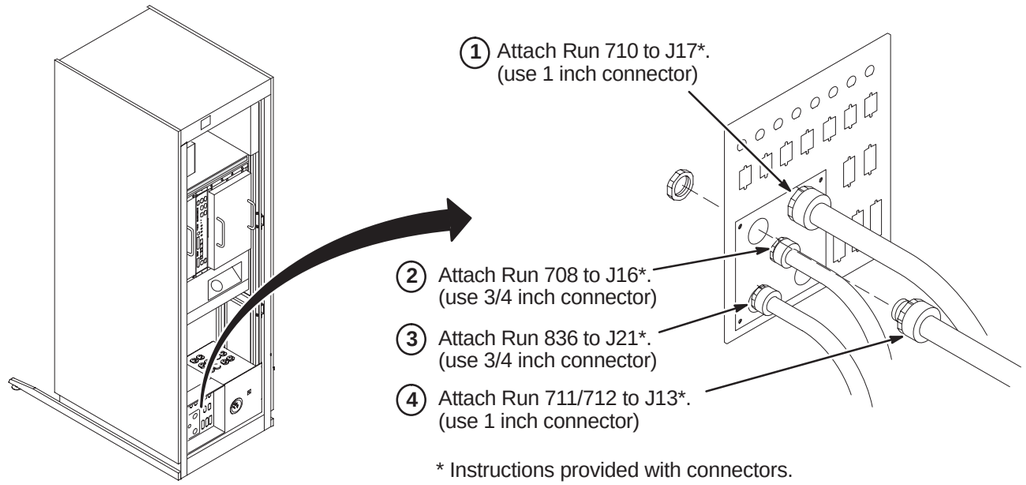
Note: Refer to Direction 2230681, *Magnet Monitor Hardware Installation Manual,* for instructions on connecting cables in the System Cabinet. This manual should be found in the box containing the parts for Magnet Monitoring.



❑ C – CONNECT FIBER OPTIC RUNS 708, 710, 711/712, AND 836 TO I/F PANEL

CAUTION

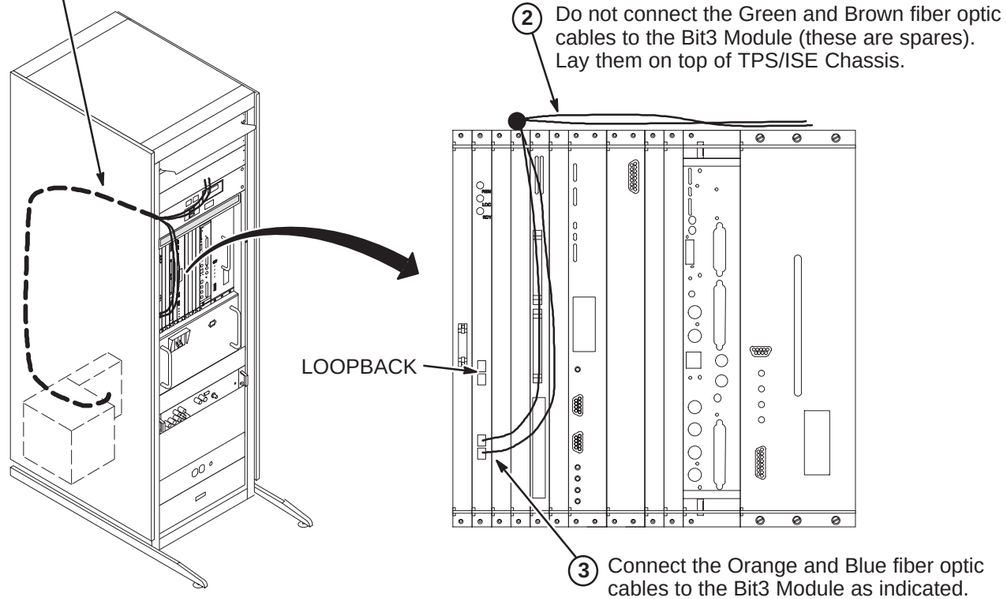
Handle fiber optic cables carefully. Do not bend fiber optic cables to radius smaller than two inches (50mm). Avoid scratching connector ends. Keep connectors protected until ready to connect.



* Instructions provided with connectors.

❑ D – ROUTE/CONNECT FIBER OPTIC RUN 836 TO BIT3 MODULE

1. Route Run 836 fiber optic cables from cabinet I/F J21 to front of Bit3 module (MR2 A11 A30). Secure cable to side of cabinet.
   Do not bend fiber optic cables to radius smaller than two inches (50mm).



❑ E – ROUTE/CONNECT FIBER OPTIC RUNS 708, 710, AND 711/712 TO TYME II

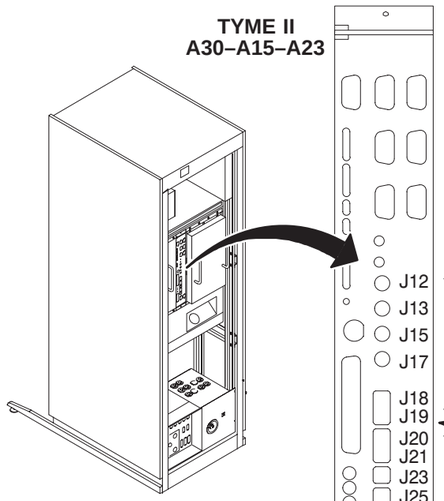
CAUTION

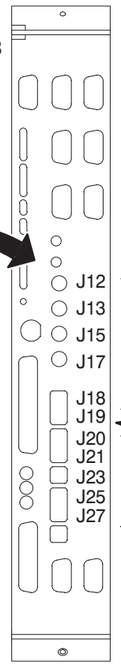
Handle fiber optic cables carefully. Do not bend fiber optic cables to radius smaller than two inches. Avoid scratching connector ends. Keep connectors protected until ready to connect. Do not coil naked outside of cabinet, or store fiber optic cables in bottom of cabinet.

Note:
Runs 708, 710, 711, and 712 are used for both Horizon 5.x and 8.x. The fiber optic connections to the TYME board are different for 5.x and 8.x. The labels on the cables include both the 5.x and 8.x connections.

The table below indicates the connection labels as they should be marked on this end of the fiber optic cables. **Use only the 8.x connections.**

RUN #	5.x	8.x
708–1	J5	J19
710–1	J13	J12
710–2	J15	J13
710–3	J17	J15
710–4	J14	J17
710–5	J4	J18
711–1	J6,J7	J25,J27
711–2	J8	J23
712–1	J9,J10	J20,J21



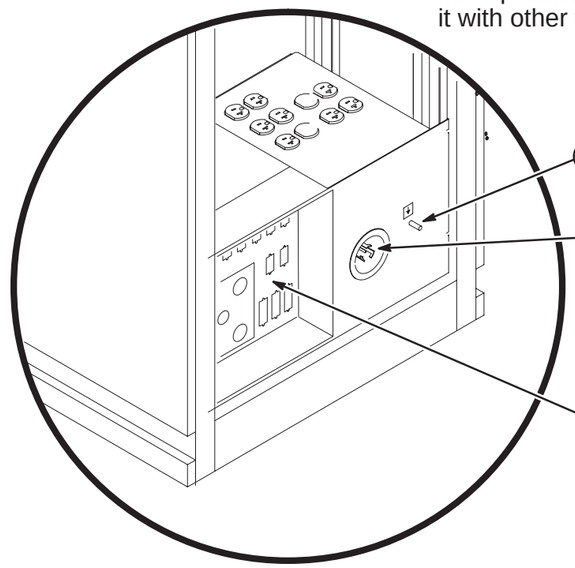


1. Route/Connect as marked Run 710 fiber optic cables to J12, J13, J15, J17 and J18 on the TYME II Board.
2. Route/Connect as marked Run 708 fiber optic cable to J19 on the TYME II Board.
3. Route/Connect as marked Run 711/712 fiber optic cables to J20, J21, J23, J25, and J27 on the TYME II Board.

Note:
Use tie-wraps to secure fiber optic cables to ISE Chassis cables.

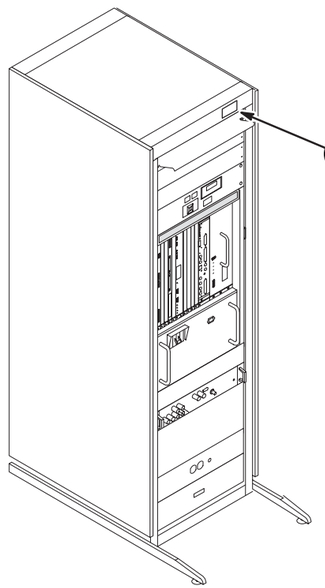
❑ F – CONNECT POWER, GROUND, AND DATA CABLES

Note:
Locate CERD Test Cable, 2168505 (it is packed with the Operator Workspace cable kit, 2154392). Store it with other test cables or in the System Cabinet.



1. Connect Run 037 GND cable to ground stud.
2. Connect Run 030 or 968 cable plug to “J1”. Be sure to push and turn plug for secure connection.
3. Perform Ground Resistance Checks before connecting remaining cabinet cables.
4. Connect remaining cabinet cables as marked.

❑ G – INSTALL INSITE “SYSTEMS” CABINET MAGNET



1. From the 8.0 LX Insite Kit (46–301708G14), locate the ”Systems” cabinet magnet (46–320095P5) and attach to front of cabinet as shown.

SIGNA 1.5T Twin*Speed* SYSTEM CABINET UPGRADE INSTRUCTIONS

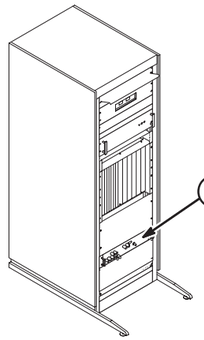
INSTALLATION STEPS SUMMARY

- ❑ **A1 – Remove for Transfer Fast Receiver Module from Horizon System Cabinet**
- ❑ **A2 – Install Required Options for Upgrade to 1.5T Twin*Speed***
- ❑ **A3 – Install Fast Receiver Module (If Required)**

The Signa 1.5T Twin*Speed* System Cabinet Upgrade is for a cabinet already in use with a Signa LX system.

Pre–LX systems (Signa Advantage 4.x, Advantage 5.x, or Horizon 5.x) being upgraded will have a new System Cabinet, without Fast Receiver installed. If Fast Receiver needs to be transferred, refer to Procedure **A1** below. If not, refer to Signa 8.x System Cabinet Installation instruction, Direction 2170004, in this Tab.

❑ A1 – REMOVE FAST RECEIVER MODULE FROM HORIZON SYSTEM CABINET



Note:
If existing System Cabinet at site is a Horizon 5.x with Fast Receiver, then complete Step 1 below for transfer of module to new Twin*Speed* System Cabinet.

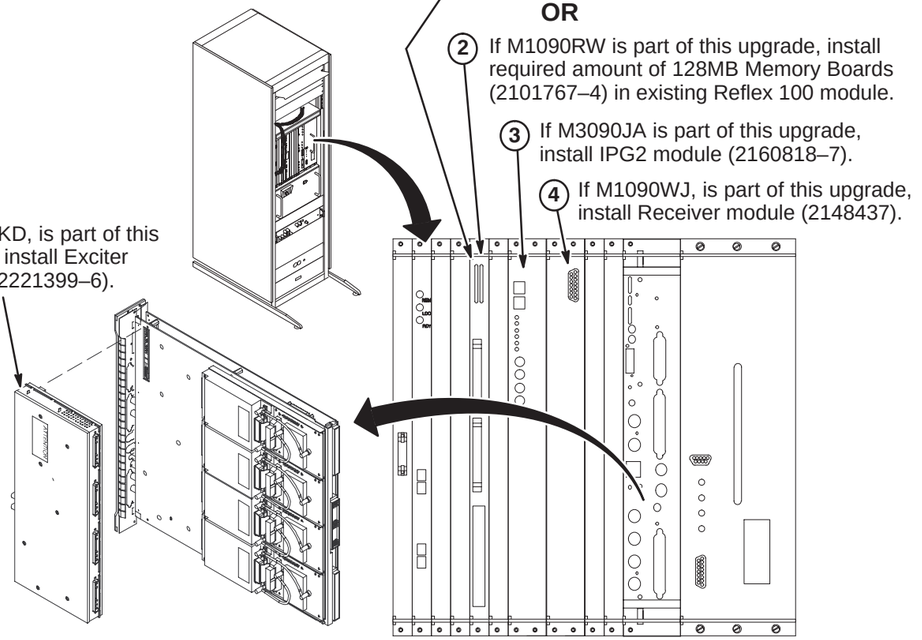
1. Remove Fast Receiver, rear and front vertical mounting rail brackets, mounting hardware, and slides from Horizon 5.x System Cabinet.

❑ A2 – INSTALL REQUIRED OPTIONS FOR UPGRADE TO 1.5T Twin*Speed*

1. If M3000RA is part of this upgrade, install Reflex 100/512 MB module (2292662–10).

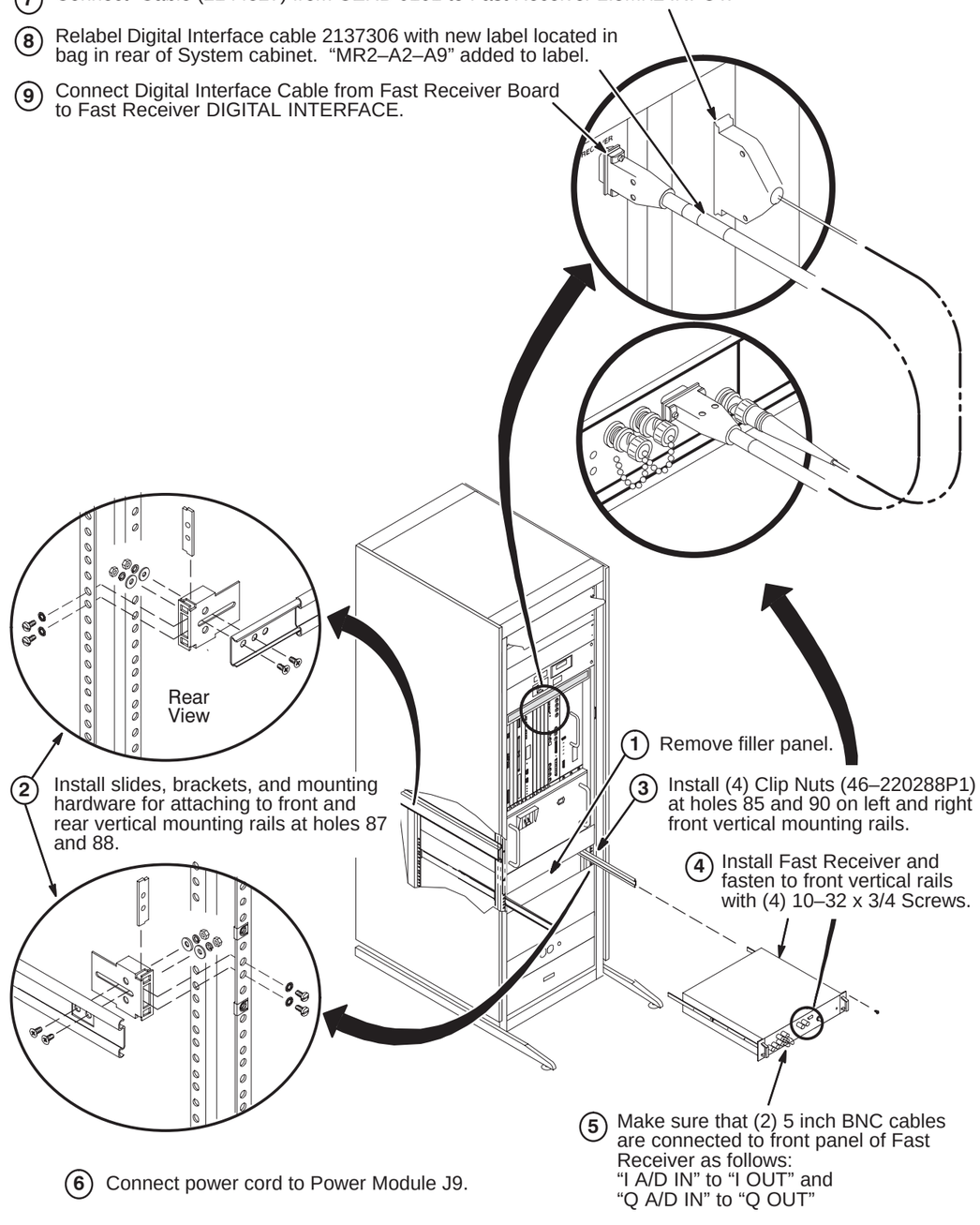
OR

2. If M1090RW is part of this upgrade, install required amount of 128MB Memory Boards (2101767–4) in existing Reflex 100 module.
3. If M3090JA is part of this upgrade, install IPG2 module (2160818–7).
4. If M1090WJ, is part of this upgrade, install Receiver module (2148437).
5. If M3090KD, is part of this upgrade, install Exciter module (2221399–6).



❑ A3 – INSTALL FAST RECEIVER MODULE (M1090WG)

7. Connect Cable (2144527) from CERD J101 to Fast Receiver 2.5MHZ INPUT.
8. Relabel Digital Interface cable 2137306 with new label located in bag in rear of System cabinet. “MR2–A2–A9” added to label.
9. Connect Digital Interface Cable from Fast Receiver Board to Fast Receiver DIGITAL INTERFACE.



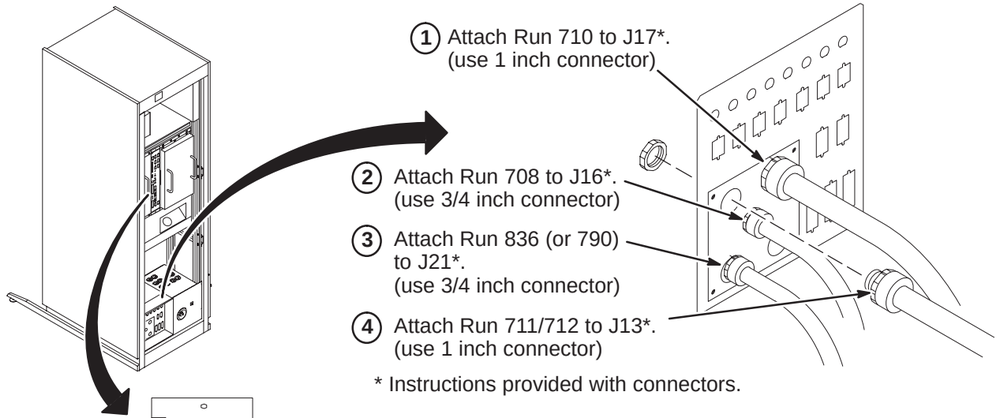
INSTALLATION STEPS SUMMARY

- ❑ **B1 – Connect Fiber Optic Runs**
- ❑ **B2 – Connect Power, Ground, and Data Cables**
- ❑ **B3 – Install Rating Plate**

❑ B1 – CONNECT FIBER OPTIC RUNS

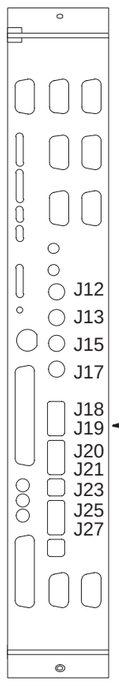
CAUTION

Handle fiber optic cables carefully. Do not bend fiber optic cables to radius smaller than two inches (50mm). Avoid scratching connector ends. Keep connectors protected until ready to connect. Do not coil naked outside of cabinet, or store fiber optic cables in bottom of cabinet.



1. Attach Run 710 to J17*. (use 1 inch connector)
2. Attach Run 708 to J16*. (use 3/4 inch connector)
3. Attach Run 836 (or 790) to J21*. (use 3/4 inch connector)
4. Attach Run 711/712 to J13*. (use 1 inch connector)

* Instructions provided with connectors.

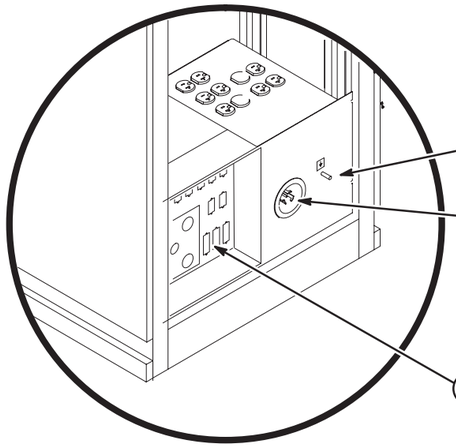


TYME II
MR2–A15–A23

Note:
Use tie-wraps to secure fiber optic cables to ISE Chassis cables.

5. Route/Connect as marked Run 710 fiber optic cables to J12, J13, J15, J17 and J18 on the TYME II Board.
6. Route/Connect as marked Run 708 fiber optic cable to J19 on the TYME II Board.
7. Route/Connect as marked Run 711/712 fiber optic cables to J20, J21, J23, J25, and J27 on the TYME II Board.

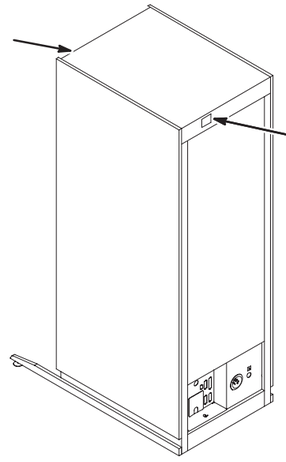
❑ B2 – CONNECT POWER, GROUND, AND DATA CABLES



1. Connect Run 037 GND cable to ground stud.
2. Connect Run 968 cable plug to “J1”. Be sure to push and turn plug for secure connection.
3. Perform Ground Resistance Checks before connecting remaining cabinet cables.
4. Connect remaining cabinet cables as marked.

❑ B3 – INSTALL RATING PLATE

1. From the 8.0 8.x Insite Kit (46–301708G14), locate the ”Systems” cabinet magnet (46–320095P5) and attach to font of cabinet as shown.



2. Apply Rating Plate (46–302200P12)

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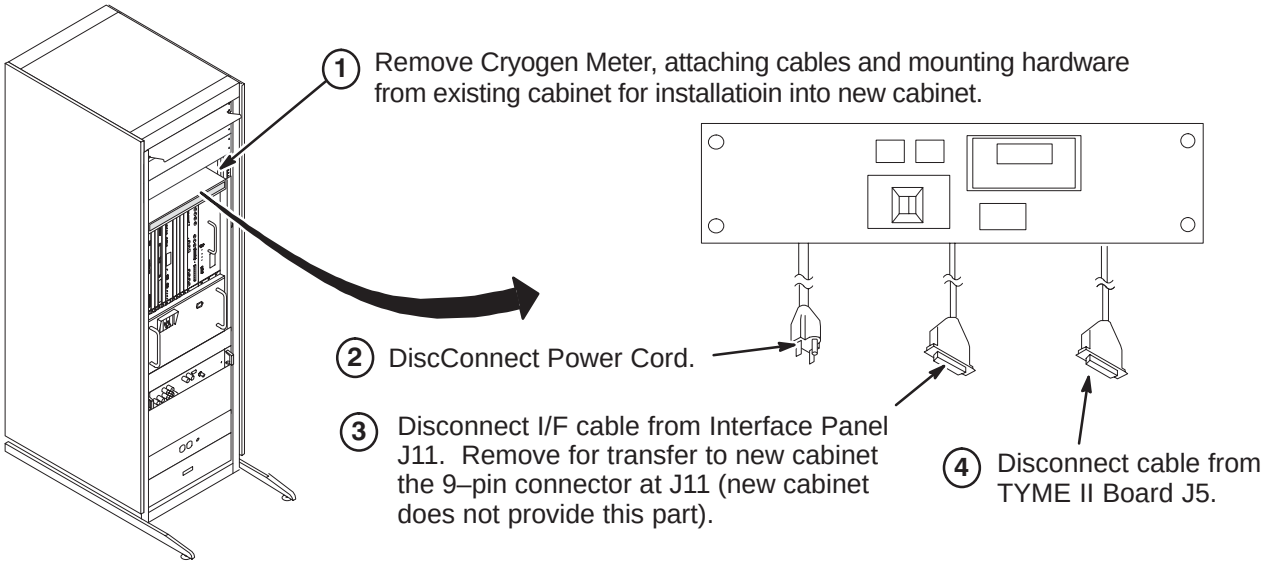
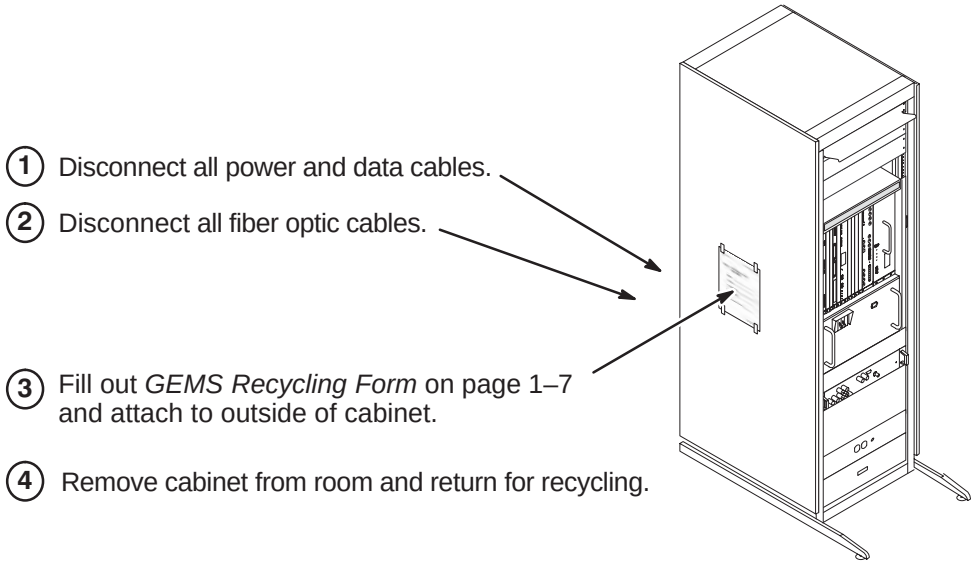
1–8 ROUTE/CONNECT FIBER OPTIC RUN 1083 TO APS BOARD 1–5
1–9 ROUTE/CONNECT FIBER OPTIC RUNS1033, 1034, AND 1045 TO STIF BOARD 1–6
1–10 GEMS GOLDSEAL RECYCLING FORM 1–7

1–1 REMOVE CRYOGEN METER (for non–Magnet Monitor systems)

The new EXCITE System Cabinet does not contain a cryogen meter. For those non–Magnet Monitor sites being upgraded to EXCITE, the cryogen meter will have to be transferred to the new System cabinet. This section refers to removal of cryogen meter from existing cabinet and Section 1–5 refers to installing it in new EXCITE System cabinet.



1–2 DISCONNECT CABLES AND PREPARE CABINET FOR RETURN



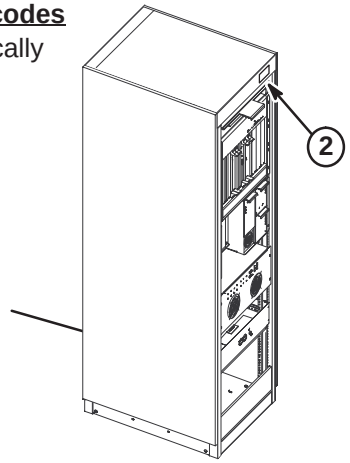
1–3 POSITION AND SECURE EXCITE SYSTEM CABINET

Comply with UL requirements or local codes for securing the cabinet to the floor with locally supplied brackets and floor anchors.

1. Position System cabinet to final position as indicated by site layout drawings.
2. From the LX Insite Kit (46–301708G14), locate the ”Systems” cabinet magnet (46–320095P5) and attach to front of cabinet as shown.

Comply with UL requirements or local codes for securing the cabinet to the floor with locally supplied brackets and floor anchors.

NOTE: Refer to Section 4 for cable routing and connection information.

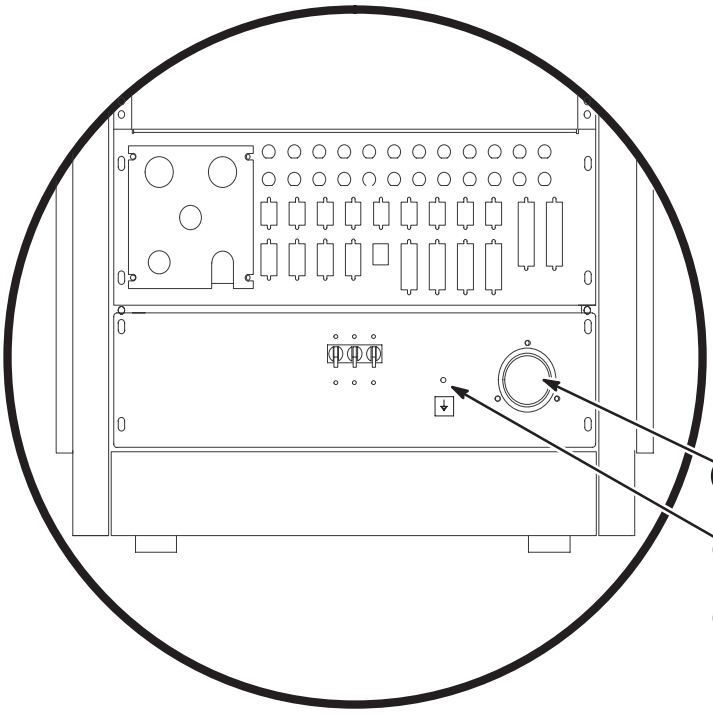


(1) Position System cabinet to final position as indicated by site layout drawings.

(2) From the LX Insite Kit (46–301708G14), locate the ”Systems” cabinet magnet (46–320095P5) and attach to front of cabinet as shown.

1–4 SYSTEM CABINET POWER AND GROUND CABLE CONNECTIONS

Note:
Transfer CERD Test Cable, 2168505from removed System cabinet.
Store it with other test cables or in the new Excite System Cabinet.



WARNING!

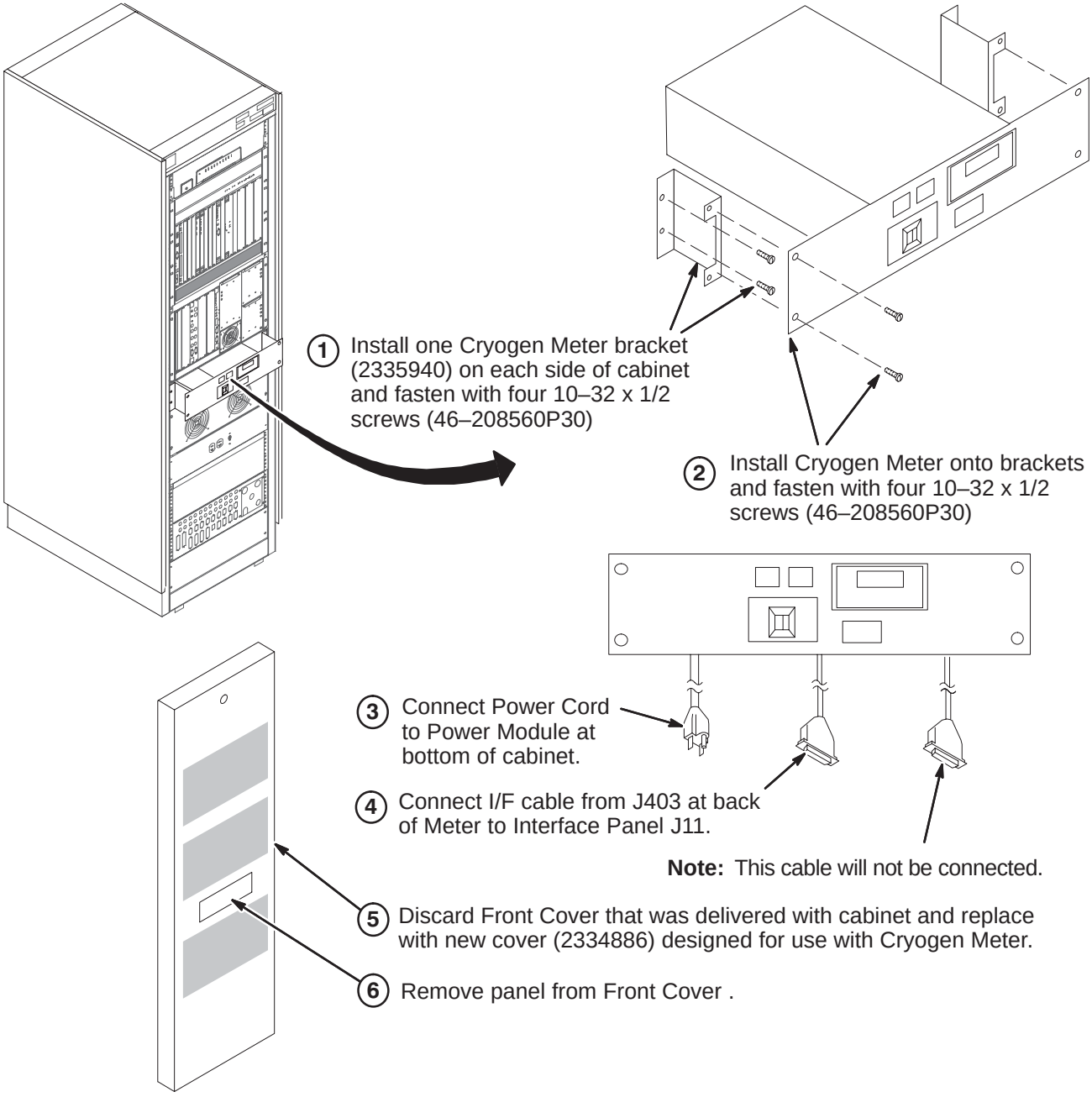
SYSTEM CABINET POWER AND GROUND CABLES MUST BE CONNECTED TO PDU MODULE LOCATED WITHIN ACGD/PDU CABINET.

(1) Connect Run 968 cable plug to “J1”. Be sure to push and turn plug for secure connection.

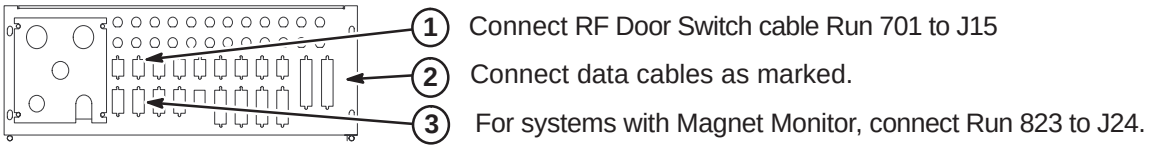
(2) Connect Run 037 GND cable to ground stud.

(3) Perform Ground Resistance Checks before connecting remaining cabinet cables.

1–5 INSTALL CRYOGEN METER (for non–Magnet Monitor systems)



1–6 CONNECT COMMUNICATION CABLES TO SYSTEM CABINET I/F

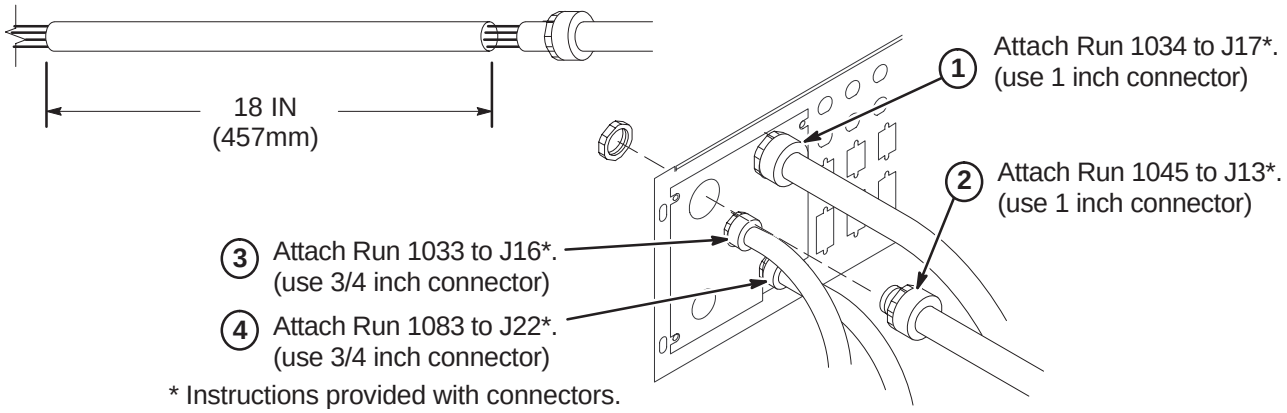


1–7 CONNECT FIBER OPTIC RUNS 1033, 1034, 1045, AND 1083 TO SYSTEM CABINET I/F PANEL

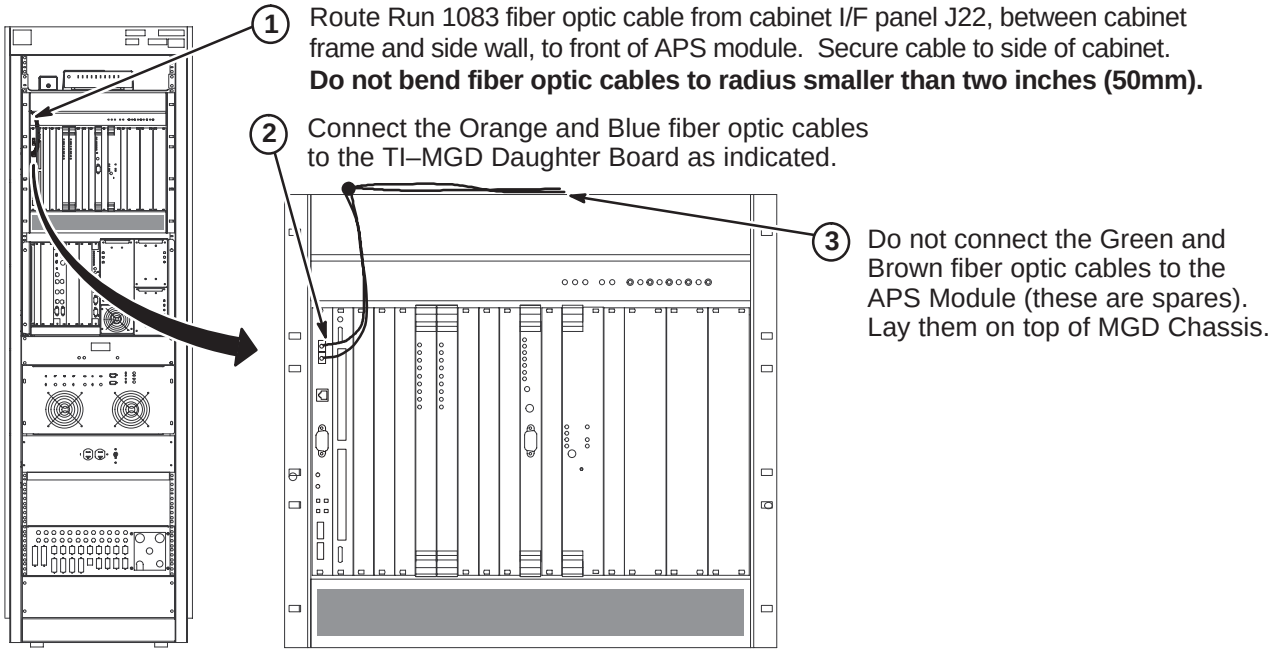
CAUTION

Handle fiber optic cables carefully. Do not bend fiber optic cables to radius smaller than two inches (50mm). Avoid scratching connector ends. Keep connectors protected until ready to connect.

NOTE: Runs 710, and 711/712 may be relabeled as Runs 1034 and 1045 and reused rather than installing new Runs 1034 and 1045. To reuse these Runs, the conduit will need to be shortened about 18 inches (457mm) at the System Cabinet end (see below). This is required because longer fiber optic wires are needed for routing within the cabinet. **If conduit is to be shortened, care must be taken to not damage the fiber optic wires contained within the conduit when cutting.** If damaged, remove existing Run and replace with new run 1034 or 1045 delivered with this Upgrade.



1–8 ROUTE/CONNECT FIBER OPTIC RUN 1083 TO APS BOARD



1–9 ROUTE/CONNECT FIBER OPTIC RUNS1033, 1034, AND 1045 TO STIF BOARD

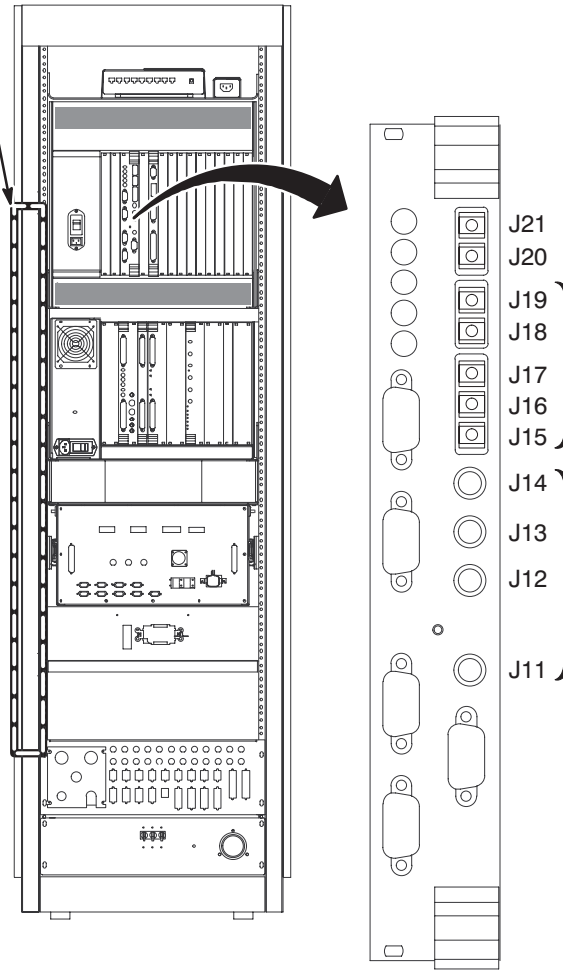
CAUTION

Handle fiber optic cables carefully. Do not bend fiber optic cables to radius smaller than two inches. Avoid scratching connector ends. Keep connectors protected until ready to connect. Do not coil naked outside of cabinet, or store fiber optic cables in bottom of cabinet.

NOTE:
Refer to table at right for relabel information if existing cables are to be reused.

New Cables		Existing Cables	
RUN #	**10.x/11.x**	**RUN #**	**8.x/9.x**
1033–1	J21	708–1	J19
1034–1	J14	710–1	J12
1034–2	J13	710–2	J13
1034–3	J12	710–3	J15
1034–4	J11	710–4	J17
1034–5	J20	710–5	J18
1045–1	J17	711–2	J23
1045–2	J18,J19	711–3	J20, J21
1045–3	J15,J16	711–1	J25, J27

1. Route fiber optic cables between cabinet frame and side cover to STIF module. Ty–wrap to existing cable bundle routed in this area.



2. Relabel (if old cable re–used) and connect Run 1033 fiber optic cable to J21 on the STIF Board.

Part of Run 1034 below.

3. Relabel (if old cable re–used) and connect Run 1045 fiber optic cables to J15, J16, J17, J18 and J19 on the STIF Board.

4. Relabel (if old cable re–used) and connect Run 1034 fiber optic cables to J11, J12, J13, J14, and J20 above on the STIF Board.

Note:
Use ty-wraps to secure fiber optic cables to MGD Chassis cables.

1–10 GEMS GOLDSEAL RECYCLING FORM

Attention: GEMS GoldSeal

FDO: _____

Site Name: _____

Removal Date: _____

Field Engineer: _____

SYSTEM Cabinet Serial Number: _____

ACCESSORIES AND OPTIONS INSTALLATION INSTRUCTIONS

1–1 Tab 11, Accessories & Options, contains installation instructions for the following:

LCC Wide-Open Magnet Enclosures

- *DIRECTION 2123158* – Patient Transport Installation Instructions
- *DIRECTION 2231762* – Signa WideOpen Pneumatic Patient Alert Installation

PATIENT TRANSPORT INSTALLATION INSTRUCTIONS

INSTALLATION STEPS SUMMARY

- ❑ **A – Patient Transport Installation**
- ❑ **B – Head Coil Holder**
- ❑ **C – Head Coil Adapters**

❑ A – PATIENT TRANSPORT INSTALLATION

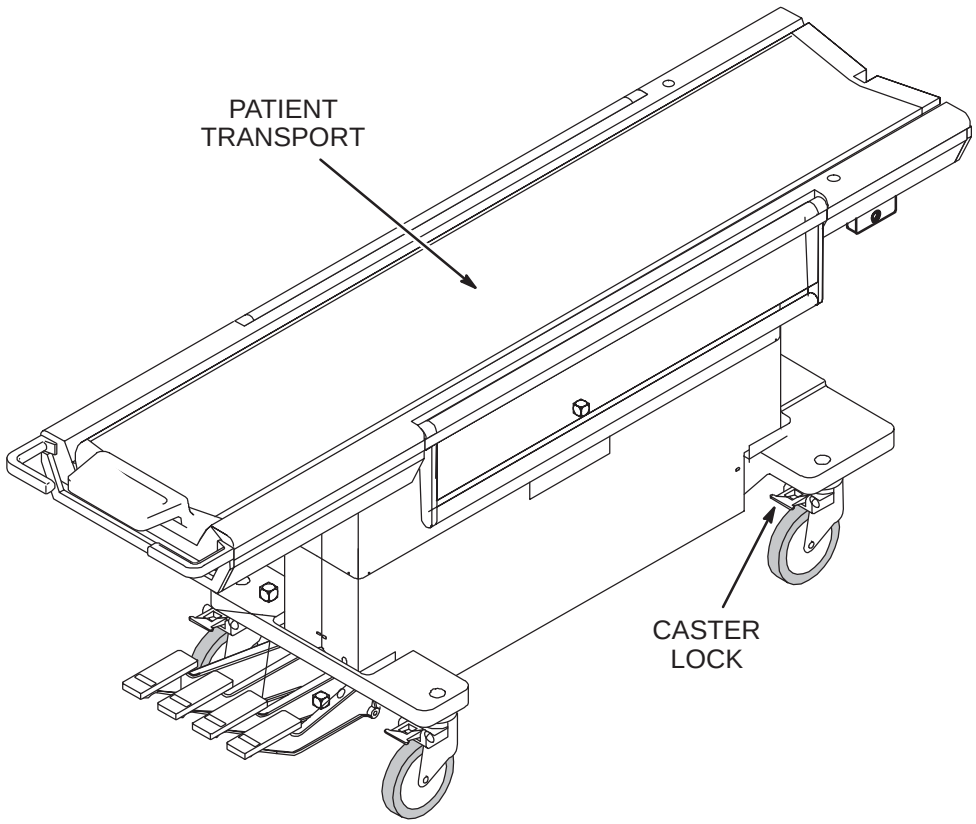
Patient Transport is shipped covered with protective cardboard which should remain in place until ready to be moved into the magnet room. Cover table with plastic previously removed when checks and adjustments are completed.

1. Unlock casters and move Patient Transport to magnet room for adjustments and function checks at the dock.
2. Remove protective plastic sheet from table.
3. Perform mechanial procedures in MR CD–ROM, Set up and Calibration: Patient Transport, LIGHTWEIGHT PATIENT TRANSPORT.

Note

If hardware fastening procedures for installation of the dock and support brackets were followed, the hardware used to fasten the dock and dock supports was left loose. The loose hardware permits a quick and easy dock centering adjustment with table docked.

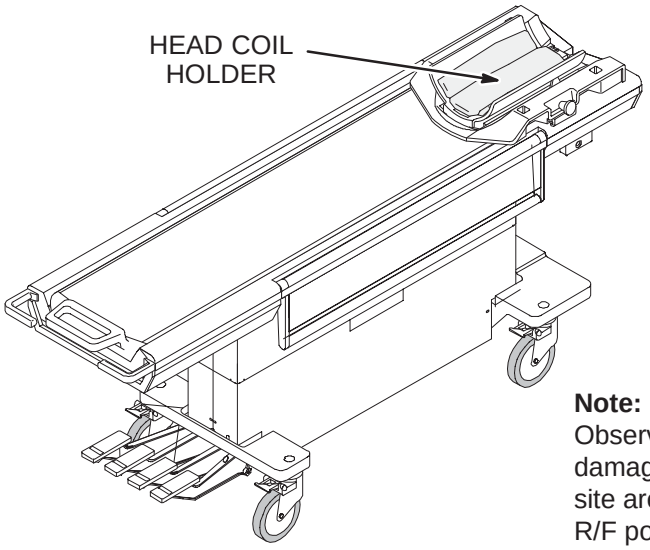
4. If additional Patient Transports are supplied, refer to *Direction 15477, Second Patient Transport Option Installation*, (delivered with M1020BD option).



PATIENT TRANSPORT INSTALLATION INSTRUCTIONS

❑ B – HEAD COIL HOLDER

1. Unpack Head Coil Holder and install Head Coil Holder on Patient Transport cradle.
2. With Patient Transport docked, check mechanical operation of Head Coil with holder.



Note:
Observe warning Label on head coil. To prevent head coil damage, be sure that all service personnel and users at the site are aware that the head coil must be removed before R/F power is applied to the body coil. This warning also applies to service procedures.

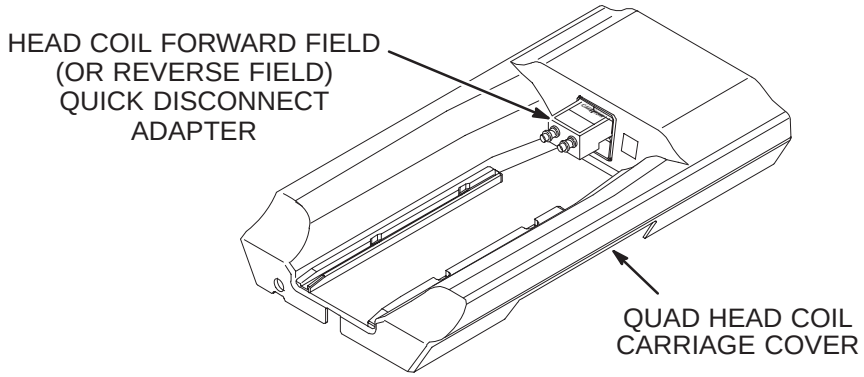
❑ C – HEAD COIL ADAPTERS

1. Unpack Head Coil, Coil Adapters (Head Coil Forward Field, Extremity Coil , Surface Coil), and adapter cables.
2. Install Head Coil Adapter (Head Coil Forward or Reverse Field) into upper coil adapter port on carriage cover.

Note

If magnet is configured with reverse polarity, “reverse field” Head and Surface Coil Adapters are required to be ordered. The “forward field” Coil Adapters must be returned. Since an unaware operator could use the wrong adapter, do not leave both adapters on site.

3. Remove head coil cables from bag attached to Head Coil. Place Head Coil on carriage cover and connect cables to verify connections. Connect blue cable to connector indicated with blue.
3. Set Head Coil with cables, holder, and adapters aside for safe storage (outside of magnet room) until needed during set–up calibrations, functional checks, and system tests.



INSTALLATION STEPS SUMMARY

- ❑ **A1 – Preinstallation Planning**
- ❑ **A2 – Squeeze Bulb Hanger Installation**
- ❑ **A3 – Squeeze Bulb Installation**
- ❑ **A4 – Magnet Room Routing of Tubing & Wave Guide Installation**
- ❑ **A5 – Determining Need of Extender Box**

❑ A1 – PREINSTALLATION PLANNING

The customer and users should be involved in the following decisions:

Routing of Pneumatic Tubing:

Location of Control Box

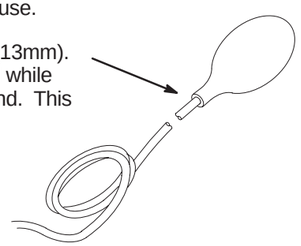
CAUTION

Do not substitute other types of tubing for the pneumatic tubing supplied with this Installation Kit. Substitution of other types of tubing may cause a control box malfunction.

❑ A2 – SQUEEZE BULB INSTALLATION

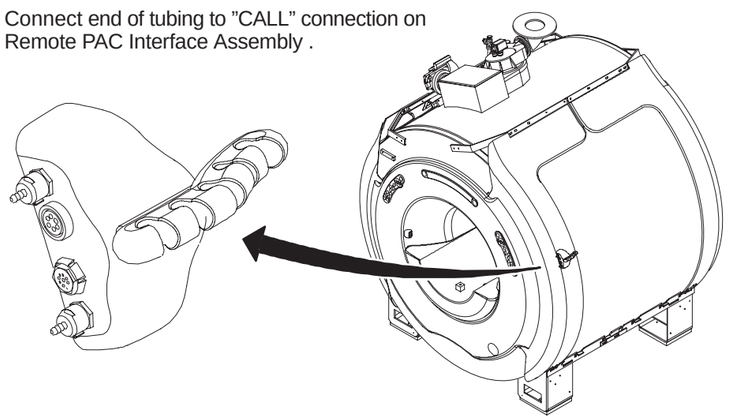
(2) Before cutting pneumatic tubing from roll, verify that when the squeeze bulb is held by a patient being scanned, the tubing length can be routed to the “CALL” connector on the Remote PAC Interface Assembly without getting in the way of operator or patient during use.

(1) Insert end of Pneumatic Tubing into Squeeze Bulb approximately 1/2 inch (13mm). For ease of pneumatic tubing insertion, pinch pneumatic tubing in one hand while squeezing squeeze bulb and pushing pneumatic tubing in with the other hand. This will create a positive pressure and expand squeeze bulb opening.



❑ A3 – CONNECT TUBE TO REMOTE PAC INTERFACE ASSEMBLY

(1) Connect end of tubing to ”CALL” connection on Remote PAC Interface Assembly .



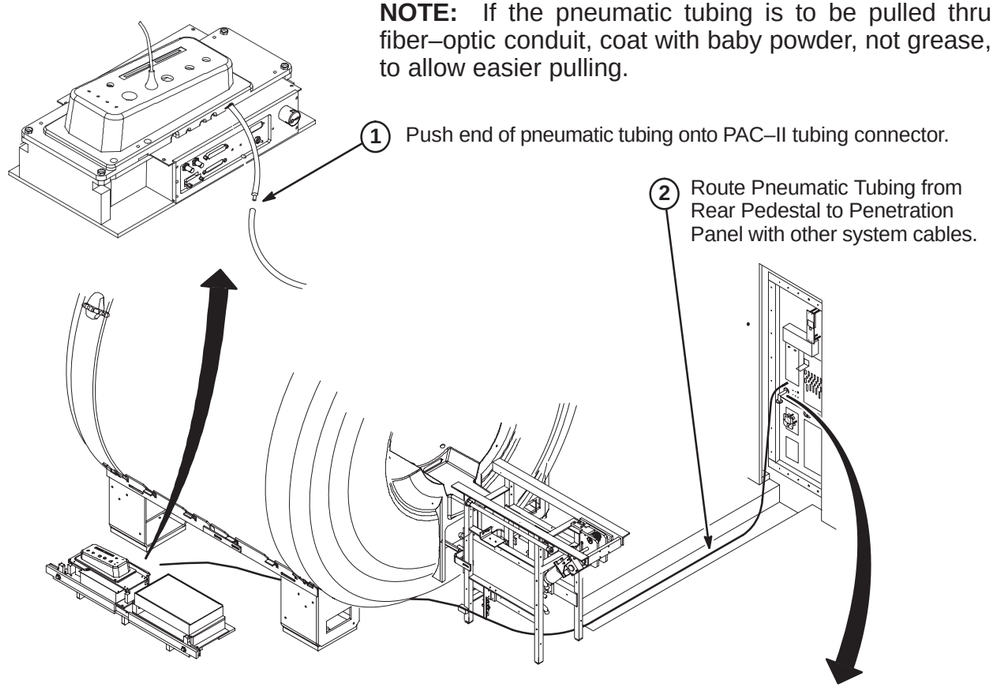
❑ A4 – MAGNET ROOM ROUTING OF TUBING & WAVE GUIDE INSTALLATION

CAUTION

Make sure that pneumatic tubing is not routed where it can be stepped on, pinched, or have an object set on it. The control box alarm will not work if pneumatic tubing is pinched.

NOTE: Also, make sure that the pneumatic tubing can be routed from the PAC connector through the Rear Pedestal, and to the Penetration panel without being pinched along the route by other cables.

NOTE: If the pneumatic tubing is to be pulled thru fiber–optic conduit, coat with baby powder, not grease, to allow easier pulling.

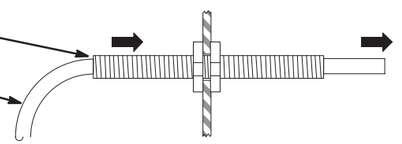


(1) Push end of pneumatic tubing onto PAC–II tubing connector.

(2) Route Pneumatic Tubing from Rear Pedestal to Penetration Panel with other system cables.

(3) Insert Wave Guide thru “ALERT AIR LINE” hole and fasten to Penetration Panel with nut on each side.

(4) Route end of pneumatic tubing from Magnet Room side of Penetration Panel thru Wave Guide into the Equipment Room where the Control Box will be installed.



❑ A5 – DETERMINING NEED OF EXTENDER BOX

Note: If installation requires greater than 115 feet of pneumatic tubing between the squeeze bulb (hanging on Magnet Enclosure) and control box (near Operator’s Console), Extender Kit, 46–317758P2, must be ordered.

If the pneumatic tubing is long enough to reach control box:
The extender is <u>not</u> needed. Proceed to Step **B3**, CONTROL BOX INSTALLATION.

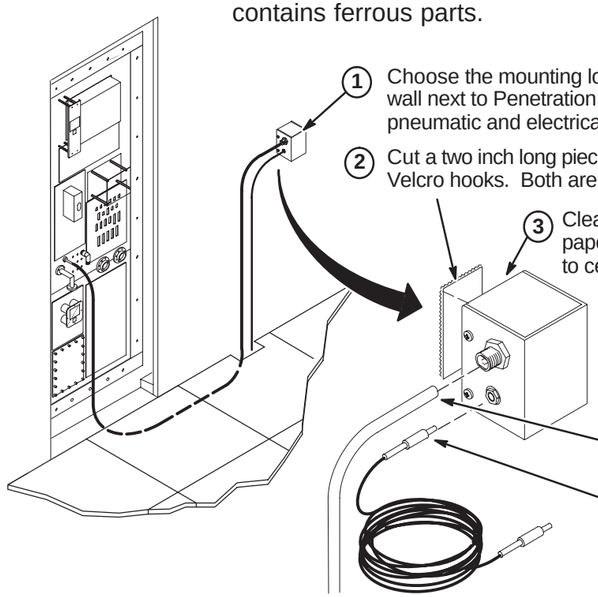
If the pneumatic tubing is <u>not</u> long enough to reach control box:
The extender is needed. Proceed to Step **B1**, INSTALLATION OF EXTENDER KIT.

INSTALLATION STEPS SUMMARY

- ❑ **B1 – Installation of Extender Kit (46–317758P2)**
- ❑ **B2 – Connection of Extender Wire to Control Box**
- ❑ **B3 – Control Box Installation**
- ❑ **B4 – Control Box Installation on Wall or Under Shelf**
- ❑ **B5 – Control Box Mounted with Velcro**

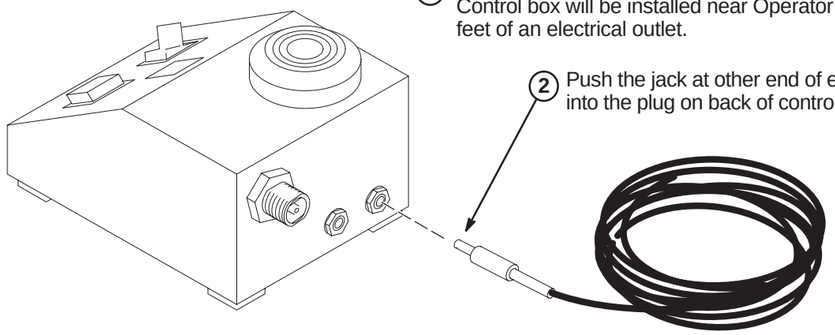
❑ B1 – INSTALLATION OF EXTENDER KIT (46–317758P2)

Note: Do not mount Extender Box in Magnet Room because the box contains ferrous parts.



1. Choose the mounting location for extender box on equipment room wall next to Penetration Panel. Extender box will be mounted with pneumatic and electrical jacks on side of extender box.
2. Cut a two inch long piece of Velcro loops and a two inch long piece of Velcro hooks. Both are obtained from the Pneumatic Patient Alert Kit.
3. Clean the back of extender box, remove protective paper from back of Velcro loops, and attach Velcro to center of extender box back.
4. Clean wall in the area where extender box will be mounted, remove protective paper from back of Velcro hooks, and attach velcro to wall in same orientation as Velcro loops on extender box.
5. Push end of pneumatic tubing fully onto Feed–thru connector on Extender Box.
6. Push the jack on one end of the 65 foot Extender Wire into the plug on side of Extender Box.

❑ B2 – CONNECTION OF EXTENDER WIRE TO CONTROL BOX



1. Route the extender wire from extender box to control box. Control box will be installed near Operator Console, within five feet of an electrical outlet.
2. Push the jack at other end of extender wire into the plug on back of control box.

❑ B3 – CONTROL BOX INSTALLATION

Consult with the operator in choosing the mounting orientation for the control box. Some key factors to consider are ease of use by operator, remaining within sight of operator, and remaining within five feet of an electrical outlet. Choose one of the following control box locations:

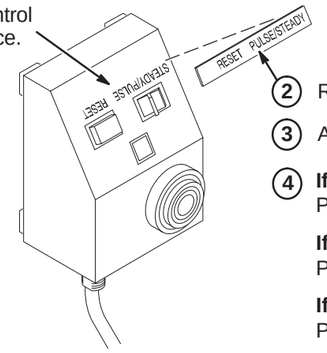
Mount control box on a wall or other vertical surface per Step **B4**, CONTROL BOX INSTALLATION ON WALL OR UNDER SHELF.

Mount control box under shelf per Step **B4**, CONTROL BOX INSTALLATION ON WALL OR UNDER SHELF.

Place Control Box on a counter top, desk top, or other horizontal surface. Set the Control Box near Operator Console and within five feet of electrical outlet. Control Box should be placed within sight of operator. Proceed to Step **C5**, FINAL CONNECTIONS TO CONTROL BOX.

Note: The installer must provide additional mounting hardware if supplied screws or adhesive backed Velcro are not adequate for installation of the control box.

❑ B4 – CONTROL BOX INSTALLATION ON WALL OR UNDER SHELF

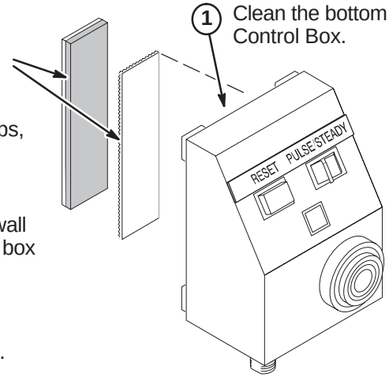


1. Clean Control Box surface.
2. Remove adhesive backing from metalized nameplate.
3. Apply nameplate over silk screened lettering as shown.
4. **If control box will be mounted to WALL or SHELF with Velcro:** Proceed to Step **B5**.

   If control box will be mounted on WALL with screws: Proceed to Step **C1**.

   If control box will be mounted under SHELF with screws: Proceed to Step **C3**.

❑ B5 – CONTROL BOX MOUNTED WITH VELCRO



1. Clean the bottom surface of the Control Box.
2. From the Pneumatic Patient Alert Kit, cut a three inch long piece of Velcro loops and a three inch piece of Velcro hooks.
3. Remove protective paper from back of Velcro loops, and attach Velcro to center bottom of control box.
4. Choose the mounting location for control box on wall (or under shelf) next to operator console. Control box should be mounted within sight of operator.
5. Clean the area where control box will be mounted.
6. Remove protective paper from back of Velcro hooks and attach to mounting location in same orientation as Velcro on box.
7. Mount the control box by pressing Velcro on control box against Velcro on mounting location and twisting slightly.

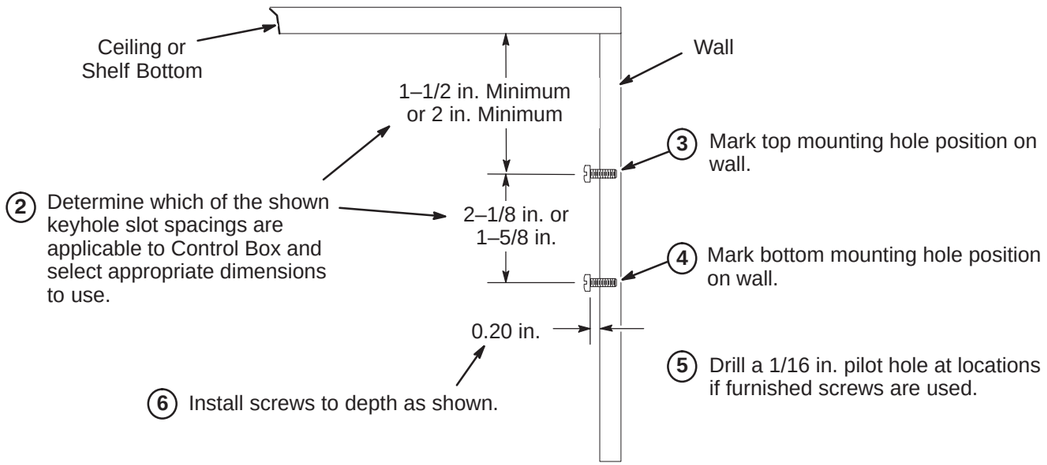
SIGNA WideOpen PNEUMATIC PATIENT ALERT INSTALLATION

INSTALLATION STEPS SUMMARY

- ❑ **C1 – Installing Mounting Screws in Vertical Surface**
- ❑ **C2 – Installing Control Box on Vertical Surface**
- ❑ **C3 – Installing Mounting Screws Under Shelf**
- ❑ **C4 – Installing Control Box Under Shelf**
- ❑ **C5 – Final Connections to Control Box**

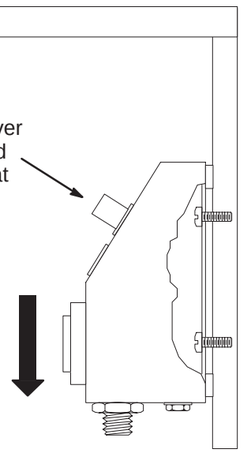
❑ C1 – INSTALLING MOUNTING SCREWS IN VERTICAL SURFACE

1. Choose the mounting area near the Operator Console and install mounting screws (item 9). Control box should be mounted within sight of operator.



2. Determine which of the shown keyhole slot spacings are applicable to Control Box and select appropriate dimensions to use.
3. Mark top mounting hole position on wall.
4. Mark bottom mounting hole position on wall.
5. Drill a 1/16 in. pilot hole at locations if furnished screws are used.
6. Install screws to depth as shown.

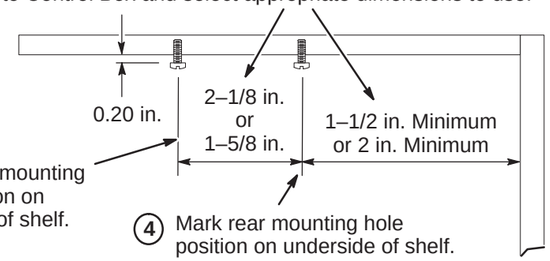
❑ C2 – INSTALLING CONTROL BOX ON VERTICAL SURFACE



1. Center box keyhole slots over screws, push in on box, and then push downward to seat screws within slots.
2. Tighten or loosen screws as necessary to obtain a snug fit of box against wall.
3. Proceed to Step **C5**, FINAL CONNECTIONS TO CONTROL BOX.

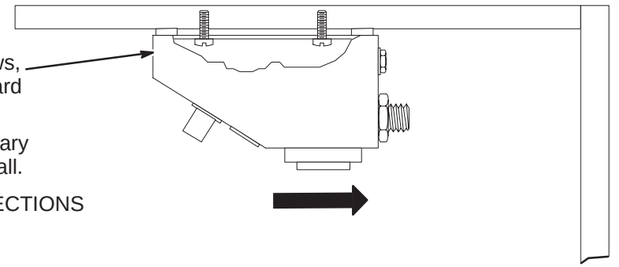
❑ C3 – INSTALLING MOUNTING SCREWS UNDER SHELF

1. Choose the mounting area near the Operator Console and install mounting screws (item 9). Control box should be mounted within sight of operator.
2. Determine which of the shown keyhole slot spacings are applicable to Control Box and select appropriate dimensions to use.



3. Mark front mounting hole position on underside of shelf.
4. Mark rear mounting hole position on underside of shelf.
5. Drill a 1/16 in. pilot hole at locations if furnished screws are used.

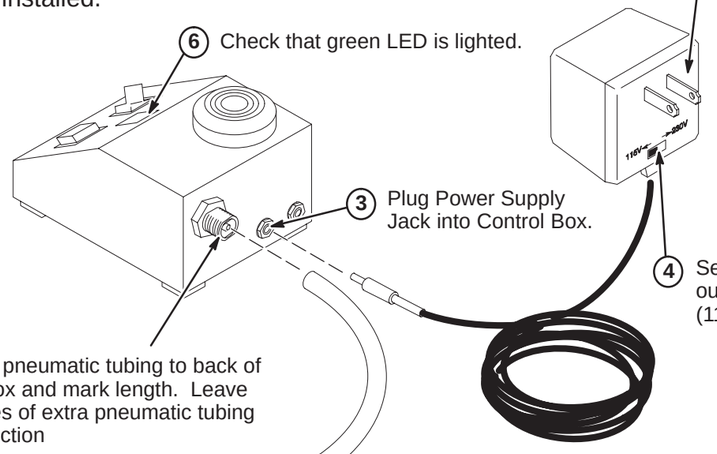
❑ C4 – INSTALLING CONTROL BOX UNDER SHELF



1. Center box keyhole slots over screws, push up on box, and then push inward to seat screws within slots.
2. Tighten or loosen screws as necessary to obtain a snug fit of box against wall.
3. Proceed to Step **C5**, FINAL CONNECTIONS TO CONTROL BOX.

❑ C5 – FINAL CONNECTIONS TO CONTROL BOX

Note: Steps 1 and 2 are not needed if Extender Box (46–317758P2) has been installed.



5. Plug Power Supply into AC outlet.
6. Check that green LED is lighted.
3. Plug Power Supply Jack into Control Box.
4. Set Power Supply to outlet voltage (115VAC or 230VAC).
1. Bring the pneumatic tubing to back of control box and mark length. Leave two inches of extra pneumatic tubing for connection
2. Cut tubing and push fully onto feed–thru connector on back of control box.

OPERATOR WORKSPACE INSTALLATION INSTRUCTIONS

1–1 Tab 13, Operator Workspace, contains installation instructions for the following:

- *DIRECTION* 2210982 – Signa Octane Operator Workspace Installation Instructions
- *DIRECTION 2*386129 – Signa Linux Operator Workspace Installation Instructions
- *DIRECTION 2*403543 – Operator Workspace Upgrade to EXCITE II Installation Instructions

Use only the applicable System Cabinet Upgrade Installation Instruction Directions

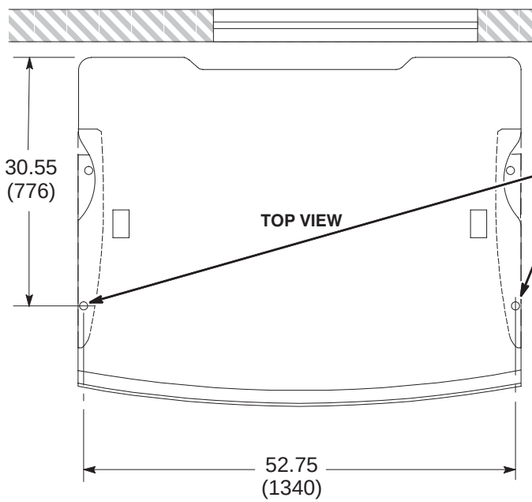
SIGNA OCTANE OPERATOR WORKSPACE INSTALLATION INSTRUCTIONS

INSTALLATION STEPS SUMMARY

- ❑ **A1 – Operator Workspace Table Anchor Installation**
- ❑ **A2 – Securing Operator Workspace Table to Floor**
- ❑ **A3 – Attach Workspace Interface Module (2141978 series) to Table**
- ❑ **A4 – Attach Power Distribution Box (46–307830G1) to Table**

Note: The CERD Spike Noise Test Cable (2168505) is part of the 8.x Octane Operator Workspace Cable collector (2154392–2). Remove this cable from the collector and place it in the TPS RF Service Interface Kit (46–301927G1).

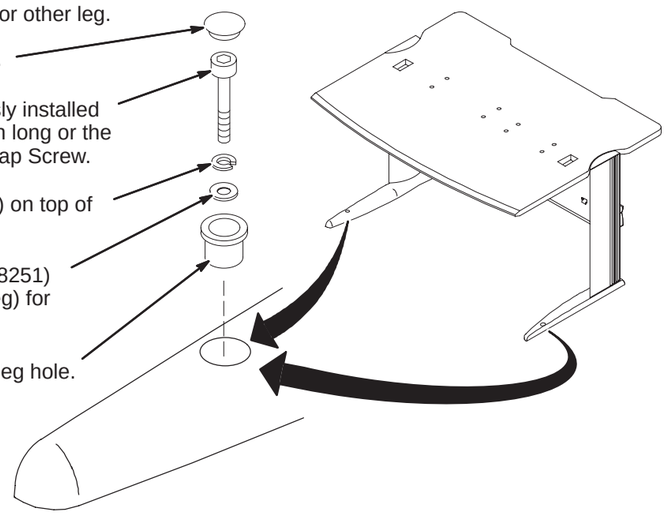
❑ A1 – OPERATOR WORKSPACE TABLE ANCHOR INSTALLATION



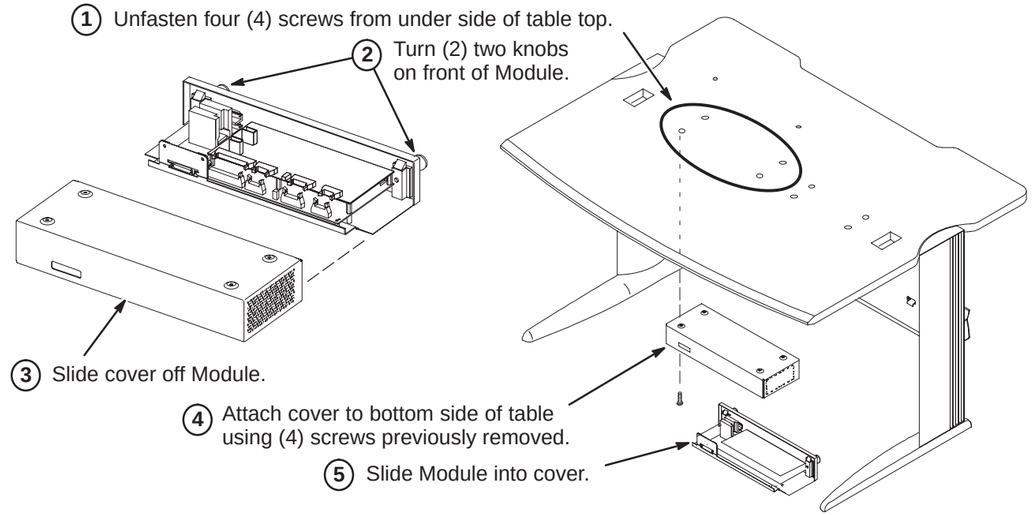
1. Refer to room layout plan and consult with Site customer for exact location of Operator Workspace Table (2135998–2).
2. Remove and discard the two (2) cover plugs. Locate and mark on floor the two hole locations at the front of the table legs.
3. Move table to prepare for installing the floor anchors in Steps 4 and 5.
4. At each hole marked in Step 2, drill a .38 inch hole and insert 1/4–20 x .375 diameter anchor (2168253).
5. Secure anchor in place with supplied Setting Tool (2168781).

❑ A2 – SECURING OPERATOR WORKSPACE TABLE TO FLOOR

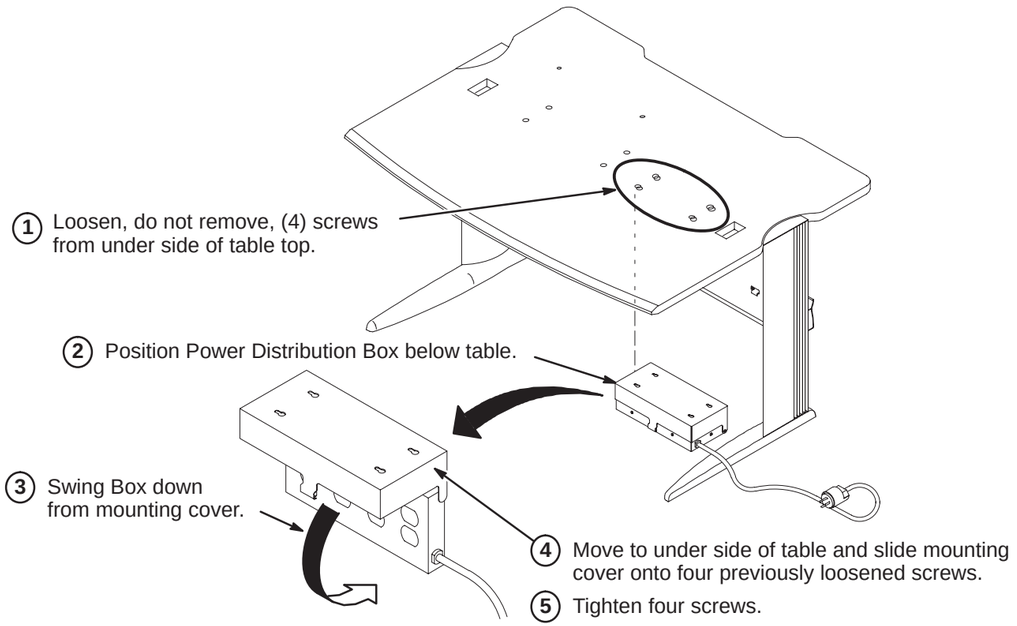
6. Repeat anchoring process below for other leg.
5. Install black nylon Plug (2168254).
4. Depending upon depth of previously installed anchor, install either the 1–3/4 inch long or the 2 inch long 1/4 x 20 Hex Socket Cap Screw.
3. Insert one Lock Washer (2168252) on top of Flat Washer(s).
2. Insert as many Flat Washers (2168251) as required (3 provided for each leg) for securing table to floor.
1. Insert Bushing (2151454) in table leg hole.



❑ A3 – ATTACH WORKSPACE INTERFACE MODULE (2141978 series) TO TABLE



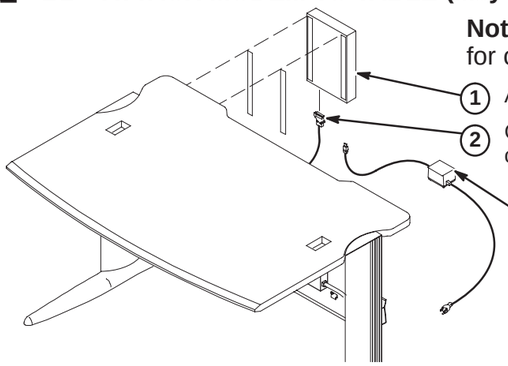
❑ A4 – ATTACH POWER DISTRIBUTION BOX (46–307830G1) TO TABLE



INSTALLATION STEPS SUMMARY

- ❑ **B1 – Attach Modem to Table (May be replaced by ethernet connection)**
- ❑ **B2 – Attach DASM to Table**
- ❑ **B3 – Attach Serial Expansion Box Asm to Underside of Table Top**
- ❑ **B4 – Attach Serial Coverter to Underside of Table Top (MGD & Open*Speed* only)**

❑ B1 – ATTACH MODEM TO TABLE (May be replaced by ethernet connection)



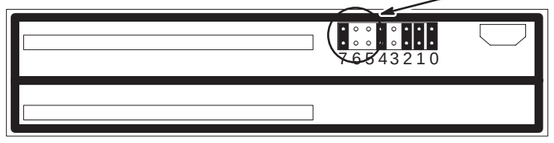
Note: Modem may be replaced by Ethernet cable for connection to InSite (See Procedure **E4**).

1. Attach to back plate of table.
2. Connect Run 812 (2188746) to Modem. Other end to be connected to Operator Workspace Cabinet SER 1 later.
3. Modem Power Adapter to be supplied by District office and connected to Power Distribution Box J7.

❑ B2 – ATTACH DASM TO TABLE

Note: The Analog and Digital DASMs are shipped with the jumper set to SCSI ID=0. This is the correct ID for an AW, but incorrect for Signa Horizon LX (SCSI ID=3).

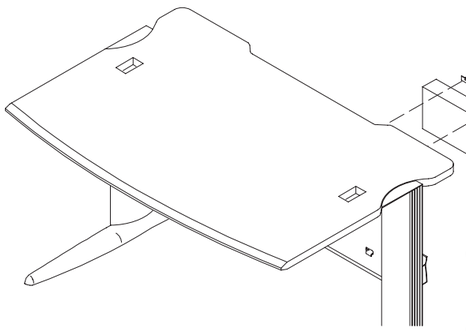
1. Unfasten DASM cover screw and remove cover.



2. For SCSI ID = 3, set Configuration Jumper J2 as follows:
   5=OFF, 6=OFF, 7=ON
   Note: A jumper in the OFF position enables the SCSI ID bit.
3. Re-attach DASM cover.

Note: Consult with Site customer for preference of DASM location. This procedure installs DASM in the cable trough. Customer may prefer DASM on top of table.

CAUTION: Longer SCSI cables cannot be substituted.

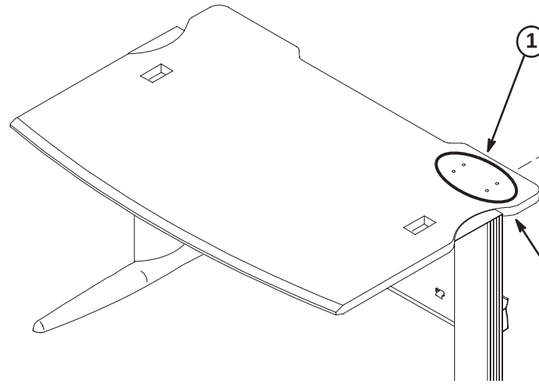


4. Unfasten DASM Bracket from back plate. Use only for 46–269566P3 or 2143388–2. Not used for 2251040 or 2251043.
5. Install DASM (Analog, 46–269566P3, or Digital, 2143388–2) in cable trough and fasten in place with DASM Bracket.

   OR

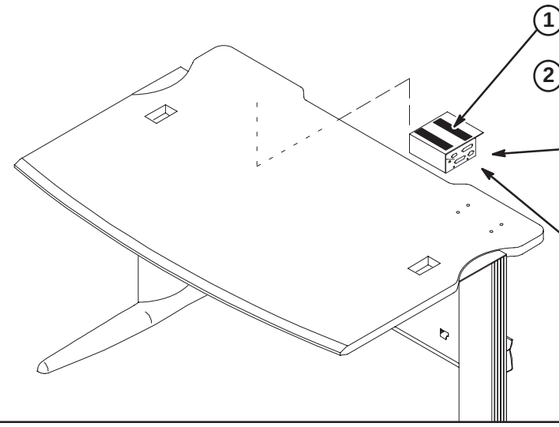
   Install DASM (Analog, 2251040, or Digital, 2251043) in cable trough. Refer to installation instructions that are shipped with DASM.
6. Route and connect DASM cables and accessories according to instructions provided with DASM Module and Cable Map in Overview Tab of this manual.
7. Connect power cable to Power Distribution Box J2.

❑ B3 – ATTACH SERIAL EXPANSION BOX ASM TO UNDERSIDE OF TABLE TOP



1. Loosen, do not remove, (4) screws from under side of table top.
2. Position Serial Expansion Box Asm (2204796) below table.
3. Move to under side of table and slide mounting cover onto four previously loosened screws.
4. Tighten four screws.

❑ B4 – ATTACH SERIAL CONVERTER TO BOTTOM OF TABLE (MGD & Open*Speed*)



1. Cut supplied velcro strip into two pieces and attach to module.
2. Attach Serial Converter Module to underside of table top.

3A. **FOR Open*Speed*:** Connect to module Runs 837 (J4), 838 (J3), 910 (J2), and 911 (J1).

OR

3B. **FOR MGD: If provided, c**onnect to module Runs 838 (J3) and 911 (J1). (future feature)

4. Connect Power cable to Power Distribution Box J8.

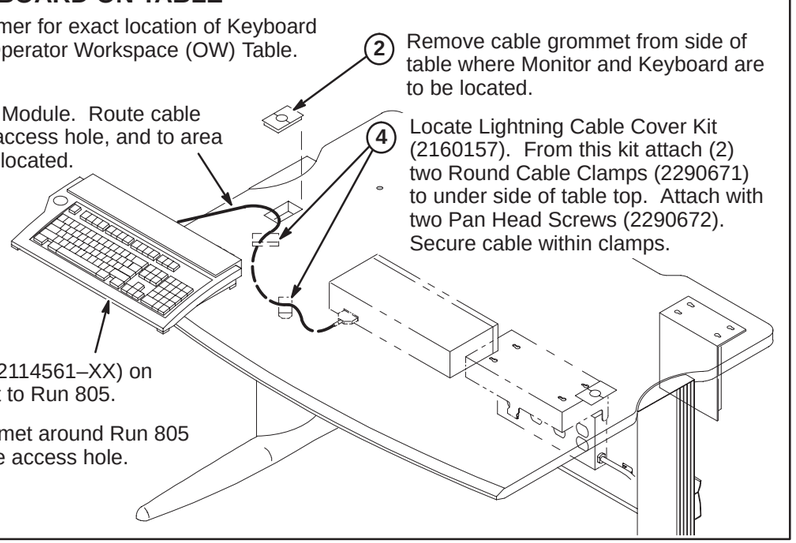
INSTALLATION STEPS SUMMARY

- ❑ **C1 – Install Keyboard on Table**
  OR
- ❑ **C2 – Install SCIM/Keyboard Data Cable on Table**
- ❑ **C3 – Install SCIM/Keyboard on Table**
- ❑ **C4 – Install Flat Screen Color Monitor on Table**

NOTE:
Consult with Site customer for exact location of Color Monitor on Operator Workspace Table.

❑ C1 – INSTALL KEYBOARD ON TABLE

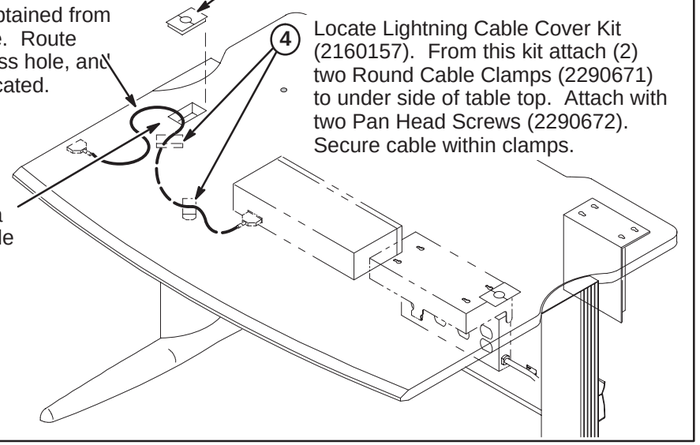
1. Consult with Site customer for exact location of Keyboard and Color Monitor on Operator Workspace (OW) Table.
2. Remove cable grommet from side of table where Monitor and Keyboard are to be located.
3. Connect Run 805 to I/F Module. Route cable under table, thru cable access hole, and to area where Keyboard will be located.
4. Locate Lightning Cable Cover Kit (2160157). From this kit attach (2) two Round Cable Clamps (2290671) to under side of table top. Attach with two Pan Head Screws (2290672). Secure cable within clamps.
5. Place Keyboard (2114561–XX) on table and connect to Run 805.
6. Place cable grommet around Run 805 and insert in cable access hole.



OR

❑ C2 – INSTALL SCIM/KEYBOARD DATA CABLE ON TABLE

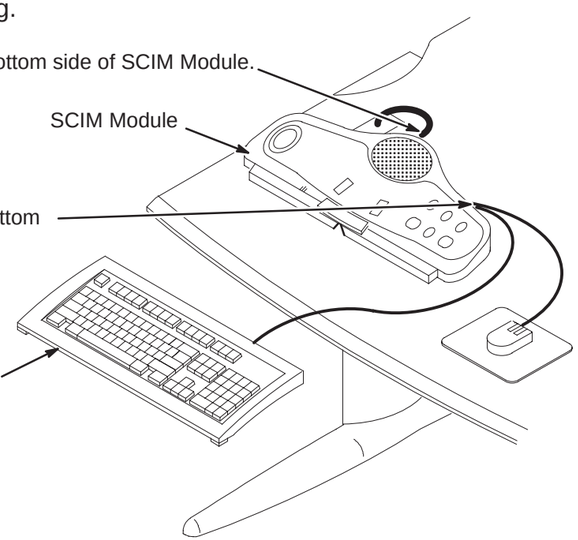
1. Consult with Site customer for exact location of Keyboard and Color Monitor on Operator Workspace (OW) Table.
2. Remove cable grommet from side of table where Monitor and Keyboard are to be located.
3. Connect Data Cable (Run 805), obtained from SCIM Kit (2307175), to I/F Module. Route cable under table, thru cable access hole, and to area where Keyboard will be located.
4. Locate Lightning Cable Cover Kit (2160157). From this kit attach (2) two Round Cable Clamps (2290671) to under side of table top. Attach with two Pan Head Screws (2290672). Secure cable within clamps.
5. Place cable grommet around Data Cable (Run 805) and insert in cable access hole.



❑ C3 – INSTALL SCIM/KEYBOARD ON TABLE

NOTE: Refer to Installation document OW1INA3.DOC on Service Methods CD–ROM or MR Service Engineering web site for installation information on language labels and keyboard mounting.

1. Connect Data Cable to bottom side of SCIM Module.
2. Connect Keyboard and Mouse cables to bottom side of SCIM Module as marked.
3. Place Keyboard on table in front of SCIM Module.

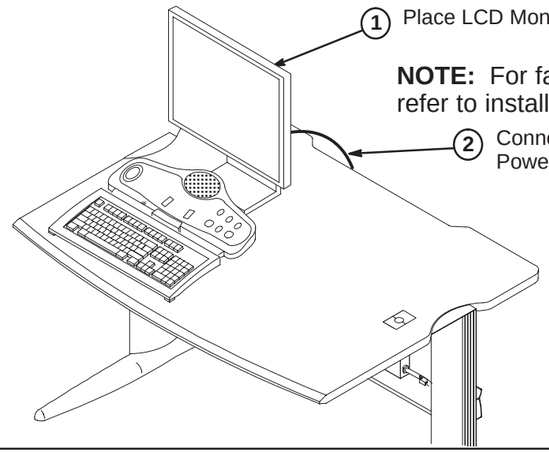


❑ C4 – INSTALL FLAT SCREEN COLOR MONITOR ON TABLE

1. Place LCD Monitor on table in back of SCIM.

NOTE: For fastening monitor to surface, refer to installation drawing 2204493DDW.

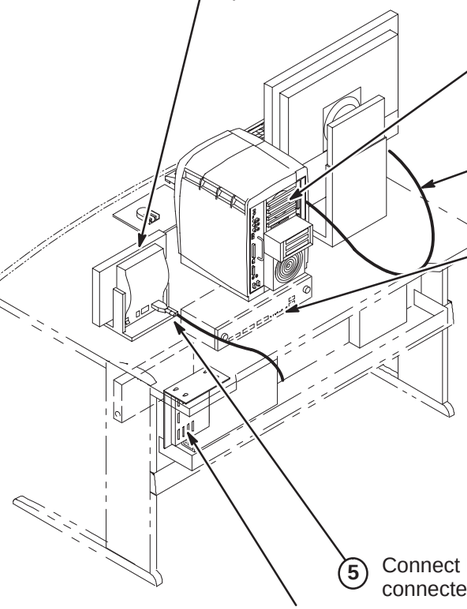
2. Connect power cable to Power Distribution Box J1.



INSTALLATION STEPS SUMMARY

- ❑ **D1 – Install LCD Display on Table and Position Octane Computer**
- ❑ **D2 – Connect Table Component Cables**
- ❑ **D3 – Serial Expansion Box Set Up**
- ❑ **D4 – SGI Octane Computer Cables Connections**

❑ D2 – CONNECT TABLE COMPONENT CABLES



1. Place LCD Display (2138599) on table. Connect power cable to Power Distribution Box J5.
2. Place Octane Computer on table.
   NOTE: Refer to Procedure **D4** for Run connections to SGI Octane Computer.
3. Connect Run 798/821 (2150533–2) to R IN, B IN, G IN on Monitor and route/connect to MONITOR on the Octane Computer module.
4. Connect the following cables from the OW I/F Module (OW A1 A4) for later connection to Operator Workspace Cabinet:

RUN #	CONNECTION	PART #
805	J6	2114561–38
810	J8	2141980–2
814	J9	2196990
817	J17	46–328000G958

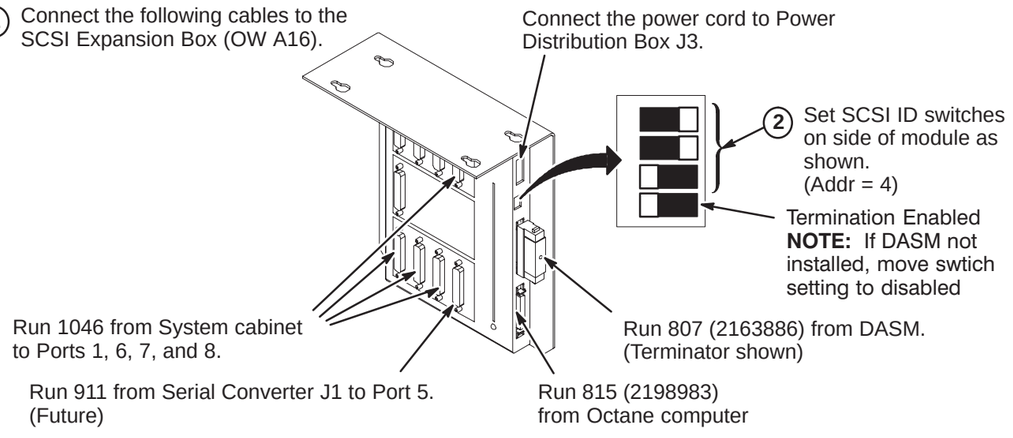
   Connect the following cables to OW I/F Module. These cables will be routed to the System Cabinet and Penetration Panel:

RUN #	CONNECTION	PART #
789	J18	46–317068G938
788	J7	46–328000G937

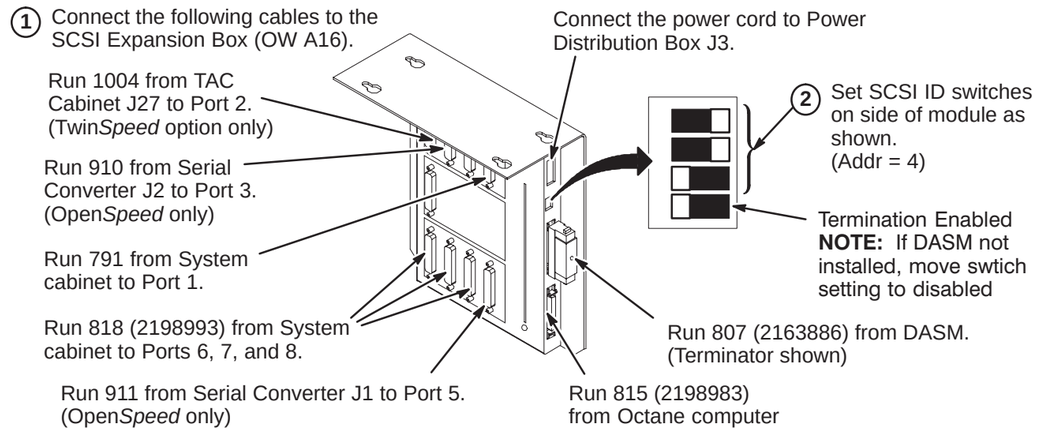
5. Connect Run 797 (2138599–2) to LCD Display. Other end is connected later to PC in the Operator Workspace Cabinet.

NOTE: Refer to Procedure **D3** for Run connections and DIP switch settings.

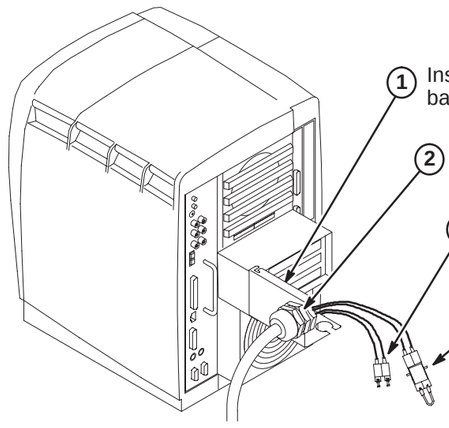
❑ D3 – SERIAL EXPANSION BOX SET UP FOR MGD (10.x)



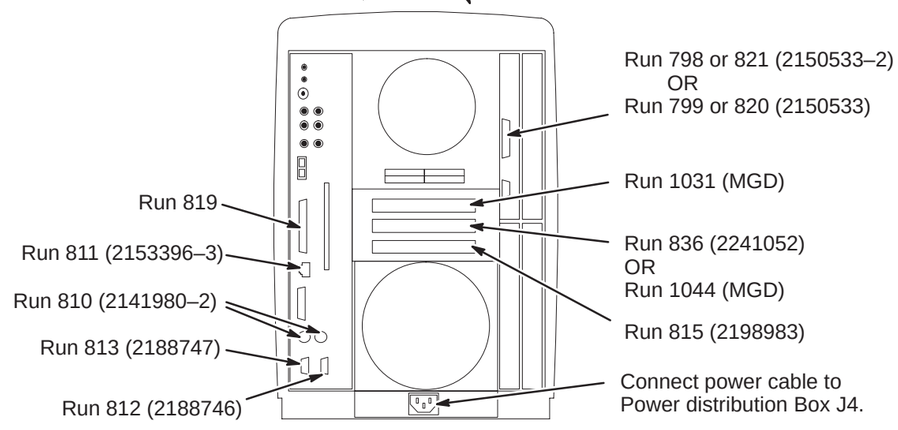
❑ D3 – SERIAL EXPANSION BOX SET UP (9.x)



❑ D4 – SGI OCTANE COMPUTER CABLES CONNECTIONS



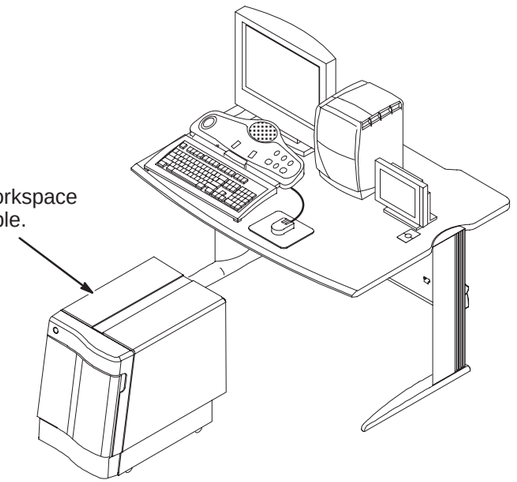
1. Install fiber optic Strain Relief Bracket (2245994) to back of Octane Computer using existing screws.
2. Route and connect Bit3 Fiber Optic cable Run 836 (2241052) to bracket.
3. Connect Run 836 (or Run 1044, MGD) orange and blue fiber optic cables as indicated in Step 5 below.
4. Spare Fiber Optic cable and Loopback Assembly (2241052–6).
5. Connect the following cables to the SGI Octane Computer (OW A15) as marked.



INSTALLATION STEPS SUMMARY

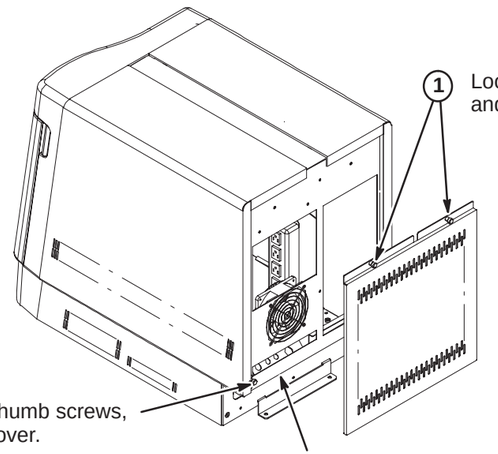
- ❑ **E1 – Locate Operator Workspace Cabinet in Front of Table**
- ❑ **E2 – Remove Operator Workspace Cabinet Rear Cover**
- ❑ **E3 – Remove Operator Workspace Cabinet Front And Side Covers**
- ❑ **E4 – Connect Ethernet Cables**
- ❑ **E5 – Route/Connect Runs 792, 797, 813, and 814 to PC Module**

❑ E1 – LOCATE OPERATOR WORKSPACE CABINET IN FRONT OF TABLE



① Position Operator Workspace Cabinet in front of table.

❑ E2 – REMOVE OPERATOR WORKSPACE CABINET REAR COVER

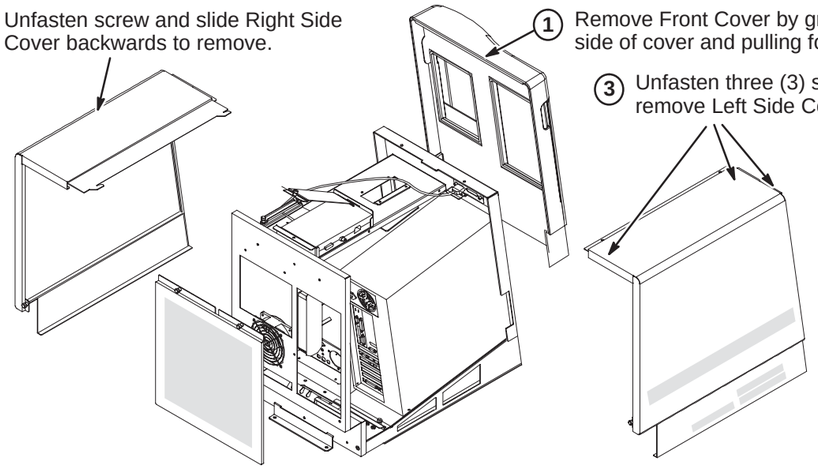


① Loosen (2) two thumb screws and remove Rear Cover.

② Loosen the (2) two thumb screws, one on each Side Cover.

Cable Access Hole

❑ E3 – REMOVE OPERATOR WORKSPACE CABINET FRONT AND SIDE COVERS



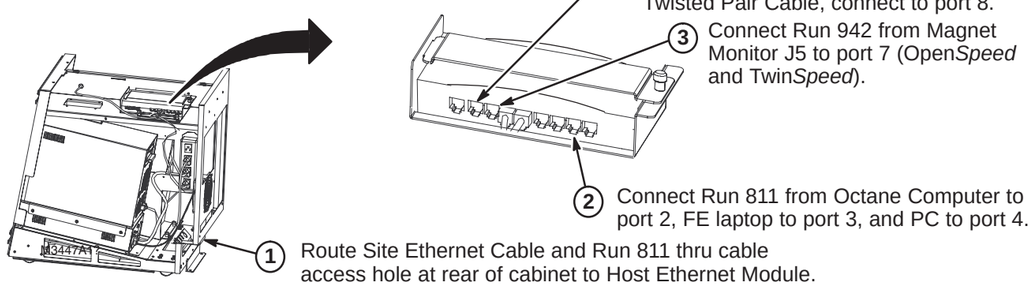
② Unfasten screw and slide Right Side Cover backwards to remove.

① Remove Front Cover by grasping each side of cover and pulling forward.

③ Unfasten three (3) screws and remove Left Side Cove.

❑ E4 – CONNECT ETHERNET CABLES

Note: Site Ethernet cable for InSite connection is supplied by customer. For Europe, connection to ISDN router is required. Refer to catalog required for country or region for specific equipment to be installed.



④ Site Ethernet cable is supplied by customer. If cable supplied is a Shielded Twisted Pair Cable, connect to port 8.

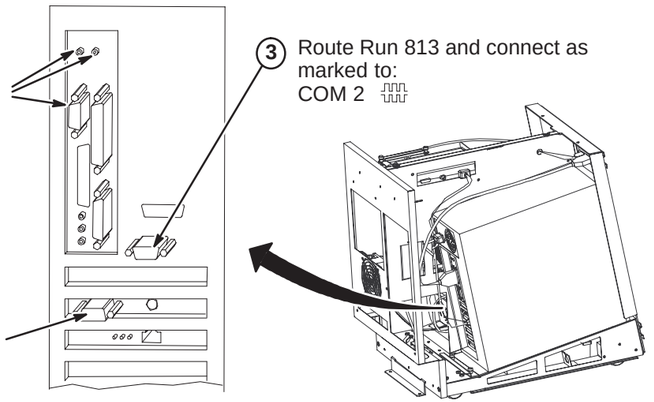
③ Connect Run 942 from Magnet Monitor J5 to port 7 (Open*Speed* and Twin*Speed*).

② Connect Run 811 from Octane Computer to port 2, FE laptop to port 3, and PC to port 4.

① Route Site Ethernet Cable and Run 811 thru cable access hole at rear of cabinet to Host Ethernet Module.

❑ E5 – ROUTE/CONNECT RUNS 792, 797, 813, AND 814 TO PC MODULE

Note: Route cables thru access hole at rear of cabinet.



① Route Run 814 and connect as marked to:
KEYBOARD
MOUSE
COM1

② Route Run 797 and connect as marked to:
VIDEO

③ Route Run 813 and connect as marked to:
COM 2

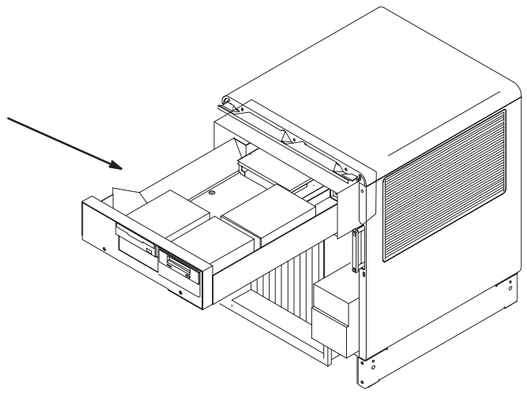
PROCEDURES F1 THRU F5 ARE USED ONLY WHEN UPGRADING FROM 5.x PLATFORMS, DO NOT PERFORM PROCEDURES F1 THRU F5 FOR NEW OCTANE INSTALLATIONS

INSTALLATION STEPS SUMMARY

- ❑ **F1 – Removal of DAT and MOD Drives from Genesis Computer**
- ❑ **F2 – Remove SCSI Expansion Box**
- ❑ **F3 – DAT Drive Settings**
- ❑ **F4 – MOD Drive Settings**
- ❑ **F5 – Install DAT and MOD Drives (Legacy Media) in SCSI Expansion Box**

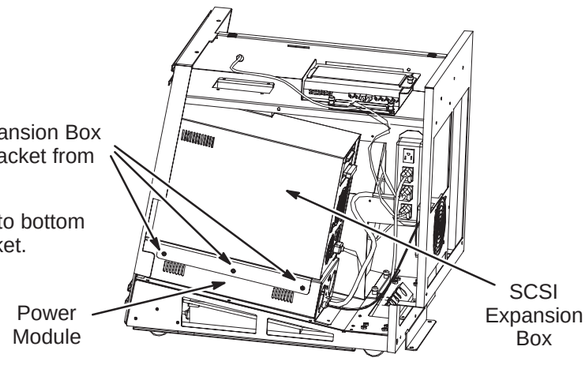
❑ F1 – REMOVAL OF DAT AND MOD DRIVES FROM GENESIS COMPUTER

UPGRADE FROM 5.x OPTIONS:
For transferring Legacy Media DAT and MOD Drives from Genesis Computer – refer to Tab 13, Directions 2174955 and 2174956, steps **A1** thru **A4** only for removal of existing drives.



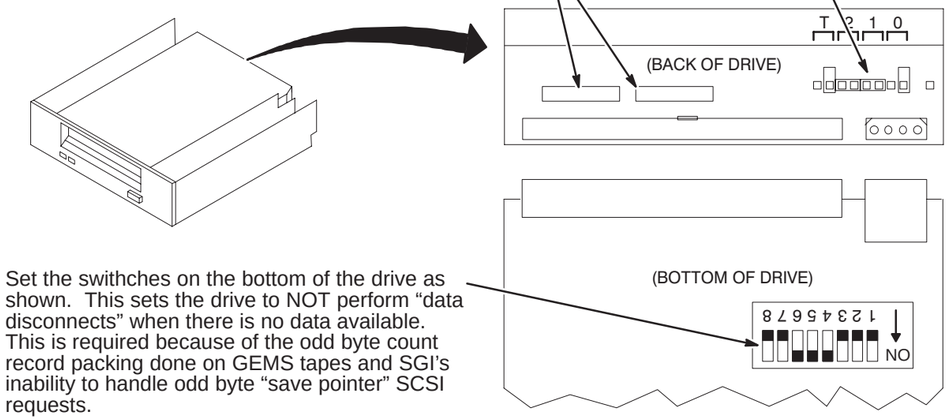
❑ F2 – REMOVE SCSI EXPANSION BOX

1. Unfasten three (3) screws from SCSI Expansion Box mounting bracket and remove Box and bracket from power module.
2. Unfasten six (6) screws that hold bracket to bottom of SCSI Expansion Box and remove bracket.
3. Remove SCSI Expansion Box cover.



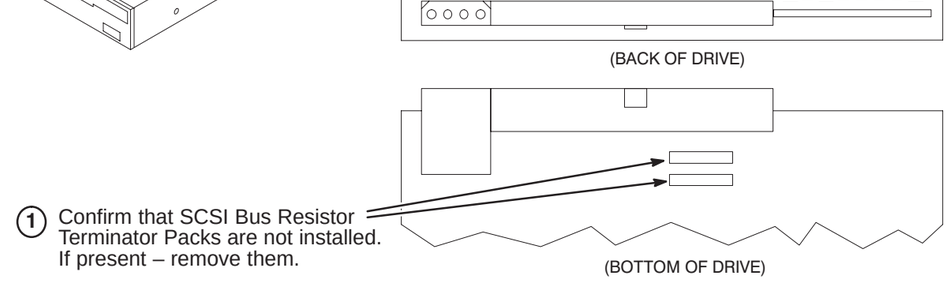
❑ F3 – DAT DRIVE SETTINGS

1. Confirm that SCSI Bus Resistor Terminator Packs are not installed. If present – remove them.
2. For Octane, set SCSI ID = 6
3. Set the swithches on the bottom of the drive as shown. This sets the drive to NOT perform "data disconnects" when there is no data available. This is required because of the odd byte count record packing done on GEMS tapes and SGI's inability to handle odd byte "save pointer" SCSI requests.



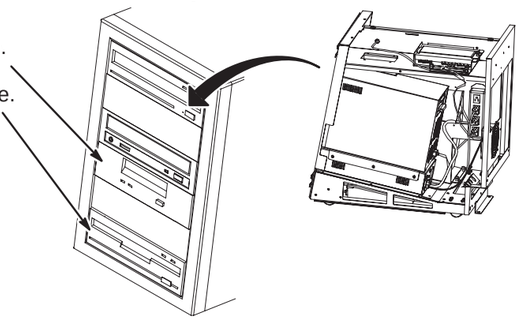
❑ F4 – MOD DRIVE SETTINGS

1. Confirm that SCSI Bus Resistor Terminator Packs are not installed. If present – remove them.
2. For Octane, SCSI ID = 5
3. Make sure jumper is installed on pins at position 8 for SCSI Optical Disk.



❑ F5 – INSTALL DAT AND MOD DRIVES (LEGACY MEDIA) IN SCSI EXPANSION BOX

1. Install DAT Drive in slot 4 with existing hardware.
2. Install MOD Drive in slot 6 with existing hardware.
3. Connect power cords to DAT and MOD Drives.
4. Connect ribbon cable to DAT and MOD Drives.
5. Install SCSI Expansion Box cover. Reattach bracket to bottom of Box. Reattach bracket and Box assembly to power module.

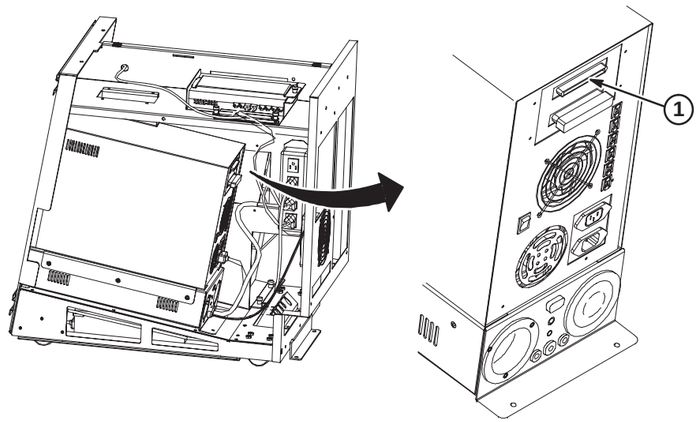


INSTALLATION STEPS SUMMARY

- ❑ **G1 – Route/Connect Run 819 to SCSI Expansion Box**
- ❑ **G2 – Route/Connect Runs 047, 048, 049/969, and 817 to Power Module**
- ❑ **G3 – Align Operator Workspace Cabinet Cables & Attach InSite “Computer” Magnet**
- ❑ **G4 – Bundle Operator Workspace Cabinet Cables**

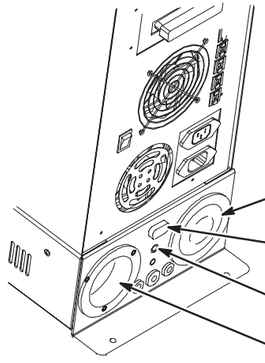
❑ G1 – ROUTE/CONNECT RUN 819 TO SCSI EXPANSION BOX

Note: Route all cables from SGI Octane Computer thru cable access hole at rear of cabinet.



1. Route/Connect Run 819 from SGI Octane Computer.

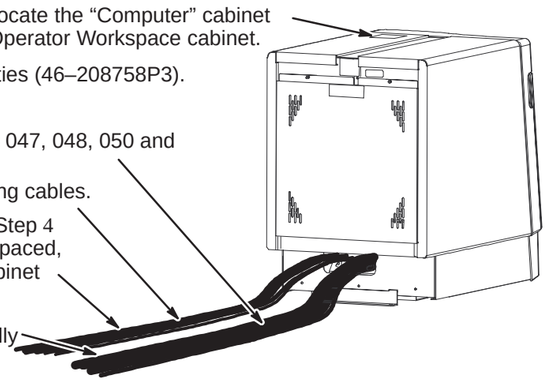
❑ G2 – ROUTE/CONNECT RUNS 047, 048, 049/969, AND 817 TO POWER MODULE



1. Route/Connect Run 049 or Run 969 Power Cable from Operator Workspace I/F to J2.
2. Route/Connect Run 817 Power Cable from Operator Workspace Power Module to J3.
3. Route/Connect Run 048 Ground Cable from PDU to ground screw.
4. Route/Connect Run 047 Power Cable from PDU to J1.

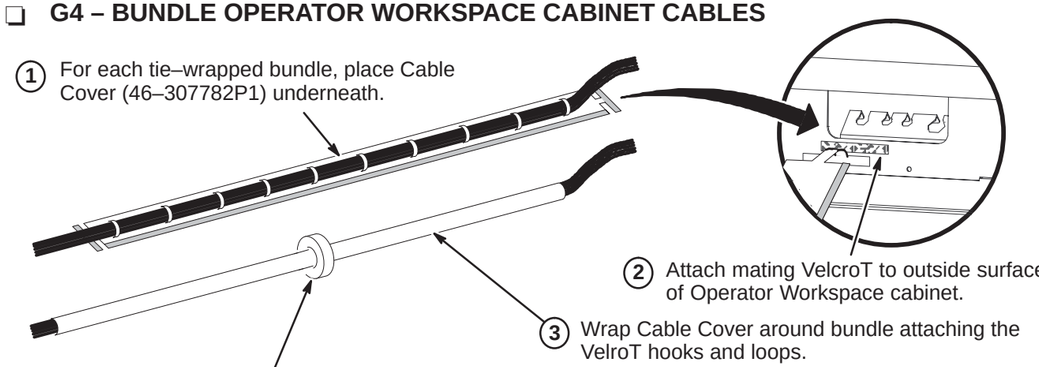
❑ G3 – ALIGN CABINET CABLES & ATTACH InSite “COMPUTER” MAGNET

1. Install Operator Workspace Cabinet right and left Side covers, Front cover and Rear cover.
2. From the 8.0 LX InSite Kit (46–301708G14), locate the “Computer” cabinet magnet (46–320095P1) and attach to top of Operator Workspace cabinet.
3. Locate the twenty (20) seven inch long cable ties (46–208758P3).
4. Seperate cables into two bundles;
   The first bundle will include power cable Runs 047, 048, 050 and fiber optic cable Run 790.
   The second bundle will include all the remaining cables.
5. Align the cables of the first bundle created in Step 4 and attach ten (10) of the cable ties, equally spaced, around the cable bundle between the OW Cabinet and the OW Table.
6. Attach the remaining ten (10) cable ties, equally spaced, around the second cable bundle.



❑ G4 – BUNDLE OPERATOR WORKSPACE CABINET CABLES

1. For each tie–wrapped bundle, place Cable Cover (46–307782P1) underneath.



2. Attach mating VelcroT to outside surface of Operator Workspace cabinet.
3. Wrap Cable Cover around bundle attaching the VelroT hooks and loops.
4. Attach cable bundle Clamp (46–307873P1) to center of Cable Cover.
5. Carefully roll OW Cabinet into final position. Make sure cable bundles are unobstructed and slide easily. Attach to mating Velcro on cabinet.
6. Repeat Step 5 as often as necessary.

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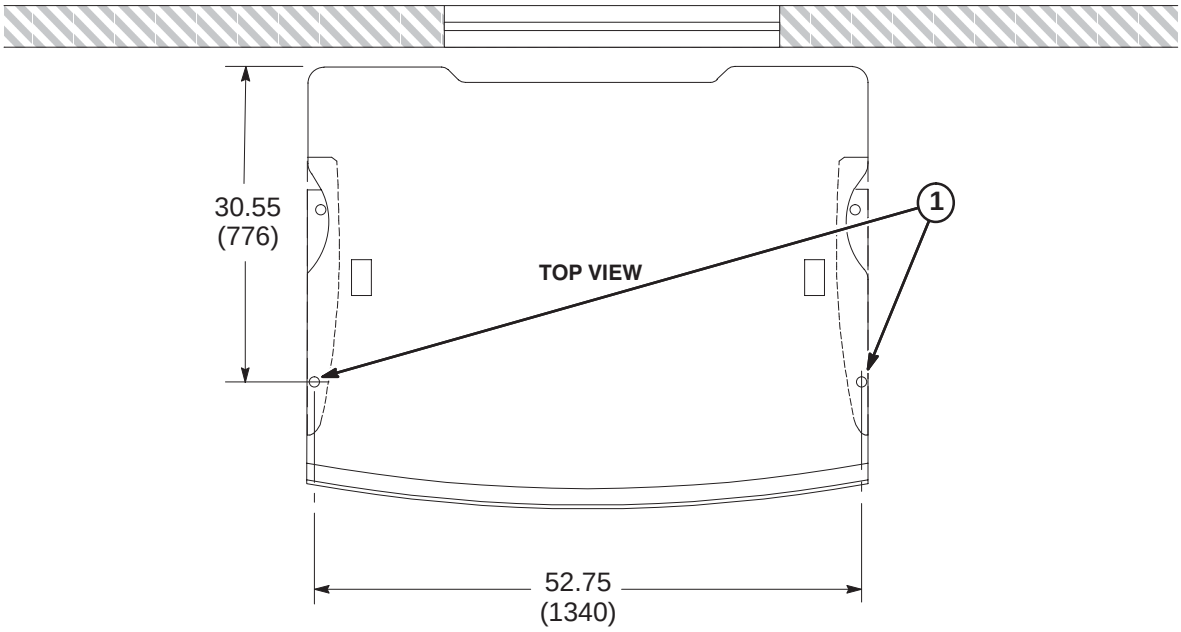
1–1 OPERATOR WORKSPACE TABLE ANCHOR INSTALLATION

Refer to room layout plan and consult with Site customer for exact location of Operator Workspace Table. Items installed are part of Color Monitor Table Tie Down Kit, 2154928.

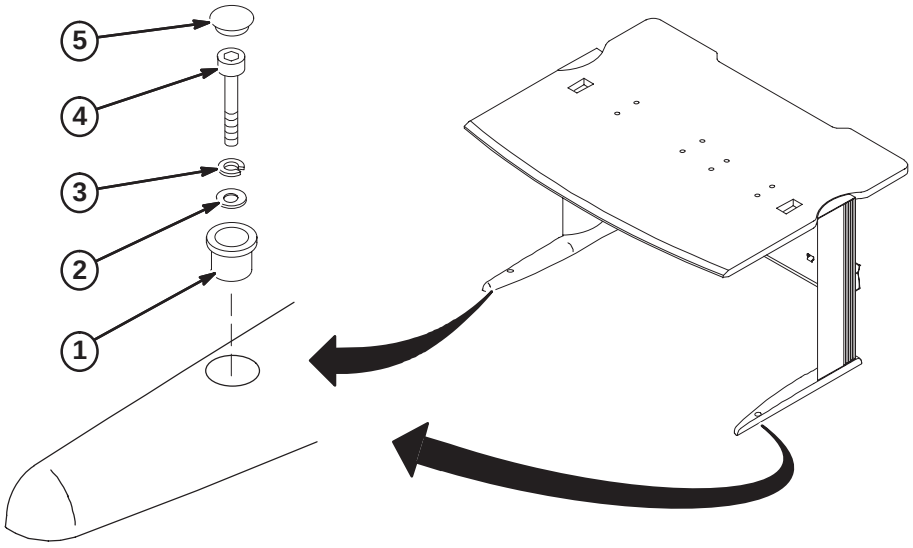
1. Remove and discard the two (2) cover plugs. Locate and mark on floor the two hole locations at the front of the table legs.
2. Move table to prepare for installing the floor anchors in Steps 3 and 4.
3. At each hole marked in Step 2, drill a .38 inch hole and insert 1/4–20 x .375 diameter anchor (2168253).
4. Secure anchor in place with supplied Setting Tool (2168781).



1–2 SECURE OPERATOR WORKSPACE TABLE TO FLOOR

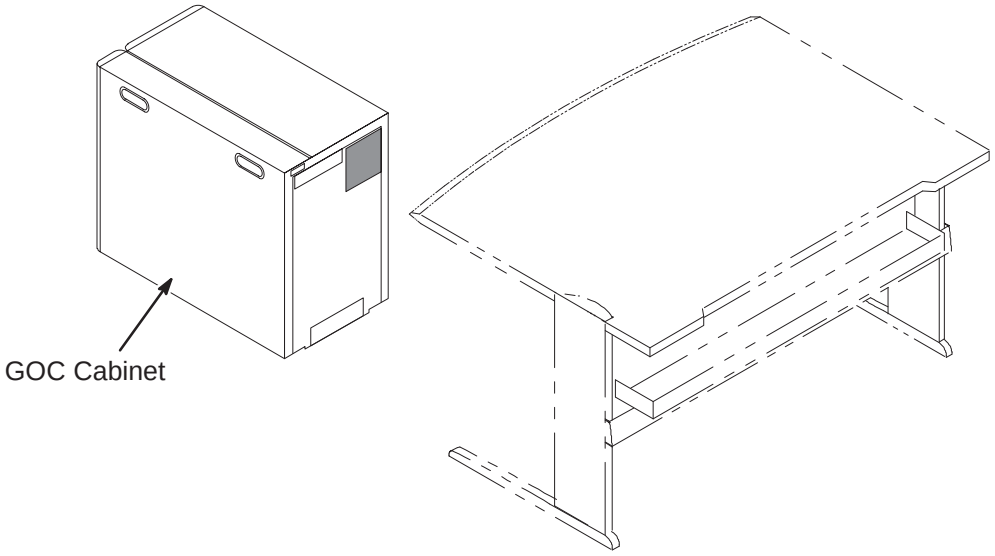
Items installed are part of Color Monitor Table Tie Down Kit, 2154928.

1. Insert Bushing (2151454) in table leg hole.
2. Insert as many Flat Washers (2168251) as required (3 provided for each leg) for securing table to floor.
3. Insert one Lock Washer (2168252) on top of Flat Washer(s).
4. Depending upon depth of previously installed anchor, install either the 1–3/4 inch long or the 2 inch long 1/4 x 20 Hex Socket Cap Screw.
5. Install black nylon Plug (2168254).
6. Repeat anchoring process below for other leg.



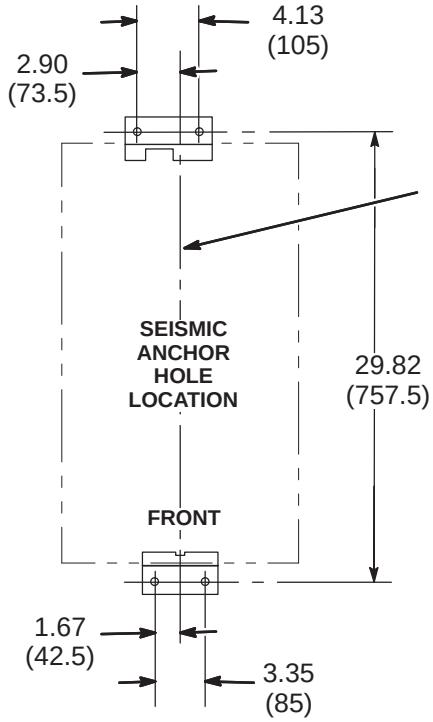
1–3 POSITION COMPUTER CABINET

Consult with Site customer for exact location of Global Operator Cabinet (GOC). The location could be underneath the left or right side of the Operator Workspace table, or on the outside left or right side of the table.



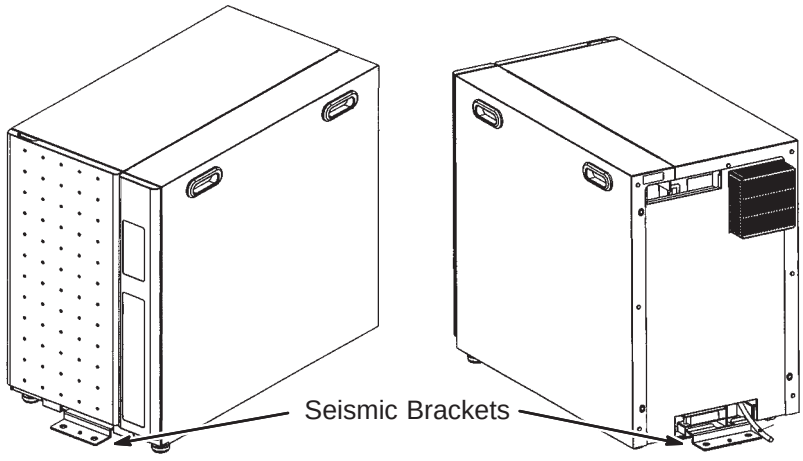
1–4 SEISMIC ANCHORING (IF REQUIRED)

If seismic anchoring is required, refer to site architectural drawings for fastener type details or applicable Pre–installation manual. Illustration below indicates hole location for installing brackets.



NOTE:

- ALL DIMENSIONS ARE IN INCHES. ALL BRACKETED () DIMENSIONS ARE IN MILLIMETERS.



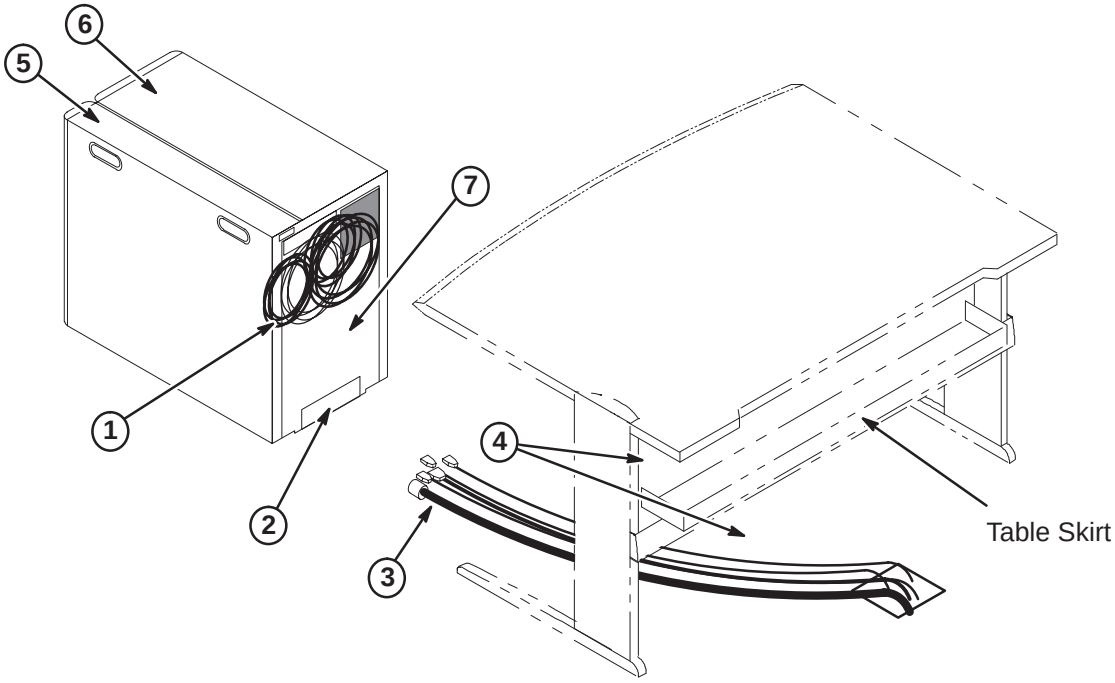
1–5 COMPUTER CABINET CABLE ROUTING AND CONNECTIONS

The GOC (Computer) Cabinet is shipped with seven cables connected to the computer that will be routed and connected to equipment that will be installed on the top of the OW Table. The cables are:

- Three power cords
- Two video ouput cables
- Keyboard output cable
- SCSI output cable

These cables are already connected to the computer and routed thru the opening located at the top of the rear of the GOC cabinet as shown in the illustration below. The remainder of the cables to be connected to designated modules within the GOC Cabinet will have to be routed thru the lower opening.

1. Runs 1062, 1063, 1064, 1065, 1068, 1069, and 1070 are pre–connected to computer and are routed thru top opening.
2. Runs 1077, 1081, 1082, 1083, 1084, 1085, power cord for the Patient Alert system, and any other option cables will be routed thru the lower opening.
3. Route all cables before connecting any cables. Refer to cable map for connection information.
4. If GOC Cabinet is to be located under OW Table, the cable coming out of the top opening of the cabinet will be routed above the table skirt. The cables coming out of the lower opening will be routed below the tabel skirt.



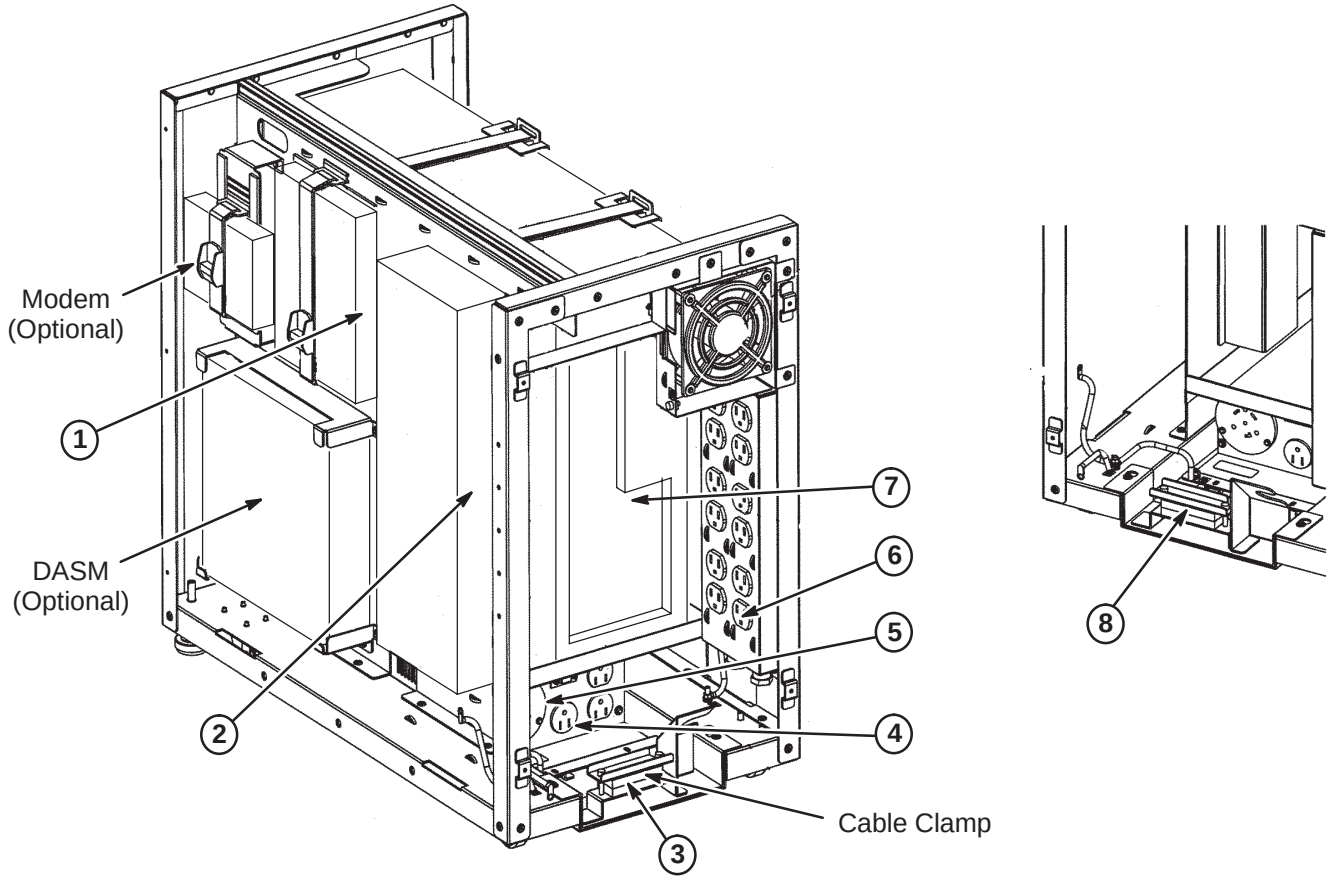
The Computer Cabinet covers need to be removed to access the cable connection points.

5. For right side cover, remove three screws at rear of cover, slide toward rear of cabinet and then lift up.
6. For left side cover, remove four screws at rear of cover, slide toward rear of cabinet and then lift up.
7. Loosen four screws holding the back cover. Lift and remove cover.

1–6 ROUTE CABLES FOR LOWER OPENING

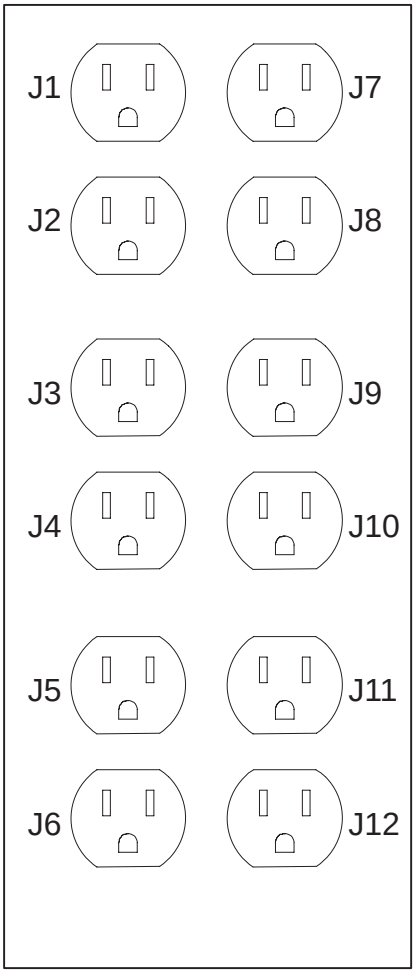
Refer to cable map for information on cables to be connected. Route cables thru clamp at lower rear of cabinet and connect cable runs as shown in illustration below.

1. Run 1077 to Lan Hub.
2. Run 1085 to WIM.
3. Run 1084 routes from GOC Cabinet thru clamp to J26 on System Cabinet.
4. Make sure Modem power cable is connected to J5 on Computer Cabinet PDU.
5. Run 1081 to PDU J1.
6. Patient Alert Power cable to power strip at J12. Refer to Section 1–7 for other power cable connections to power strip.
7. Runs 1082 and 1083 to Linux PC computer. Refer to Section 1–8 for all cables connected to Linux PC computer.
8. Tighten clamp to secure cables in place.



1–7 POWER STRIP CONNECTIONS

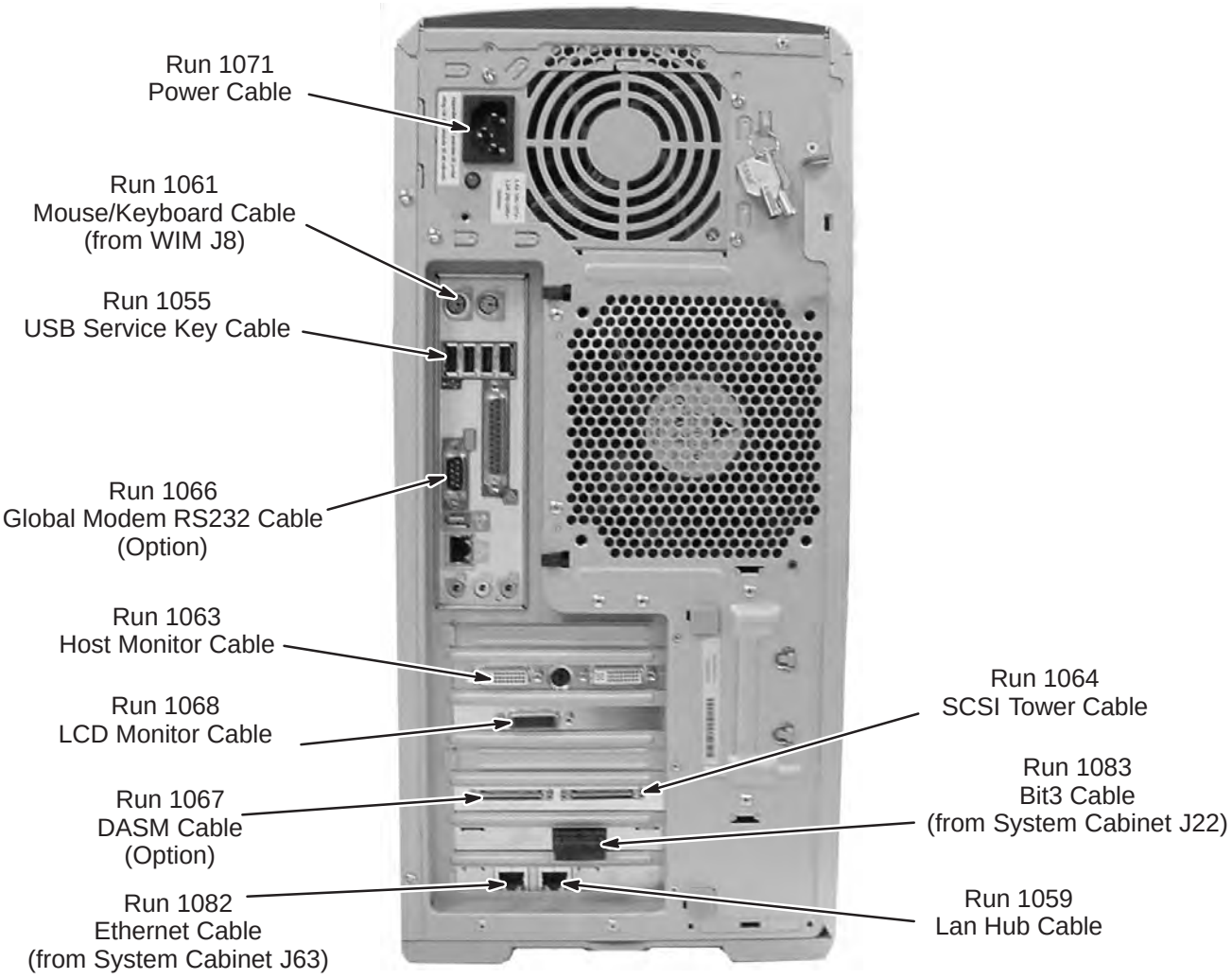
The illustration below show the power cable connection locations to the power strip in the GOC cabinet. Make sure power cables are attached as shown.



POSITION	NAME	MAX AMP CIRCUIT 1	MAX AMP CIRCUIT 2
J1	Host	6.4	
J2	Host LCD	0.8	
J3	Fan	0.2	
J4			
J5			
J6			
J7	Hub		0.2
J8	2nd LCD		0.8
J9			
J10	DASM		0.6
J11	SCSI Tower		7.0
J12	Patient Alert		0.2
TOTAL		7.4	8.8

1–8 LINUX PC CABLE CONNECTIONS

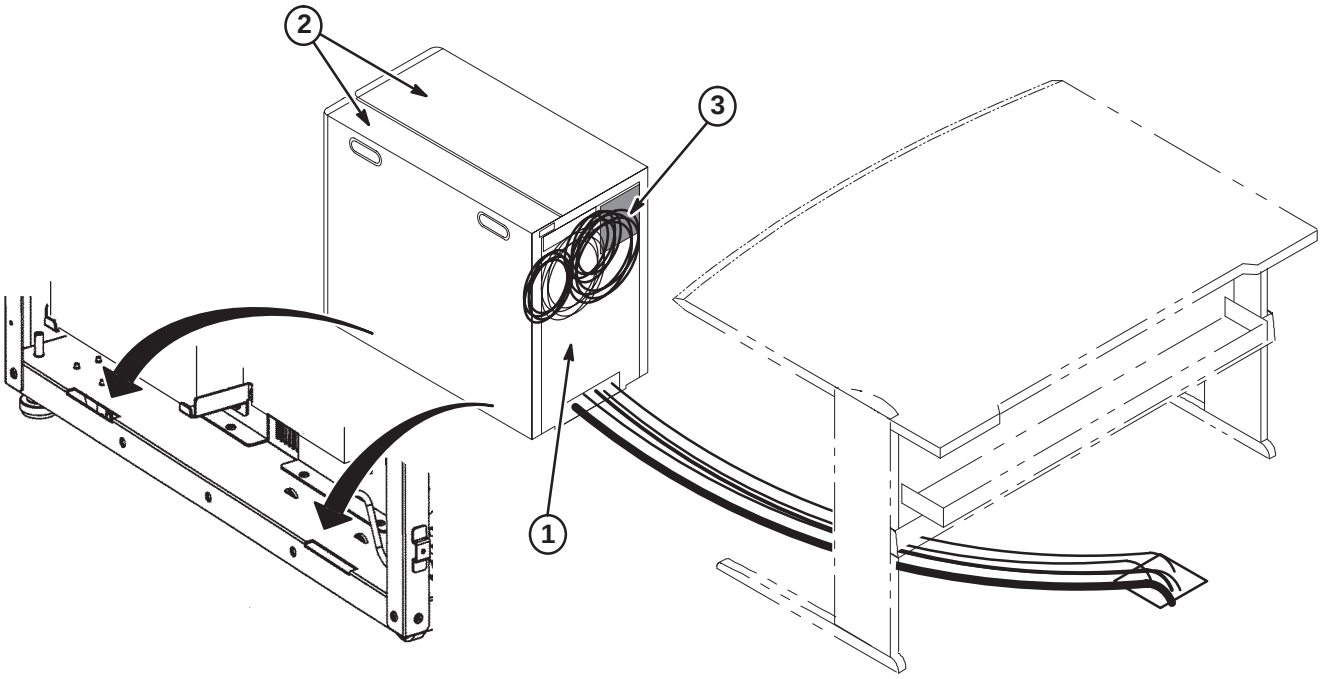
The illustration below shows the connection points of cables routed to the Linux PC. All cables shown are preconnected except for Runs 1082 and 1083, which have to be routed and connected at site.



1–9 FINAL POSITIONING OF GOC CABINET

Complete positioning of GOC Cabinet.

1. Re–attach rear cover and tighten screws.
2. Install both side covers by inserting tabs at bottom of covers into slots (as indicated in illustration below) and slide forward. Install screws at rear of cover that were removed in earlier procedure.
3. Route remaining cables from top opening at rear of GOC Cabinet thru opening of table skirt.
4. Place cabinet in final position as determined by customer.



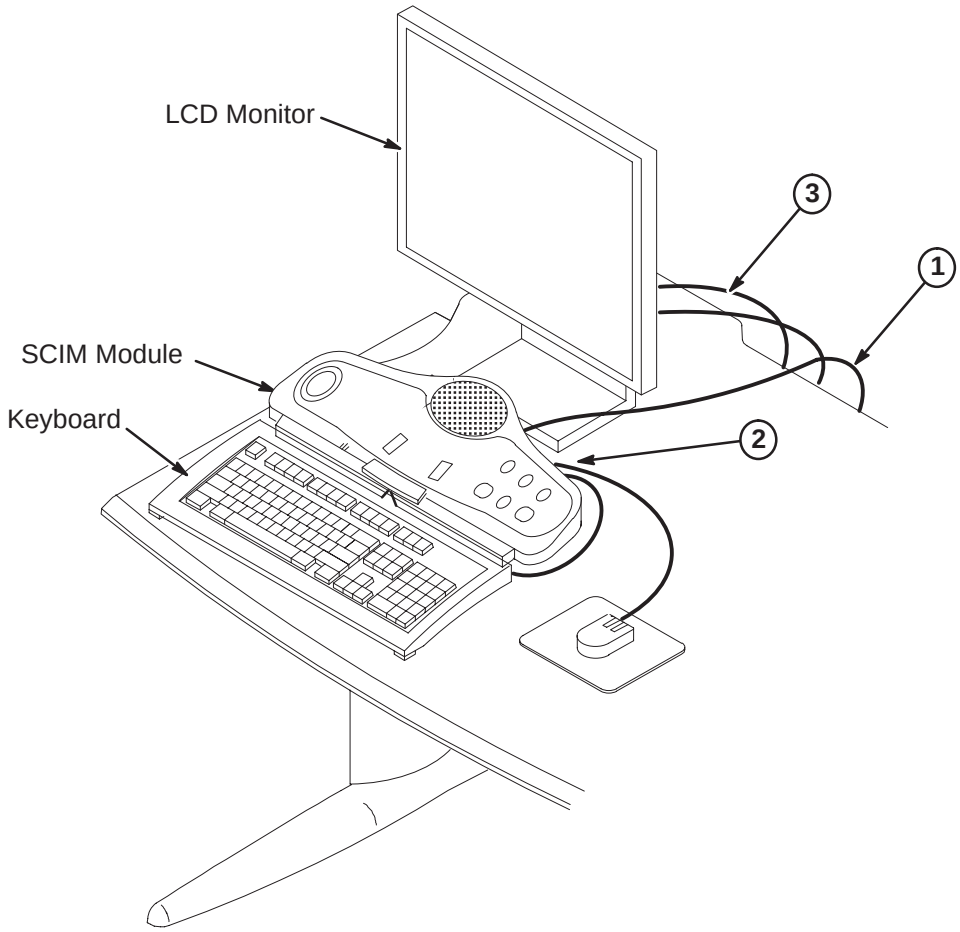
1–10 INSTALL SCIM/KEYBOARD AND MONITOR

Consult with Site customer for exact location of Keyboard and Monitor on Operator Workspace (OW) Table.

Note

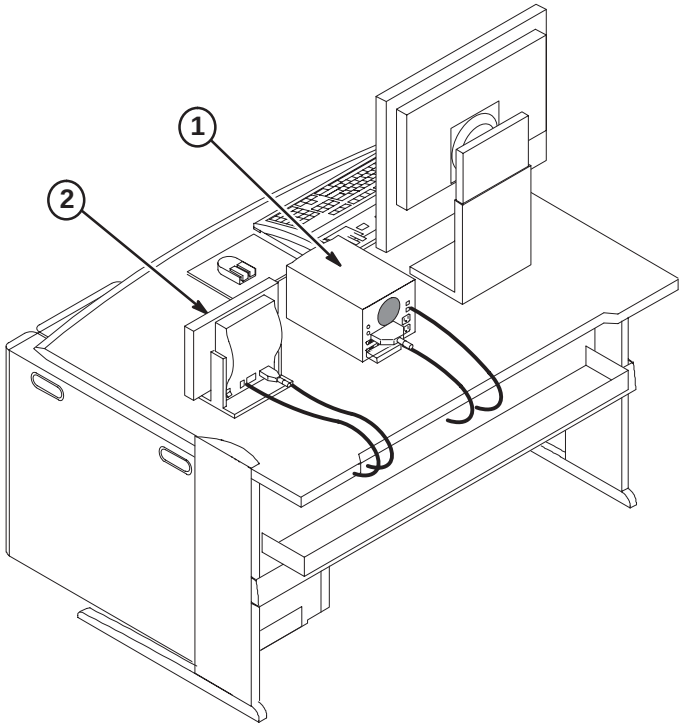
Refer to Installation document OW1INA3.DOC on Service Methods CD–ROM or MR Service Engineering web site for installation information on language labels and keyboard mounting.

1. Route data cable Run 1062 from Computer Cabinet to bottom side of SCIM Module and connect as marked. (Run 805, supplied with SCIM Kit (2307175) is not used for EXCITE) Run 1062 is preconnected to the Computer Cabinet and is located on back side of cabinet.
2. Place Keyboard and Mouse on table and connect cables to bottom side of SCIM Module as marked.
3. Place LCD Host Monitor on table in back of SCIM. Route Runs 1063 and 1065 from Computer Cabinet and connect to monitor.



1–11 INSTALL SCSI EXPANSION BOX AND LCD DISPLAY

1. Place the SCSI Tower on the OW table and connect Runs 1064 and 1070 from GOC Cabinet. Install terminator.
2. Place LCD Display on OW table and connect Runs 1068 and 1069 from GOC Cabinet.



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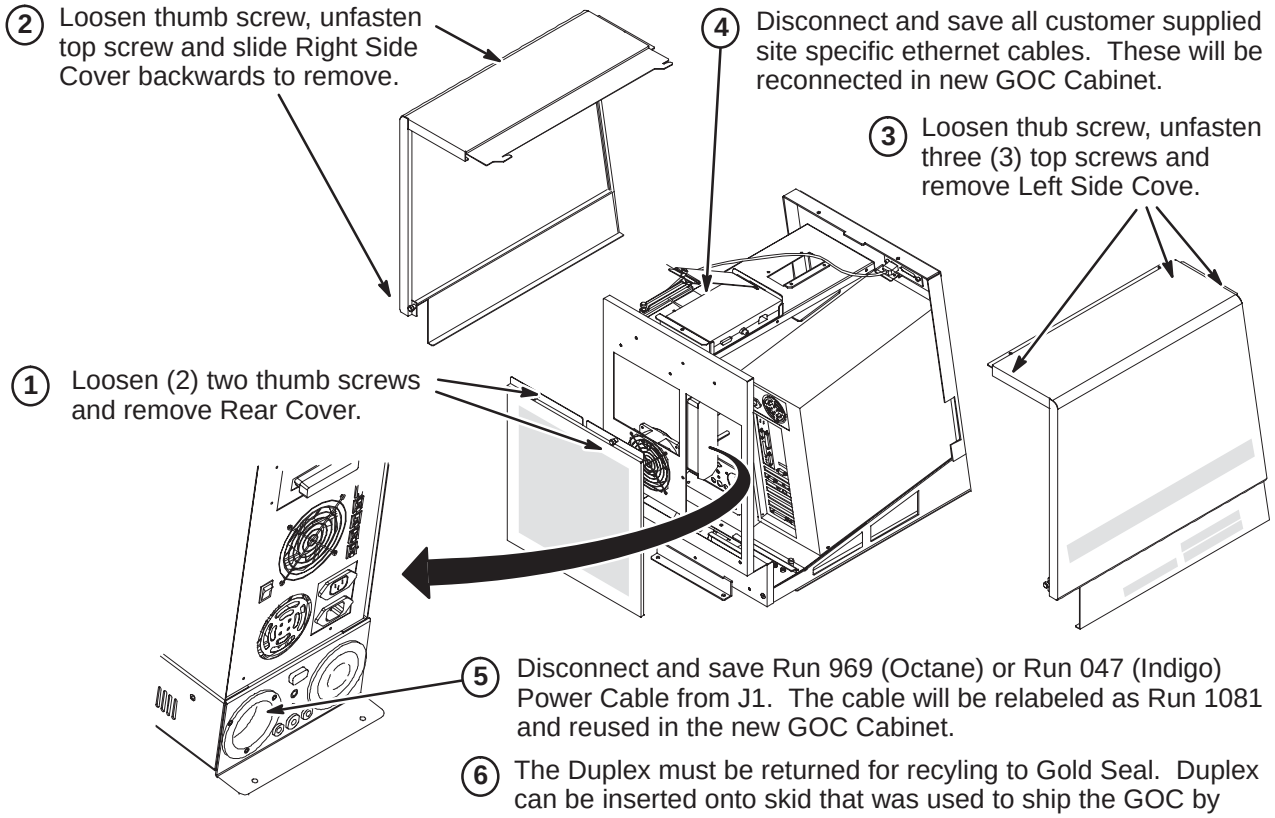
1–1 INTRODUCTION

This upgrade procedure is to be performed on LX sites that have an Indigo or Octane computer and are upgrading to EXCITE II with a Linux computer.

1–2 DEINSTALLATION OF DUPLEX CABINET



5 Disconnect and save Run 969 (Octane) or Run 047 (Indigo) Power Cable from J1. The cable will be relabeled as Run 1081 and reused in the new GOC Cabinet.

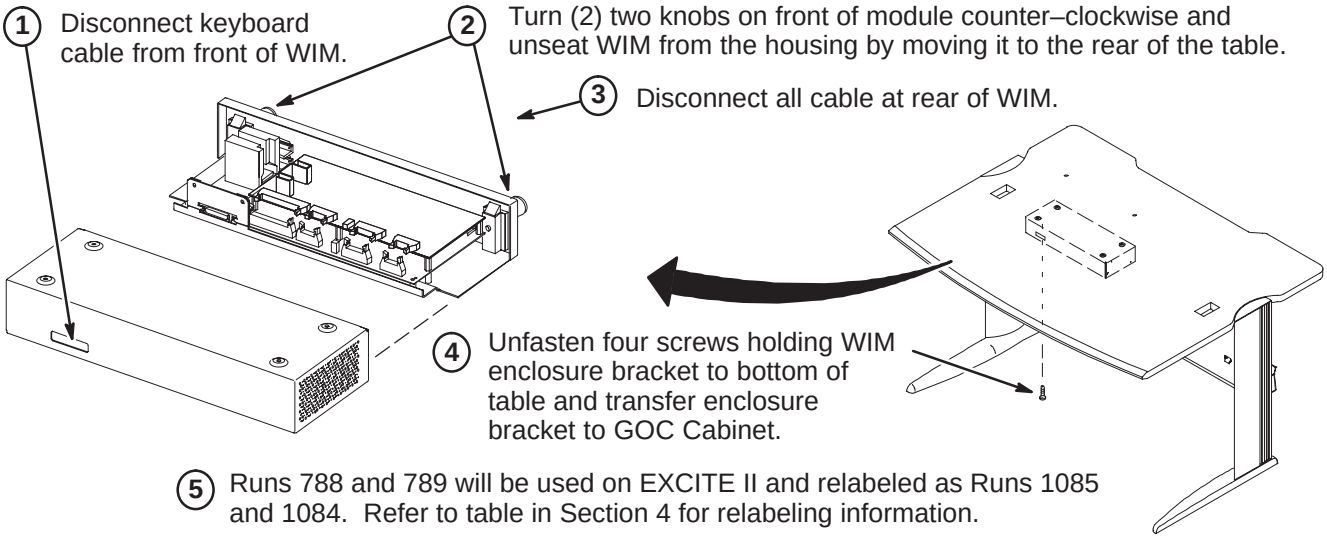
6 The Duplex must be returned for recyling to Gold Seal. Duplex can be inserted onto skid that was used to ship the GOC by removing the white foam on the bottom that supported the GOC.

7 The remaining Duplex cables will not be used on the new GOC Cabinet and must be returned for recyling to Gold Seal.

1–3 DEINSTALLATION OF OPERATOR WORKSPACE TABLE AREA

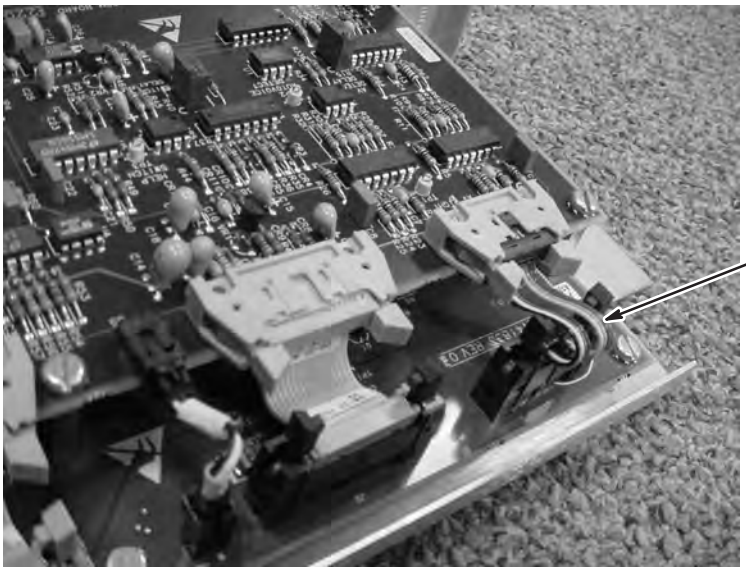
If applicable, the WIM (Workspace Interface Module) will be transferred to the new GOC but needs a modification. If present, other modules (DASM, Modem) will be retained for use with new EXCITE II Operator Workspace.

1–3–1 WIM REMOVAL



5. Runs 788 and 789 will be used on EXCITE II and relabeled as Runs 1085 and 1084. Refer to table in Section 4 for relabeling information.
6. The remaining cables will not be used on the new EXCITE II and must be returned for recyling to Gold Seal.

1–3–2 WIM MODIFICATION



1. Remove the short jumper cable on the WIM, between J1 om motherboard to J3 on the console intercom board.
2. Install the replacement cable that came inside of the new GOC.

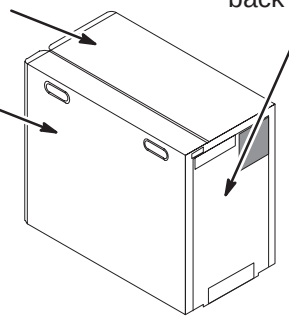
1–3–3 WIM INSTALLATION INTO GOC

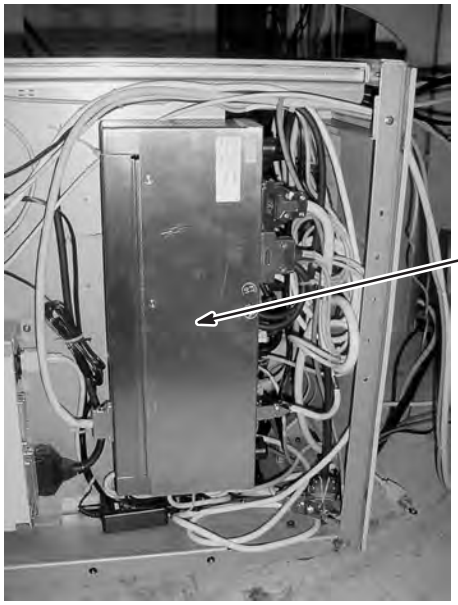
The Computer Cabinet covers need to be removed for installation of WIM and other cables.

(2) For left side cover, remove four screws at rear of cover, slide toward rear of cabinet and then lift up.

(1) For right side cover, remove three screws at rear of cover, slide toward rear of cabinet and then lift up.

(3) Loosen four screws holding the back cover. Lift and remove cover.





(4) Install WIM enclosure bracket into the GOC.

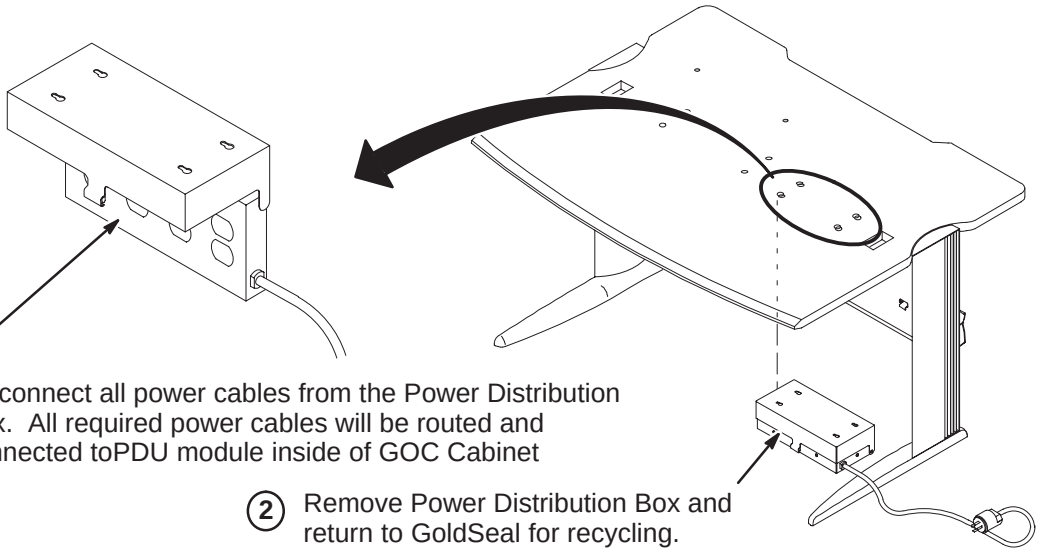
(5) Install the WIM into the enclosure bracket.

(6) Connect Run 1062 (supplied with GOC) to J6.

(7) Connect Run 1061 (supplied with GOC) to J8.

(8) Connect Run 1060 (supplied with GOC) to J17.

1–3–4 REMOVAL OF POWER DISTRIBUTION BOX

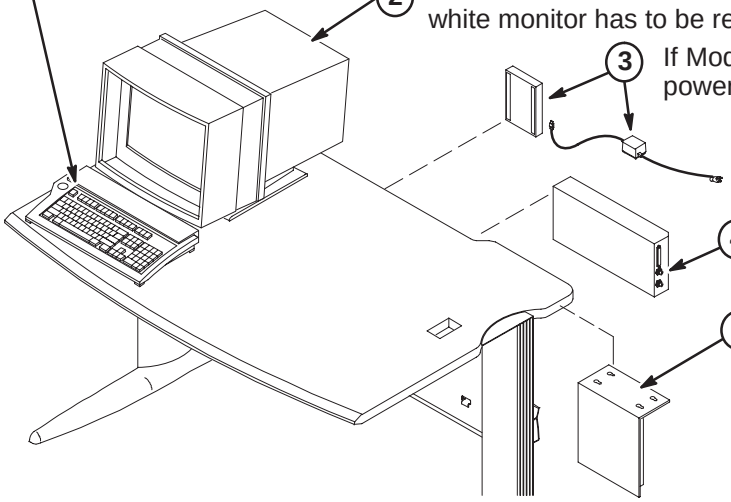


(1) Disconnect all power cables from the Power Distribution Box. All required power cables will be routed and connected toPDU module inside of GOC Cabinet

(2) Remove Power Distribution Box and return to GoldSeal for recycling.

1–3–5 DEINSTALL OW TABLE MODULES (If Applicable)

1. SCIM is required for EXCITE II. If older style keyboard is part of existing site, it will have to be replaced.
2. Color Monitor can be used with EXCITE II. Black and white monitor has to be replaced by new LCD Monitor.
3. If Modem is part of existing site, remove Modem and power cord and transfer to GOC Cabinet.

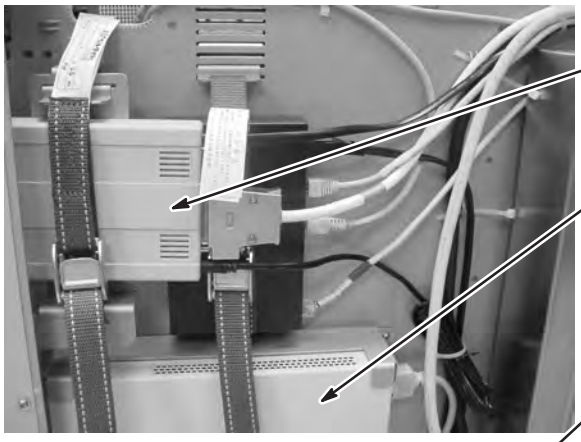


NOTE: DASM–1 is not compatible with the Linux PC, must use DASM–2.

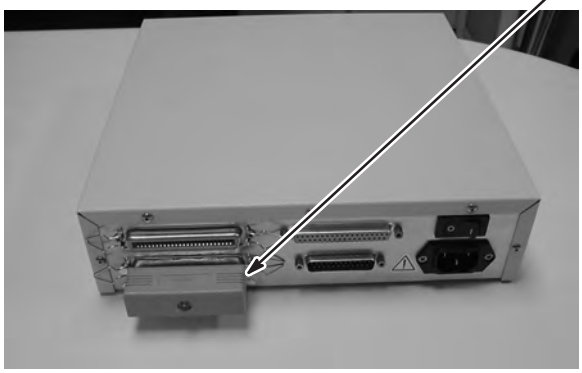
4. Remove DASM and cable to filming device and transfer to GOC Cabinet.
5. Remove SCSI Expansion Box and return to GoldSeal for recycling.

NOTE: If site is TwinSpeed, and has HOS option, disconnect Run 1004 from SCSI Expansion Box and save. This cable will be reconnected to GOC.

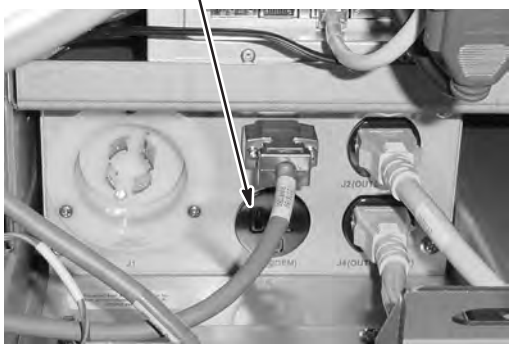
1–3–6 INSTALL MODEM AND DASM IN GOC CABINET (If Applicable)



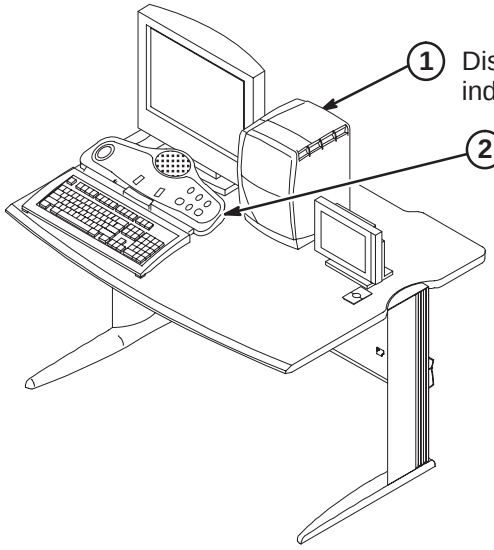
1. Mount Modem to GOC so that the underside is facing out to cover. Route customer provided phone lineand connect to Modem.
2. Mount DASM at this location. Route and connect cable from filming device.
3. Cable routed between DASM or Modem to the Linux PC are provided. Connect Run 1066 to Modem and Run 1067 to DASM.
4. If applicable, install the SCSI Terminator onto the bottom port of the DASM.
5. Verify that the **Active SCSI Terminator** located on the bottom of the DASM is in the **OFF** position.



6. Modem power cord must be connected to J5 on GOC PDU Module



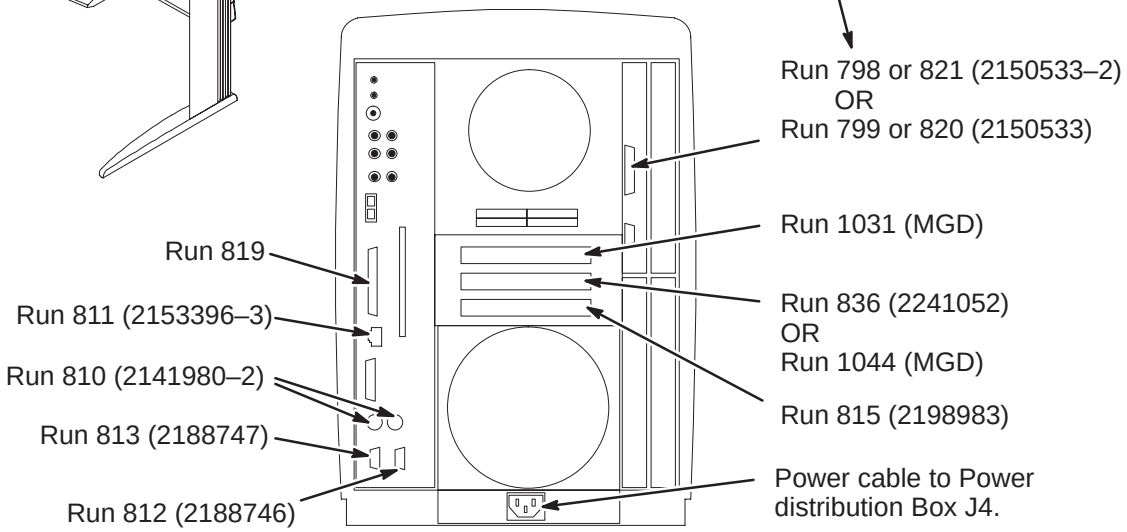
1–3–7 DEINSTALL OCTANE COMPUTER



(1) Disconnect all cables from back of Octane Computer as indicated below and return to GoldSeal for recycling.

(2) Disconnect cable between SCIM keyboard and WIM. Return for recycling aince it is no longer needed.

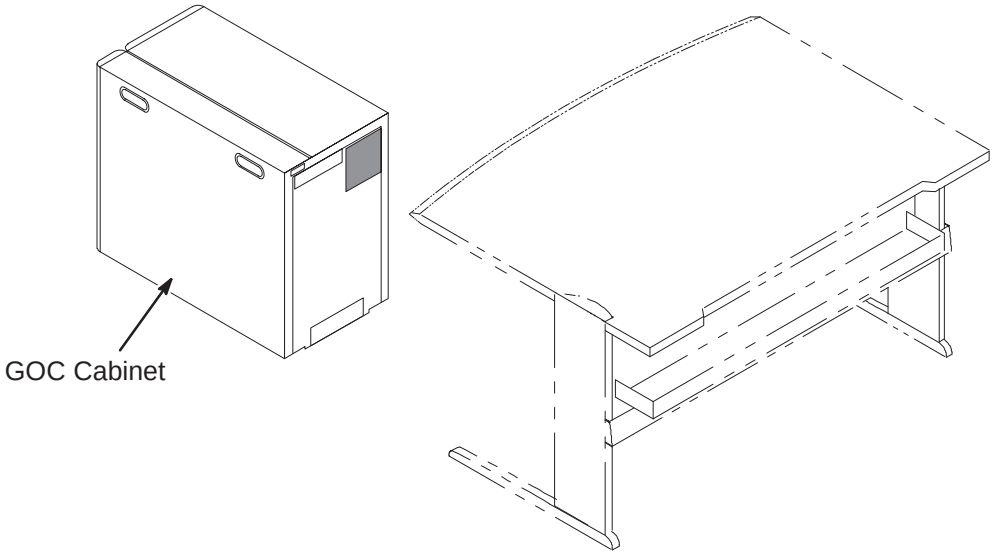
(3) The only cable which may be reused is the Color Monitor cable, Run 709/821, if existing Color Monitor is to be reused. Cable will be connected to monitor adaptor cable 2385096.



(4) Remove Octane Computer and return to GoldSeal for recycling.

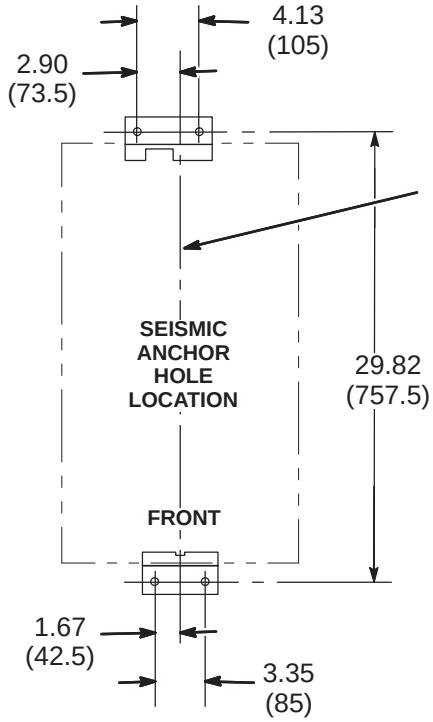
1–4 POSITION NEW GOC COMPUTER CABINET

Consult with Site customer for exact location of Global Operator Cabinet (GOC). The location could be underneath the left or right side of the Operator Workspace table, or on the outside left or right side of the table.



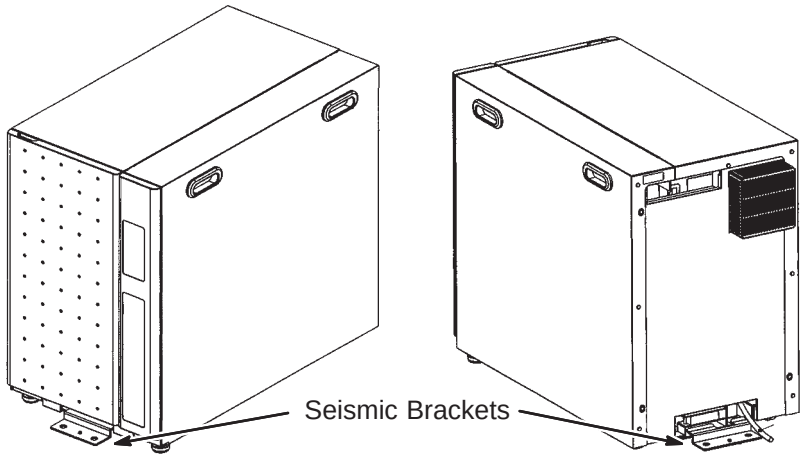
1–5 SEISMIC ANCHORING (IF REQUIRED)

If seismic anchoring is required, refer to site architectural drawings for fastener type details or applicable Pre–installation manual. Illustration below indicates hole location for installing brackets.



NOTE:

- ALL DIMENSIONS ARE IN INCHES. ALL BRACKETED () DIMENSIONS ARE IN MILLIMETERS.

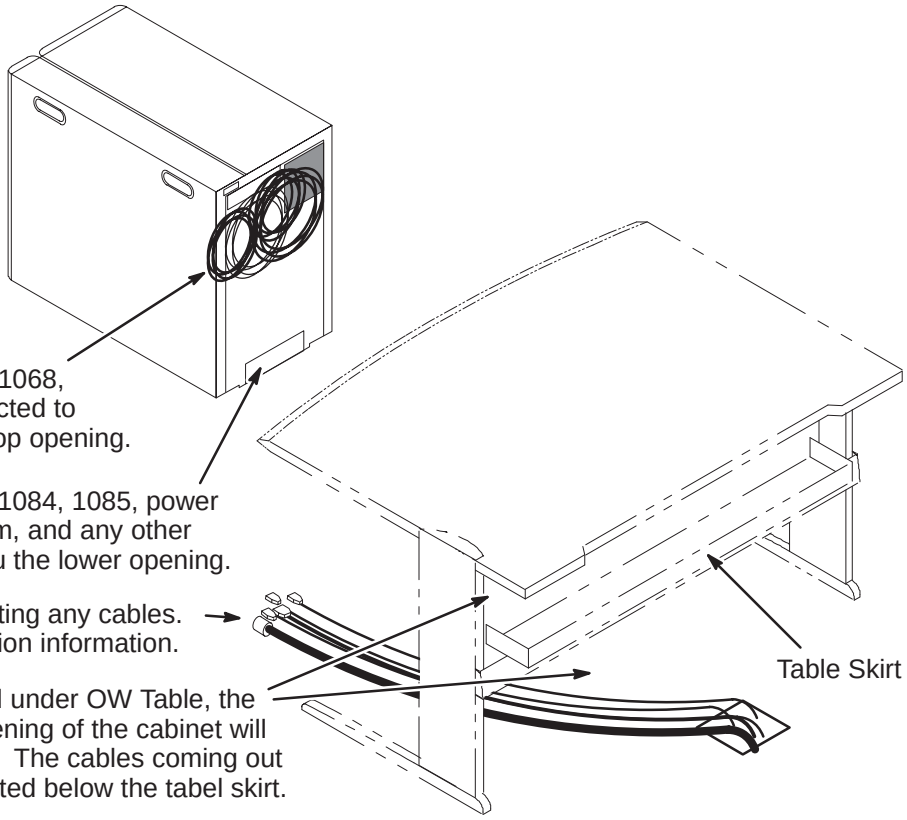


1–6 COMPUTER CABINET CABLE ROUTING AND CONNECTIONS

The GOC (Computer) Cabinet is shipped with seven cables connected to the computer that will be routed and connected to equipment that will be installed on the top of the OW Table. The cables are:

- Three power cords
- Two video ouput cables
- Keyboard output cable
- SCSI output cable

These cables are already connected to the computer and routed thru the opening located at the top of the rear of the GOC cabinet as shown in the illustration below. The remainder of the cables to be connected to designated modules within the GOC Cabinet will have to be routed thru the lower opening.



(1) Runs 1062, 1063, 1064, 1065, 1068, 1069, and 1070 are pre–connected to computer and are routed thru top opening.

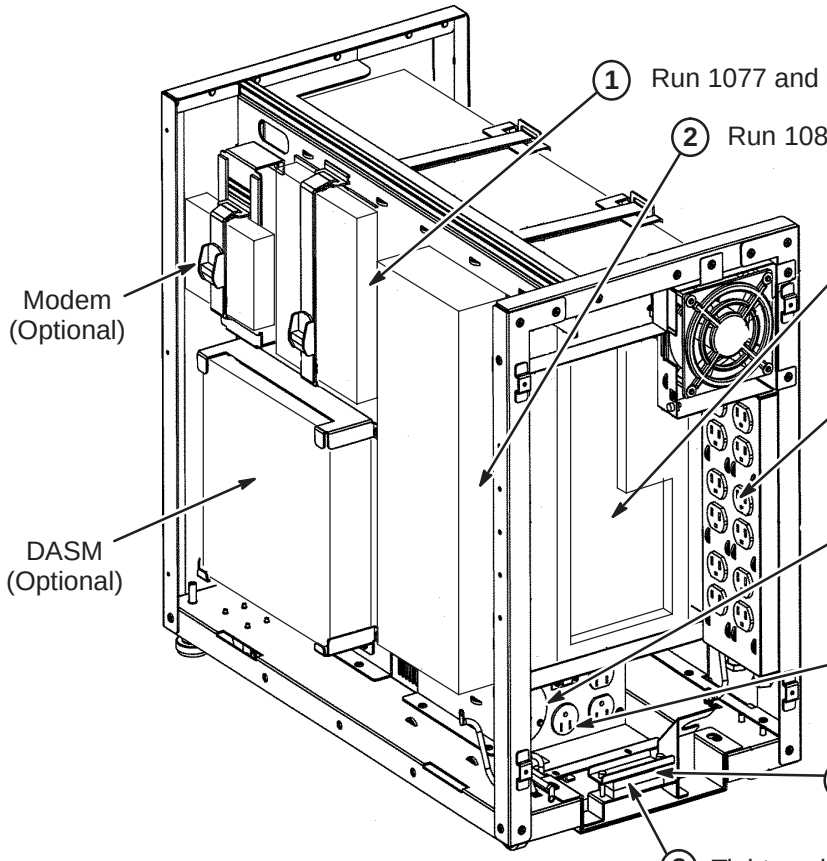
(2) Runs 1077, 1081, 1082, 1083, 1084, 1085, power cord for the Patient Alert system, and any other option cables will be routed thru the lower opening.

(3) Route all cables before connecting any cables. Refer to cable map for connection information.

(4) If GOC Cabinet is to be located under OW Table, the cable coming out of the top opening of the cabinet will be routed above the table skirt. The cables coming out of the lower opening will be routed below the tabel skirt.

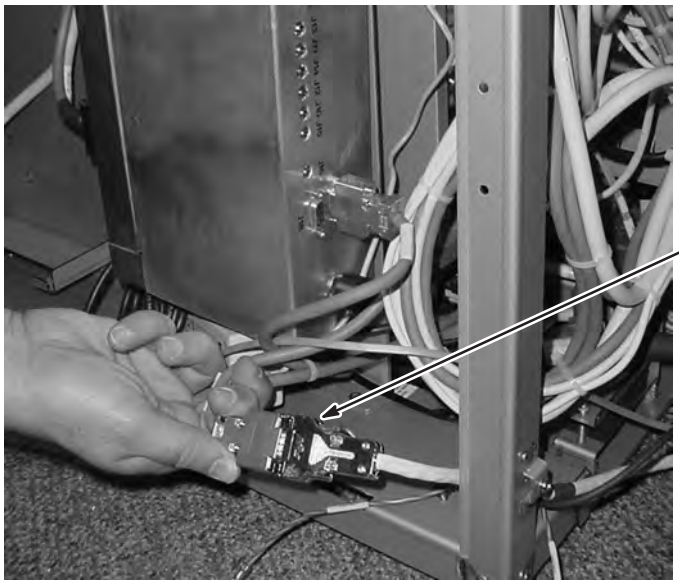
1–7 ROUTE CABLES FOR LOWER OPENING

Refer to cable map for information on cables to be connected thru lower opening.



1. Run 1077 and other ethernet cables to Lan Hub.
2. Run 1085 (formerly 788) to J7 on WIM.
3. Runs 1082 and 1083 to Linux PC computer. Refer to Section 1–11 for all cables connected to Linux PC computer.
4. Patient Alert Power cable to power strip at J12. Refer to Section 1–9 for other power cable connections to power strip.
5. Run 1081 to PDU J1. This is the former Indigo or Octane power cord that has been relabeled.
6. Make sure Modem power cable is connected to J5 on Computer Cabinet PDU.
7. Run 1084 (formerly 789) routes from GOC Cabinet thru clamp to J26 on System Cabinet.
8. Tighten clamp to secure cables in place.

1–8 CONNECT RUN 1084

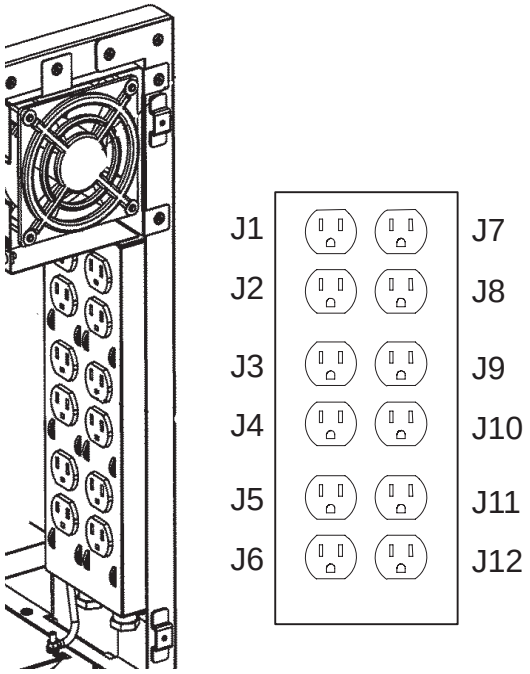


IMPORTANT
Do not connect Run 1084 to J18 on the WIM. The E–stop circuit will be open.

1. Connect Run 1084 to Run 1062 “Y” cable on the bottom of the GOC cabinet.

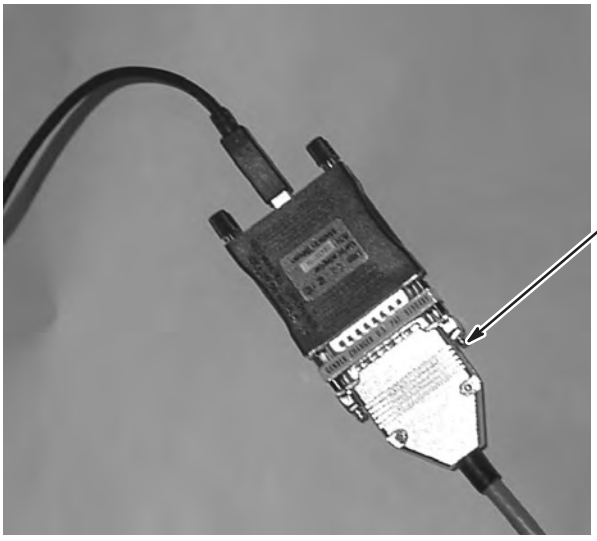
1–9 POWER STRIP CONNECTIONS

The illustration below show the power cable connection locations to the power strip in the GOC cabinet. Make sure power cables are attached as shown.



POSITION	NAME	MAX AMP CIRCUIT 1	MAX AMP CIRCUIT 2
J1	Host Comp	6.4	
J2	Host LCD	0.8	
J3	Fan	0.2	
J4			
J5			
J6			
J7	LAN Hub		0.2
J8	2nd LCD		0.8
J9			
J10	DASM		0.6
J11	SCSI Tower		7.0
J12	Patient Alert		0.2
TOTAL		7.4	8.8

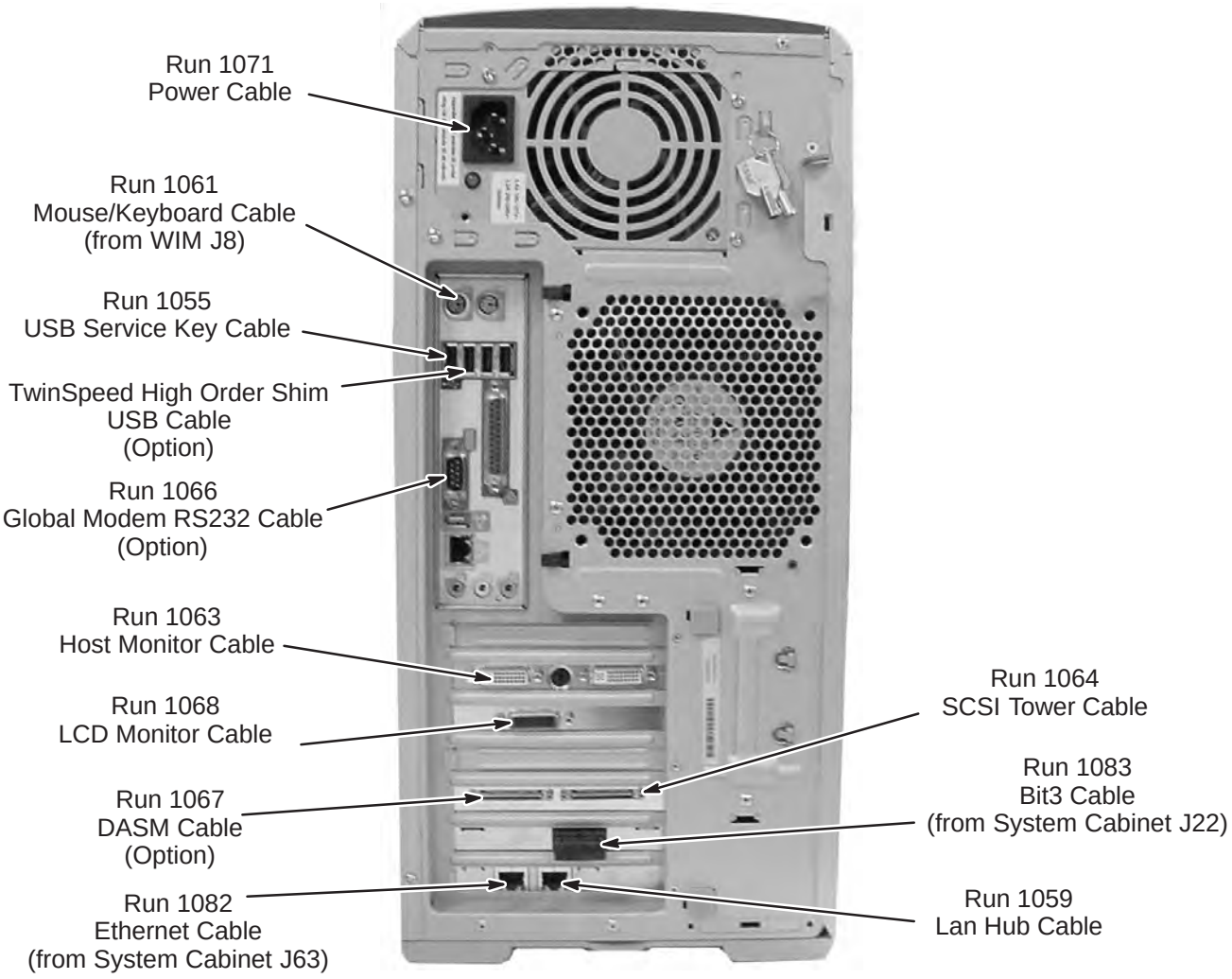
1–10 HIGH ORDER SHIM OPTION CABLE INSTALLATION (TwinSpeed Only)



(1) If the site is TwinSpeed with the High Order Shim option, connect cable Run 1076 (formerly 1004) to the cable located in the rear of the GOC cabinet. The other end of this cable routes to a USB port on the Linux PC.

1–11 LINUX PC CABLE CONNECTIONS

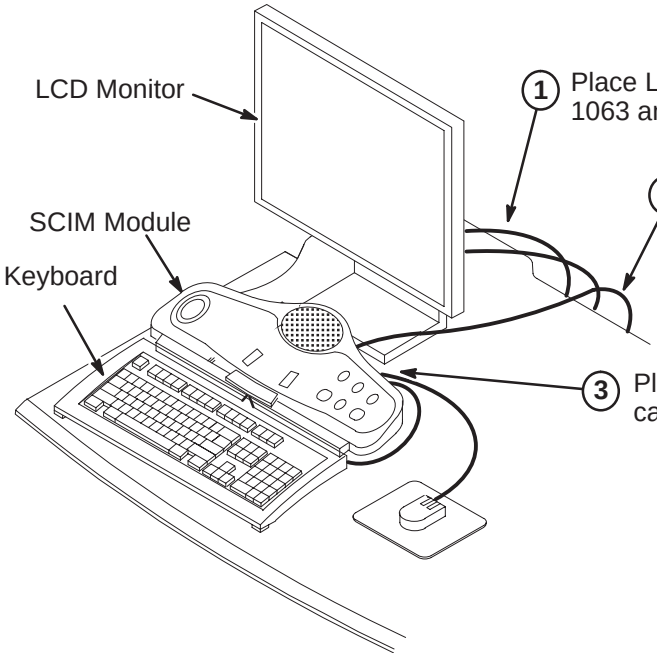
The illustration below shows the connection points of cables routed to the Linux PC. All cables shown are preconnected except for Runs 1082 and 1083, which have to be routed and connected at site.



1–12 INSTALL SCIM/KEYBOARD AND MONITOR

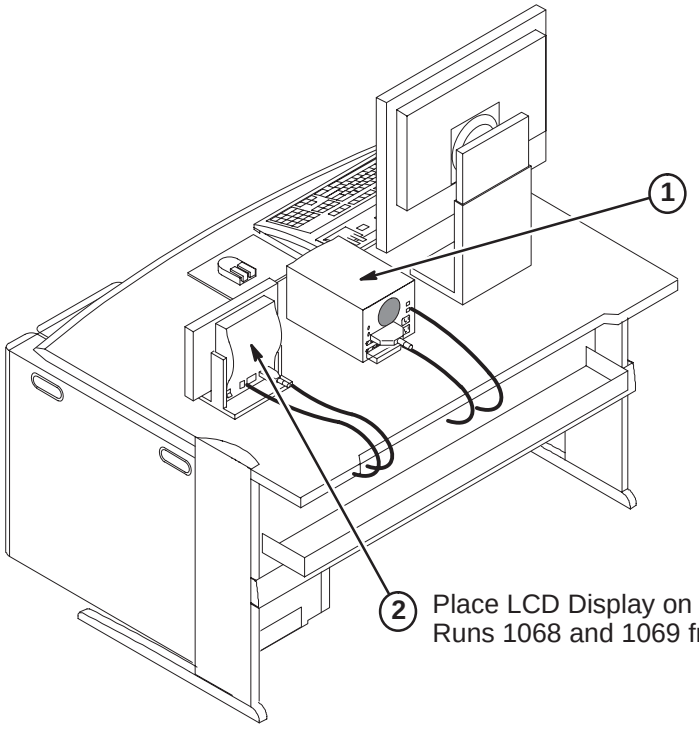
Note

Refer to Installation document OW1INA3.DOC on Service Methods CD–ROM or MR Service Engineering web site for installation information on language labels and keyboard mounting.



1. Place LCD Host Monitor on table in back of SCIM. Route Runs 1063 and 1065 from Computer Cabinet and connect to monitor.
2. Route data cable Run 1062 from Computer Cabinet to bottom side of SCIM Module and connect as marked. (Run 805, supplied with SCIM Kit (2307175) is not used for EXCITE) Run 1062 is preconnected to the Computer Cabinet and is located on back side of cabinet.
3. Place Keyboard and Mouse on table and connect cables to bottom side of SCIM Module as marked.

1–13 INSTALL SCSI EXPANSION BOX AND LCD DISPLAY



1. Place the SCSI Tower on the OW table and connect Runs 1064 and 1070 from GOC Cabinet. Install terminator.
2. Place LCD Display on OW table and connect Runs 1068 and 1069 from GOC Cabinet.

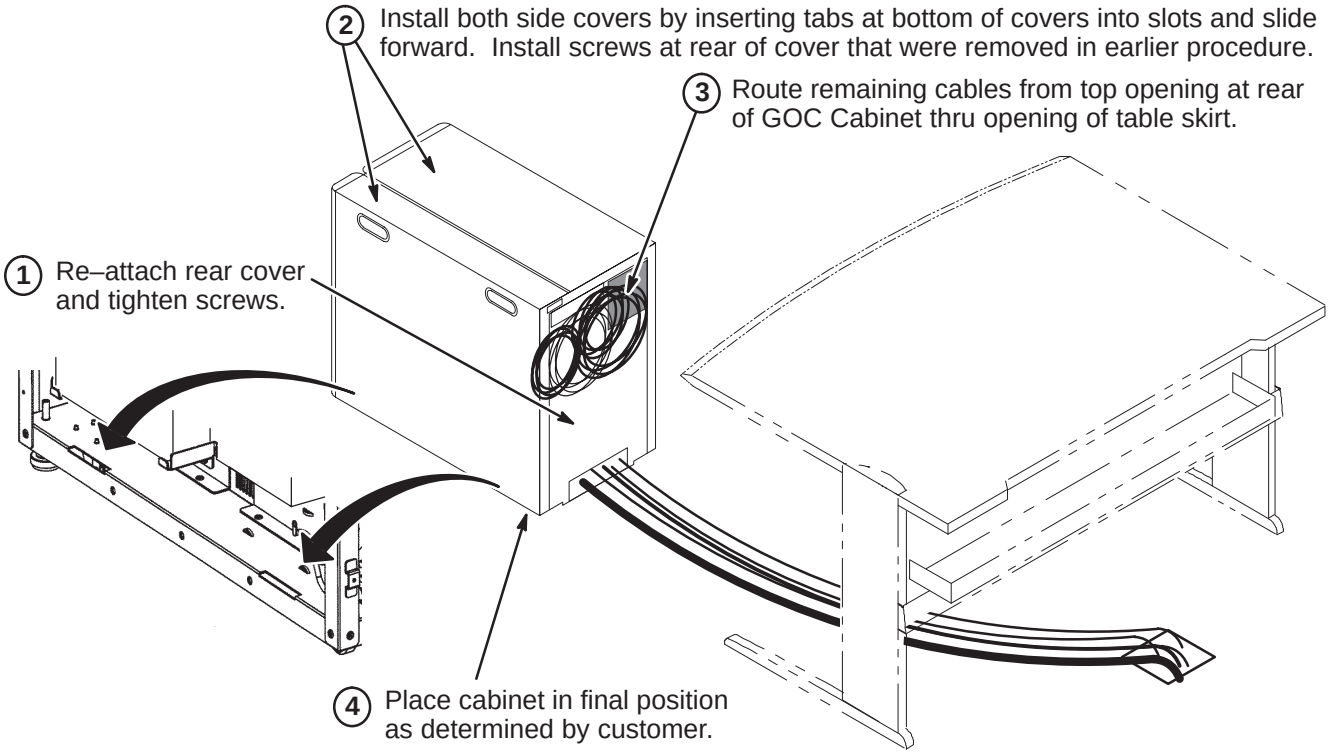
1–14 POWER ON INFORMATION

IMPORTANT
When turning on the circuit breaker in the PDU, both the PC and Host circuit brakers must be energized.

Note

When powering up the GOC, there is a Main breaker located in the front of the GOC. There are also two switches for the WIM and Modem power.

1–15 FINAL POSITIONING OF GOC CABINET



1–16 RETURN OF REPLACED PARTS

Refer to Section 1–4 in Overview Tab for instructions on returning discarded parts.

1. Remove the white Styrofoam from the bottom of the GOC skid. The Duplex will now fit onto the bottom of the GOC skid. Place the removed Duplex onto the GOC Skid. Properly secure the top cardboard box onto the skid using straps. Return to GoldSeal.
2. Return the Octane or Indigo computer to GoldSeal.
3. Return all cables that have been replaced by this upgrade to GoldSeal.

ACGD/PDU CABINET INSTALLATION INSTRUCTIONS

1–1 Tab 15, ACGD/PDU Cabinet, contains installation instructions for the following:

- *DIRECTION* 2308653 – Signa 1.5T Twin*Speed* ACGD/PDU Cabinet Upgrade Instructions
- *DIRECTION 2*403139 – ACGD/PDU GP Module Upgrade for EXCITE

Use only the applicable ACGD/PDU Cabinet Upgrade Installation Instruction Directions

SIGNA 1.5T Twin*Speed* ACGD/PDU CABINET INSTALLATION INSTRUCTIONS

INSTALLATION STEPS SUMMARY

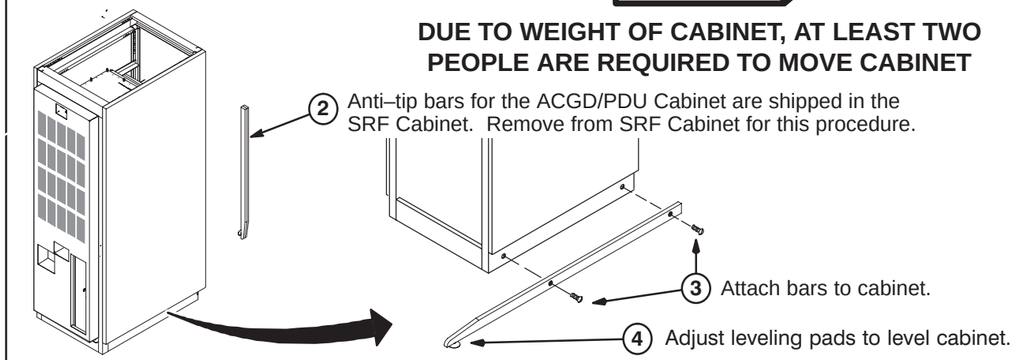
- ❑ **A1 – Position ACGD/PDU Cabinet**
- ❑ **A2 – Install Fan Asembly and Attach InSite Cabinet Magnet**
- ❑ **A3 – Input Voltage Selection**
- ❑ **A4 – Circuit Breaker DIP Switch Settings**

❑ A1 – POSITION ACGD/PDU CABINET

1. Move cabinet to final position.

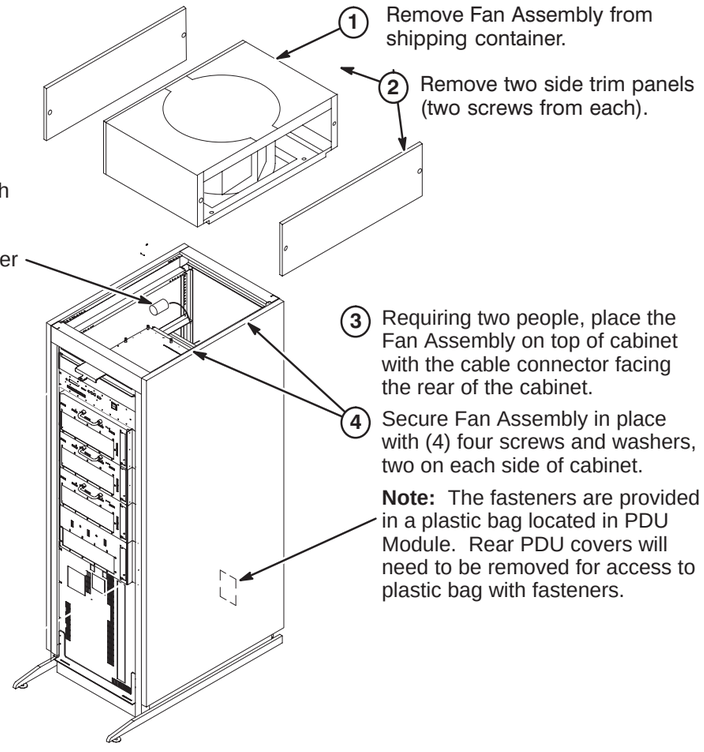
WARNING!

DUE TO WEIGHT OF CABINET, AT LEAST TWO PEOPLE ARE REQUIRED TO MOVE CABINET



2. Anti–tip bars for the ACGD/PDU Cabinet are shipped in the SRF Cabinet. Remove from SRF Cabinet for this procedure.
3. Attach bars to cabinet.
4. Adjust leveling pads to level cabinet.

❑ A2 – INSTALL FAN ASSEMBLY AND ATTACH INSITE MAGNET



1. Remove Fan Assembly from shipping container.
2. Remove two side trim panels (two screws from each).
3. Requiring two people, place the Fan Assembly on top of cabinet with the cable connector facing the rear of the cabinet.
4. Secure Fan Assembly in place with (4) four screws and washers, two on each side of cabinet.

Note: The fasteners are provided in a plastic bag located in PDU Module. Rear PDU covers will need to be removed for access to plastic bag with fasteners.

5. Install two side trim panels with previously removed screws.
6. Connect cable from SGA Power Supply to the fan connector.

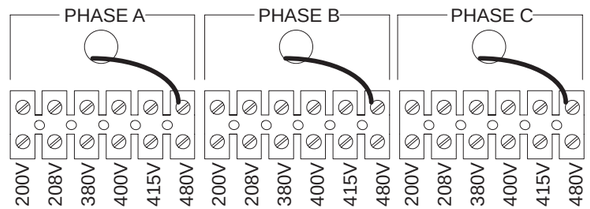
DANGER!!

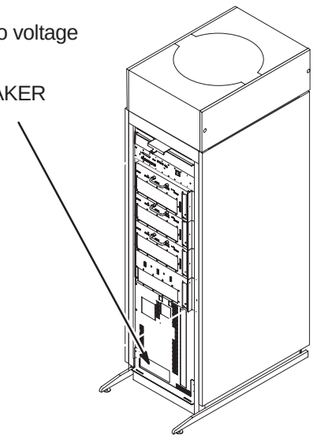
LETHAL VOLTAGES ARE PRESENT WITHIN THE PDU. CHECK THAT POWER AT THE MAIN DISCONNECT IS OFF, LOCKED, AND TAGGED BEFORE PROCEEDING.

❑ A3 – INPUT VOLTAGE SELECTION

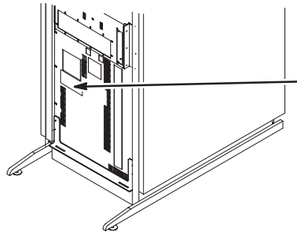
1. Using a voltmeter or other voltage indicating device, check to be sure that no voltage is being applied to the input of the PDU.
2. Remove the plate from the front of the PDU marked INPUT CIRCUIT BREAKER CURRENT SELECT / INPUT VOLTAGE SELECT.
3. For each of the three phases, be sure the wire is connected to the proper terminal for the actual input voltage at the site and that the terminal screw is tight to make a good connection.

(SHOWN WIRED FOR 480V)





❑ A4 – CIRCUIT BREAKER DIP SWITCH SETTINGS



1. Remove small cover plate under the main circuit breaker to access DIP switches controlling the circuit breaker operation.
2. Table below shows the position of the DIP switches for each input voltage selection. The switches immediately under the letter “L” and “I” are the only ones that should be changed.

INPUT VOLTAGE	DIP SWITCH “L” SETTING	L	I	DIP SWITCH “I” SETTING	INPUT VOLTAGE
200V		Set these switches according to the input voltage shown at the left.	Set these switches according to the input voltage shown at the right.		200V
208V					208V
380V					380V
400V					400V
415V		If these switches are present, set both of them in the **DOWN** position as shown.			415V
480V					480V

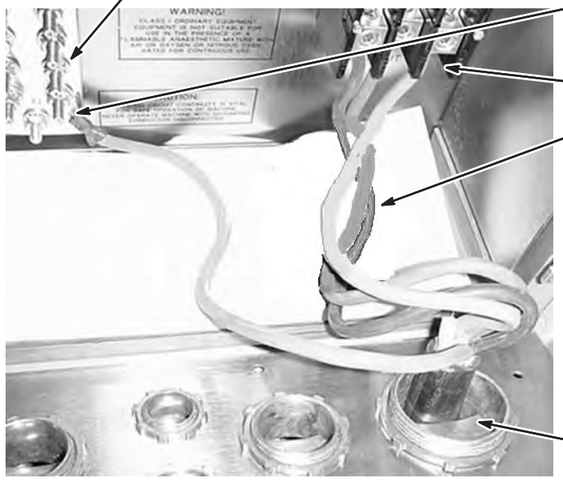
INSTALLATION STEPS SUMMARY

- ❑ **B1 – Facility Power and Ground Connention**
- ❑ **B2 – Route Power Cables Thru Interface Panel**
- ❑ **B3 – Run 967 Power Cable Alteration**
- ❑ **B4 – Connect Power Cables to PDU Module**

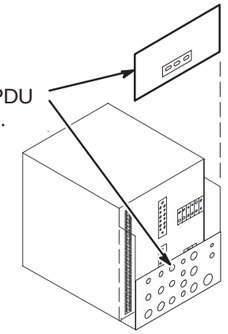
❑ B1 – FACILITY POWER AND GROUND CONNECTION

WARNING!

IF 3 PHASE WYE WITH NEUTRAL AND GROUND (5 WIRE SYSTEM) INPUT IS USED THE NEUTRAL MUST BE TERMINATED INSIDE THE MAIN DISCONNECT CONTROL AND NOT BROUGHT TO THE ACGD/PDU CABINET.



(1) Remove rear PDU module covers.



(2) Connect RF screen room ground conductor to Ground Bus Bar.

(3) **NOTE:** Air flow thru cabinet must exit thru top of cabinet. If not, fan at top of cabinet is rotating in wrong direction. To reverse rotation of fan, switch any two of the three incoming L1–L3 power wires.

(4) Connect L1–L3 conductors to terminal block.

(5) Connect facility input dedicated ground conductor to Ground (GRN/YEL) Bus Bar.

DANGER!!

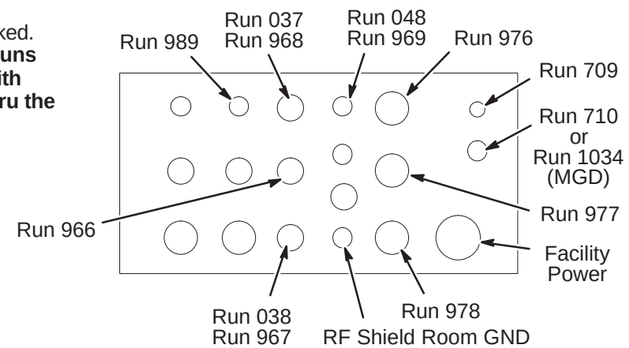
MAKE SURE ALL POWER TO CABINET IS OFF, LOCKED, & TAGGED BEFORE SWITCHING ANY ABOVE WIRES.

(1) Route facility input power cable and ground wire thru interface panel.

❑ B2 – ROUTE POWER CABLES THRU INTERFACE PANEL

(1) Route Runs thru interface panel as marked. **Note: The GRN/YEL ground wires (Runs 037, 038, and 048) MUST be routed with their respective power cable Runs thru the same port.**

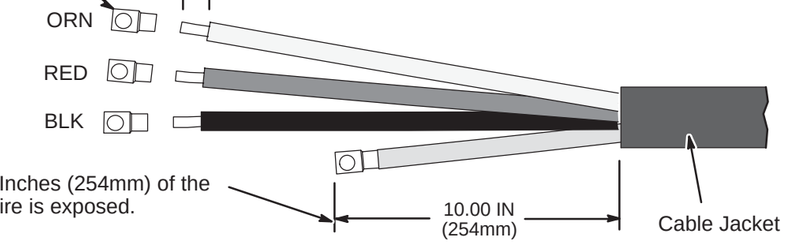
(2) Route any option Runs as marked.



❑ B3 – RUN 967 POWER CABLE ALTERATION

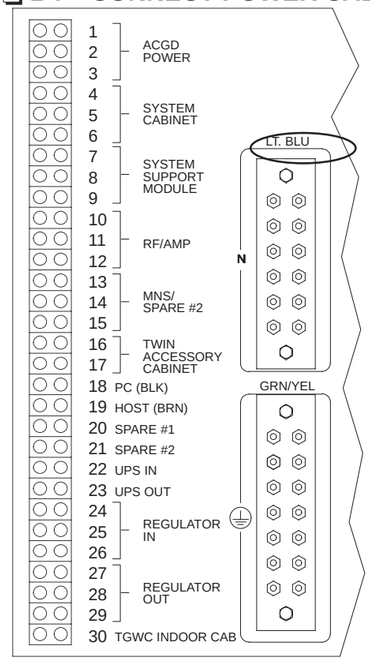
(1) Cut off ring terminal from ORN, RED, and BLK wires.

(2) Strip 0.75 IN (19mm) of insulation from end of each wire.



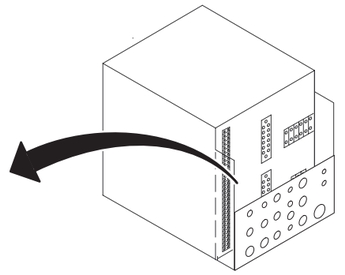
(3) Strip jacket until 10 Inches (254mm) of the GRN/YEL ground wire is exposed.

❑ B4 – CONNECT POWER CABLES TO PDU MODULE



WARNING!

ALL POWER CABLES LISTED BELOW MUST BE CONNECTED TO PDU MODULE LOCATED WITHIN ACGD/PDU CABINET.



(1) Route/connect power cables to pressure connectors and studs on back of PDU module as shown in Table below.

(2) Trim and connect ground wire cables (Runs 037, 038, and 048) to ground bus connectors.

(3) Tighten clamps of interface panel to secure cables in place.

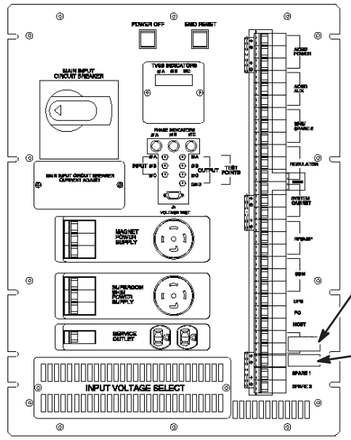
CONNECT TO	RUN	PHASE	DESTINATION	
4,5,6	968	ϕ A, B, C	System Cabient	3ϕ, Neutral, GND
7,8,9	966	ϕ A, B, C	SSM	3ϕ Neutral, GND
10,11,12	967	ϕ A, B, C	RFI/AMP	3ϕ, GND
16,17	989	ϕ A,C	TAC Cabinet	Single ϕ Neutral, GND
18,19	969	ϕ C,A	Operator Workspace	Single ϕ, Neutral, GND
30		ϕ A	TGWC Indoor Water Cooled Cabinet	Single ϕ, Neutral, GND
GRN/YEL	037		System Cabinet Ground Wire	
GRN/YEL	038		SRF Cabinet Ground Wire	
GRN/YEL	048		Operator Workspace Ground Wire	
GRN/YEL			RF Shield Room Ground (Customer Supplied)	

COLOR CODE: for remainder of cables:
3ϕ= Black, Red, Orange Neutral = Light blue Gnd = Grn/Yel
Single ϕ = Brown, Black

INSTALLATION STEPS SUMMARY

- ❑ **C1 – Apply New Circuit Breaker Labels to Front of PDU**
- ❑ **C2 – Route/Connect Ribbon Cable 2315915 Inside ACGD/PDU Cabinet**
- ❑ **C3 – Route/Connect Run 974 to GP Module (If Required)**
- ❑ **C4 – Install Ferrite Filters on Gradient Cables (Required for Twin*Speed*)**

❑ C1 – APPLY NEW CIRCUIT BREAKER LABELS TO FRONT OF PDU



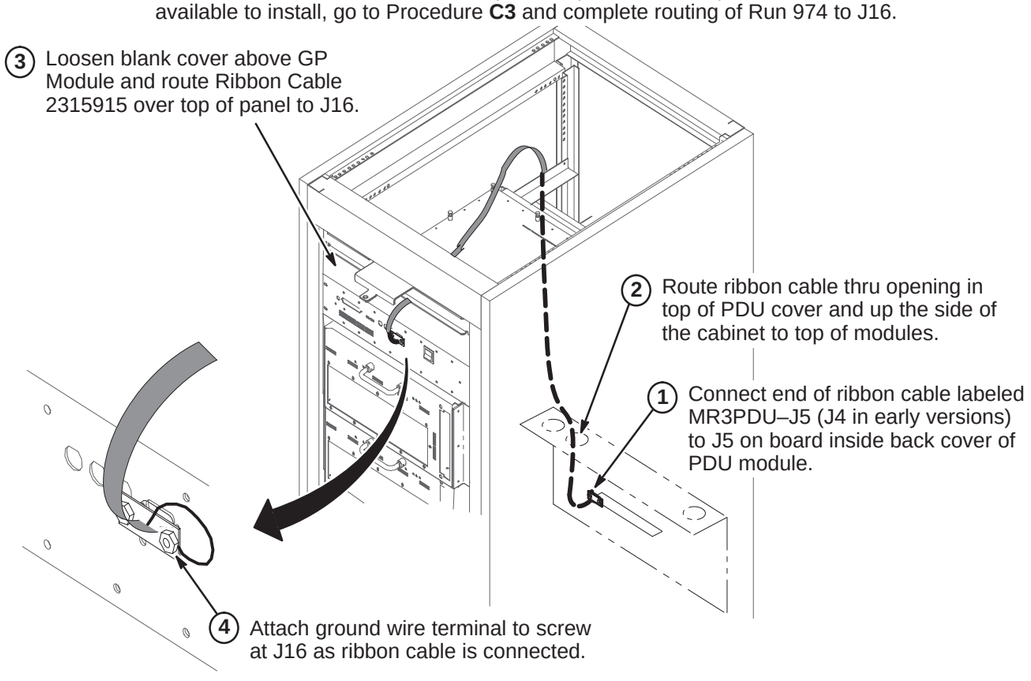
ACGD CABINET
(FRONT VIEW)

1. Apply TWIN ACCESSORY CABINET label over GRADIENT WATER CHILLER
2. If system being installed has a TGWC Indoor Water Cooled Cabinet, apply TGWC COOLING CAB label over GRADIENT FAN.

   If system being installed does not have a TGWC indoor water cooled cabinet, apply “NOT USED” label over Gradient Fan.

❑ C2 – ROUTE/CONNECT RIBBON CABLE 2315915 INSIDE ACGD/PDU CABINET

NOTE: Grounded Ribbon Cable may not be present on early versions. If not available to install, go to Procedure **C3** and complete routing of Run 974 to J16.

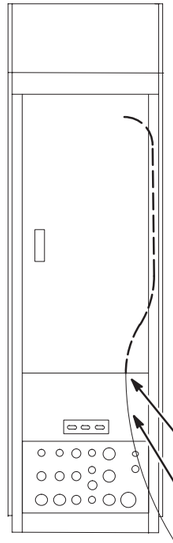


3. Loosen blank cover above GP Module and route Ribbon Cable 2315915 over top of panel to J16.
2. Route ribbon cable thru opening in top of PDU cover and up the side of the cabinet to top of modules.
1. Connect end of ribbon cable labeled MR3PDU–J5 (J4 in early versions) to J5 on board inside back cover of PDU module.
4. Attach ground wire terminal to screw at J16 as ribbon cable is connected.

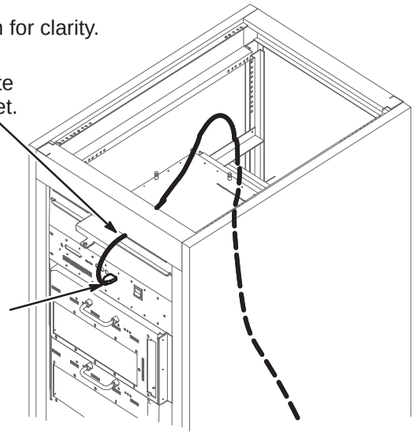
❑ C3 – ROUTE/CONNECT RUN 974 TO GP MODULE (IF REQUIRED)

NOTE: COMPLETE THIS PROCEDURE ONLY IF RUN 974 CAN NOT BE CONNECTED TO J5 ON THE REAR INTERFACE PANEL. THIS WOULD INDICATE THAT THE INTERNAL CABINET CABLE THAT IS ROUTED IN PROCEDURE **C2** FROM J5 TO J16 ON THE GP MODULE IS NOT PRESENT.

THIS PROCEDURE INSTRUCTS YOU TO ROUTE THE CABLE DIRECTLY TO J16 ON THE GP MODULE.

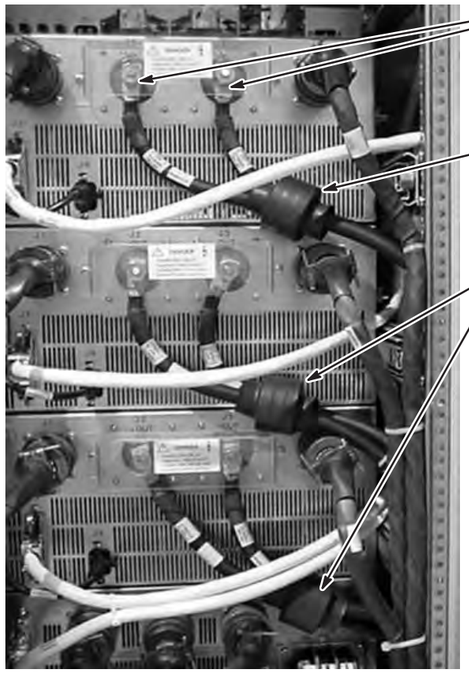


NOTE: Fan Module not shown for clarity.



3. Loosen front cover bracket and route Run 974 thru notch on top of bracket.
4. Connect to J16 at the front of the cabinet.
1. Cut a notch in bottom of rear door large enough for cable to be route thru. Apply electrical tape on edges to avoid damage to routed cable.
2. Route Run 974 thru notch, to wall of cabinet. to top of GP Module.

❑ C4 – INSTALL FERRITE FILTERS ON GRADIENT CABLES (Twin*Speed* REQUIRED)



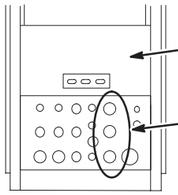
1. Unfasten lug nuts holding gradinet cables to studs on back of amplifier.
2. Slide Ferrite Filter (2308879) over gradient cables as shown and refasten cables to studs using previously removed lug nuts.
3. Repeat steps 1 and 2 for the other two sets of gradient cables.

INSTALLATION STEPS SUMMARY

- ❑ **D1 – Gradient Output Cable Interface Panel Access**
- ❑ **D2 – Gradient Output Cable Routing**
- ❑ **D3 – Route/Connect Fiber Optics Cables to GP Module**
- ❑ **D4 – Connect Runs 971 and 972 to PDU Module**
- ❑ **D5 – Atach InSite Cabinet Magnets**

❑ D1 – GRADIENT OUTPUT CABLE INTERFACE PANEL ACCESS

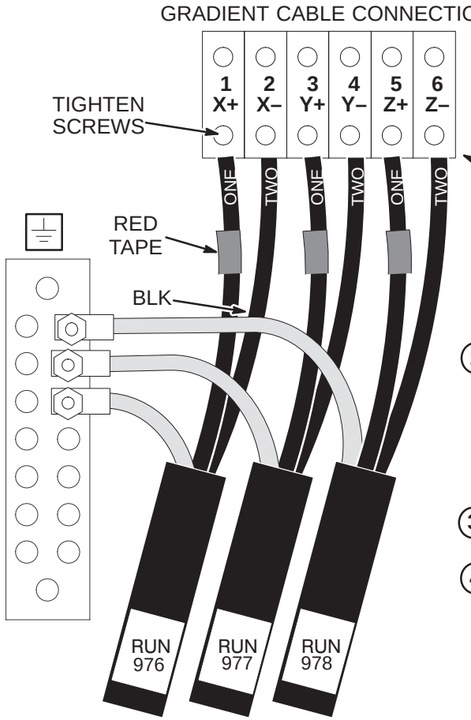
ACGD CABINET
(REAR VIEW)



NOTE: Output cables (Runs 976, 977, and 978) were previously routed, cut to length, and terminated.

1. Remove Rear Cover Plate by removing seven screws that hold it in place.
2. Loosen screws on clamps for gradient output cables. Insert ends of gradient output cables into Cabinet Interface as marked. (Runs 976 into J3, Run 977 into J4, and Run 978 into J5)

❑ D2 – GRADIENT OUTPUT CABLE ROUTING

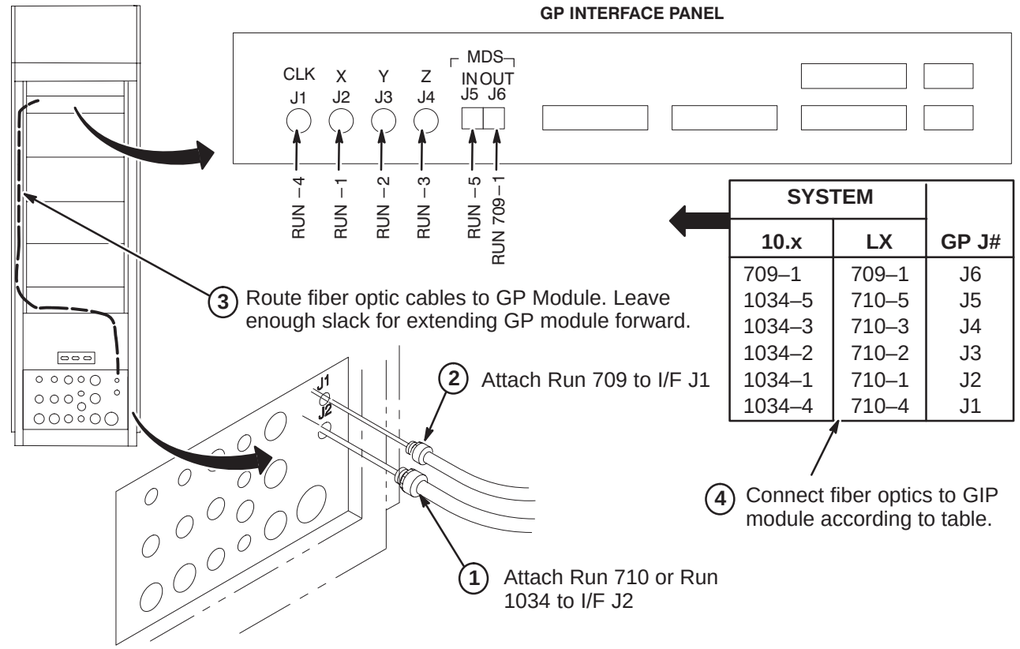


1. Connect gradient output cables with red–taped (+) #1 wires to + output terminals and black (–) #2 wires to – output terminals.

   NOTE: OVER TIGHTENING OF SCREWS IN STEP 2 CAN DAMAGE TERMINAL BLOCK.

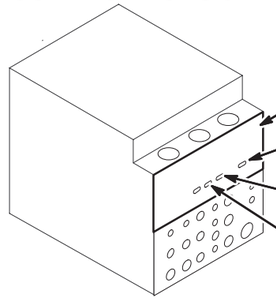
2. Tighten screws to 52–65 inch–lbs (5,88–7,34 N–M). This is about what can be applied using only your thumb and little finger on wrench. Loosen 1/2 turn and re-tighten to the same torque. Repeat approximately 6 times or until wrench returns to the same spot after torquing.
3. Connect the GND leads of each run to the Ground Bus Bar studs.
4. Tighten clamps on Interface Panel to secure gradient output cables.

❑ D3 – ROUTE/CONNECT FIBER OPTICS TO GP MODULE



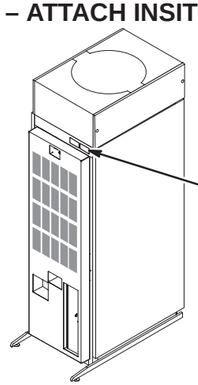
SYSTEM		
10.x	LX	GP J#
709–1	709–1	J6
1034–5	710–5	J5
1034–3	710–3	J4
1034–2	710–2	J3
1034–1	710–1	J2
1034–4	710–4	J1

❑ D4 – CONNECT RUNS 971 AND 972 TO PDU MODULE



1. Attach rear PDU module covers removed in Procedure **B1.**
2. Connect Run 974 to J5 if ribbon cable 2315915 is installed in cabinet.
3. Connect Run 972 to J3.
4. Connect Run 971 to J2.

❑ D5 – ATTACH INSITE CABINET MAGNETS



1. Attach front and rear covers.
2. From the 8.0 LX InSite Kit (46–301708G14), locate the “Gradient” cabinet magnet (46–320095P7) and the “PDU” cabinet magnet (46–320095P4). Attach to front of cabinet as shown.

1–1 INTRODUCTION

Specific GP modules may need to be upgraded because of intermittent current distortion faults, specifically on oblique imaging prescriptions.

Perform the EEPROM firmware upgrade in Section 1–3 if your GP is one of following:

- All GP's (2248992) without Deviation M–179–02 applied
- GP2's (2248992–3) Revision 0 only

Perform the Capacitor/Jumper upgrade in Section 1–4 if your GP is one of following:

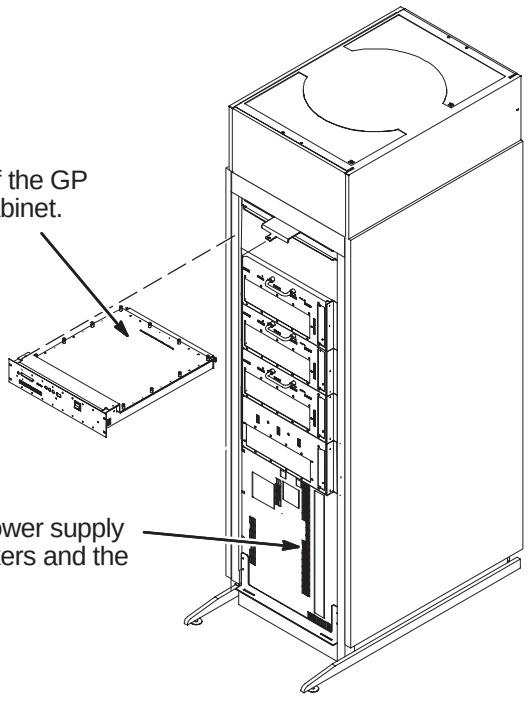
- All GP's (2248992)
- GP2's (2248992–3) with Revision 0, 1 or 2

NOTE

The GP Module upgrade must be completed before EPI calibrations are performed.

CAUTION:
GP Module is a static sensitive component and needs to be handled as such (wrist strap).

1–2 REMOVE GP MODULE FROM ACGD/PDU CABINET



(2) Disconnect all the cables on the back of the GP module and remove from the ACGD cabinet.

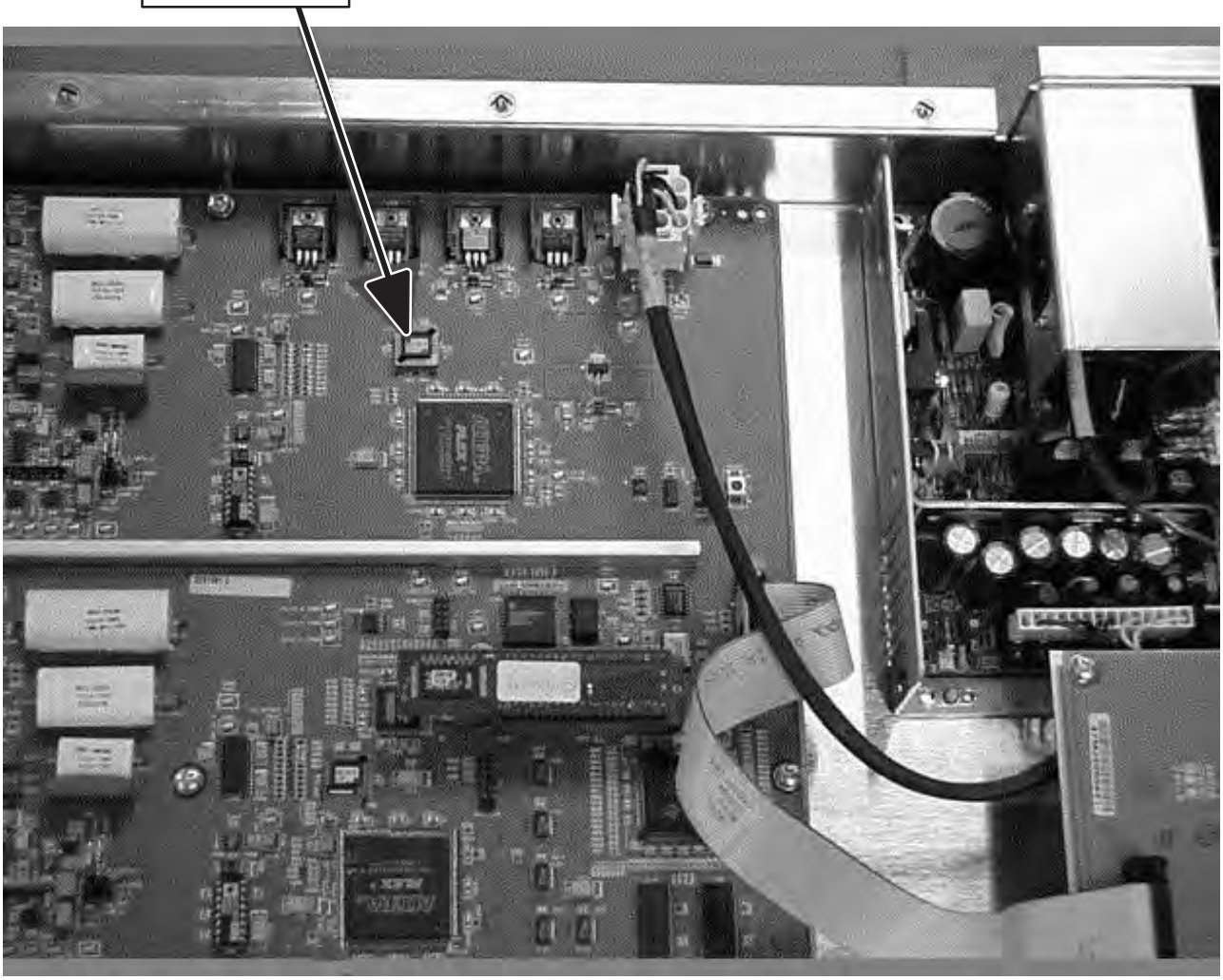
(3) Lay on table or floor to perform this upgrade procedure.

(1) Remove power from the GP, SGA's, and power supply by turning off the ACGD power circuit breakers and the ACGD AUX circuit breakers on the PDU.

1–3 REPLACE EEPROM AT U108

NOTE: These devices are extremely ESD sensitive. Use of grounding strap is required.

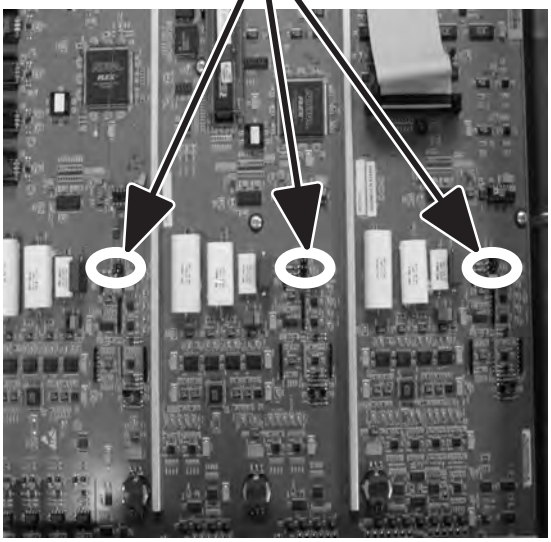
1. Remove top cover.
2. Carefully pull U108 from its socket.
3. Place the new EEPROM (2261124–4) at U108. Make sure that the notched corner of the EEPROM lines up with the notch on the socket. (top left corner on the image below)

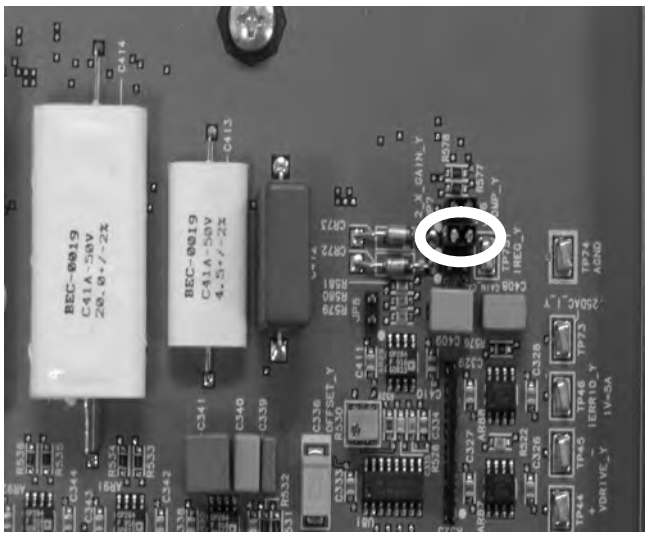


1–4 GP CAPACITOR/JUMPER INSTALLATION

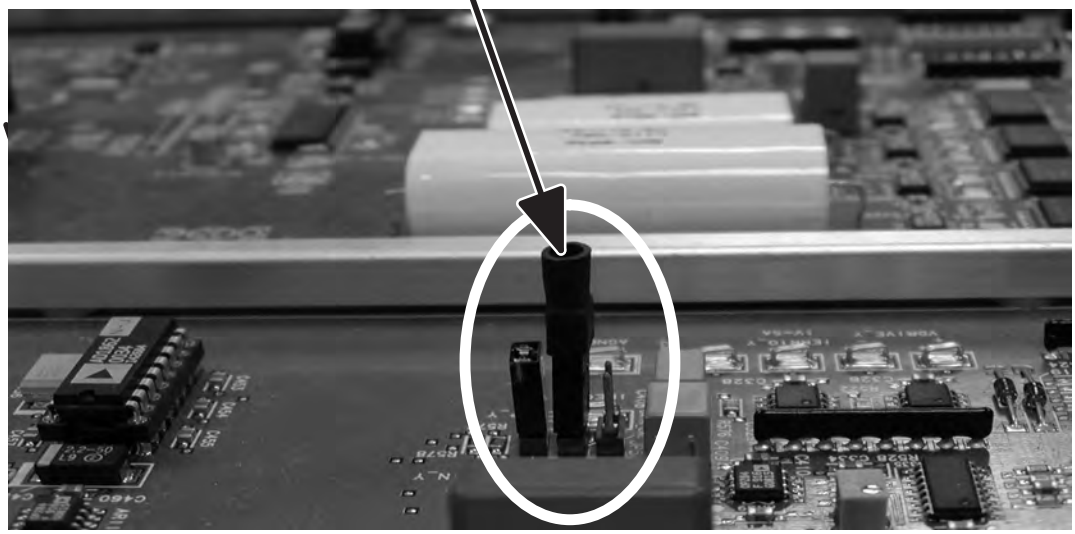
NOTE: These devices are extremely ESD sensitive. Use of grounding strap is required.

1. Locate jumpers JP10, JP6 and JP2 on the board.





2. For each of the jumpers remove the shunt and replace with the Capacitor/Jumper Adaptor assembly (2354359) as shown.



3. Replace the GP cover (be sure to torque down the captive screws).
4. Reinstall GP Module into the cabinet and reconnect all cables.
5. Turn power on.

SIGNA SRFD2 CABINET INSTALLATION INSTRUCTIONS

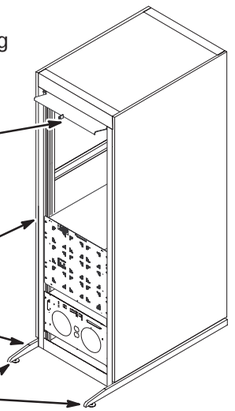
INSTALLATION STEPS SUMMARY

- ❑ A – Install New SRFD2 Cabinet
- ❑ B – Route/Connect Run 967
- ❑ C – Connect Runs 235 and 236 to RF Amp & Interface Module
- ❑ D – Connect Fiber Optics and Run 229
- ❑ E – System Support Module Cable Connections
- ❑ F – Attach InSite Cabinet Magnets

❑ A – INSTALL NEW SRFD2 CABINET

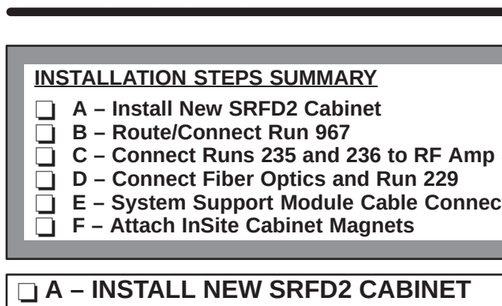
Note: Comply with UL requirements by either installing anti tip legs or securing the cabinet to the floor with local supplied brackets and floor anchors.

Note: UFI Label Kit (2146243) is attached to upper rail inside of cabinet.

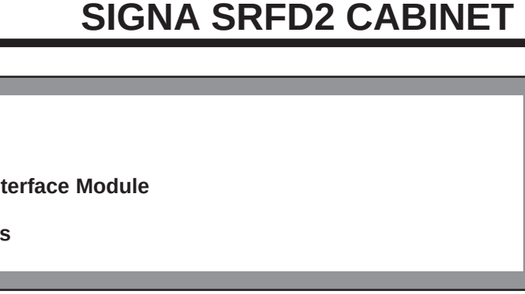


1. Move new SRFD2 Cabinet to final position.
2. Remove anti–tip bars from inside of cabinet and attach to each side.
3. Adjust leveling pads to level cabinet.

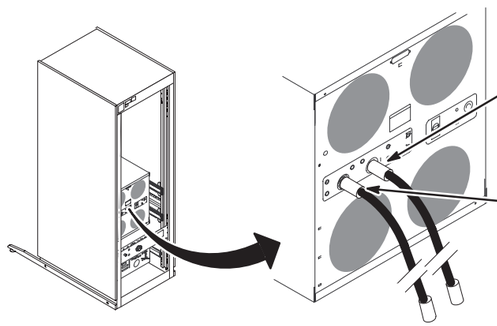
❑ B – ROUTE/CONNECT RUN 967



1. Remove cover from bracket.
2. Route Run 967 to rear bracket and connect to TS1 as marked.
3. Connect Run 038 to stud GND stud on rear bracket.
4. Replace cover after completion of power cable connection.



❑ C – CONNECT RUNS 235 AND 236 TO RF AMP & INTERFACE MODULE

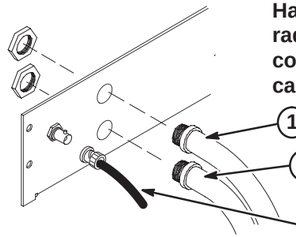


1. Connect Extension Cable with HN plugs (2105362) to J3 Head Output on RFI Module.
2. Connect Run 236 (1.5T) to above Extension cable using HN Bulkhead connector (46–221942P1).
3. Connect Extension Cable with N plugs (2105358) to J4 Body Output on RFI Module.
4. Connect Run 235 (1.5T) to above Extension cable using N Bulkhead connector (46–221865P1).

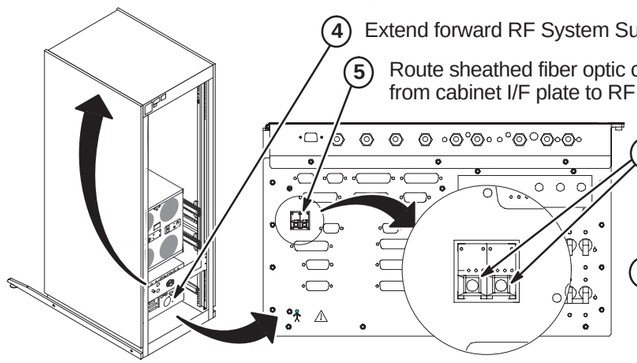
❑ D – ROUTE/CONNECT FIBER OPTICS AND RUN 229

CAUTION

Handle fiber optic cables carefully. Do not bend fiber optic cables to radius smaller than two inches. Avoid scratching connector ends. Keep connectors protected until ready to connect. Routing of fiber optic cables must be done with care to prevent damage to optical fibers.

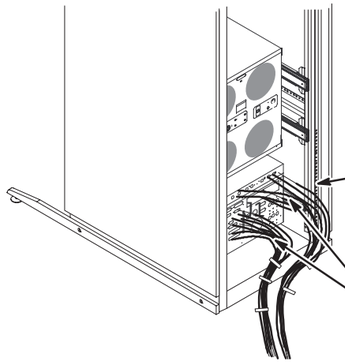


1. Attach Run 709 to I/F RX*.
2. Attach Run 708 (or1033) to I/F TX*.
   * Instructions provided with connectors.
3. Attach Run 229 to J1.



4. Extend forward RF System Support Module into servicing position.
5. Route sheathed fiber optic cables (Run 708/1033 and Run 709) from cabinet I/F plate to RF System Support Module.
6. Connect fiber optic cables as marked to TR1 and TR2 at rear of Module:
   – Run 708/1033 to Transmit (TX)
   – Run 709 to Receive (RX)
7. Dress and secure fiber optic cables along route from Module to I/F Panel. While checking Fiber Optic Cable routing, push RF System Support Module into cabinet.

❑ E – SYSTEM SUPPORT MODULE CABLE CONNECTIONS



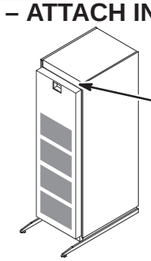
CAUTION

All cables connected to System Support Module Interface Panel must have a service loop of approximately 2 feet (610mm) to allow enough slack for serviceability when Module is moved completely forward.

1. Connect remainder of SRFD2 Cabinet cables to System Support Module.

   Note:
   If needed, refer to Overview: Section 2 – System Cables, for Run descriptions and designator information located at end of each cable.
2. Dress and secure cables connected to System Support Module. Verify sufficient slack for service loop by moving Module completely forward and back again. Adjust as necessary.

❑ F – ATTACH INSITE CABINET MAGNET



1. Attach all front and rear covers.
2. From the 8.0 LX InSite Kit (46–301708G14), locate the “RF/Penetration” cabinet magnet (46–320095P13). Attach to front of cabinet as shown.

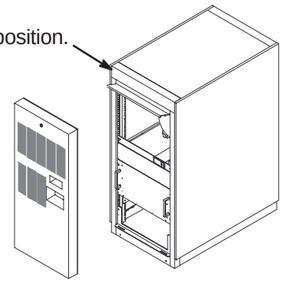
SIGNA Twin*Speed* TAC (TWIN ACCESSORY CABINET) INSTALLATION

INSTALLATION STEPS SUMMARY

- ❑ **A – Install TAC Cabinet**
- ❑ **B – Route/Connect Runs 976, 977, and 978 from ACGD/PDU Cabinet**
- ❑ **C – Route/Connect Runs 979, 980, and 981 from Penetration Panel**
- ❑ **D – Connect Runs 568, 611, 974, 989, 991, 992, and Vacuum to TAC Interface Panel**

❑ A – INSTALL TAC CABINET

1. Move new TAC Cabinet to final position.



Note: Comply with UL requirements by securing the cabinet to the floor with local supplied brackets and floor anchors.

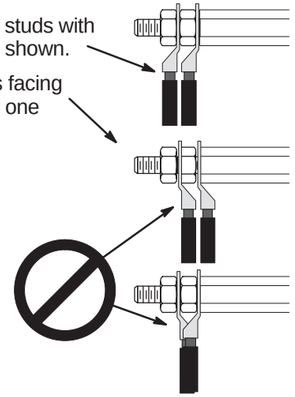
Note: RUN 975 is a service tool cable. It will not be part of installation.

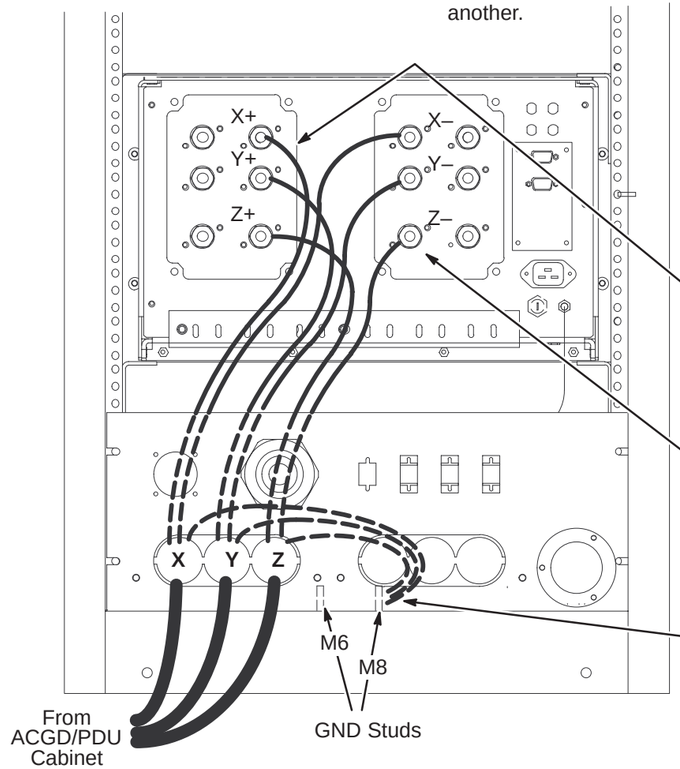
❑ B – ROUTE/CONNECT RUNS 976, 977, AND 978 FROM ACGD/PDU CABINET

Note: To make installation easier, route and connect Run 978 (Z terminals) first, then Run 977 (Y), and last Run 976 (X).

Note: Connect cables to all studs with terminals facing outward as shown.

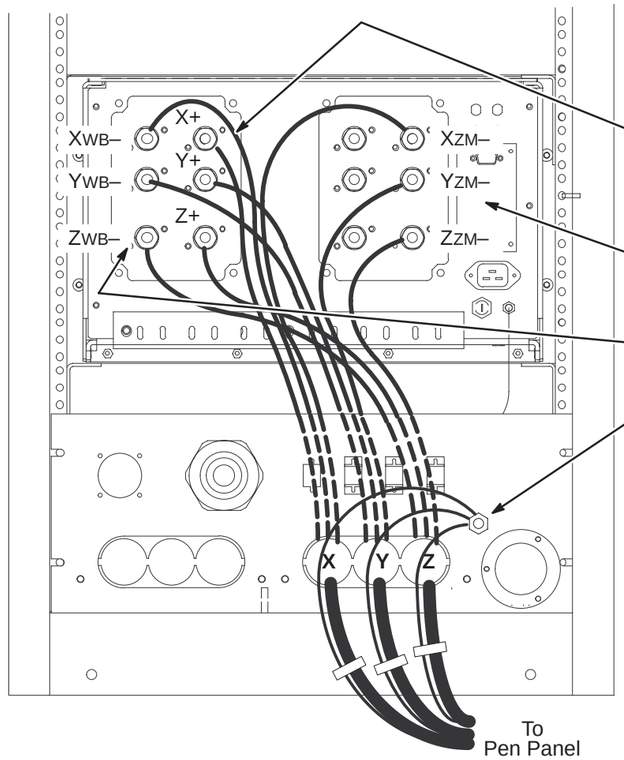
Do not install with terminals facing toward the module or facing one another.





1. Connect X+, Y+, and Z+ cables as marked. Cables should have red tape applied towards end of cable.
2. Make sure X+, Y+, and Z+ labels are applied to respective “ONE” conductor cables.
3. Connect X–, Y–, and Z– cables as marked.
4. Make sure X–, Y–, and Z– labels are applied to respective “TWO” conductor cables.
5. Connect Ground leads from each cable to M8 GND stud located at bottom of cabinet.
4. Apply GND label to each “THREE” conductor cable.

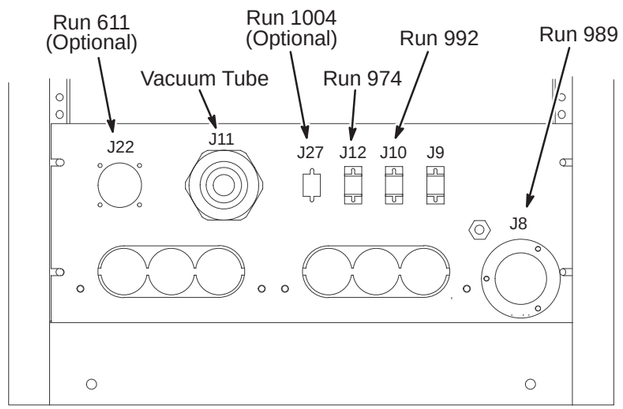
❑ C – ROUTE/CONNECT RUNS 979, 980, AND 981 FROM PENETRATION PANEL



Note: To make installation easier, route and connect Run 981 (Z terminals) first, then Run 980 (Y), and last Run 979 (X).

1. Connect X+, Y+, and Z+ cables as marked. Cables should have red tape applied towards end of cable.
2. Connect XZM–, YZM–, and ZZM– cables as marked.
3. Connect XWB–, YWB–, and ZWB– cables as marked.
4. Route and connect the three Run 988 Ground wires to GND stud on interface panel, (each ground wire has been ty–wrapped to a gradient cable, refer to Tab 1, Direction 2308287).

❑ D – CONNECT RUNS 568, 611, 974, 989, 991, 992, AND VACUUM TO TAC I/F PANEL



1. Connect cables as marked.
2. Connect vacuum tube to J11 using supplied Chain Clamp (2293618–2) and Centering Ring (2293608). Apply vacuum grease to centering ring and outside of flanges. These parts come from the Twin Vacuum Hose Asm Kit (2295226).

   Note: The end of the vacuum tube should already have been cut to length and the 1” Hose Connector (2293616) installed in the end. It’s attached with a worm–drive clamp (2294010–3).