



GE Medical Systems

Technical Publications

2150293–100

Revision 6

SG-60 Vertical Bucky Stand sm Service Manual

do not duplicate

Copyright© 1998 by General Electric Co.

ATTENTION

LES APPAREILS À RAYONS X SONT DANGEREUX À LA FOIS POUR LE PATIENT ET POUR LE MANIPULATEUR SI LES MESURES DE PROTECTION NE SONT PAS STRICTEMENT APPLIQUEES

Bien que cet appareil soit construit selon les normes de sécurité les plus sévères, la source de rayonnement X représente un danger lorsque le manipulateur est non qualifié ou non averti. Une exposition excessive au rayonnement X entraîne des dommages à l'organisme.

Par conséquent, toutes les précautions doivent être prises pour éviter que les personnes non autorisées ou non qualifiées utilisent cet appareil créant ainsi un danger pour les autres et pour elles-mêmes.

Avant chaque manipulation, les personnes qualifiées et autorisées à se servir de cet appareil doivent se renseigner sur les mesures de protection établies par la Commission Internationale de la Protection Radiologique, Annales 26 : Recommandations de la Commission Internationale sur la Protection Radiologique et les normes nationales en vigueur.

WARNING

X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED

Though this equipment is built to the highest standards of electrical and mechanical safety, the useful x-ray beam becomes a source of danger in the hands of the unauthorized or unqualified operator. Excessive exposure to x-radiation causes damage to human tissue.

Therefore, adequate precautions must be taken to prevent unauthorized or unqualified persons from operating this equipment or exposing themselves or others to its radiation.

Before operation, persons qualified and authorized to operate this equipment should be familiar with the Recommendations of the International Commission on Radiological Protection, contained in Annals Number 26 of the ICRP, and with applicable national standards.

ATENCIÓN

LOS APARATOS DE RAYOS X SON PELIGROSOS PARA EL PACIENTE Y EL MANIPULADOR CUANDO LAS NORMAS DE PROTECCIÓN NO ESTAN OBSERVADAS

Aunque este aparato está construido según las normas de seguridad más estrictas, la radiación X constituye un peligro al ser manipulado por personas no autorizadas o incompetentes. Una exposición excesiva a la radiación X puede causar daños al organismo.

Por consiguiente, se deberán tomar todas las precauciones necesarias para evitar que las personas incompetentes o no autorizadas utilicen este aparato, lo que sería un peligro para los demás y para sí mismas.

Antes de efectuar las manipulaciones, las personas habilitadas y competentes en el uso de este aparato, deberán informarse sobre las normas de protección fijadas por la Comisión Internacional de la Protección Radiológica, Anales No 26: Recomendaciones de la Comisión Internacional sobre la Protección Radiológica y normas nacionales.

ACHTUNG

RÖNTGENAPPARATE SIND EINE GEFAHR FÜR PATIENTEN SOWIE BEDienungSPERSONAL, WENN DIE GELTENDEN SICHERHEITSVORKEHRUNGEN NICHT GENAU BEACHTET WERDEN

Dieser Apparat entspricht in seiner Bauweise strengsten elektrischen und mechanischen Sicherheitsnormen, doch in den Händen unbefugter oder unqualifizierter Personen wird er zu einer Gefahrenquelle. Übermäßige Röntgenbestrahlung ist für den menschlichen Organismus schädlich.

Deswegen sind hinreichende Vorsichtsmaßnahmen erforderlich, um zu verhindern, daß unbefugte oder unqualifizierte Personen solche Geräte bedienen oder sich selbst und andere Personen deren Bestrahlung aussetzen können.

Vor Inbetriebnahme dieses Apparats sollte sich das qualifizierte und befugte Bedienungspersonal mit den geltenden Kriterien für den gefahrlosen Strahleneinsatz durch sorgfältiges Studium des Hefts Nr. 26 der Internationalen Kommission für Strahlenschutz (ICRP) vertraut machen: Empfehlungen der Internationalen Kommission für Strahlenschutz und anderer nationaler Normenbehörden.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	REVISION HISTORY	vii
	LIST OF EFFECTIVE PAGES	vii
1	INSTALLATION	1-1
	SECTION 1 – TOOLS AND TEST EQUIPMENT	1-2
	SECTION 2 – SITE PREPARATION	1-2
	SECTION 3 – INSTALLATION SEQUENCE GUIDE	1-3
	SECTION 4 – UNPACKING	1-4
	4-1 Wall Mounting Kit	1-4
	4-2 Unpack the SG-60 from Shipping Container	1-4
	SECTION 5 – STANDING & MOUNTING	1-5
	JOB CARD IST01 – SG-60 VERTICAL BUCKY STAND WALL MOUNTING	1-7
	SECTION 6 – COUNTERWEIGHT & BUCKY CARRIAGE COUNTERBALANCE CHECK	1-13
	SECTION 7 – ADDING OR REMOVING COUNTERWEIGHTS	1-16
	7-1 Counterweight Cover Removal/Installation	1-16
	SECTION 8 – ELECTRICAL INSTALLATION	1-18
	SECTION 9 – HEIGHT CORRELATION SCALE	1-20
	SECTION 10 – OPTIONAL KNEE SPACER INSTALLATION	1-21
	SECTION 11 – SPECIFICATION LABELS	1-21
	SECTION 12 – BUCKY GRID SPEED	1-21
	12-1 Liebel Bucky	1-21
	12-2 Medys Bucky	1-21
	JOB CARD LJS01 – SG-60 VERTICAL BUCKY STAND LIEBEL–FLARSHEIM BUCKY SWITCHES	1-23
	JOB CARD LJS02 – SG-60 VERTICAL BUCKY STAND MEDYS BUCKY SWITCHES ...	1-27
2	FUNCTIONAL CHECKS	2-1
	SECTION 1 – INTRODUCTION	2-1
	1-1 General	2-1
	1-2 Tools and Test Equipment	2-1
	SECTION 2 – MECHANICAL CHECKS	2-1
	2-1 Vertical Lock	2-1
	SECTION 3 – ELECTRICAL CHECKS	2-2
	3-1 Grid Selections	2-2
	3-2 Bucky Grid Check	2-2
	3-3 Ion Chamber	2-2
	3-4 Collimator Test	2-2
	JOB CARD VF01 – SG-60 VERTICAL BUCKY STAND IMAGE PERFORMANCE TEST ..	2-3

TABLE OF CONTENTS (CONT.)

CHAPTER	TITLE	PAGE
3	MIS MAPS	3-1
	SECTION 1 – INTRODUCTION	3-1
	SECTION 2 – MIS MAPS	3-1
	ILLUSTRATION 3-1 System Grounding Example	3-2
	ILLUSTRATION 3-2 STANDARD CONFIGURATION MIS MAP (C40E AUTO / MPH50/65/80 / XT w / TOMOLINK / SINGLE ROOM)	3-3
	ILLUSTRATION 3-3 STANDARD CONFIGURATION MIS MAP (C40E MANUAL / MPH50/65/80 / XT w / TOMOLINK / SINGLE ROOM)	3-4
	ILLUSTRATION 3-4 STANDARD CONFIGURATION MIS MAP (COMPAX I AUTO / MPH50/65/80 / SINGLE ROOM)	3-5
	ILLUSTRATION 3-5 STANDARD CONFIGURATION MIS MAP (COMPAX I MANUAL / MPH50/65/80 / SINGLE ROOM)	3-6
	ILLUSTRATION 3-6 STANDARD CONFIGURATION MIS MAP (COMPAX I/T AUTO / MPH50/65/80 / SINGLE ROOM)	3-7
	ILLUSTRATION 3-7 STANDARD CONFIGURATION MIS MAP (COMPAX I/T MANUAL / MPH50/65/80 / SINGLE ROOM)	3-8
	ILLUSTRATION 3-8 STANDARD CONFIGURATION MIS MAP (C40E AUTO / MPH50/65/80 / RS 85 / SINGLE ROOM)	3-9
	ILLUSTRATION 3-9 STANDARD CONFIGURATION MIS MAP (C40E MANUAL / MPH50/65/80 / RS 85 / SINGLE ROOM)	3-10
4	MIS CHARTS	4-1
	SECTION 1 – INTRODUCTION	4-2
	SECTION 2 – CABLE/SIGNAL DEFINITIONS (MIS CHART)	4-2
	ILLUSTRATION 4-1 Cable #27221 (2145641)	4-2
	ILLUSTRATION 4-2 Cable #27222 (2145642)	4-3
	ILLUSTRATION 4-3 Cable #27223 (2145644)	4-4
	ILLUSTRATION 4-4 Cable #27224 (2145656)	4-5
	ILLUSTRATION 4-5 Cable #27284 (21456020)	4-6
	ILLUSTRATION 4-6 Cable #27289 (2145656)	4-7

TABLE OF CONTENTS (CONT.)

CHAPTER	TITLE	PAGE
5	PERIODIC MAINTENANCE	5-1
	SECTION 1 – PERIODIC MAINTENANCE	5-1
	1-1 Functional Checks	5-1
	1-2 Counterweight Chain Inspection	5-1
	1-3 Carriage Roller Bearing Maintenance	5-1
	1-4 Electrical Tests	5-2
	1-5 Vertical Lock	5-2
	SECTION 2 – PERIODIC MAINTENANCE SCHEDULE	5-2
6	RENEWAL PARTS	6-I
7	SCHEMATICS	7-1

Blank page.

WARNING

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

AVERTISSEMENT

- CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.
- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.

WARNUNG

- DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.
- FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.
- VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.
- WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.

AVISO

- ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.
- SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.
- NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
- LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.

ATENÇÃO

- ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.
- SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.
- NÃO TENHA TENTADO REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.
- O NÃO CUMPRIMENTO DESTA AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.

AVVERTENZA

- IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.
- SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.
- SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.
- NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL'ADDETTO ALLA MANUTENZIONE, ALL'UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.

警告

- ・ このサービスマニュアルには英語版しかありません。
- ・ GEMS以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
- ・ このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。
- ・ この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

注意：

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

REVISION HISTORY

REV	DATE	REASON FOR CHANGE
0	29 January, 1996	CE Marking, change from PI No. 2135942–100
1	29 July , 1996	Updates, new schematics, equipment changes
2	25 October , 1996	New revision of schematics 2155181.
3	6 August, 1997	Update of vertical lock maintenance and of MIS maps.
4	6 December, 1997	TCI updated.
5	24 September, 1998	Added Medys Bucky.
6	24 November, 1998	New retainer pin and counterweight.

LIST OF EFFECTIVE PAGES

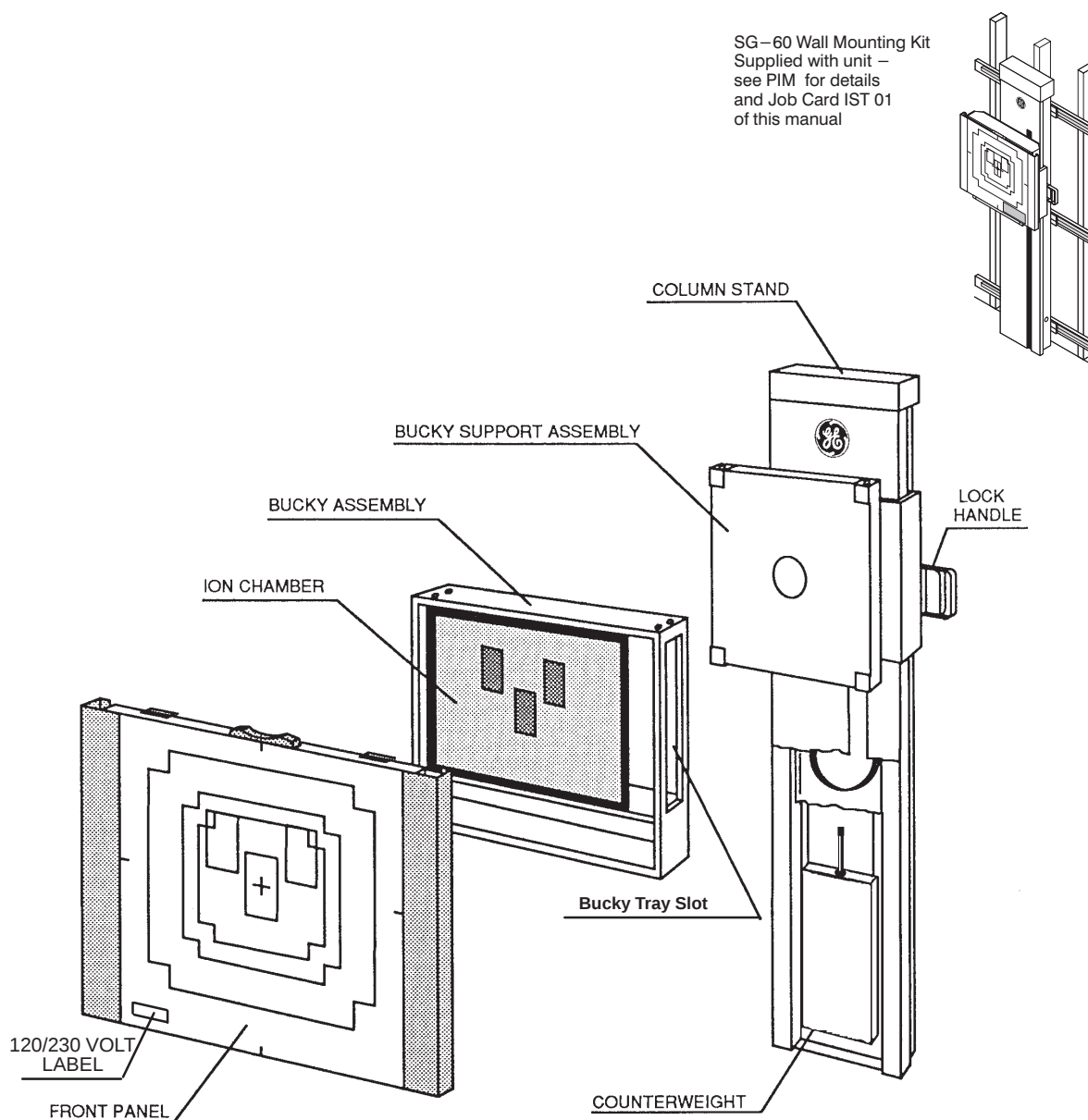
PAGE NUMBER	REVISION NUMBER	PAGE NUMBER	REVISION NUMBER	PAGE NUMBER	REVISION NUMBER
Title page	6				
Safety Instruction	6				
i thru viii	6				
1–1 thru 1–30	6				
2–1 thru 2–12	6				
3–1 thru 3–12	6				
4–1 thru 4–8	6				
5–1 thru 5–2	6				
6–i thru 6–ii	6				
6–1 thru 6–36	6				
7–1 thru 7–4	6				

NUMBER 2150293–100TPH	FORMAT A4	REVISION 6
--------------------------	--------------	---------------

Blank page.

CHAPTER 1 – INSTALLATION

SG-60 COMPONENTS



SECTION 1 TOOLS AND TEST EQUIPMENT

The following list summarizes the tools and test equipment needed to install and calibrate the SG–60 Vertical Bucky Stand:

REQUIRED

- Standard serviceman’s metric tool kit
- Electric hammer drill with 11 mm (1/2”) bits
- Digital multimeter
- FDA test kit (for HSS), part no. 46–177372G1
- Spirit level
- Wrench set

RECOMMENDED

- Laser alignment tool, part no. 46–21664061

SECTION 2 SITE PREPARATION

Note: Before installing the SG–60 Vertical Bucky Stand, the x–ray tube supports and table must first be installed.

Note: This procedure is normally part of the pre–installation.

To ensure proper functioning of the SG-60 and to preserve image quality it is essential that the room be properly prepared before installation, including analysis of the wall construction where the SG-60 will be mounted. Refer to Pre–installation Manual 2150301–100 for detailed instructions and follow the installation sequence guide in that manual.

SECTION 3 INSTALLATION SEQUENCE GUIDE

This sequence guide refers to procedures contained in the SG-60 Pre-Installation Manual (part number 2150301–100) and procedures contained within this document.

SEQUENCE	TASK TITLE	REFERENCE	NOTES
1.	SG-60 Vertical Bucky Stand Wall Evaluation	pim 2150301–100, Chapter 2, Job Card IST01	Analyze hospital wall construction PIM references are valid for Revision 1.
2.	SG-60 Vertical Bucky Stand Unpacking	This document, Chapter 1, Section 4	
3.	Knee Spacer Installation (Optional)	This document, Chapter 1, Section 10	Optional.
4.	SG-60 Vertical Bucky Stand Wall Mounting Preparation	pim 2150301–100, Chapter 2, Job Card IST02	PIM references are valid for Revision 1.
5.	SG-60 Vertical Bucky Stand Wall Mounting	This document, Chapter 1, Section 5, Job Card IST01	
6.	Counterweight & Bucky Carriage Counterbalance Check	This document, Chapter 1, Section 6 & 7	
7.	Electrical Installation	This document, Chapter 1, Section 8	
8.	Bucky Front Cover Removal	This document, Chapter 1, Section 8	
9.	Verify that supplied 36 lines/cm (for Medys Bucky) or 44 lines/cm (for Liebel Bucky) grid has been factory installed in Bucky	This document, Chapter 2, Section 3	If not pre-installed, Mount securely in Bucky tabs.
10.	Height Correlation Scale	This document, Chapter 1, Section 9	
11.	SG-60 Vertical Bucky Stand Bucky Switches	This document, Chapter 1, Section 12, Job Card LJS01 (for Liebel Bucky) or LJS02 (for Medys Bucky)	Verify Bucky S1 switch is set per Job Card LJS01 or LJS02 .
12.	SG-60 Vertical Bucky Stand Image Performance Check	This document, Chapter 2, Section 3, Job Card VF01	Ensure SG-60 Image Performance meets requirements per Job Card VF01 .

SECTION 4 UNPACKING

Note: When unpacking, first find the packing list and check that all items are present. Check also that there is no damage to the components received. Do not discard packing material, envelopes, boxes, etc., until all parts are accounted for.

Any damage or shortage of parts must be reported immediately to the distribution center or factory. The problem must be described as clearly and accurately as possible.

Each SG-60 is equipped with the following shipping retention hardware:

- The Bucky carriage is secured at the top end of the vertical column with (4) angle brackets held in place with (8) attaching screws.
- The counterweight carriage (with the counterweight installed) is held in position at the bottom of the vertical column by (1) shipping retaining pin and (2) lock nuts.
- The SG-60 is factory set for 110 VAC or 220 VAC. See the label on the front panel.

See Illustration 1–1 (SG-60).



AVOID PERSONNEL INJURY OR EQUIPMENT DAMAGE!

DO NOT REMOVE SHIPPING RETAINING PIN, BRACKETS, OR HARDWARE FROM THE SG-60 UNTIL INSTRUCTED TO DO SO. THE SHIPPING RETAINING PIN LOCKS THE BUCKY IN A FIXED VERTICAL POSITION THAT PROVIDES THE INSTALLER A SAFETY FEATURE DURING INSTALLATION. THIS RETAINING PIN SHOULD NOT BE REMOVED UNTIL THE SG-60 IS SECURELY MOUNTED TO THE WALL.

4-1 Wall Mounting Kit (Optional)

A Wall Mounting Kit is supplied with the SG-60. It is intended for hospital sites that are constructed with non-load bearing drywall construction. Refer to the Pre-Installation Manual (part number 2150301–100) for a list of its contents and details of its use.

4-2 Unpack the SG-60 from Shipping Container

1. Move the SG-60, in the shipping container, to the installation area. Leave the container in the horizontal position.
2. Remove the banding and cardboard box that is covering and clamped to the wooden pallet.
3. Remove the (3) shipping screws holding the SG-60 to the pallet.
4. Rest the bottom end of the SG-60 on soft support material outside the shipping container.
5. Continue with procedures in Section 5 and Job Card IST 01 of this manual.

SECTION 5 STANDING & MOUNTING

WARNING

INJURY HAZARD! AT LEAST TWO PEOPLE ARE REQUIRED TO TURN OR TILT THE SG-60. THE SG-60 WEIGHS APPROXIMATELY 265 lbs (120 KG) AND CAN EASILY BE TIPPED OR UNBALANCED.

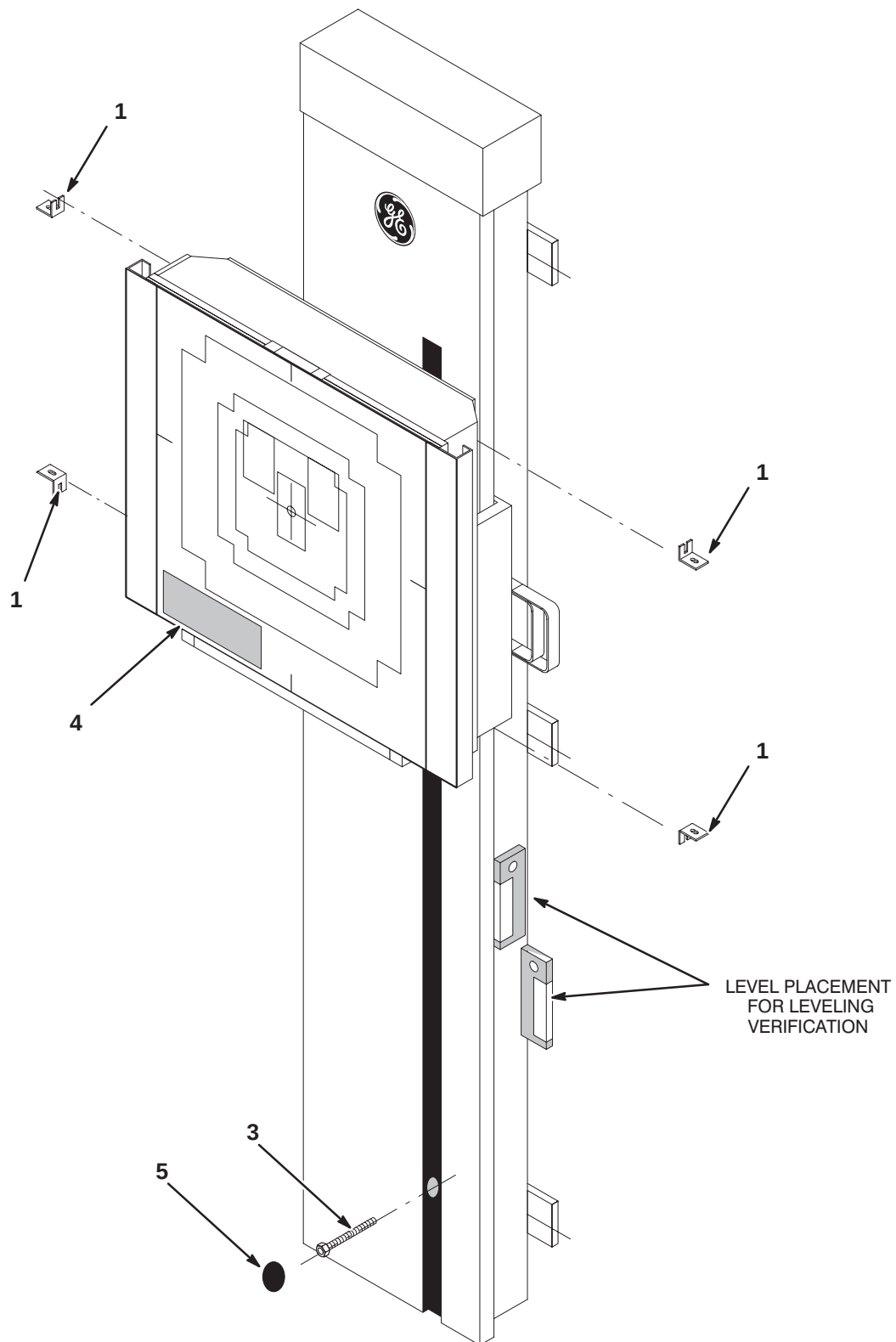
The SG-60 is shipped as follows:

- The Bucky carriage assembly is secured at the top end of the vertical column with eight shipping screws and four stop brackets (*see illustration 1-1, item 1*),
- The counterweight carriage with the counterweight installed is positioned and fixed at the bottom of the vertical column by one shipping retainer pin and two lock nuts (*see illustration 1-1 , item 3*),
- The SG-60 is factory set for 110 or 220V power supply (refer to the caution label on SG front panel, (*see illustration 1-1, item 4*).
- Continue with mounting instructions in Job Card IST01. If the optional Wall Mounting Kit is used, follow the procedure in section 5.1 of Job Card IST01. If the SG-60 is to be mounted directly to the wall, use the procedure in section 5.2 of Job Card IST01.

WARNING

INJURY HAZARD! DO NOT REMOVE THE SHIPPING HARDWARE UNTIL INSTRUCTED TO DO SO.

ILLUSTRATION 1-1
SG-60 SHIPPING RETAINERS



SG-60 Vertical Bucky Stand

Job Card IST01

1 of 7

Purpose: **SG-60 VERTICAL BUCKY STAND WALL MOUNTING**

Version No.: F

Date: August 12, 1996

Time: 30 Minutes

Personnel: 2 Persons

SECTION 1 SUPPLIES

1.1 SG-60 to Unistrut Wall Supports Mounting Hardware (Drywall construction only)

See Table 1. Refer to the Pre-Installation Manual (part number 2150301–100) for details on this kit and its use.

Note: The use of the Wall Mounting Kit is optional but *strongly recommended* in the case of certain kinds of hospital wall construction.

TABLE 1
SG-60 TO UNISTRUT MOUNTING HARDWARE

CATALOG	KIT NUMBER	PART NUMBER	QTY	DESCRIPTION
B3500J or S19011AV	2161320	2161319	3	102 cm (40 in.) length of P1000T Unistrut
		46–316373P3	6	1/4–20 Unistrut spring loaded mounting nut
		46–208561P25	6	1/4–20 x 1 1/4 in. long Hex Head Bolt – Grade 5
		46–220181P7	15	1/4 in. Lock washer (OD: 0.75 in.)
		12–1407	15	ID 0.328 OD 0.750 THK .125
		2162142–100	1	SG–60 VBS Installation Guide
		2162390	9	1/4–20 x 1 1/2 in. long Lag Screw – Grade 2 (used for wood stud supported walls)
		2162393	9	1/4–20 x 1 1/2 in. long, slotted head, Toggle Bolt (used for metal stud supported walls)
		2161313	3	Trim cover for P1000T Unistrut piece

**SG-60 VERTICAL BUCKY STAND WALL
MOUNTING****Job Card IST01**

2 of 7

SECTION 2**TOOLS REQUIRED**

- Standard service person's tool kit
- Spirit level
- Torque Wrench (Metric with 1/4 in. SAE hex socket adapter or SAE)
- Laser Alignment Tool (46–216640G1), if required

SECTION 3**SAFETY, PRECAUTIONS TO TAKE****WARNING****AVOID POSSIBLE SEVERE INJURY!**

TO PREVENT POSSIBLE SEVERE INJURY, AT LEAST TWO PEOPLE ARE REQUIRED TO LIFT, TILT, OR TURN THE SG-60 VERTICAL BUCKY STAND. THE SG-60 WEIGHS APPROXIMATELY 265 LBS. (120 KG). THE SG-60 CAN EASILY BE TIPPED OR DROPPED UNTIL SECURELY MOUNTED TO THE WALL.

CAUTION**AVOID PERSONNEL INJURY OR EQUIPMENT DAMAGE!**

DO NOT REMOVE SHIPPING RETAINING PIN, BRACKETS, OR HARDWARE FROM THE SG-60 UNTIL INSTRUCTED TO DO SO. THE SHIPPING RETAINING PIN LOCKS THE BUCKY IN A FIXED VERTICAL POSITION THAT PROVIDES THE INSTALLER A SAFETY FEATURE DURING INSTALLATION. THIS RETAINING PIN SHOULD NOT BE REMOVED UNTIL THE SG-60 IS SECURELY MOUNTED TO THE WALL.

SECTION 4**PREREQUISITES**

Before installing the SG-60 to the wall, ensure the following is complete:

- Identify the Wall Mounting Kit enclosed with the SG–60 and refer to Pre–Installation Manual (part number 2150301–100) Job Cards IST01 and IST02 to ensure that the wall is properly prepared and that the Kit is installed correctly if needed.
- Knee Spacer option is securely installed (see following note).

Note:**SG-60 Knee Spacer Installation:**

If the optional Knee Spacer (45433375) is part of the order, install the Knee Spacer before raising the SG-60 to the wall. Refer to Section 10 of this chapter (Optional Knee Spacer Installation).

SG-60 VERTICAL BUCKY STAND WALL
MOUNTING

Job Card IST01

3 of 7

SECTION 5
PROCEDURE

5.1 Mount SG-60 to Unistrut Wall Supports (Drywall construction only)

WARNING**AVOID POSSIBLE SEVERE INJURY!**

TO PREVENT POSSIBLE SEVERE INJURY, AT LEAST TWO PEOPLE ARE REQUIRED TO LIFT, TILT, OR TURN THE SG-60 VERTICAL BUCKY STAND. THE SG-60 WEIGHS APPROXIMATELY 265 LBS. (120 KG). THE SG-60 CAN EASILY BE TIPPED OR DROPPED UNTIL SECURELY MOUNTED TO THE WALL.

1. Slide the two 1/4–20 Unistrut spring loaded mounting nuts into each of the three Unistrut rails (two nuts per rail).
2. Place the three Unistrut trim covers over each of the three Unistrut rails.
3. Using two people, carefully raise the SG-60 to an upright position.
4. Stand the SG-60 against the wall and attach to the (3) Unistrut supports using the provided (6) 1/4–20 Unistrut spring loaded mounting nuts, 1/4–20 x 1 1/4 in. long hex head bolts, lock washers, and flat washers. See Illustration 1.
5. Align the SG-60 laterally across the wall, to the X-Ray Tube Suspension beam or table centerline using the centerline marks on the wall and floor or the Laser Alignment Tool.

Note: The SG-60 must be level on the wall with no more than 1/16 in. (1.5 mm) deflection to ensure that the hardware holding the Unistrut to the wall does not come loose over time. Use the shims provided with the SG-60 to ensure this requirement.

6. Verify the SG-60 level across wall to ensure that no more than 1/16 in. (1.5 mm) deflection exists, laterally or vertically. See Illustration 2 for recommended placement of the level.
7. Insert supplied shims, as required, between the SG-60 and the Unistrut trim covers. See Illustration 1.
8. Tighten the SG-60 VBS-to-Unistrut mounting hardware using a torque wrench:

- **SG-60 to Unistrut:**

Tighten each 1/4–20 bolt to Unistrut spring loaded nut to 6 ft. lbs. $\pm$ 0.5 ft. lbs. (8.1 Nm $\pm$ 0.7 Nm).

**SG-60 VERTICAL BUCKY STAND WALL
MOUNTING****Job Card IST01**

4 of 7

5.2 Mount SG-60 directly to Hospital Wall Supports (Concrete Block or Solid Concrete construction only)**WARNING****AVOID POSSIBLE SEVERE INJURY!**

TO PREVENT POSSIBLE SEVERE INJURY, AT LEAST TWO PEOPLE ARE REQUIRED TO LIFT, TILT, OR TURN THE SG-60 VERTICAL BUCKY STAND. THE SG-60 WEIGHS APPROXIMATELY 265 LBS. (120 KG). THE SG-60 CAN EASILY BE TIPPED OR DROPPED UNTIL SECURELY MOUNTED TO THE WALL.

1. Using two people, carefully raise the SG-60 to an upright position.
2. Stand the SG-60 against the wall and attach to the wall using the locally provided (6) wall anchors.
3. Align the SG-60 or SG-60, laterally across the wall, to the X-Ray Tube Suspension beam or table centerline using the centerline marks on the wall and floor or the Laser Alignment Tool.

Note: The SG-60 must be level on the wall with no more than 1/16 in. (1.5 mm) deflection to ensure that the anchors holding the SG-60 to the wall does not come loose over time. Use the shims provided with the SG-60 to ensure this requirement.

4. Verify the SG-60 level across wall to ensure that no more than 1/16 in. (1.5 mm) deflection exists, laterally or vertically. See Illustration 2 for recommended placement of the level.
5. Insert supplied shims, as required, between the SG-60 and the wall.
6. Tighten the six SG-60 anchor bolts according to the torque specifications for the anchors.

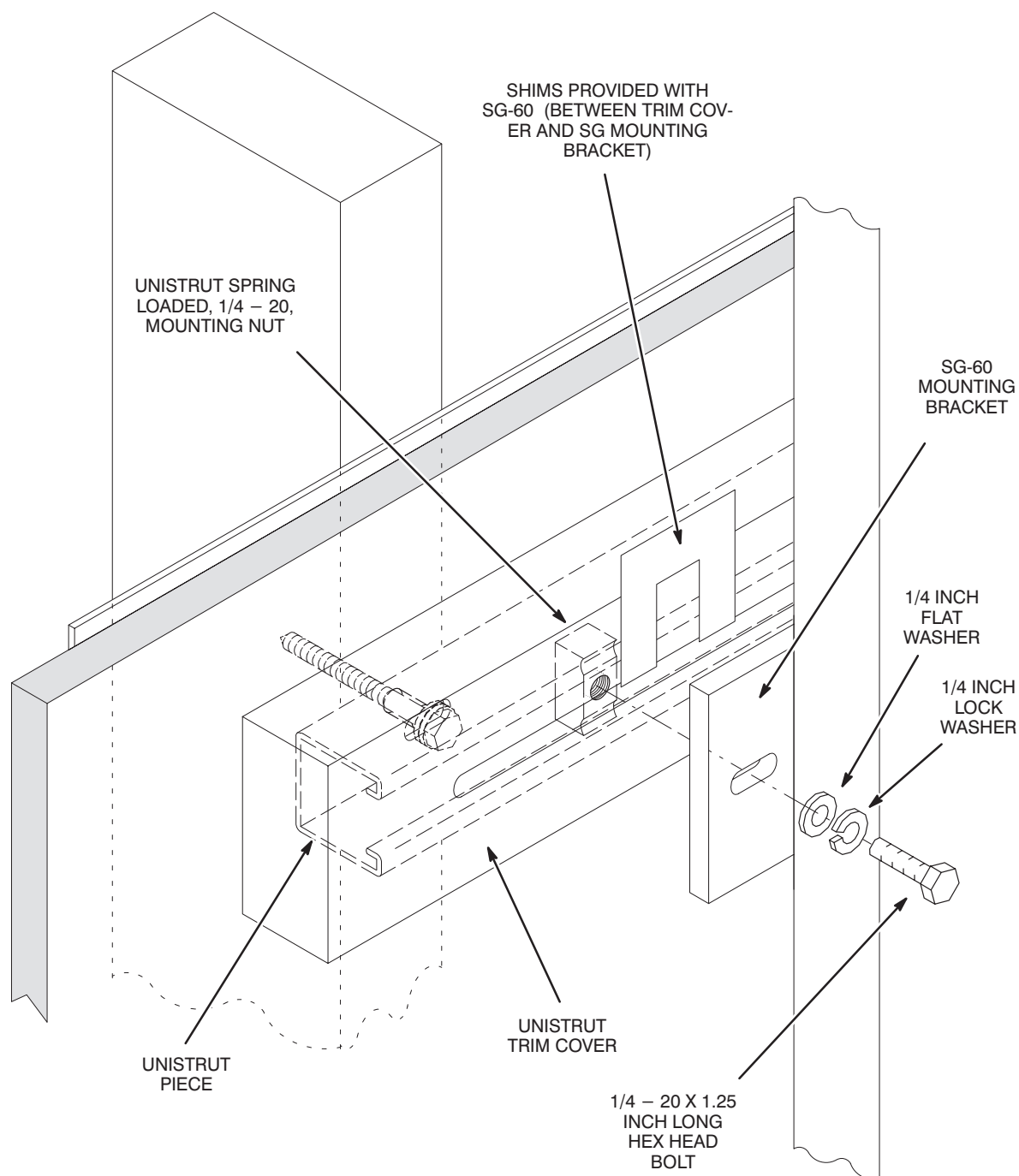
SG-60 VERTICAL BUCKY STAND WALL MOUNTING

Job Card IST01

5 of 7

ILLUSTRATION 1

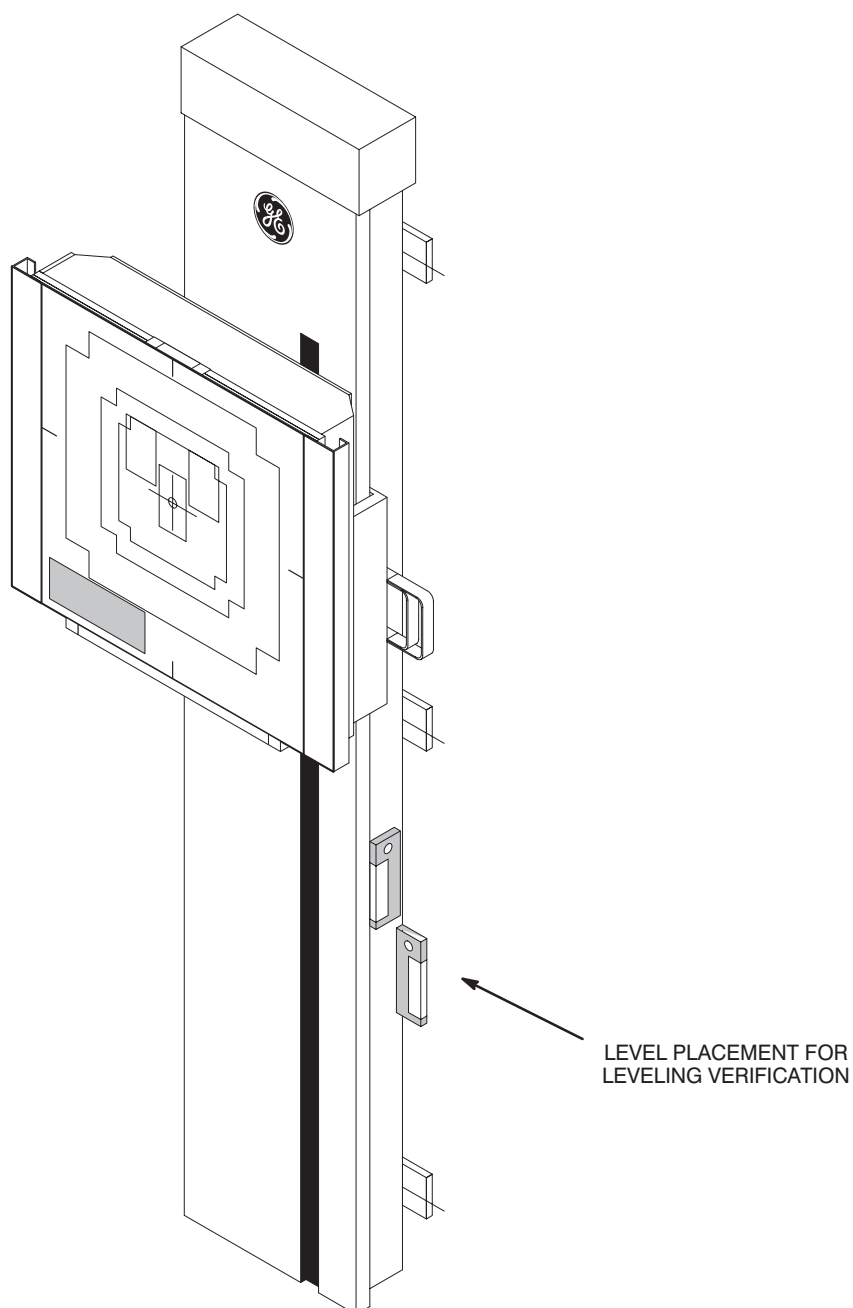
SG-60 WALL SUPPORT (UNISTRUT) MOUNTING ON WALLS WITH WOOD STUDS AND DRYWALL



**SG-60 VERTICAL BUCKY STAND WALL
MOUNTING****Job Card IST01**

6 of 7

ILLUSTRATION 2
SG-60 LEVEL PLACEMENT

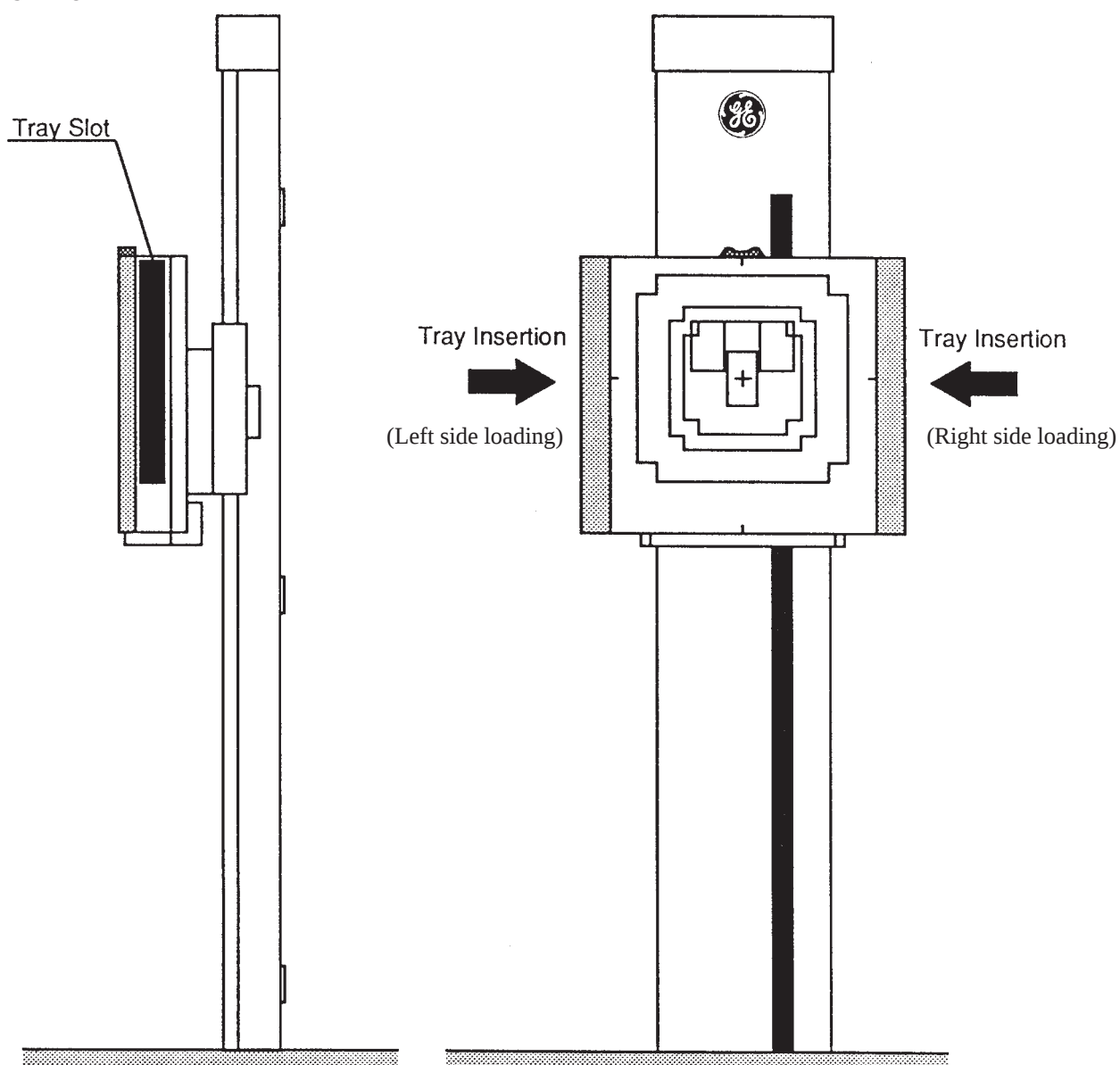


SECTION 6 COUNTERWEIGHT & BUCKY CARRIAGE COUNTERBALANCE CHECK

Note: Even though the bucky carriage is factory balanced this procedure must be carried out.

1. Insert the cassette tray in the tray slot of the bucky. The tray assembly can be installed from either the left or right side, depending on the model of the SG-60. (Refer to *Illustration 1-2.*)
2. Place a medium size cassette into cassette tray.

ILLUSTRATION 1-2
TRAY INSERTION



3. Remove the top cover and ensure the pulley chains are on their sprockets. (See *illustration 1-3 below*). If they are not, appropriate action must be taken to correct the problem. USE CAUTION.

If the problem can not be corrected, The SG-60 must be returned to GE Medical Systems Europe as DOA.

ILLUSTRATION 1-3
PULLEY CHAIN ON SPROCKETS



4. Loosen and remove the shipping nuts and retainer pin, then move the Bucky carriage in vertical direction (*See illustrations 1-1, item 3 and 1-4*).
5. Install and affix the cover disk (*See illustrations 1-1, item 5 and 1-4*).

ILLUSTRATION 1-4
LOCATION OF RETAINER PIN AFTER WALL MOUNTING



6. Remove the eight shipping screws and four stop brackets that fix the bucky carriage (*see illustration 1-1, item 1*)
7. Check that the counterweight and Bucky carriage are well balanced, and move easily in both directions when the mechanical brake is released. If not, follow the procedure detailed in section 7.

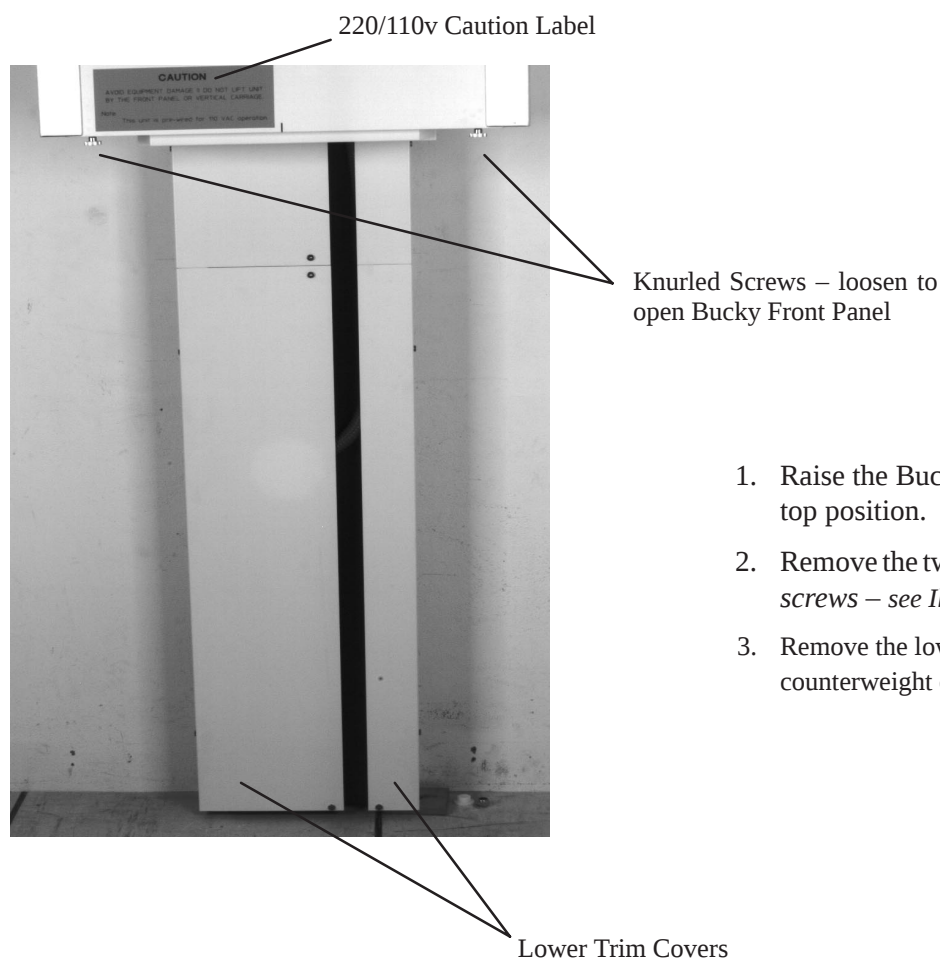
SECTION 7 ADDING OR REMOVING COUNTERWEIGHTS

7-1 Counterweight Cover Removal/Installation



During this operation, the bucky carriage and counterweight carriage can move.

ILLUSTRATION 1-5
REMOVING TRIM AND BUCKY FRONT PANELS

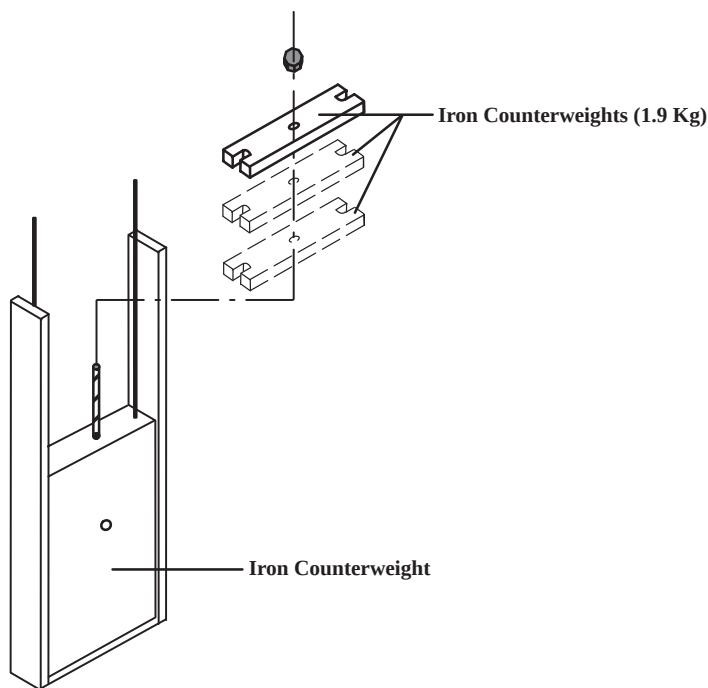


1. Raise the Bucky assembly to its top position.
2. Remove the two lower trim covers (3 screws – see *Illustration 1-5* at left)
3. Remove the lower (charcoal grey) counterweight cover (6 screws)

4. Add or remove counterweights until the bucky carriage is balanced See Illustration 1–6).

Note: *Extra counterweights are furnished as part of the Ion Chamber option.*

ILLUSTRATION 1–6
ADDING/REMOVING COUNTERWEIGHTS



5. Raise the Bucky assembly to 63" (1.6 m) from the floor to enable installation of the lower charcoal grey cover and the lower trim covers.
6. Replace the charcoal grey cover. Ensure that the Bucky harness is outside the cover.
7. Reinstall lower trim covers.

SECTION 8
ELECTRICAL INSTALLATION

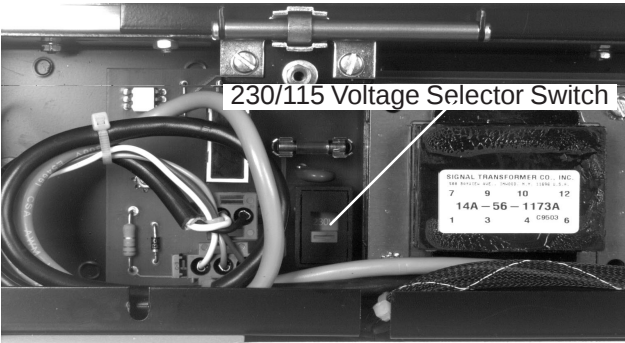


THE SG-60 BUCKY IS FACTORY SET FOR 115 VAC (GEMS) OR 230 VAC (ROW) VIA THE SETTING OF THE BUCKY VOLTAGE SELECT SWITCH (FOR LIEBEL BUCKY) OR VIA TWO JUMPERS (FOR MEDYS BUCKY).

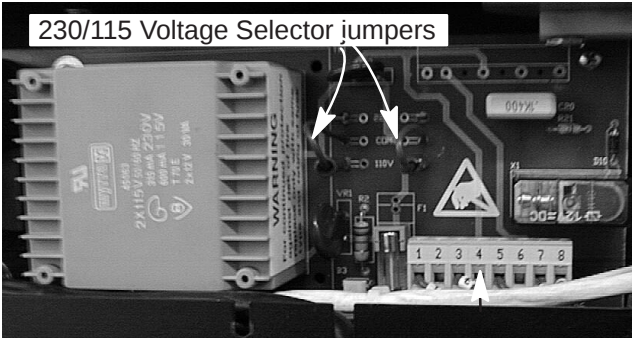
1. Set the bucky voltage selector switch or jumpers to the appropriate position: 230v or 115v, if the line voltage at the installation site is different than the line voltage setting indicated on the CAUTION label attached to the lower left corner of the bucky front panel. The bucky voltage selector switch or jumpers are located next to the signal transformer in the electronic compartment behind the front panel (see illustration 1-7).

To access this electronic compartment, turn the large knurled screws located underneath the front panel counterclockwise (see illustration 1-5). Tilt the front panel up and secure it with the prop on the right hand side. Then loosen, without removing, the three flathead screws on the bottom of the lower panel, remove the two top roundhead screws and slide the black cover plate up and out to access the switch.

ILLUSTRATION 1-7
230 V 115 V SWITCH



LIEBEL SWITCH



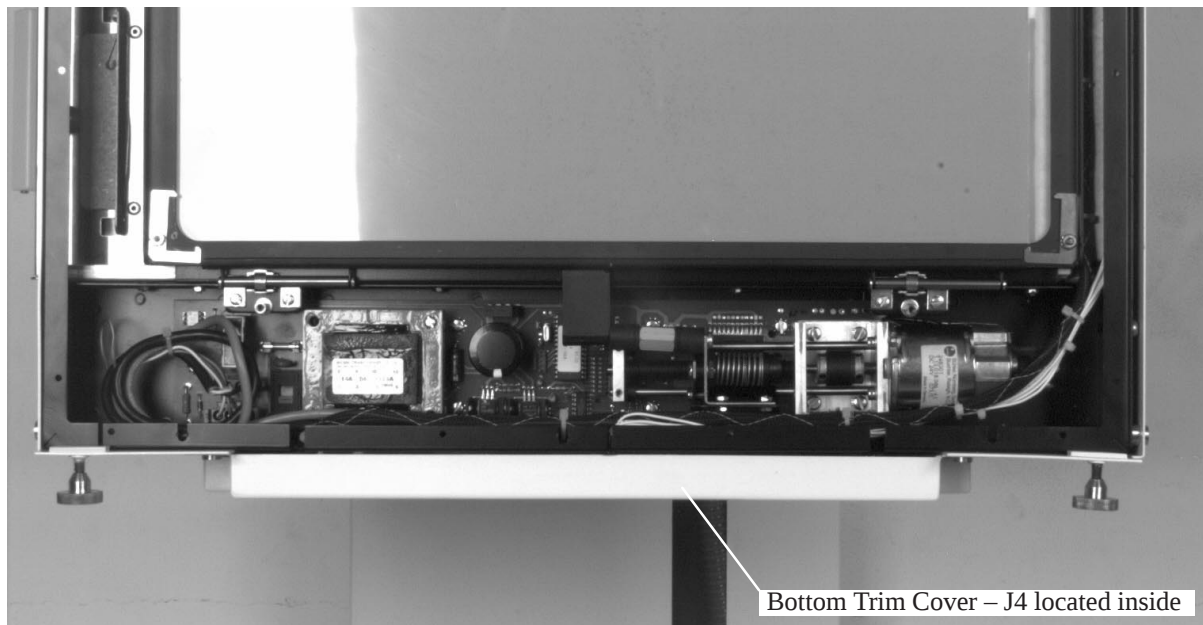
MEDYS JUMPERS

2. Route and install system cables to the I/O panel at the top of the SG-60 (see table below). Connect cables in accordance with MIS MAP's in Chapter 3.

CONNECTOR	DESTINATION
J40	Collimator Electronics (optional)
J41	Generator
J42	AEC Electronics (optional)

COMMON	DESTINATION
	Ground

ILLUSTRATION 1-8
BUCKY ELECTRONICS



LIEBEL SWITCH



MEDYS JUMPERS

SECTION 9

HEIGHT CORRELATION SCALE

Attach the self-adhesive height correlation scale to the SG-60 Bucky Stand so it corresponds with the height scale on the x-ray tube hanger or stand (*Illustration 1-9*).

1. Move the Bucky to approximately the middle of its vertical travel.
2. Rotate the x-ray tube unit so the x-ray beam is horizontal, directed towards the SG-60 Vertical Bucky Stand.
3. Set the SID to approximately 30". Fully open the collimator blades, then align the collimator light field crosshair pattern with the marking on the front panel of the SG-60 by vertically manipulating the tube hanger or stand.
4. Temporarily tape the furnished height scale on the vertical column so that it corresponds with the height scale on the x-ray tube hanger or stand. (The indicator on the Bucky carriage should indicate the same height as the x-ray tube height indicator).

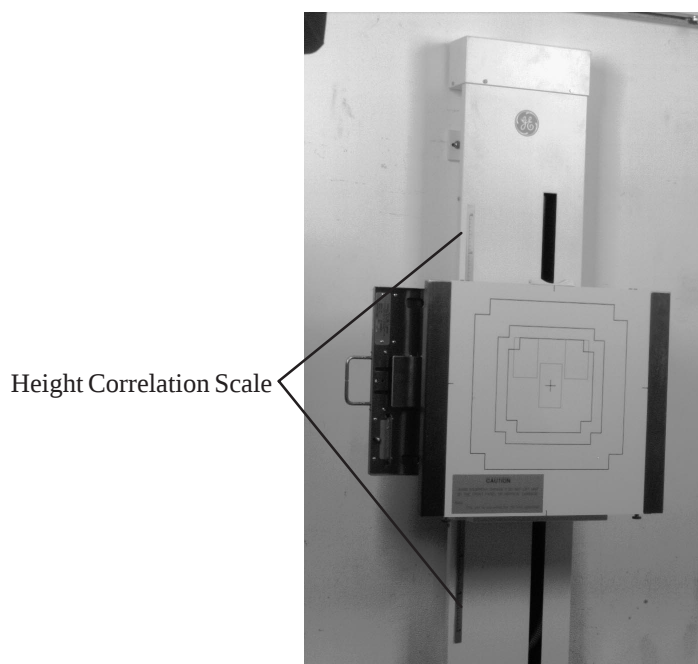
Note: The height scale and indicator can be installed on the left or right side of the SG-60.

5. Verify vertical and horizontal centering of the x-ray beam on the film at both the minimum and maximum SID points. Make necessary vertical adjustments (adjust Bucky carriage and correlation scale) and horizontal adjustments (loosen anchoring hardware and re-center SG-60).
6. Mark the position of the scale on vertical column, then mark on the scale where the top and bottom trim covers meet.

Note: This step and step 7 are essential for future cover removal

7. Remove the height scale, then cut it into two pieces at the point where the top and bottom trim covers meet.
8. Permanently install the height scale so that it corresponds with the height scale on the x-ray tube hanger or stand.

ILLUSTRATION 1-9
HEIGHT CORRELATION SCALE



SECTION 10 OPTIONAL KNEE SPACER INSTALLATION



To prevent personal Injury or equipment damage the optional knee spacer (45433375) should be installed with the SG–60 in the horizontal position.

To install the optional knee spacer:

1. Remove the Bucky assembly from the carriage:
 - a. Remove four nuts (M13) securing the Bucky assembly to the carriage.
2. Install the knee spacer:
 - b. Remove cover from the knee spacer.
 - c. Install the knee spacer onto the carriage (so the cover will be facing down), then reinstall the spacer cover.
3. Install the Bucky assembly onto the knee spacer.

Return to Section 5 and continue with step 5.1 of Job Card IST01 if the optional knee spacer is installed at the same time the SG–60 is installed.

SECTION 11 SPECIFICATION LABELS

Specification labels in four languages (French, German, Italian, Spanish) are shipped for adapting the SG–60 specification label to the corresponding language where the SG–60 is installed. The original specification label, located in the upper lock–handle side of the vertical column, is in English.

If necessary, locate the specification labels and attach the label of the appropriate language over the original specification label.

SECTION 12 BUCKY GRID SPEED

12–1 Liebel Bucky

The Liebel–Flarsheim Bucky must be set for Par speed, using a 44L/cm grid. Normally this is done at the factory. Verify that the switches are correctly set and if necessary change their settings. Refer to the procedure in Job Card LJS01 “SG-60 VERTICAL BUCKY STAND LIEBEL–FLARSHEIM BUCKY SWITCHES”.

12–2 Medys Bucky

The Medys Bucky must be set for Super speed using a 36L/cm grid. Normally this is done at the factory. Verify that the switches are correctly set and if necessary change their settings, refer to the procedure in Job Card LJS02 “SG-60 VERTICAL BUCKY STAND MEDYS BUCKY SWITCHES”.

Blank page.

SG-60 Vertical Bucky Stand

Job Card LJS01

1 of 4

Purpose: SG-60 VERTICAL BUCKY STAND LIEBEL–FLARSHEIM BUCKY SWITCHES	Version No.: E Date: June 23, 1996
Time: 10 Minutes	Personnel: 1 Person

SECTION 1
SUPPLIES

SG–60 Vertical Bucky Stand with Liebel–Flarsheim version Bucky.

SECTION 2
TOOLS REQUIRED

No special tools are required

SECTION 3
SAFETY, PRECAUTIONS TO TAKE

Ensure the SG–60 is disconnected from power before attempting to set the switches on the Bucky.

SECTION 4
PREREQUISITES

Pivot the SG–60 front panel up and latch in position to gain access to the Bucky electronics. Then loosen, without removing, the three flathead screws on the bottom of the lower panel, remove the two top roundhead screws and slide the black cover plate up and out.

INSTALLATION

SG-60 VERTICAL BUCKY STAND LIEBEL–FLARSHEIM
BUCKY SWITCHES

Job Card LJS01

2 of 4

SECTION 5
PROCEDURE

5.1 **Input Power Select Switch (S2)**

Verify the Voltage Selector Switch (S2), located on the CPU Board shows either **115** or **230** based on the system supply voltage.

See Illustration 1.

5.2 **Switch S1 Settings**

See Table for switch S1 settings.

See Illustration 1 for location of switch S1 on the Liebel–Flarsheim Bucky CPU Board.

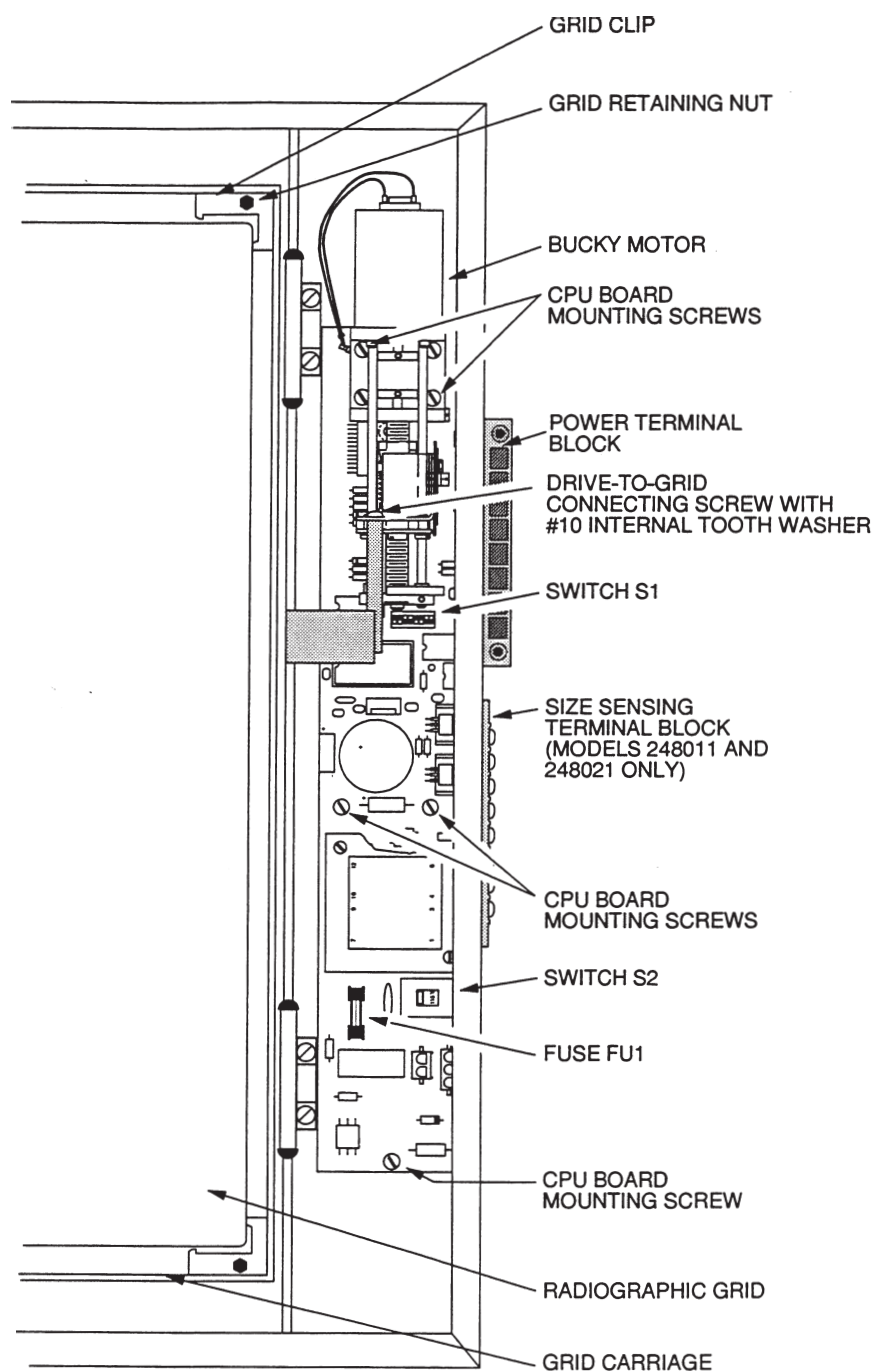
TABLE 2
SWITCH S1 SWITCH SETTINGS (POSITIONS 1 THROUGH 8)

Liebel-Flarsheim Bucky S1 Switch Positions for GEMS Applications							
1	2	3	4	5	6	7	8
on	on	off	off	on	off	on	on

**SG-60 VERTICAL BUCKY STAND LIEBEL-FLARSHEIM
BUCKY SWITCHES**
Job Card LJS01

3 of 4

ILLUSTRATION 1
LIEBEL-FLARSHEIM BUCKY ELECTRICAL COMPONENTS



**SG-60 VERTICAL BUCKY STAND LIEBEL–FLARSHEIM
BUCKY SWITCHES**

Job Card LJS01

4 of 4

Blank page

SG-60 Vertical Bucky Stand

Job Card LJS02

1 of 4

Purpose: SG-60 VERTICAL BUCKY STAND MEDYS BUCKY SWITCHES	Version No.: E Date: June 23, 1996
Time: 10 Minutes	Personnel: 1 Person

SECTION 1
SUPPLIES

SG–60 Vertical Bucky Stand with Medys version Bucky.

SECTION 2
TOOLS REQUIRED

No special tools are required

SECTION 3
SAFETY, PRECAUTIONS TO TAKE

Ensure the SG–60 is disconnected from power before attempting to set the switches on the Bucky.

SECTION 4
PREREQUISITES

Pivot the SG–60 front panel up and latch in position to gain access to the Bucky electronics. Then loosen, without removing, the three flathead screws on the bottom of the lower panel, remove the two top roundhead screws and slide the black cover plate up and out.

INSTALLATION

**SG-60 VERTICAL BUCKY STAND
MEDYS BUCKY SWITCHES**
Job Card LJS02

2 of 4

**SECTION 5
PROCEDURE**
5.1 Input Power Selection Jumpers (230V or 115V)

Verify the Voltage Selector Jumpers (230V or 115V), located on the Bucky Control Board shows either **115** or **230** based on the system supply voltage.

See Illustration 1.

5.2 Switch IN1 Settings

See Table for switch IN1 settings.

See Illustration 1 for location of switch IN1 on the Medys Bucky Control Board.

TABLE 3
SWITCH IN1 SETTINGS (POSITIONS 1 THROUGH 8)

Medys Bucky IN1 Switch Positions for GEMS Applications							
1	2	3	4	5	6	7	8
on	on	on	on	on	off	off	on

Note: For more information, refer to Medys Bucky Service Manual (sm 45297300–100, installation & configuration chapters).

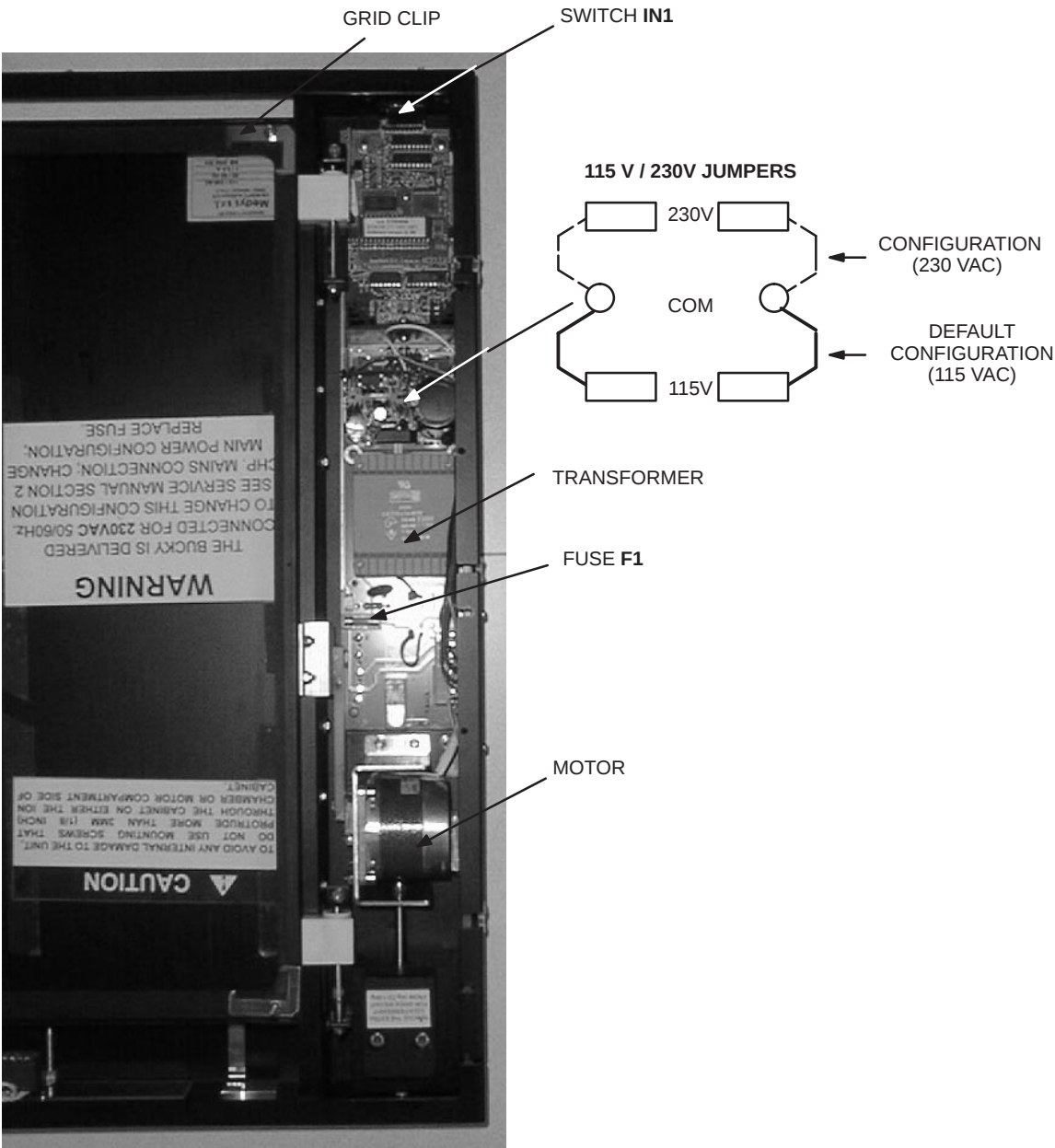
SG-60 VERTICAL BUCKY STAND
MEDYS BUCKY SWITCHES

Job Card LJS02

3 of 4

INSTALLATION

ILLUSTRATION 1
MEDYS BUCKY ELECTRICAL COMPONENTS



SG-60 VERTICAL BUCKY STAND MEDYS BUCKY SWITCHES	Job Card LJS02	4 of 4
--	-----------------------	---------------

Blank page

CHAPTER 2 – FUNCTIONAL CHECKS

SECTION 1 INTRODUCTION

1-1 General

The functional checks described in this chapter assume the person performing the tasks is familiar with the operation of the SG-60 Vertical Bucky Stand.



These checks should be performed as a final installation task, 3 months after installation, and after preventive maintenance or any major servicing of the equipment.

Use standard safety precautions required when operating any radiology equipment.

1-2 Tools and Test Equipment

No special tools or test equipment is necessary to perform the functional checks described in this chapter.

SECTION 2 MECHANICAL CHECKS

2-1 Vertical Lock

With the lock handle release the mechanical safety lock and verify that the carriage can be moved freely and smoothly over its entire range of travel with minimum side play.

If carriage motion is not smooth and free ensure that counterweights and trim covers are installed correctly. Add or remove counterweights until counterbalance is achieved. (*Refer to Section 7 of Chapter 1*).

Note:

The carriage is counterbalanced on leaving the factory, however, if necessary add further counterweights to achieve the counterbalance (*see Chapter 1*)

Release the lock handle and verify that the lock's teeth fully engage. If not, check for misalignment, wear, etc., and perform the appropriate corrective action.

SECTION 3 ELECTRICAL CHECKS

3–1 Grid Selections

Refer to Table 1–1 and Table 1–2 for a listing of possible grids used with SG-60 Vertical Bucky Stands.

TABLE 1–1
SG-60 VERTICAL BUCKY STAND GRID SELECTIONS (FOR LIEBEL BUCKY)

CATALOG	PART NUMBER	DESCRIPTION	NOTES
C3940JA	2161122	100 cm Focus, 12:1, 44 Lines per cm	Alternate
C3940JB	2163407	130 cm Focus, 10:1, 44 Lines per cm	Alternate
C3940JC	2161120	180 cm Focus, 12:1, 44 Lines per cm	Recommended
C3940JD	2161123	180 cm Focus, 8:1, 44 Lines per cm	Pediatrics Low Dose

TABLE 1–2
SG-60 VERTICAL BUCKY STAND GRID SELECTIONS (FOR MEDYS BUCKY)

CATALOG	PART NUMBER	DESCRIPTION	NOTES
C2663EF	46–908086P01	100 cm Focus, 12:1, 36 Lines per cm	Alternate
C2663JC	2228951–2	130 cm Focus, 10:1, 36 Lines per cm	Alternate
C2663EH	46–909146P01	180 cm Focus, 12:1, 36 Lines per cm	Recommended
C2663GB	2228951–4	180 cm Focus, 8:1, 36 Lines per cm	Pediatrics Low Dose

3–2 Bucky Grid Check

Take an exposure with the Vertical Bucky Stand selected. The Bucky grid should oscillate. Oscillation is distinctly audible and causes slight vibration of the bucky support assembly.

The front panel can be opened to observe the grid action.

Observe the film for quality. If shading or objectional grid lines appear, check alignment with the tube for proper focal distance setting. Also check grid binding by manually moving it. A warped grid or one that produces scratches on the film should be replaced.

3–3 Ion Chamber

Check and calibrate photo-timing action as indicated in AEC information or the Quantamat Service Manual.

3–4 Collimator Test

Perform collimator tests indicated in the collimator manual.

SG-60 Vertical Bucky Stand

Job Card VF01

1 of 10

Purpose: **SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**

Version No.: E

Date: July 23, 1996

Time: 60 Minutes

Personnel: 1 Person

SECTION 1 SUPPLIES

- Installed and operational SG-60 Vertical Bucky Stand
- Installed and operational X-Ray Tube suspension intended for the SG-60 VBS

SECTION 2 FREQUENCY

Perform this procedure every 6 months.

SECTION 3 TOOLS REQUIRED

- Film Densitometer
- 7X Power Magnifying Lens or Loop (46–194427P14)
- Roll-away cart or table to place the test phantom in front of the SG-60
- Typically used hospital cassette for the SG-60 Vertical Bucky Stand
- 200 or 400 film/screen speed combination film sized for the selected cassette
- Line Pair Resolution Wedge:
 - 1 to 7 lp/mm, 0.1 mm lead thickness (46–197871P4) or
 - 1 to 5 lp/mm, 0.1 mm lead thickness (46–197871P2)
- 14 in. x 14 in. x 1 in. thick Plexiglas (356 mm x 356 mm x 25 mm thick)
- Additional Plexiglas sheets or 1/4 in. (6 mm) Al from CV Phantom Kit, as required, to provide fine film density adjustments

SECTION 4 SAFETY, PRECAUTIONS TO TAKE

X-Ray exposures are required during this test. Take normal X-Ray exposure safety precautions.

SECTION 5 PREREQUISITES

- Installed and calibrated X-Ray generator/X-Ray Tube intended for the SG-60 VBS
- Operational and calibrated hospital film processor

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**
Job Card VF01

2 of 10

SECTION 6
IMAGE PERFORMANCE SPECIFICATIONS
6.1 SG-60 Image Performance Specifications

Refer to Table 1 for a listing of SG-60 Image Performance Specifications.

TABLE 1
SG-60 IMAGE PERFORMANCE SPECIFICATIONS

SG-60 without Knee Spacer
Current Customer Perceived Resolution Requirements in Line Pairs/mm

These specifications are based on the test conditions listed in this procedure. The line pair wedge/Plexiglas stationary phantom must be in the field of view, not in contact with, or touching, the oscillating Bucky receptor.

Film/Exposure requirements:

- 200 or 400 film/screen speed
- Manual (fixed) technique selections per this procedure
- Film Density = 1.2 ± 0.2 O.D. (Optical Density) measured near the center of the image

Exposure Time Range	Minimum Resolution Required (lp/mm)	Permissible Artifacts	Comments
4 msec to < 6 msec	5.0 lp/mm	Slight grid lines may be visible. Some low frequency grid artifacts may be slightly visible if the grid is not very uniform.	Grid lines that are visible shall disappear under higher scatter conditions. Under high scatter conditions, any non-uniformity shall disappear.
6 msec to 500 msec	5.0 lp/mm	No Grid Line artifacts are visible without magnification. Some low frequency grid artifacts may be slightly visible at exposures less than 100 msec if the grid is not very uniform.	Under 7X magnification, slight grid lines may be visible at exposures less than 25 msec. Grid lines that are visible shall disappear under higher scatter conditions. Under high scatter conditions, any non-uniformity shall disappear.
> 500 msec to 1 second	5.0 lp/mm	No Grid Line artifacts are visible.	
> 1 second to 2 seconds	5.0 lp/mm	No Grid Line artifacts are visible.	

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**
Job Card VF01

3 of 10

6.2 SG-60 with Knee Spacer

Refer to Table 2 for a listing of SG-60 with Knee Spacer.

TABLE 2
SG-60 (WITH KNEE SPACER)

SG-60 with Knee Spacers
Current Customer Perceived Resolution Requirements in Line Pairs/mm

These specifications are based on the test conditions listed in this procedure. The line pair wedge/Plexiglas stationary phantom must be in the field of view, not in contact with, or touching, the oscillating Bucky receptor.

Film/Exposure requirements:

- 200 or 400 film/screen speed
- Manual (fixed) technique selections per this procedure
- Film Density = 1.2 ± 0.2 O.D. (Optical Density) measured near the center of the image

Exposure Time Range	Minimum Resolution Required (lp/mm)	Permissible Artifacts	Comments
4 msec to < 6 msec	4.0 lp/mm	Slight grid lines may be visible. Some low frequency grid artifacts may be slightly visible if the grid is not very uniform.	Grid lines that are visible shall disappear under higher scatter conditions. Under high scatter conditions, any non-uniformity shall disappear.
6 msec to 500 msec	4.0 lp/mm	No Grid Line artifacts are visible without magnification. Some low frequency grid artifacts may be slightly visible at exposures less than 100 msec if the grid is not very uniform.	Under 7X magnification, slight grid lines may be visible at exposures less than 25 msec. Grid lines that are visible shall disappear under higher scatter conditions. Under high scatter conditions, any non-uniformity shall disappear.
> 500 msec to 1 second	4.0 lp/mm	No Grid Line artifacts are visible.	
> 1 second to 2 seconds	3.0 lp/mm	No Grid Line artifacts are visible.	

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST****Job Card VF01**

4 of 10

**SECTION 7
PROCEDURE****7.1 Test Phantom Setup (Plexiglas and Resolution Wedge)**

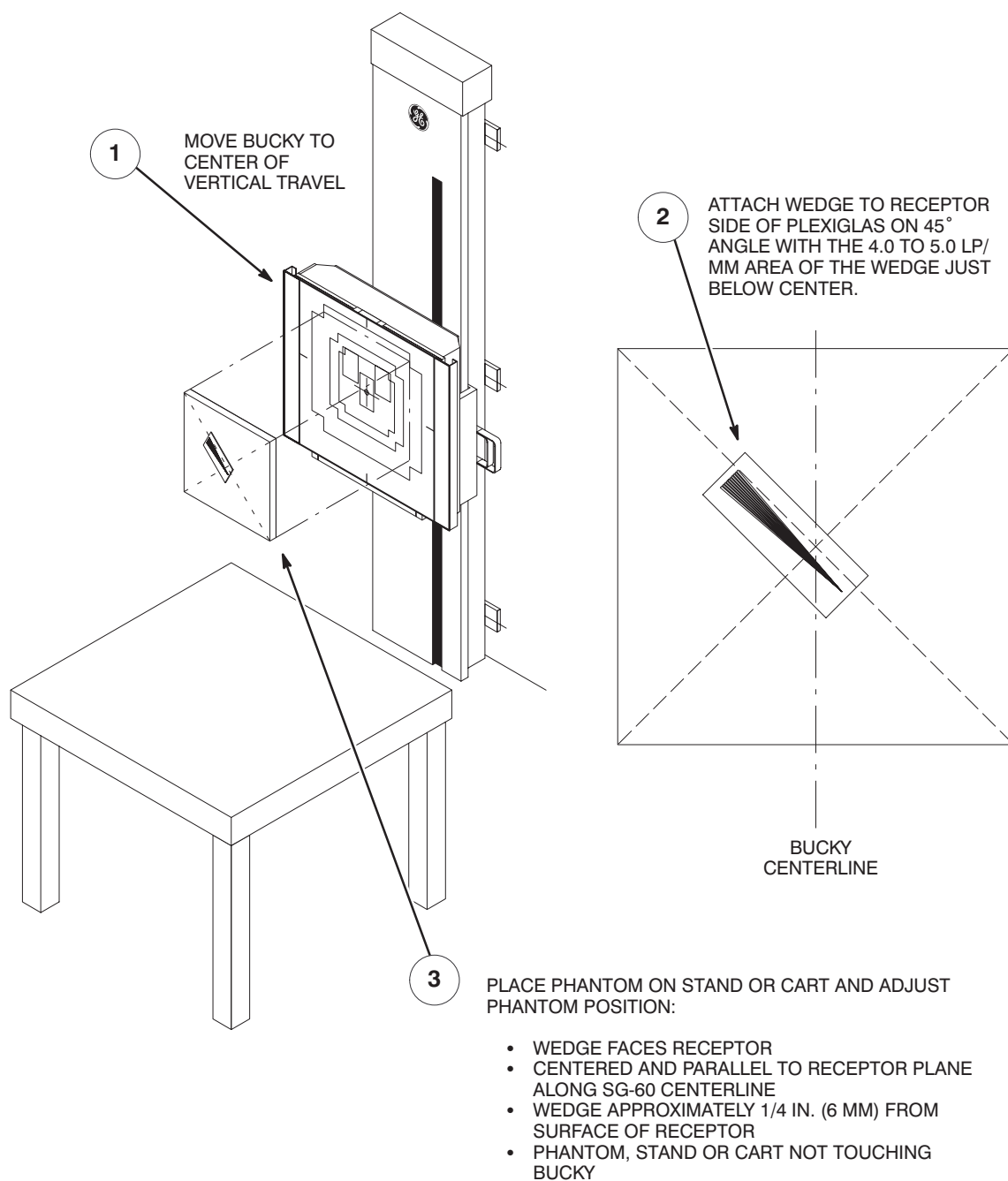
See Illustration 1.

1. Position the SG-60 Bucky receptor at mid-travel, vertically.
2. Using tape, attach the Resolution Wedge to a sheet of approximately 14 x 14 x 1 in. thick (356 x 356 x 25 mm thick) Plexiglas. Position the wedge as follows:
 - Wedge pointing downward at an angle of approximately 45 degrees
 - The 4.0 to 5.0 lp/mm area of the wedge is placed just below the center of the Plexiglas
 - The wedge is on the side of the Plexiglas that will be facing the receptor
3. Place the Plexiglas/Wedge Phantom vertically on a stand or cart and position approximately 1/4 in. (6 mm) from the SG-60 Bucky receptor surface plane. Ensure that:
 - The phantom is centered and parallel to the receptor film plane
 - The phantom or supporting device is not in contact with the Bucky to prevent the Bucky vibration from being transmitted to the phantom

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**
Job Card VF01

5 of 10

ILLUSTRATION 1

SG-60 IMAGE PERFORMANCE TESTING PHANTOM SETUP

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**
Job Card VF01

6 of 10

7.2 Image Performance Procedure

Record all values in Table 3. See Table 4 for an example of the technique settings used during a typical test.

1. Position the X-Ray Tube at the focal distance (fo) of the Bucky grid (100 cm, 130 cm, or 180 cm) and align center to the center of the Bucky/Phantom setup.
2. Setup system to analyze film image performance at a selected Target Exposure Time from Table 3 with a film optical density of 1.20 ± 0.20 :
 - a. Load cassette with 200 or 400 film/screen speed into Bucky.
 - b. Select 60 kVp.
 - c. While taking repeated exposures and developing film between exposures, adjust as follows to achieve the selected target exposure time listed in Table 3 while obtaining a film optical density of 1.20 ± 0.20 :
 - 1st, adjust kVp ± 5 kVp,
 - 2nd, adjust mAs, then mA to achieve target exposure time, then ...
 - 3rd, add Plexiglas filtration **at the collimator**, as required, to obtain fine adjustment of film optical density
3. Verify image resolution requirements and record parameters in Table 3.
 - a. Load cassette with fresh 200 or 400 film/screen speed into Bucky.
 - b. Expose film. Record actual mA, kVp, and mAs in Table 3.
 - c. Develop film. Analyze as follows and record results in Table 3:
 - Using a magnifying lens, measure line pair resolution.
 - Without magnifying lens, observe flat field areas on film for visibility of grid lines or shading.
 - Record any observations in and compare to the specifications listed in Table 1. See Section 7.3 for recommended actions should any test results fail.
4. Repeat steps 2 and 3 for the remaining Target Exposure Times listed in Table 3. See Section 7.3 for recommended actions should any test results fail.
5. Make a copy of the results recorded in Table 3 and send to:

General Electric Medical Systems X-Ray Positioners Engineering Group
W-622
3000 Grandview Blvd.
Waukesha, Wisconsin (USA)
53188

SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST

Job Card VF01

7 of 10

TABLE 3
SG-60 IMAGE PERFORMANCE RECORD TABLE

Field Engineer:				Date:				
FE Phone Number:				SG Type: SG-60 ☐ SG-60 (with Knee Spacer) ☐				
Hospital Name:				FDO:				
Target Time	Actual Technique			Plexiglas	Resolution (lp/mm)	Grid Lines Visible? (yes/no)	Shading Visible? (yes/no)	Comments
(ms)	mA	kVp	mAs					
6.4 ms								
10 ms								
25 ms								
50 ms								
100 ms								
500 ms								
1 second								

FUNCTIONAL
CHECKS

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**
Job Card VF01

8 of 10

TABLE 4
SG-60 IMAGE PERFORMANCE RECORD TABLE EXAMPLE

Field Engineer:				Date:				
FE Phone Number:				SG Type: SG-60 ☒ SG-60 (with Knee Spacer) ☐				
Hospital Name:				FDO:				
Target Time	Actual Technique			Plexiglas	Resolution (lp/mm)	Grid Lines Visible? (yes/no)	Shading Visible? (yes/no)	Comments
(ms)	mA	kVp	mAs					
6.4 ms	800	63	5	None Used	7.0	Yes	Yes (Slight)	Very faint grid lines
10 ms	640	60	6.4	1/4 in.	7.0	No	Yes (Slight)	
25 ms	250	61	6.4	1/4 in.	6.5	No	Yes (Slight)	
50 ms	125	62	6.4	1/4 in.	7.0	No	Yes (Slight)	
100 ms	64	62	6.4	1/4 in.	6.5	No	Yes (Slight)	
500 ms	12.5	62	6.4	1/4 in.	6.0	No	Yes (Slight)	
1 second	16	60	16	1 1/2 in.	5.5	No	Yes (Slight)	

**SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST**
Job Card VF01

9 of 10

7.3 Recommended Actions If Image Performance Tests Fail

- Check wall flatness (check wall level vertically and longitudinally or across wall).
- Inspect the area between the wall and the SG-60. Notice any marks on the wall that may indicate the SG-60 is moving or rocking due to loose mounting bolts. If spacers or shims were required at installation because the wall is not flat, verify they are present.
- For installations using a non-load bearing wall with drywall, verify there is drywall on both sides of the wall studs.
- Check tightness of mounting bolts using torque wrench, as applicable.
 - SG-60 to concrete block or cement wall using metal expansion anchors should be tightened per manufacturer's recommendations.
 - SG-60 to Unistrut bolts (6) should be 6 ft. lbs. $\pm$ 0.5 ft. lbs. (8.1 Nm $\pm$ 0.7 Nm).
 - Unistrut to metal frame studs on a non-load bearing wall using supplied toggle bolts should be 35 in. lbs. $\pm$ 5 in. lbs. (312 Nm $\pm$ 44 Nm).
 - Unistrut to wood studs on a non-load bearing wall using supplied lag bolts should have lock washers completely compressed.
- Check for failed or stripped toggle bolts.
- Inspect Cassette Tray. Adjust cassette tabs on the cassette tray, if required.
- Open the Bucky cover and remove the Bucky lower closeout cover and inspect the interior of the Bucky.
 - Inspect the grid tray linear slides. Clean and lubricate.
 - Make sure the bronze collars are retained and do not float within their holders. If they are not retained or float within the holder, remove the bronze collar, squeeze the holder tabs together and replace the bronze collar into the holder. After replacing the collar, verify that the collars are retained and do not float within the holders.
 - Verify that the bronze collars freely float on the bearing rod surfaces.
 - Verify Bucky S1 switch settings are correct (see Job Card LJS01).
 - Verify grid holder tabs are securely retaining the grid.
 - Verify the motor coupler screw is tight.
 - Verify the grid is the recommended 44 lines/cm or greater, 12:1, 10:1, or 8:1, grid.
- Inspect the SG-60 vertical travel bearings. Tighten the mounting hardware as required
- Inspect the Bucky cover and look for any horizontal play. Re-adjust the top cover mounting brackets, if required, to remove the horizontal play.
- Inspect the SG-60 for any loose hardware and tighten, if required. In particular, inspect the fasteners that mount the Bucky assembly to the SG-60 frame.
- Inspect the cassette. Verify the cassette is providing good film screen contact.
- Ensure that the receptor front cover thumb screws are tightened (hand tight only).

SG-60 VERTICAL BUCKY STAND
IMAGE PERFORMANCE TEST

Job Card VF01

10 of 10

Blank page

FUNCTIONAL
CHECKS

CHAPTER 3 – MIS MAPS

SECTION 1 INTRODUCTION

MIS Maps illustrate interconnections between products and subsystems in an X-ray system. Grounding, power distribution and system interconnection are illustrated. MIS Charts illustrate signal and pin connection of the cables indicated (by MIS numbers) in the MIS Maps.

For component level interconnection refer to block diagrams and schematics. (*Refer to Chapter 7 “Schematics”.*)

SECTION 2 MIS MAPS

MIS maps are contained in this section (subsequent pages). The maps may employ the following symbols:



External, field-installed cable.



External, field-supplied and installed cable.



Chassis ground.

ILLUSTRATION 3-1
SYSTEM GROUNDING EXAMPLE

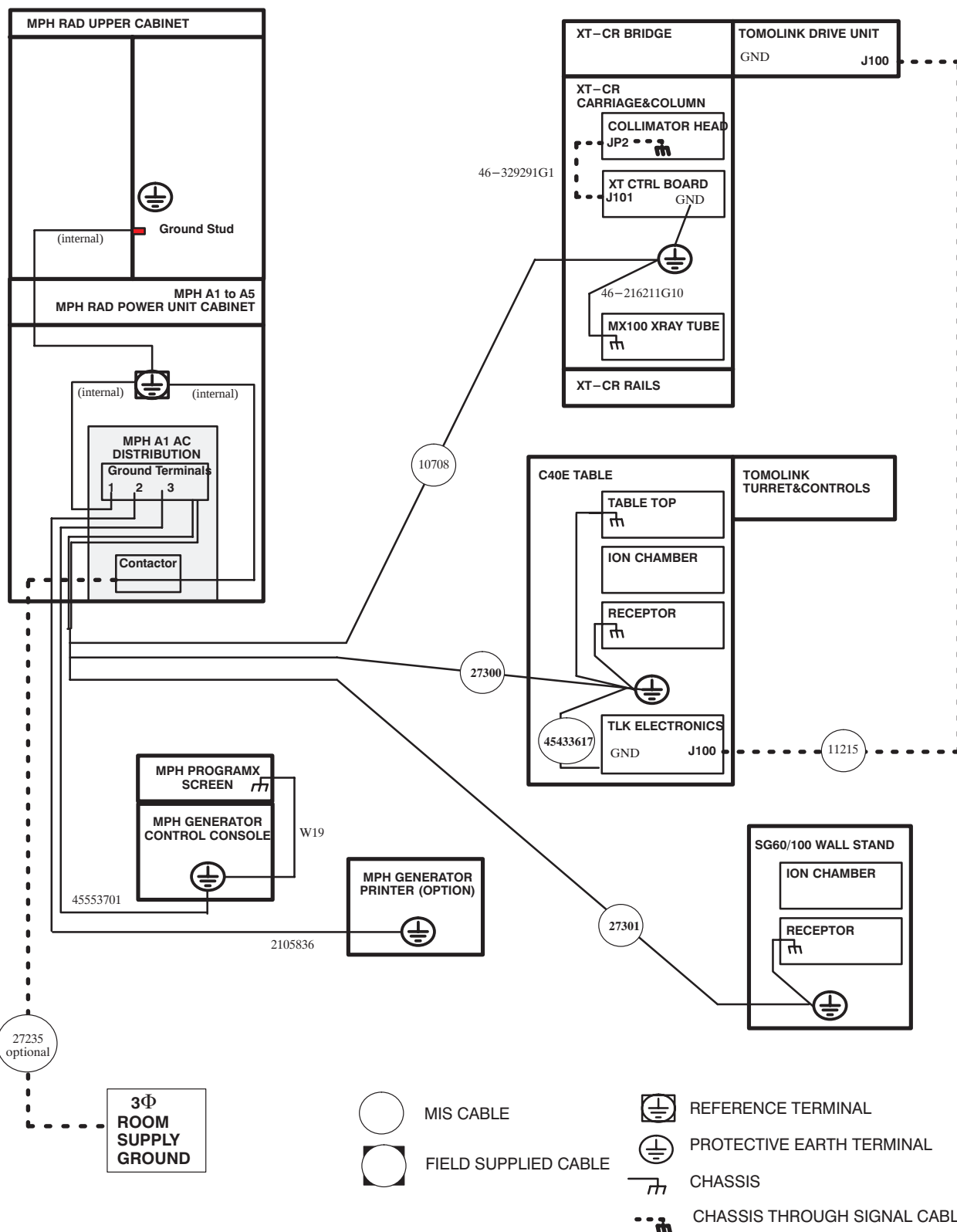


ILLUSTRATION 3-2
SYSTEM GROUNDING EXAMPLE

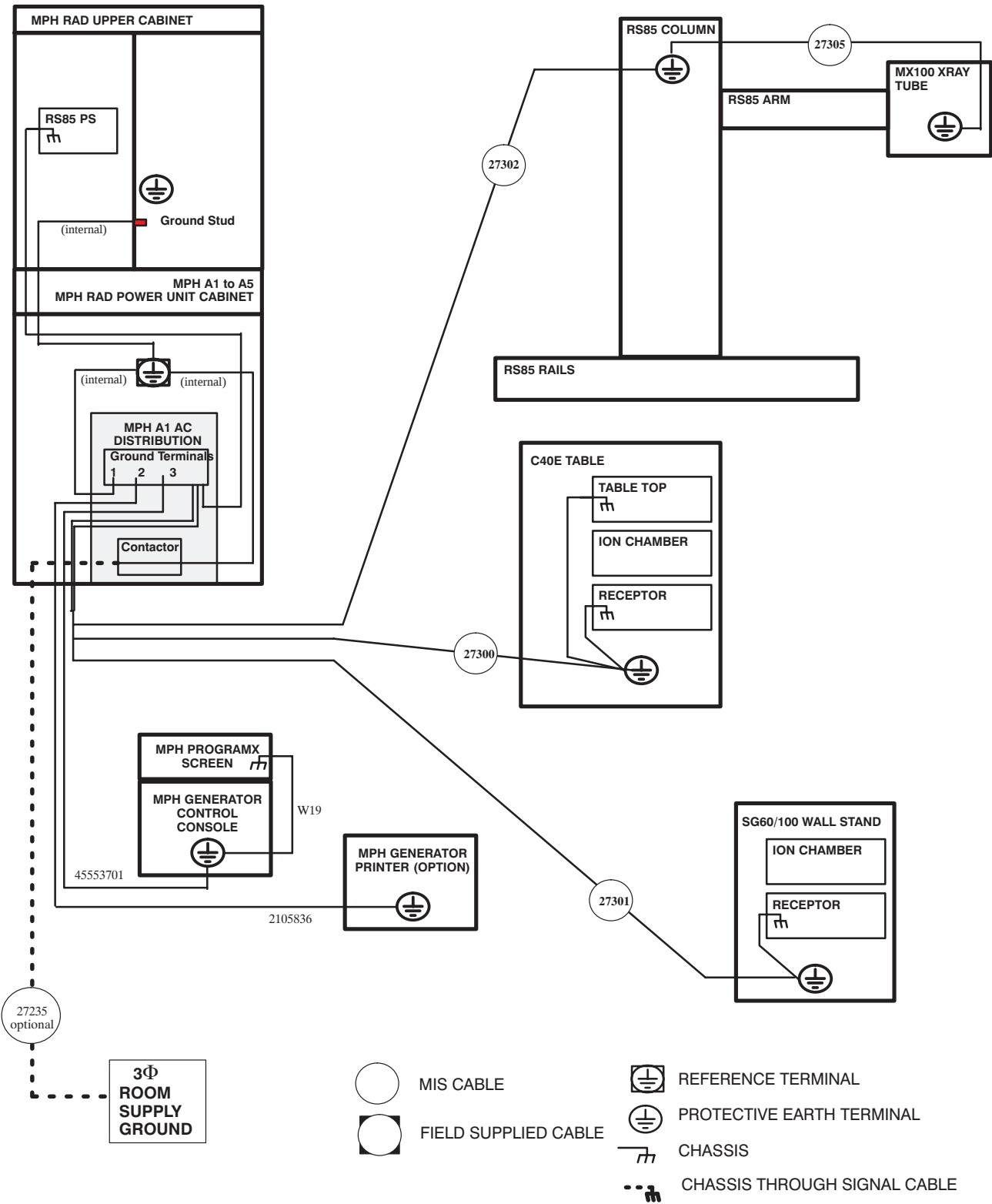


ILLUSTRATION 3-3

STANDARD CONFIGURATION MIS MAP (C40E AUTO / MPH50/65/80 / XT w/TOMOLINK / SINGLE ROOM)

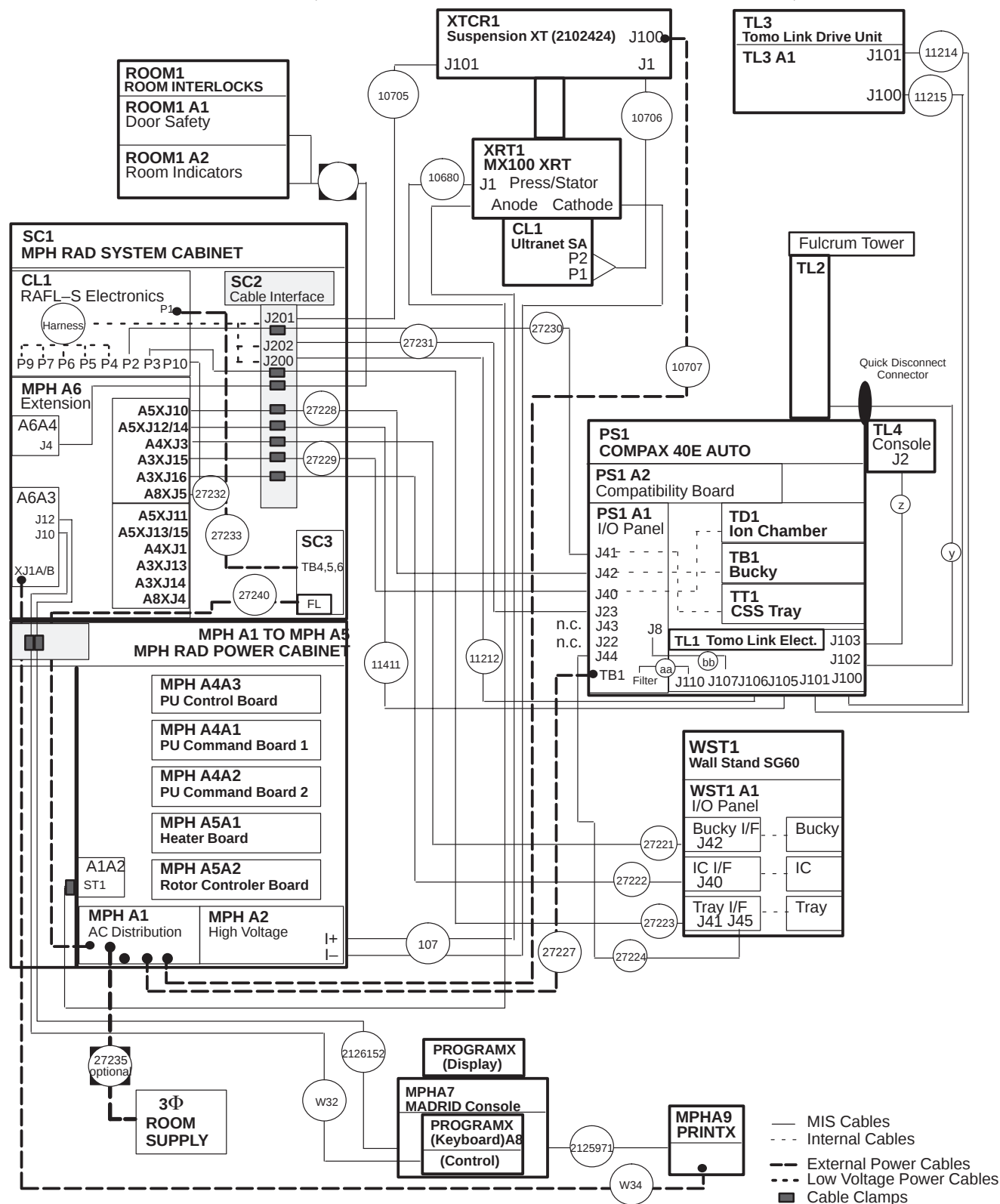


ILLUSTRATION 3-4

STANDARD CONFIGURATION MIS MAP (C40E MANUAL / MPH50/65/80 / XT w /TOMOLINK / SINGLE ROOM)

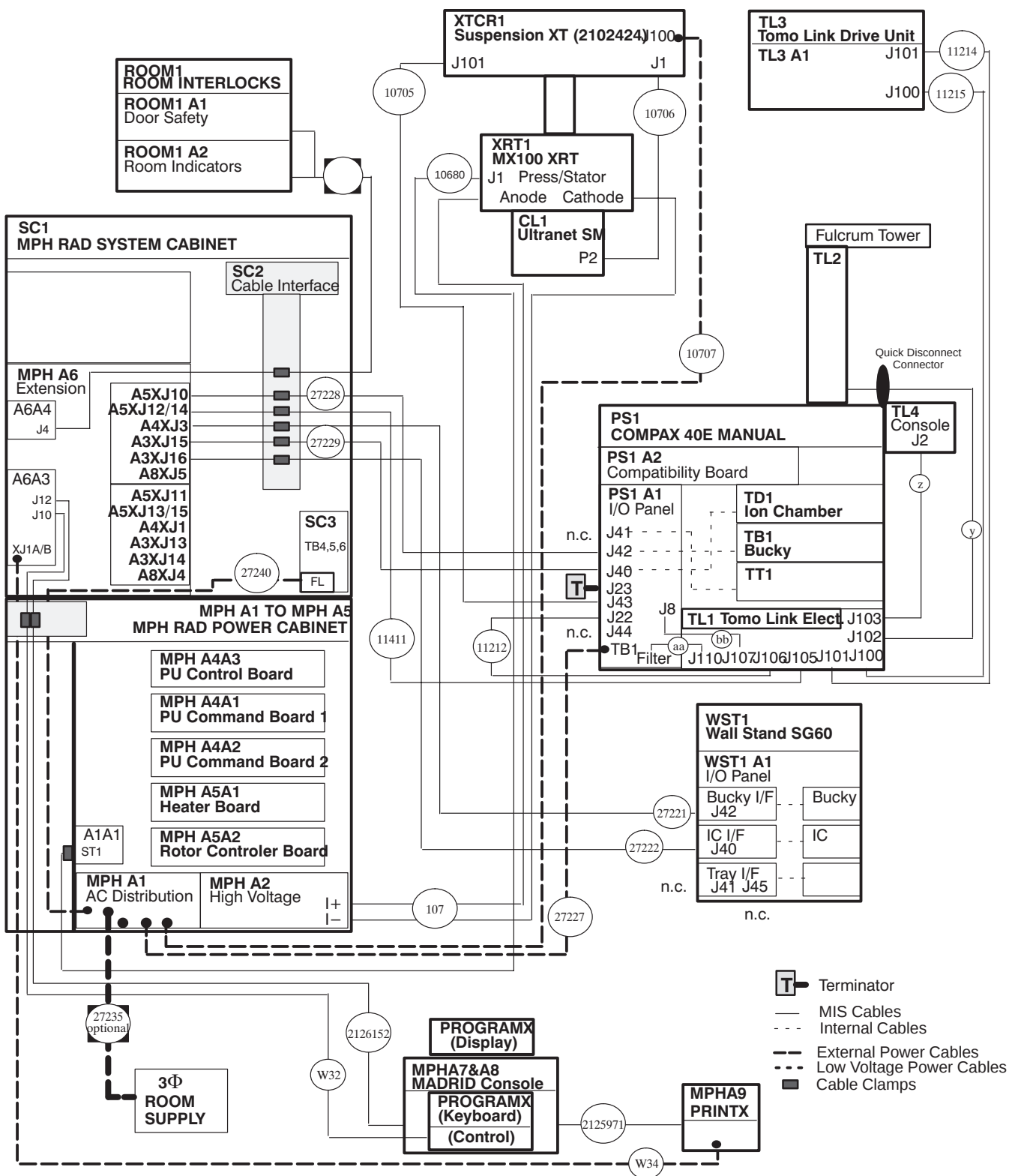


ILLUSTRATION 3-5

STANDARD CONFIGURATION MIS MAP (COMPAX I AUTO / MPH50/65/80 / SINGLE ROOM)

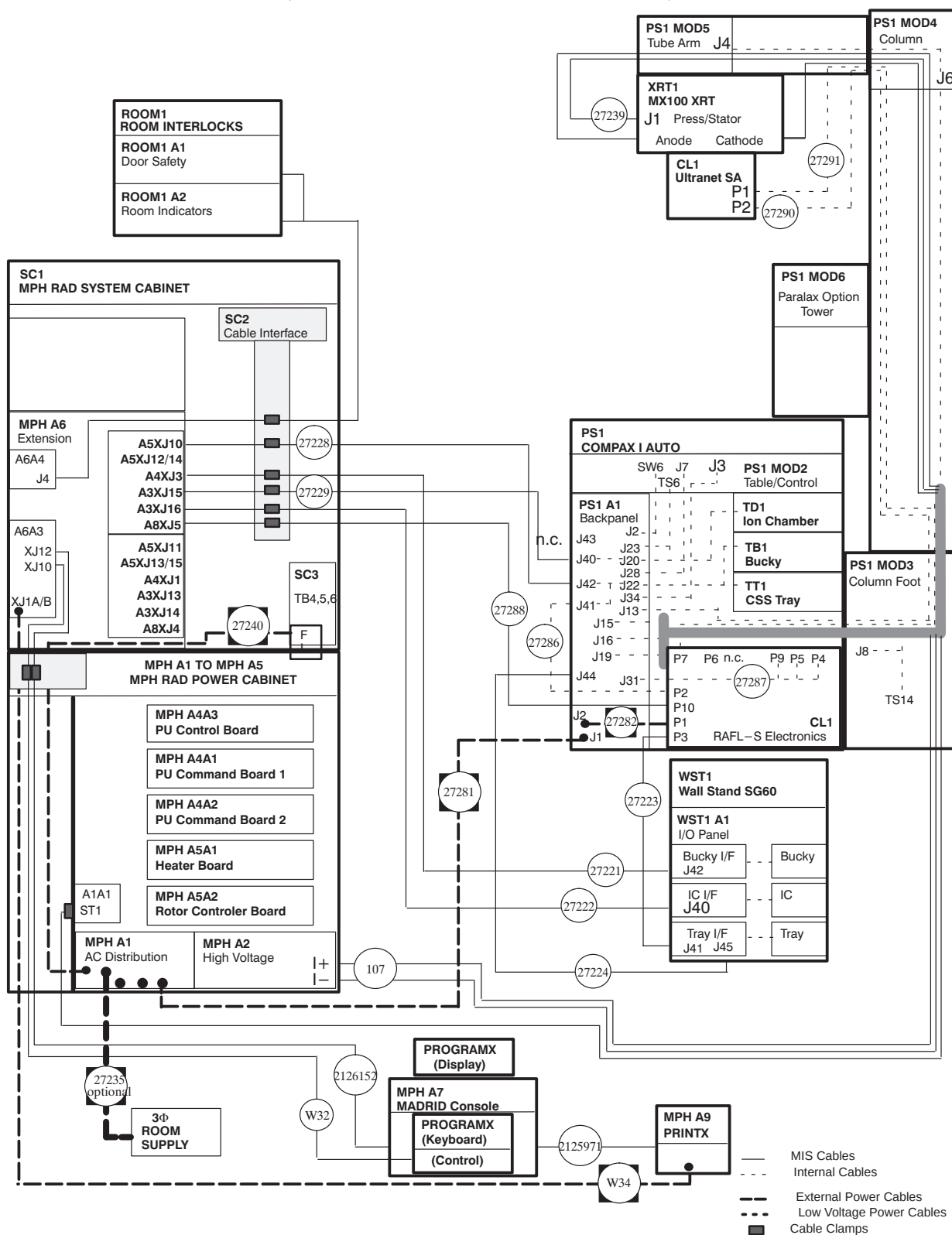
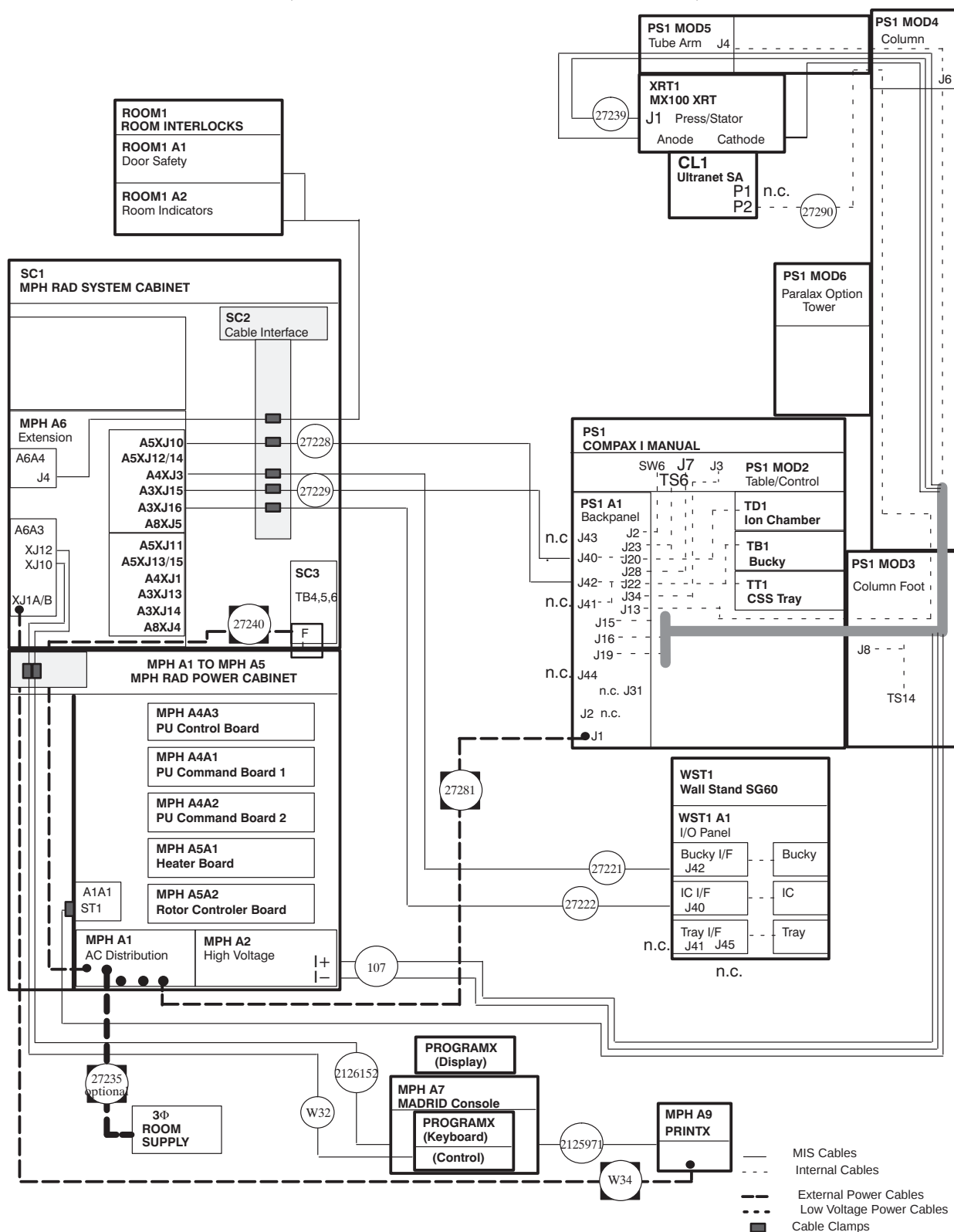


ILLUSTRATION 3-6

STANDARD CONFIGURATION MIS MAP (COMPAX I MANUAL / MPH50/65/80 / SINGLE ROOM)



MIS MAPS



ILLUSTRATION 3-8

STANDARD CONFIGURATION MIS MAP (COMPAX I/T MANUAL / MPH50/65/80 / SINGLE ROOM)

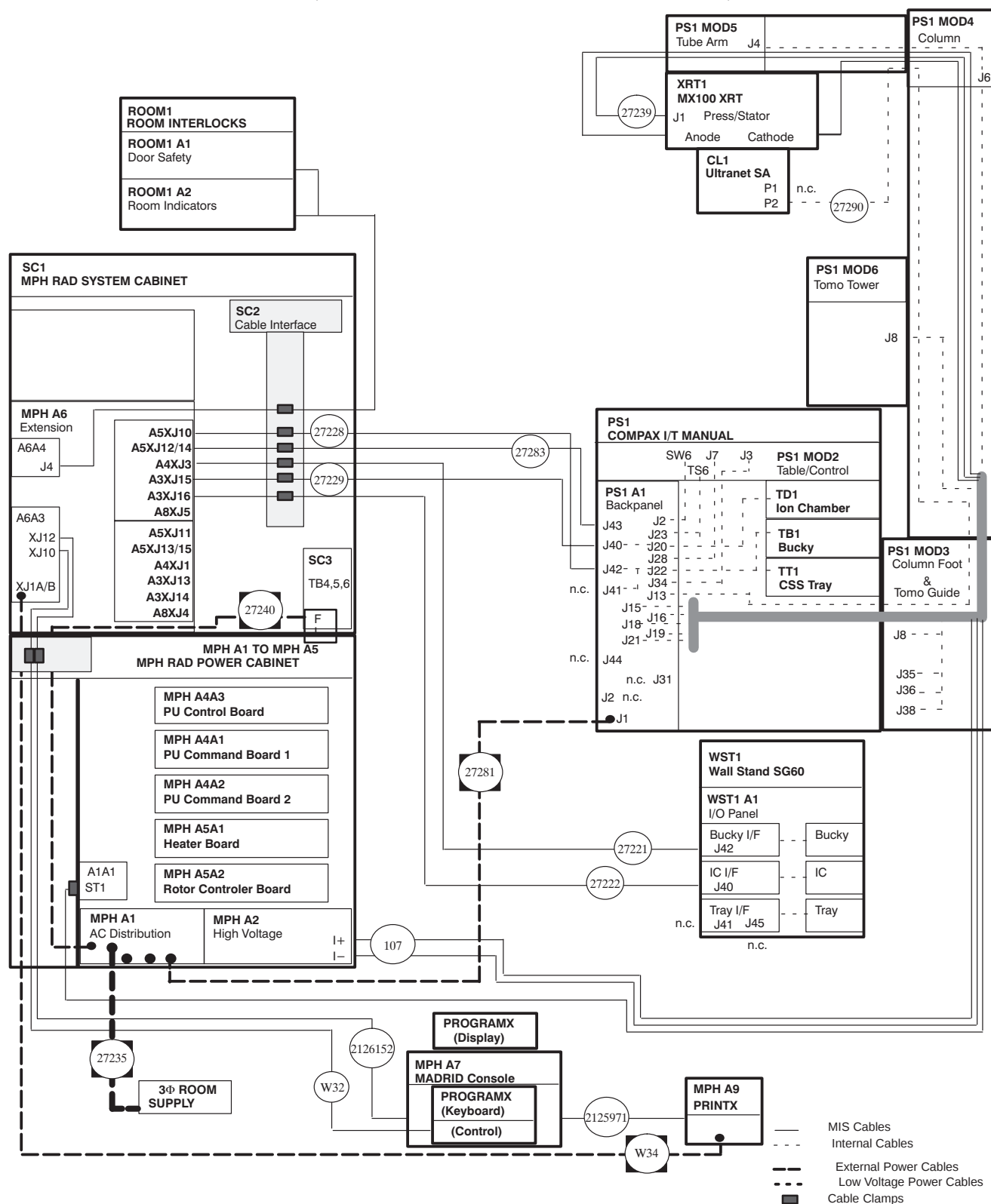


ILLUSTRATION 3-9

STANDARD CONFIGURATION MIS MAP (C40E AUTO / MPH50/65/80 / RS 85 /SINGLE ROOM)

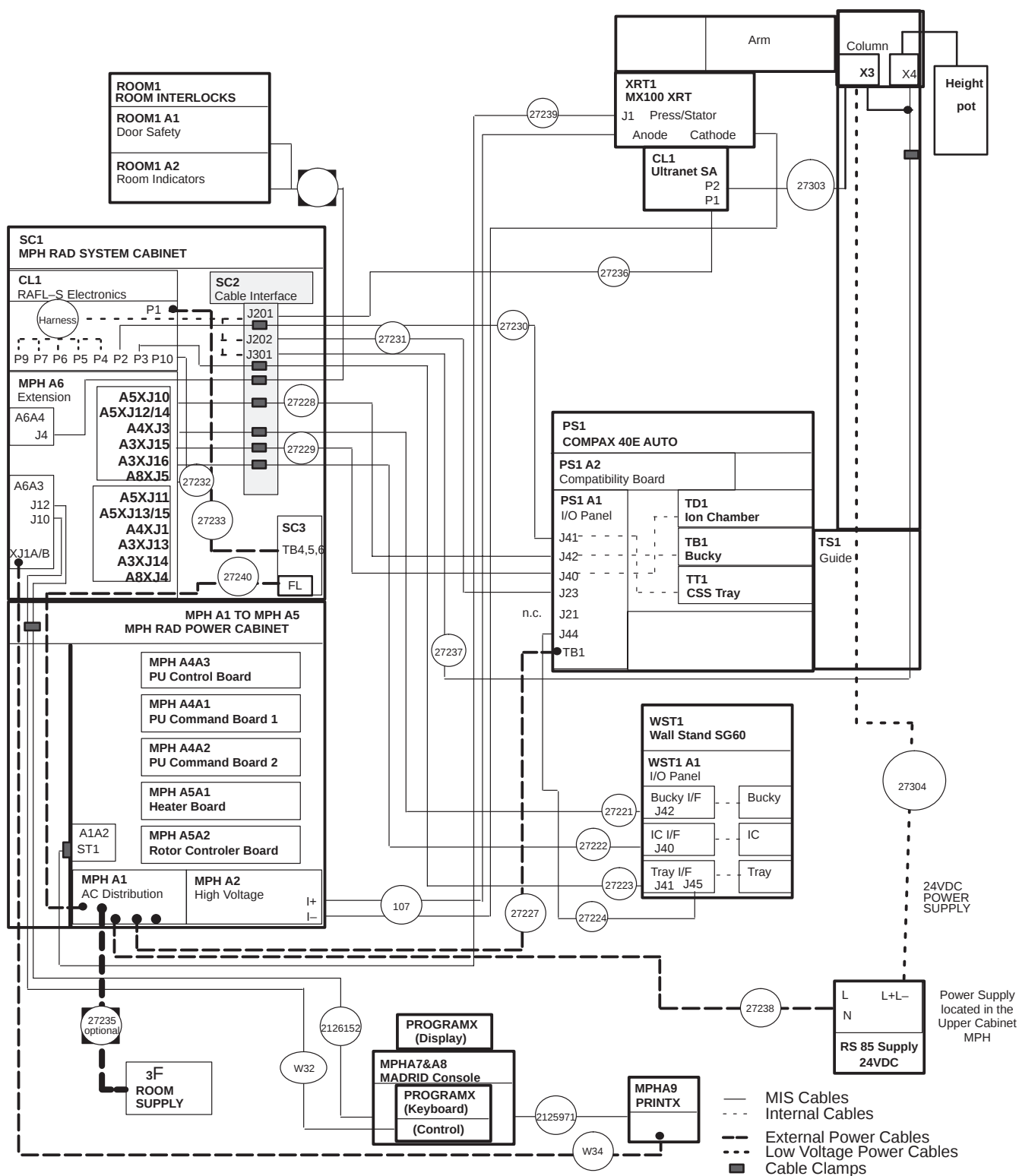
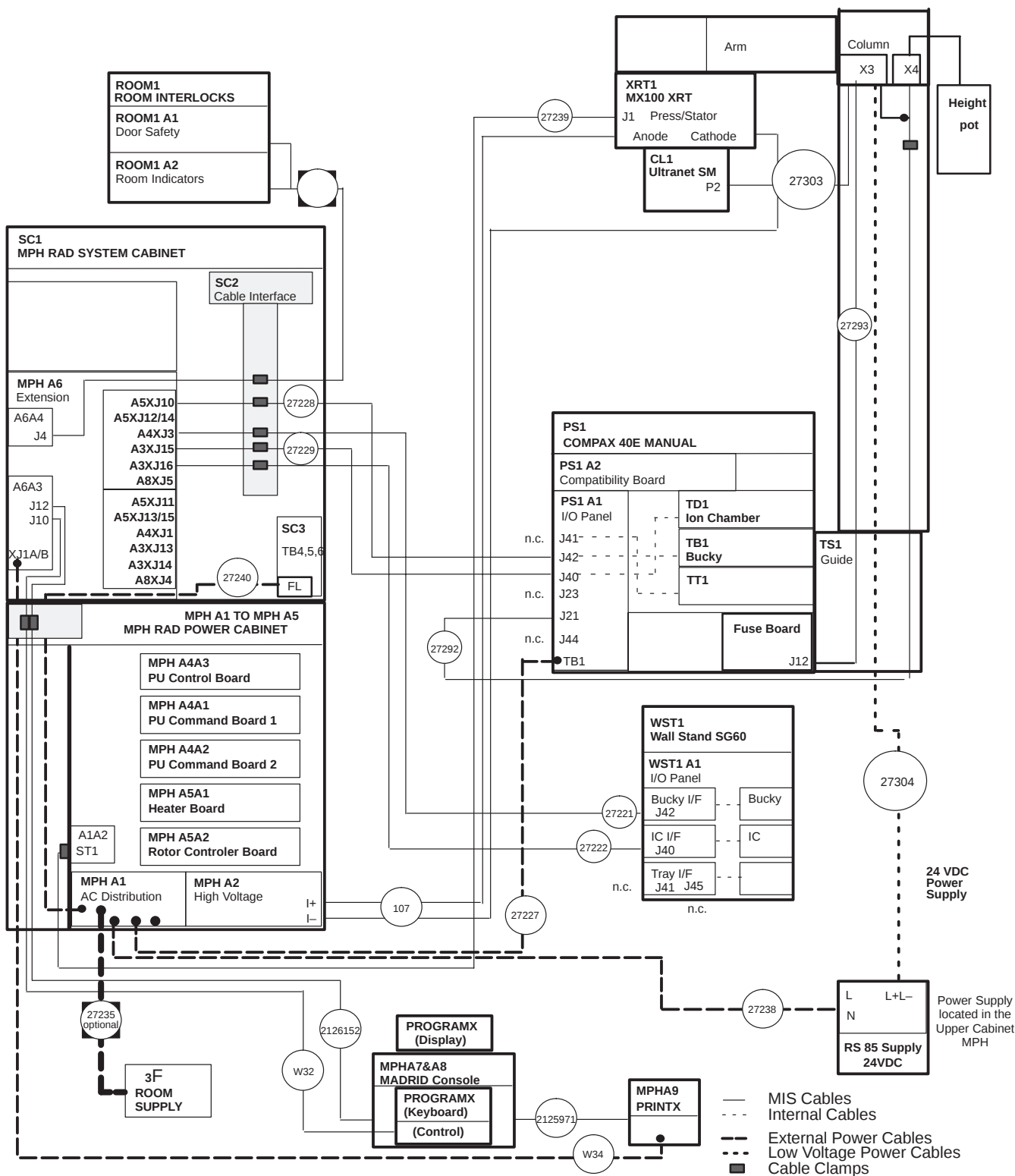


ILLUSTRATION 3-10

STANDARD CONFIGURATION MIS MAP (C40E MANUAL / MPH50/65/80 / RS 85 /SINGLE ROOM)



Blank page.

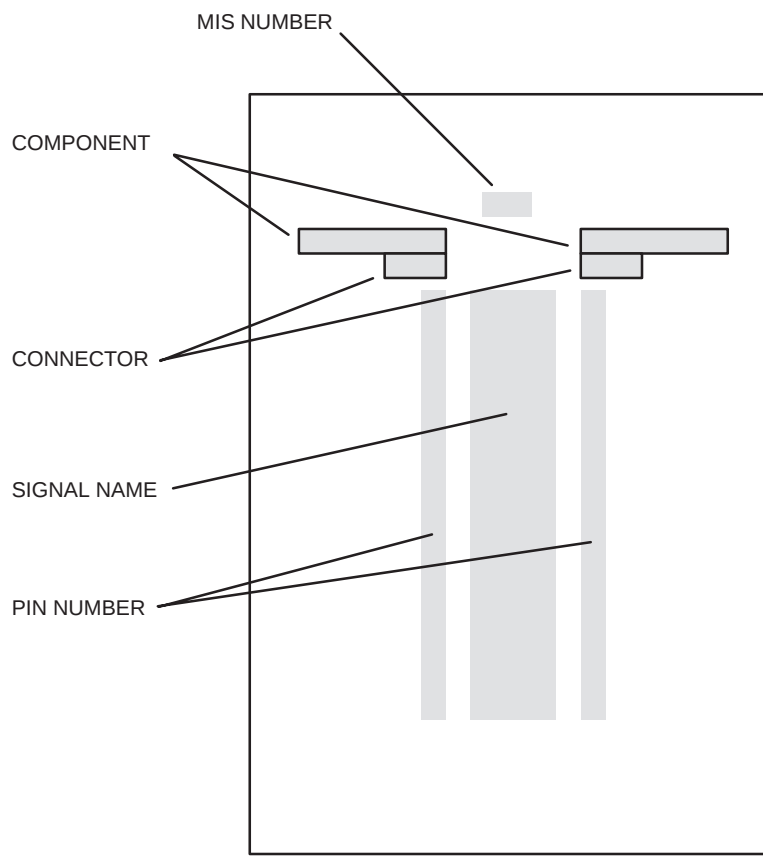
CHAPTER 4 – MIS CHARTS

SECTION 1 INTRODUCTION

MIS Charts illustrate in detail the signals and pin connections of the cables indicated (by MIS numbers) in the MIS Maps. (*Refer to Illustration 4–1.*)

Some MIS numbers are the same except for letter suffixes at the end. These cables are essentially the same but used for different applications – the points of connection differ.

ILLUSTRATION 4–1
MIS CHART EXAMPLE



SECTION 2
CABLE/SIGNAL DEFINITIONS (MIS CHART)

ILLUSTRATION 4-2
CABLE #27221 (2145641)

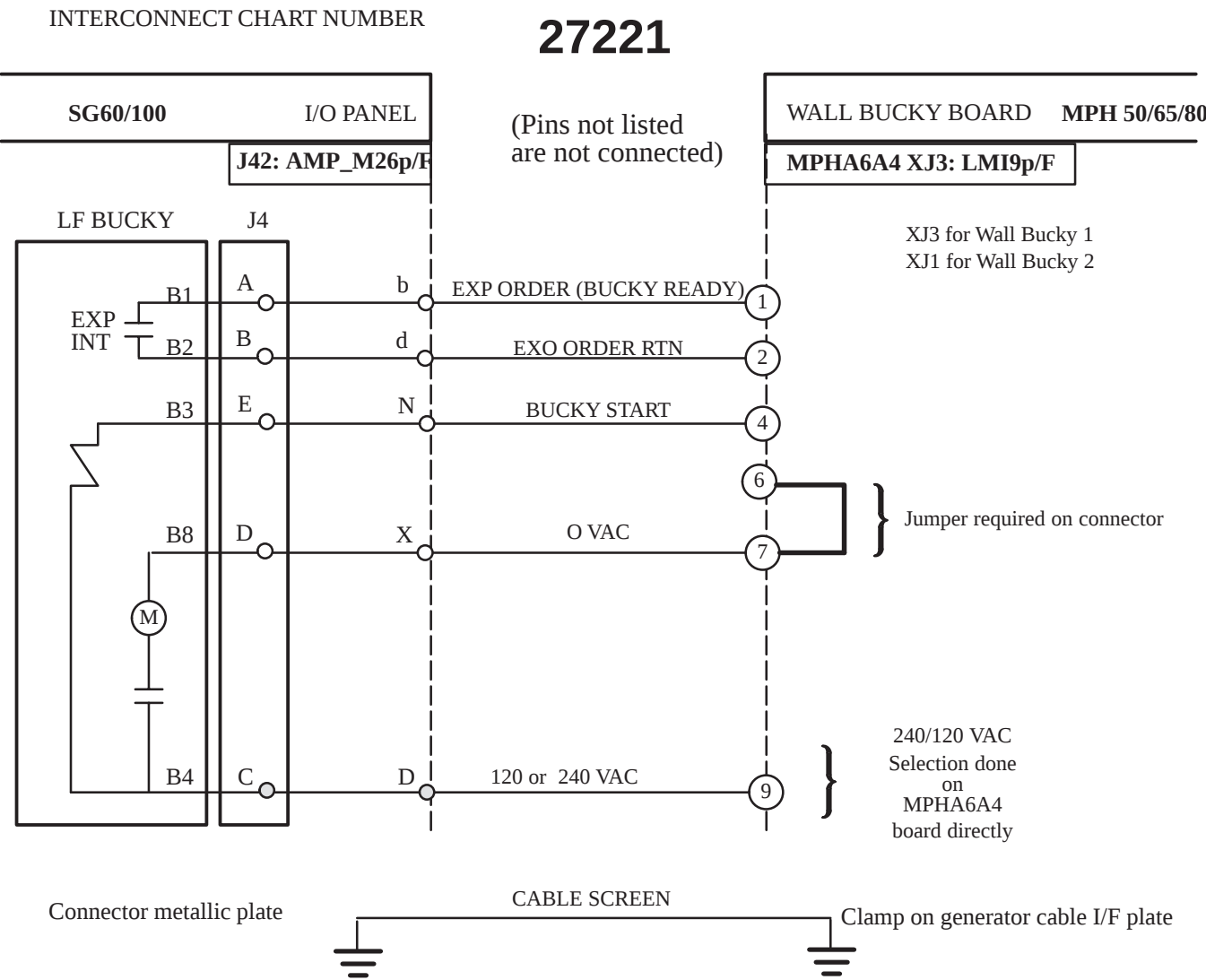


ILLUSTRATION 4-3
CABLE #27222 (2145642)

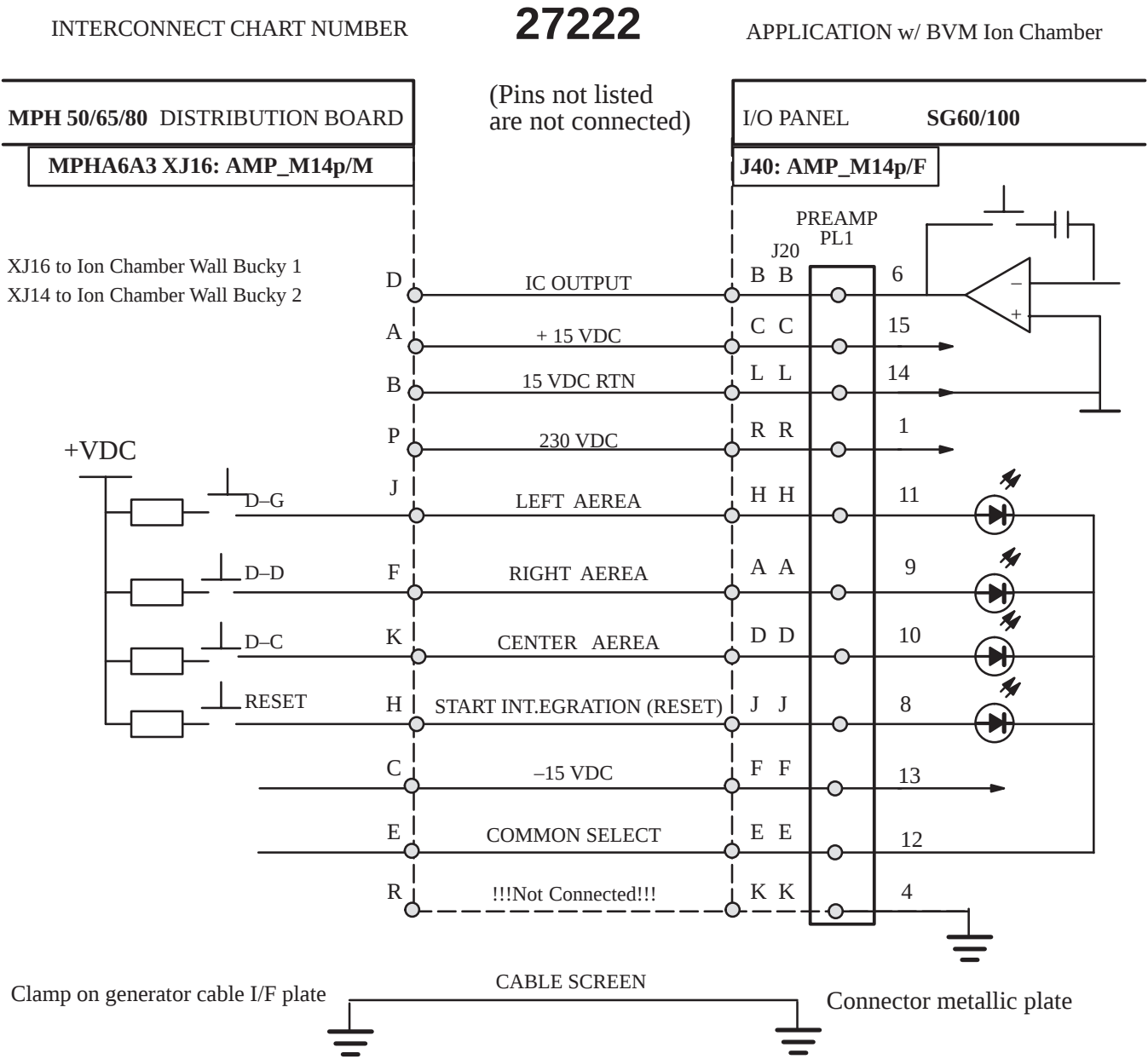
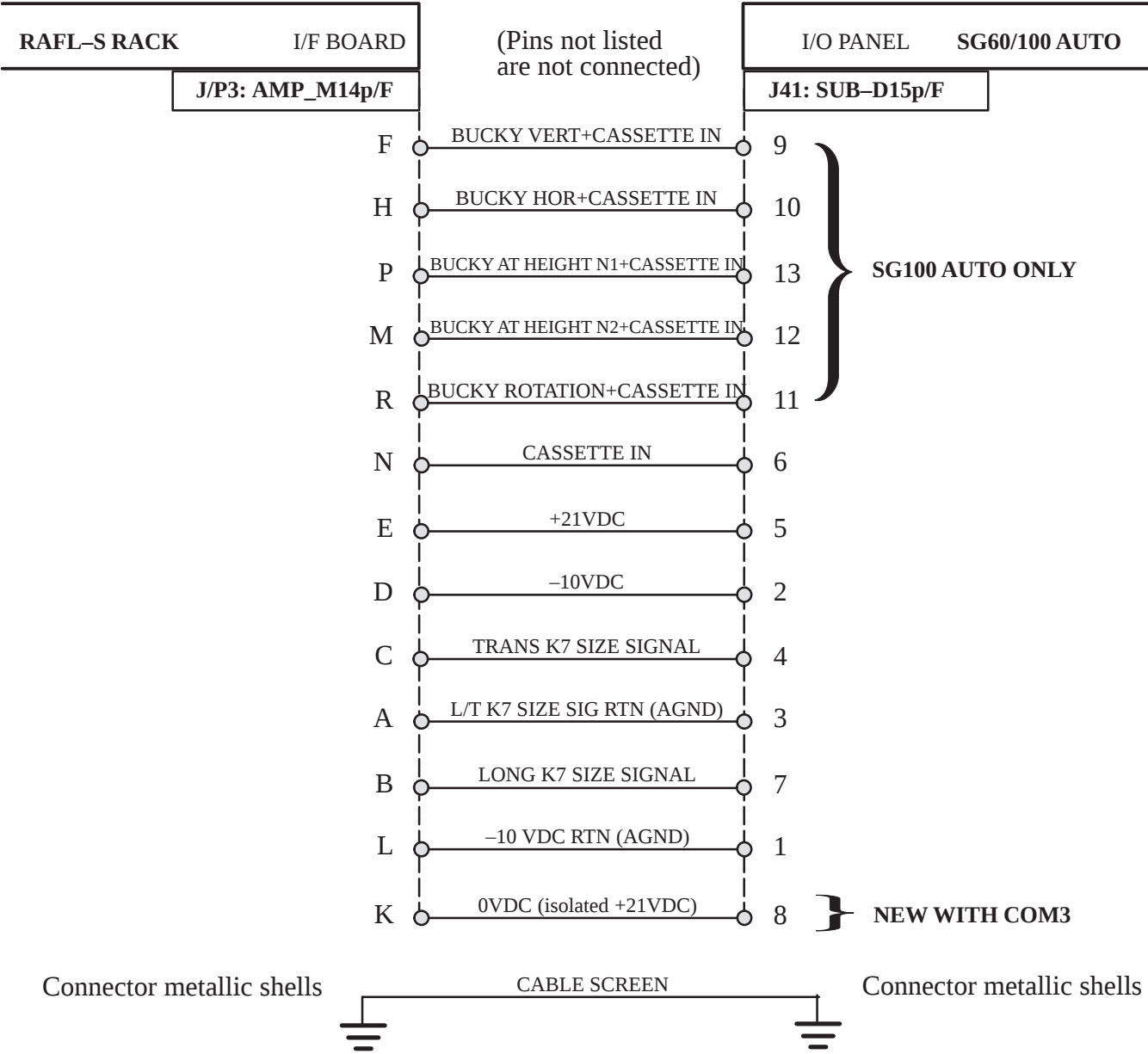


ILLUSTRATION 4-4
CABLE #27223 (2145644)

INTERCONNECT CHART NUMBER **27223**



MIS CHARTS

ILLUSTRATION 4–5
CABLE #27224 (2145656)

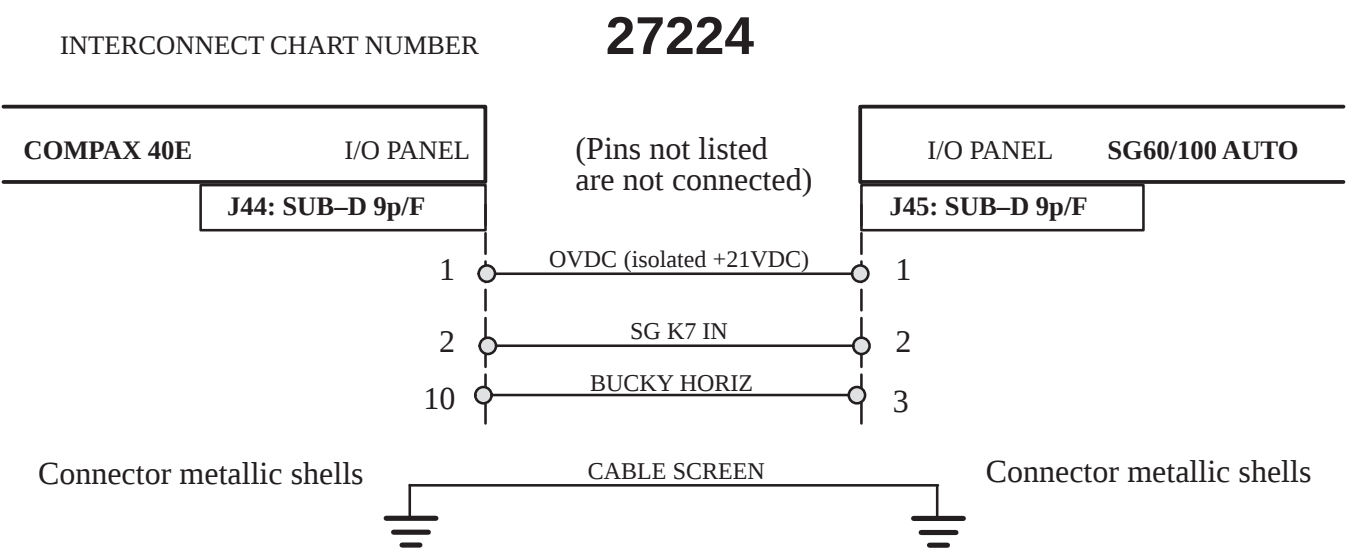


ILLUSTRATION 4-6
CABLE #27228 (2145602)

INTERCONNECT CHART NUMBER

27228

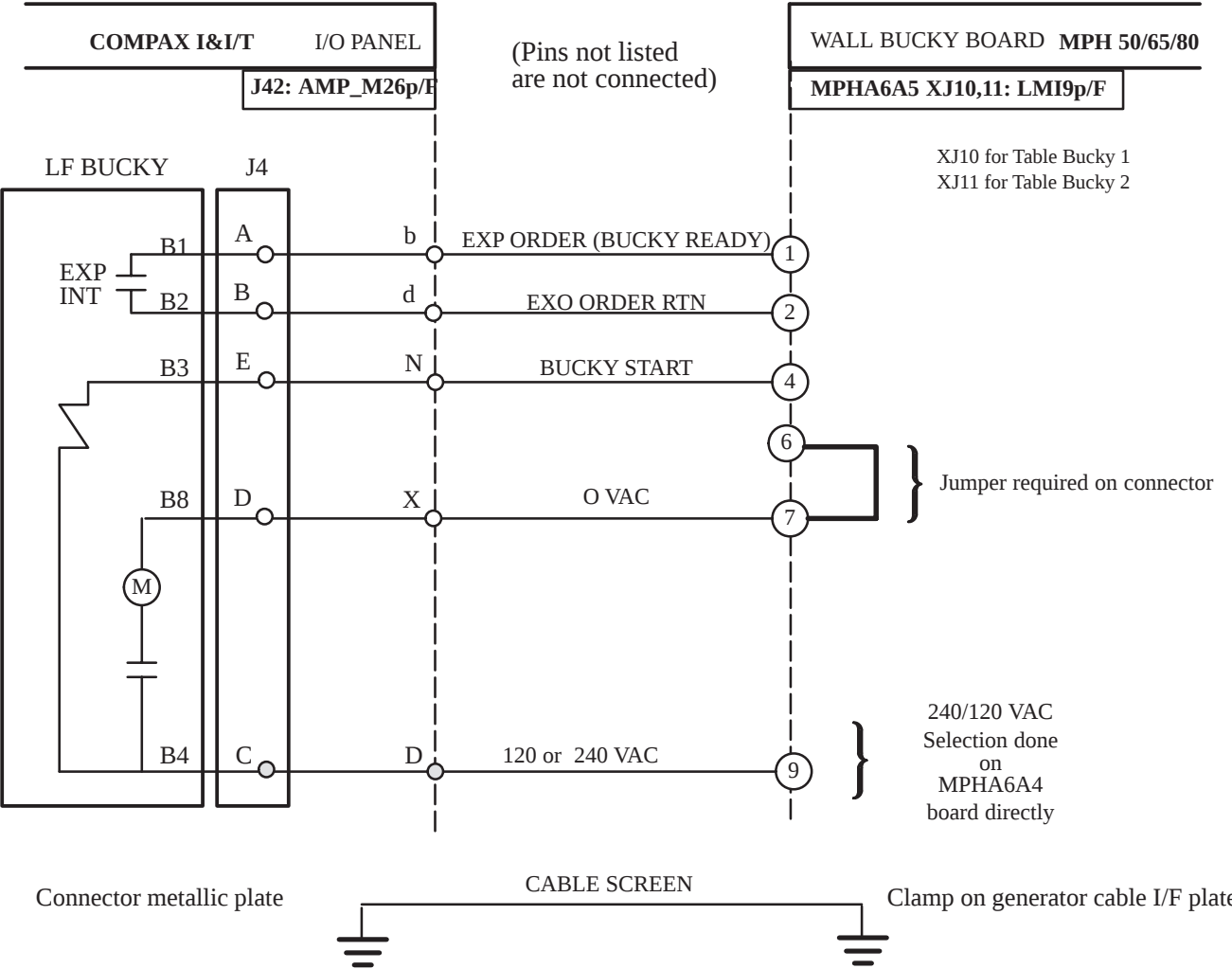
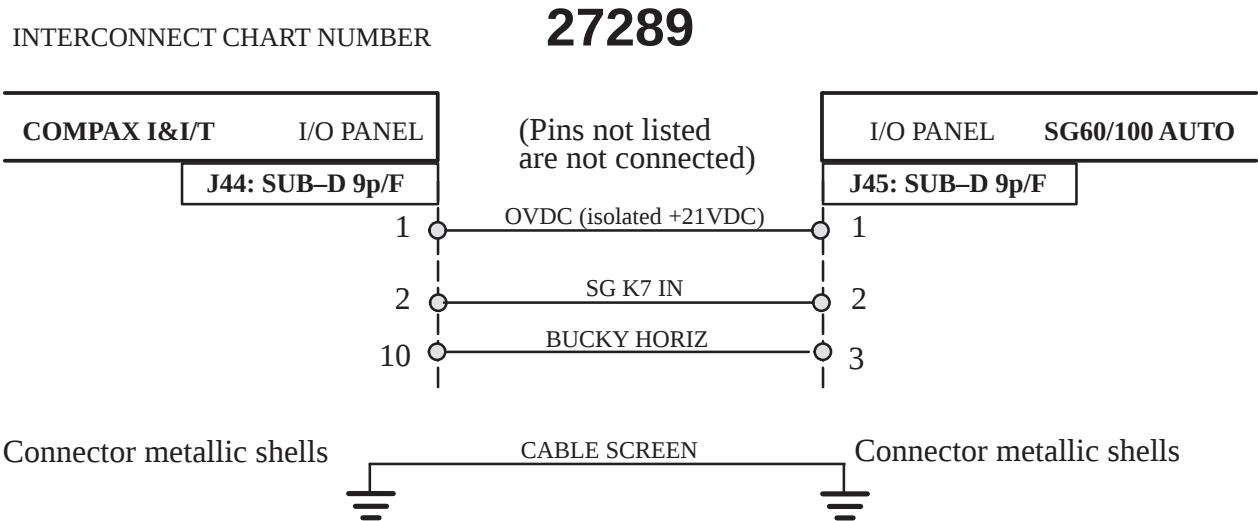


ILLUSTRATION 4-7
CABLE #27289 (2145656)



Blank page.

CHAPTER 5 – PERIODIC MAINTENANCE

SECTION 1

PERIODIC MAINTENANCE

1–1 Functional Checks

The functional checks described in Chapter 4 should be performed every 12 months to ensure complete and proper operation of the Vertical Bucky Stand.

A post installation check should be performed three months after installation. The customer should be asked for comments on equipment performance at this time.

If the Bucky Stand is equipped with a cassette–size sensing tray, refer to the automatic collimator service manual for maintenance information pertaining to the cassette–size sensing tray.

1–2 Counterweight Chain Inspection

Visually inspect the length of the counterweight chains and its anchor ends to the counterweight carriage for rust and excessive play every 12 months. Verify that there is not excessive play in the chain links.

After inspecting, grease the length of the chains.

Replace the counterweight chains and anchor ends if there is excessive play or rust.

CHAIN SPROCKETS

The counterweight sprockets, on which the counterweight chains ride, have permanently lubricated sealed bearings. The sprockets should not require lubrication or maintenance for the life of the equipment. However if maintenance becomes necessary, as indicated by excessive friction, squeaking, etc., the sprockets should be repaired or replaced.

Repairing the sprockets consists of disassembling the sprockets, cleaning and inspecting the bearing, and repacking with bearing grease.

1–3 Carriage Roller Bearing Maintenance

The Carriage travels on roller bearings that ride on stainless steel tracks. Cleanliness is the primary concern in the maintenance of Carriage roller bearings. Clean the roller bearings and tracks every 12 months.

To clean the roller bearings and tracks:

1. Wipe the outer surface of the bearings and the tracks using a rag moistened with CDX to remove dust and other foreign material that may have accumulated.
2. Moisten a rag with a mixture of STP (or similar lubricant) and machine, then wipe the outer surface of the tracks to apply a light film of protective lubricant.
3. Roll the Carriage up and down to distribute the lubrication.

1–4 Electrical Tests

Inspect electrical cables for damaged insulation or other defects. Check terminal connections for broken wire strands or damaged terminal lugs. Replace any damaged cables, wire or terminal lugs.

Check ground connections for tightness. Resistance from chassis ground or any ground point to power ground should be less than 0.1 ohm.

These electrical tests should be performed every 12 months under normal usage conditions. The tests should be performed more frequently under heavy usage conditions.

1–5 Vertical Lock

Ensure that the vertical lock notching rail is in good condition and that rail fixing screws are securely tightened.

Dismount the vertical lock by removing the two M6 Allen screws that fix the lock to the bucky. Clean any accumulated dust and dirt from the lock, especially between moving parts. Ensure that the lock functions correctly. Acuate the lock handle and check that it retracts fully and returns to the rest position without sticking.

Mount the lock and ensure that it functions correctly.

SECTION 2**PERIODIC MAINTENANCE SCHEDULE**

MAINTENANCE ITEM	FREQUENCY (MONTHS)	PROCEDURE	REFERENCE
GENERAL			
Visual Inspection	12	Check for debris that would indicate abnormal wear.	
General Cleaning	6	- Wipe exterior parts using soft cloth, water and mild soap. Do Not use CDX. - Vacuum interior if any dust or lint is present.	
Functional Checks	12	Perform tasks described in referenced document.	Ch. 2
Electrical Checks	12	- Inspect and replace any damaged cables or connectors. - Check grounding.	Ch. 5 Section 1–4
MECHANICAL			
C. Weight Chain Maintenance	12	Inspect and grease length of chains. Replace if excessively rusty.	Ch. 5 Section 1–2
Carriage Roller Bearing Inspection	12	Clean roller bearings and tracks.	Ch. 5 Section 1–3
Vertical Lock Maintenance	12	- Lock notched rail - General Cleaning - Functional Check	Ch. 5 Section 1–5

CHAPTER 6 – RENEWAL PARTS

TABLE OF CONTENTS

ILLUSTRATION	TITLE	PAGE
	ABBREVIATIONS	6–1
6–1	SG–60 SYSTEM	6–3
6–2	CABLE CABLE SET ASSEMBLY (AUTOMATIC COLLIMATOR/BVM ION CHAMBER) 2149906	6–5
6–3	CABLE CABLE SET ASSEMBLY (MANUAL COLLIMATOR/BVM ION CHAMBER) 2149754	6–7
6–4	SYSTEM CABLES	6–9
6–5	BUCKY FRONT PANEL ASSEMBLY 45432379	6–11
6–6	LIEBEL BUCKY 248051D LEFT SIDE LOAD ASSEMBLY 2154256	6–13
6–7	LIEBEL BUCKY 248051D RIGHT SIDE LOAD ASSEMBLY 2154255	6–15
6–8	MEDYS BUCKY LEFT SIDE LOAD ASSEMBLY 2209233	6–17
6–9	MEDYS BUCKY RIGHT SIDE LOAD ASSEMBLY 2209224	6–19
6–10	ION CHAMBER (BVM) 845027G055	6–21
6–11	AUTOMATIC TRAY (GE) 45435291	6–23
6–12	MANUAL TRAY (GE) 45435290	6–25
6–13	GRID FOR LIEBEL BUCKY	6–27
6–14	GRID FOR MEDYS BUCKY	6–29
6–15	COUNTERWEIGHT CHAIN KIT 2230069	6–31
6–16	MECHANICAL BRAKE ASSEMBLY 45432376	6–33
6–17	SG–60 COVERS	6–35

Blank page.

ABBREVIATIONS

ITEM NO.	
–	Not illustrated.
– 6	Item No. 6 not illustrated.

FRU	
1	Critical.
2	Not critical.
N	Not available.

REP	
Y	Repairable.

QTY	
PL	Previously listed as an assembly or subassembly.
AR	As required.

APP Applies to.

 Viewing direction.

 Renewal Parts

ILLUSTRATION 6-1
SG-60 SYSTEM

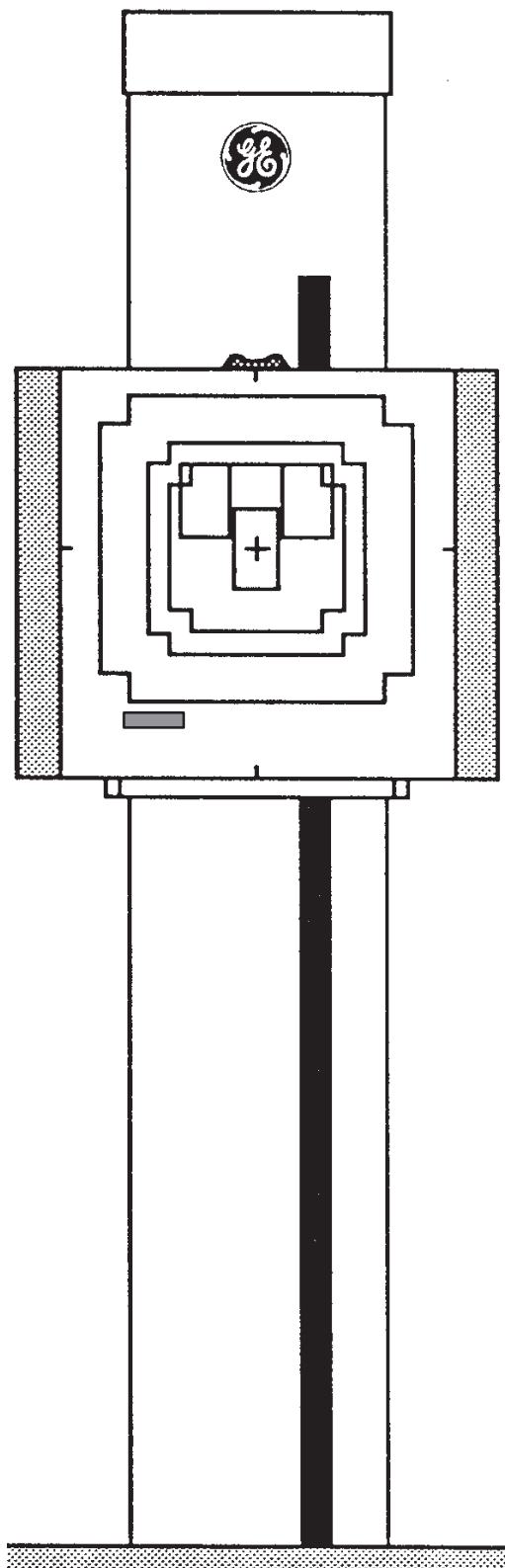
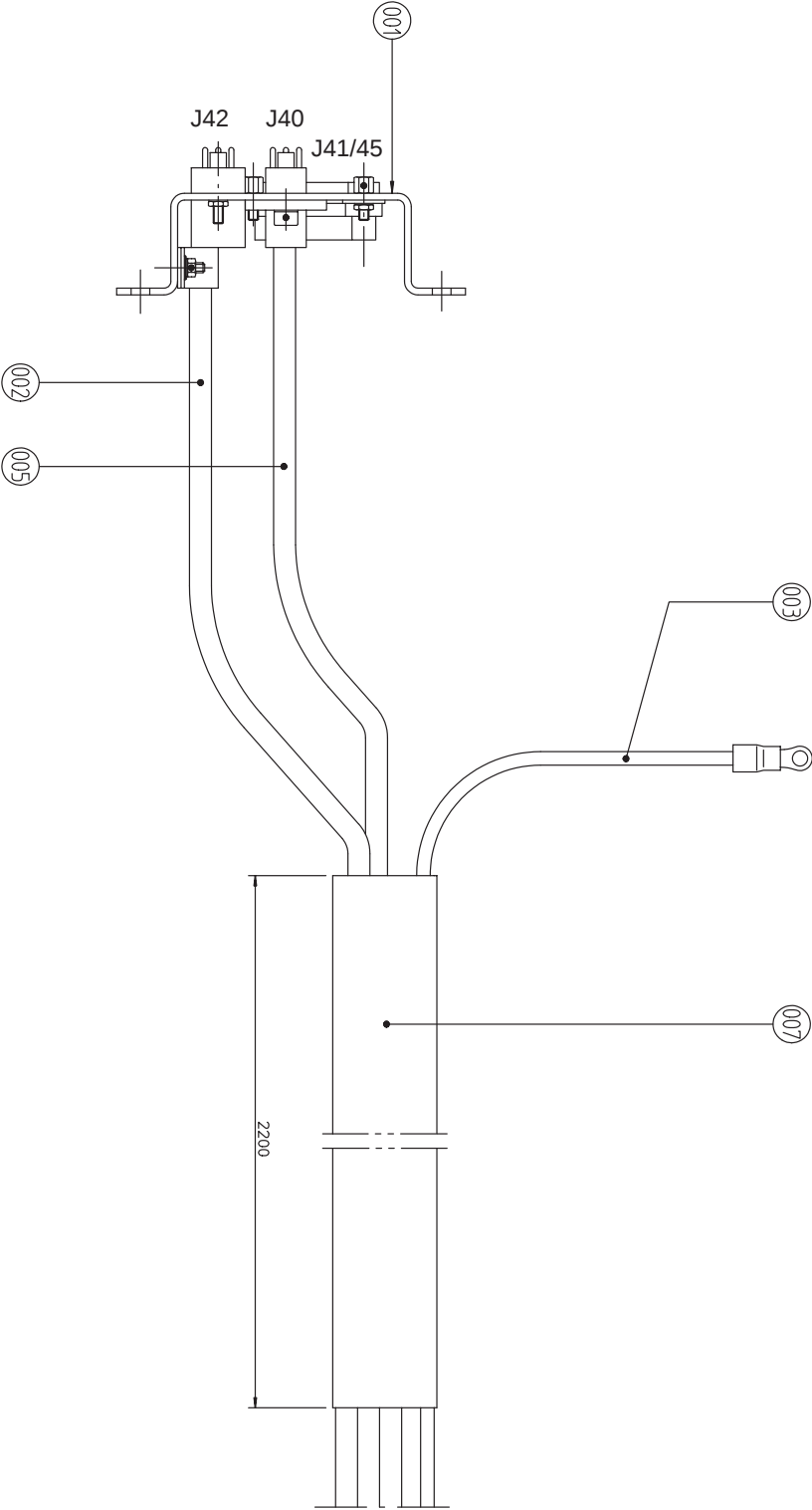


ILLUSTRATION 6–1
SG–60 SYSTEM

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
				1 2 3 4 5		
				SG–60 WITH MANUAL COLLIMATOR (WITH LIEBEL BUCKY)	1	
	2146722			• SG–60 RIGHT HAND	1	
	2146723			• SG–60 LEFT HAND	1	
				SG–60 WITH AUTOMATIC COLLIMATOR AND ION CHAMBER GEMS–EUROPE (BVM)(WITH LIEBEL BUCKY)	1	
	2146726			• SG–60 RIGHT HAND	1	
	2146727			• SG–60 LEFT HAND	1	
				SG–60 WITH MANUAL COLLIMATOR (WITH MEDYS BUCKY)	1	
	2225846			• SG–60 RIGHT HAND	1	
	2225850			• SG–60 LEFT HAND	1	
				SG–60 WITH AUTOMATIC COLLIMATOR AND ION CHAMBER GEMS–EUROPE (BVM)(WITH MEDYS BUCKY)	1	
	2225848			• SG–60 RIGHT HAND	1	
	2225852			• SG–60 LEFT HAND	1	
–	2150624			SG–60 DOCUMENTATION	1	
–	2224051–148	2	N	• OPERATOR MANUAL	1	
–	2150626	N	N	• SERVICE MANUAL	1	
–	2150293–100	2	N	• • SERVICE MANUAL	1	
–	2150301–100	2	N	• • PRE–INSTALLATION MANUAL	1	
–	45297300	2	N	• SERVICE MANUAL BUCKY MEDYS	1	

ILLUSTRATION 6-2
CABLE CABLE SET ASSEMBLY (AUTOMATIC COLLIMATOR/BVM ION CHAMBER) 2149906



RENEWAL PARTS

ILLUSTRATION 6–2

CABLE CABLE SET ASSEMBLY (AUTOMATIC COLLIMATOR/BVM ION CHAMBER) 2149906

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	A P P
	2149906	2	N	CABLE CABLE SET ASSEMBLY (AUTOMATIC COLLIMATOR/BVM ION CHAMBER)	1	
001	2149755	N	N	• CONNECTORS SUPPORT	1	
002	2149665	N	N	• WIRE BUCKY CABLE	1	
003	45432316	N	N	• GROUND CABLE	1	
005	2149668	N	N	• ION CHAMBER CABLE (BVM)	1	
007	53002P22	N	N	• TUBE VACUFLEX 22	1	

ILLUSTRATION 6-3
CABLE CABLE SET ASSEMBLY (MANUAL COLLIMATOR/BVM ION CHAMBER) 2149754

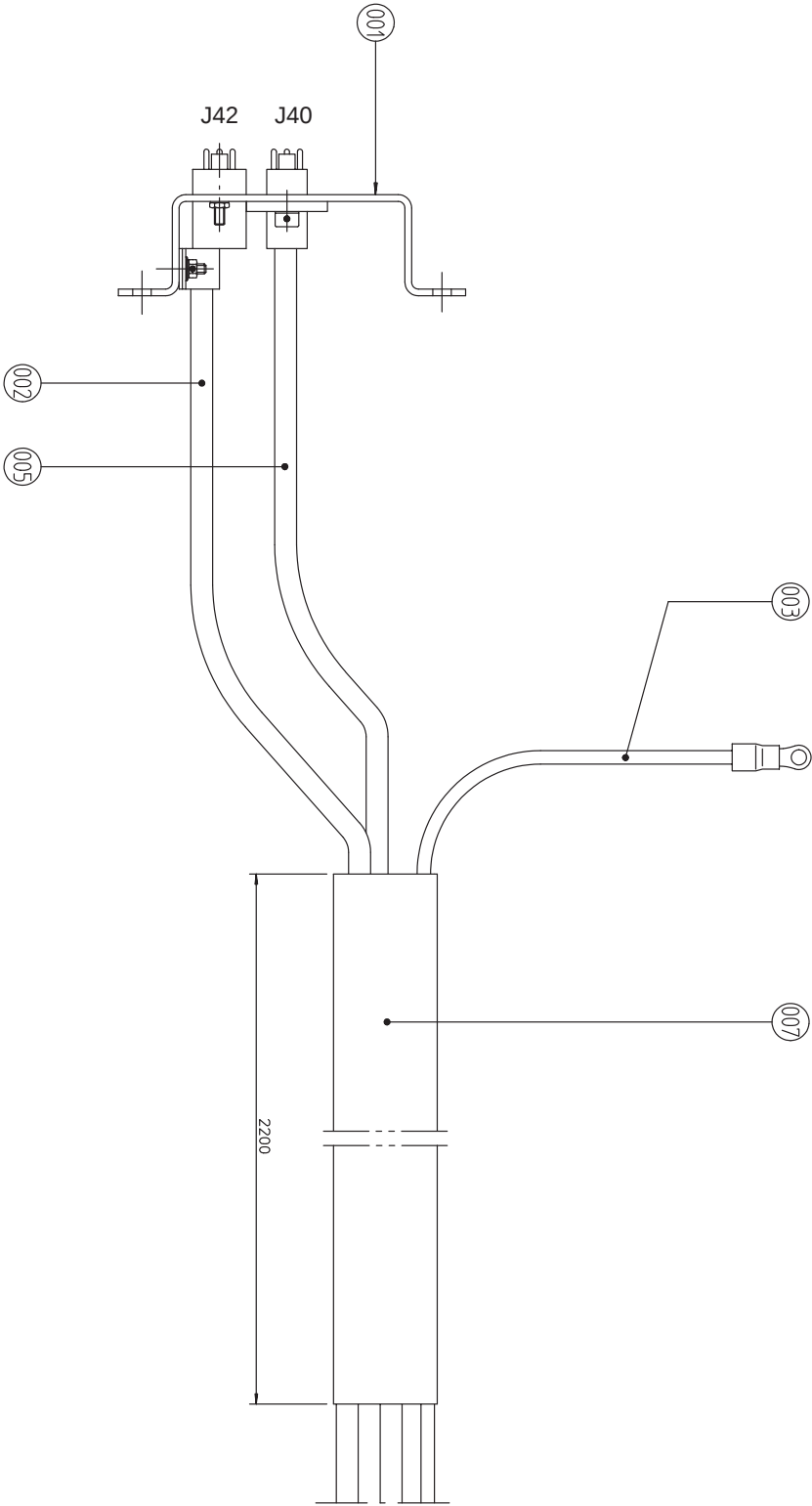


ILLUSTRATION 6-3
CABLE CABLE SET ASSEMBLY (MANUAL COLLIMATOR/BVM ION CHAMBER) 2149754

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
	2149754	2	N	CABLE CABLE SET ASSEMBLY (MANUAL COLLIMATOR/BVM ION CHAMBER)	1	
001	2149755	N	N	• CONNECTORS SUPPORT	1	
002	2149664	N	N	• WIRE BUCKY CABLE	1	
003	45432316	N	N	• GROUND CABLE	1	
005	2149668	N	N	• ION CHAMBER CABLE (BVM)	1	
007	53002P22	N	N	• TUBE VACUFLEX 22	1	

RENEWAL PARTS

**ILLUSTRATION 6-4
SYSTEM CABLES**

BLANK PAGE

ILLUSTRATION 6–4
SYSTEM CABLES

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
				1 2 3 4 5		
–		N		SYSTEM CABLES	1	
–	2157017–2	N	N	CABLE SET FOR MPH OR PPX – MANUAL W/O IC – 18M	1	
–		2	N	• BUCKY 1		
–		2		• GROUND	1	
–		2				
–	2157019–2	N	N	CABLE SET FOR MPH OR PPX – AUTO W/O IC – 18M	1	
–		2	N	• BUCKY		
–		2	N	• GROUND		
–		2	N	• CASCABLE SETTE TRAY		
–		2	N	• COMPATIBILITY		
–						
–		N	N	CABLE SET AEC CABLE FOR MPH (OPTION) – 18M	1	
–		2	N	• AEC MPH		
–						
–		N	N	CABLE SET AEC CABLE FOR PPX (OPTION) – 18M	1	
–		2	N	• AEC PPX		
–						
–		N	N	CABLE SET FOR MPH OR PPX – AUTO W/O IC – 24M	1	
–		2	N	• BUCKY		
–		2	N	• GROUND		
–		2	N	• CASCABLE SETTE TRAY		
–		2	N	• COMPATIBILITY		
–						
–		N	N	CABLE SET AEC CABLE FOR MPH (OPTION) – 24M	1	
–		2	N	• AEC MPH		
–						
–		N	N	CABLE SET AEC CABLE FOR PPX (OPTION) – 24M	1	
–		2	N	• AEC PPX		

ILLUSTRATION 6-5
BUCKY FRONT PANEL ASSEMBLY 45432379

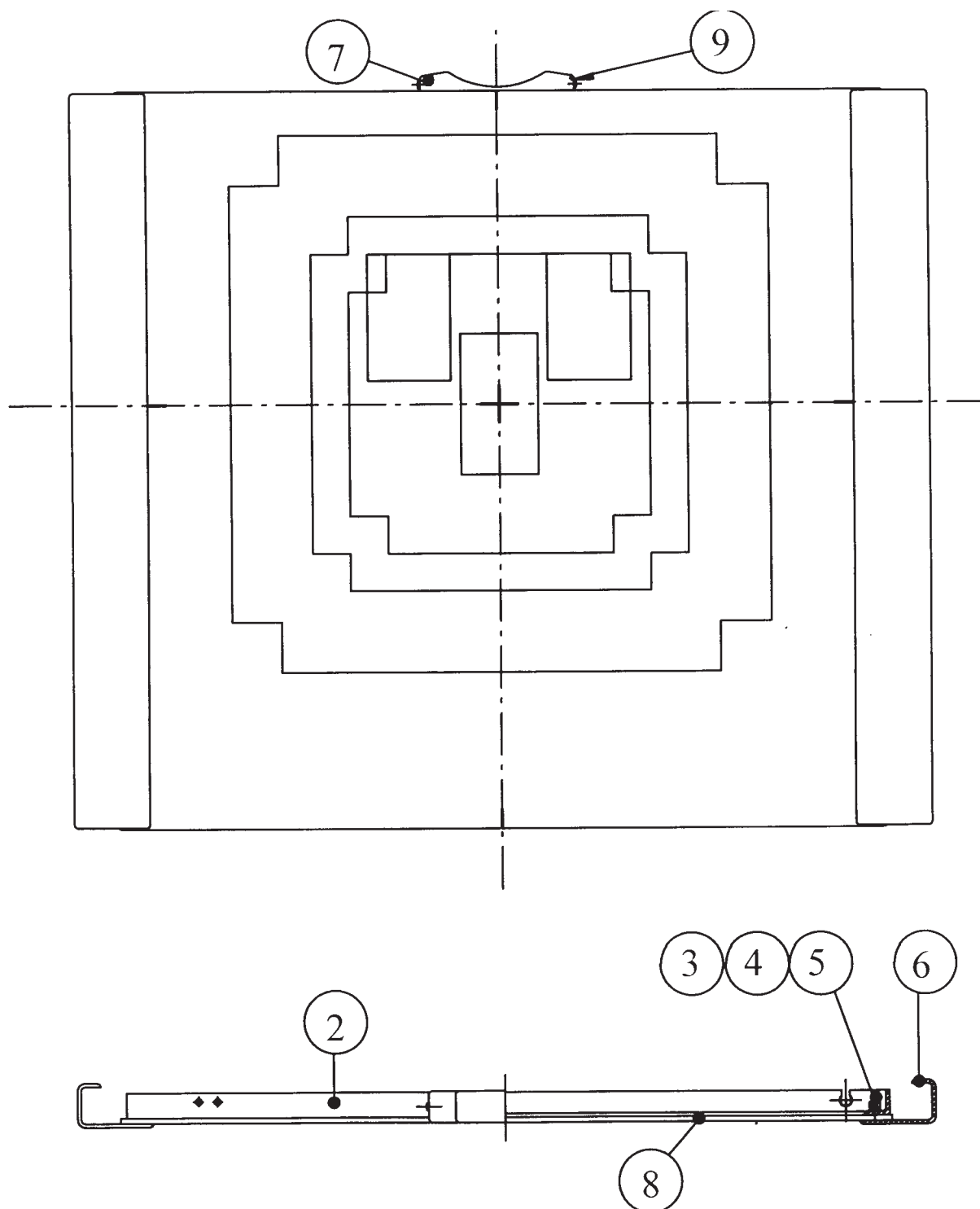


ILLUSTRATION 6-5

BUCKY FRONT PANEL ASSEMBLY 45432379

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
	45432379	1	N	BUCKY FRONT PANEL ASSEMBLY	1	
2	2126416	N	N	• FRONT PANEL FRAME	1	
3	46-951380P27	N	N	• WASHER B 5.3 AO	1	
4	46-951380P11	N	N	• WASHER AET 5	1	
5	46-951350P11	N	N	• NUT EX. M-5	1	
6	45432298	N	N	• GUIDE	2	
7	45432398	1	N	• CENTERING DEVICE	1	
8	45432399	N	N	• FRONT PANEL	1	
9	46-951236P12	N	N	• SCREW CH. CI. RA. 2.9X6.5	1	

ILLUSTRATION 6-6
LIEBEL BUCKY 248051D LEFT SIDE LOAD ASSEMBLY 2154256

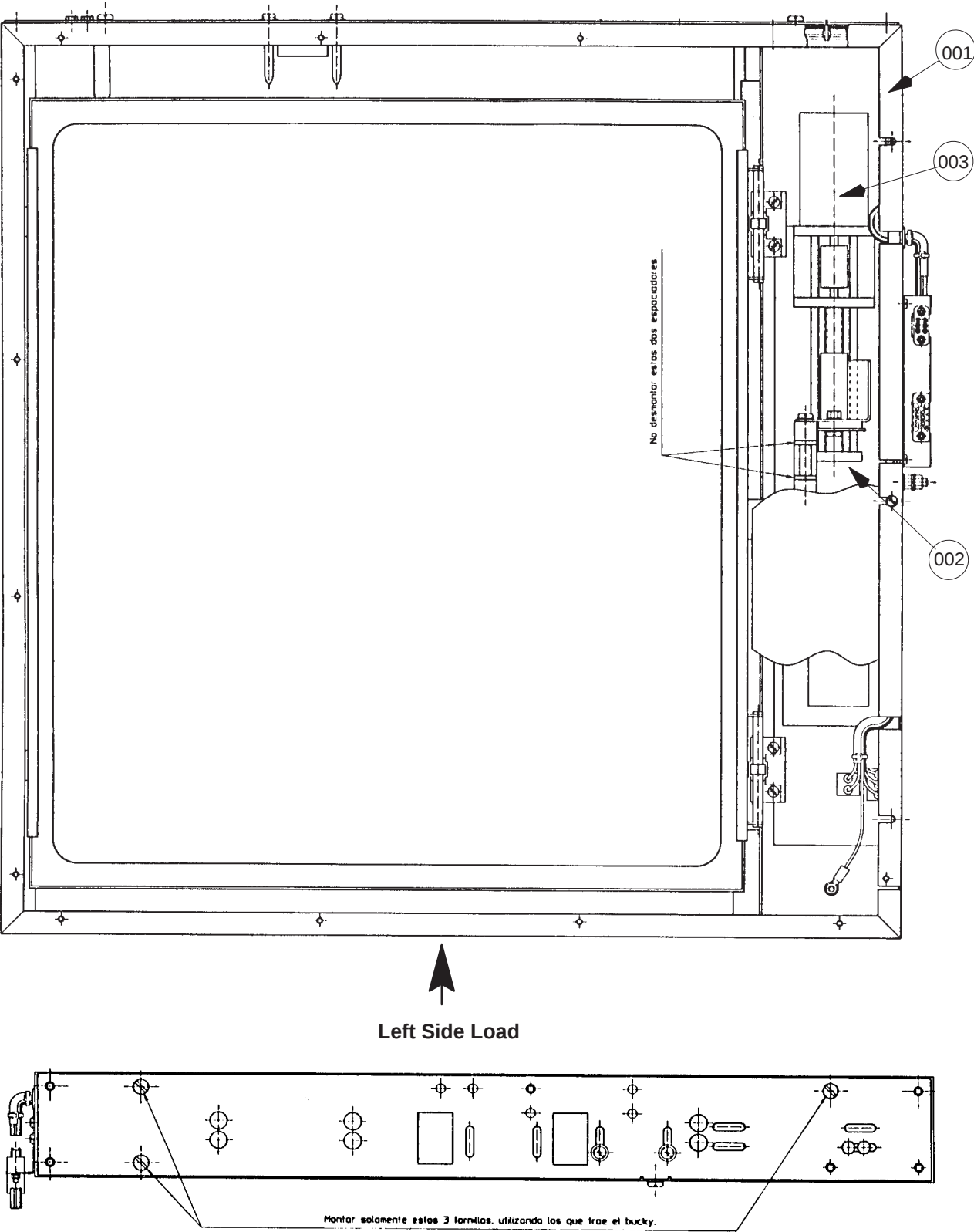


ILLUSTRATION 6-6

LIEBEL BUCKY 248051D LEFT SIDE LOAD ASSEMBLY 2154256

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
001	2154256	2	N	LIEBEL BUCKY LEFT SIDE LOAD	1	
002	46-250261P1	1	N	PCB ASSEMBLY BUCKY (LF248257)	1	
003	46-250261P2	2	N	MOTOR DRIVE (LF248300)	1	

ILLUSTRATION 6-7

LIEBEL BUCKY 248051D RIGHT SIDE LOAD ASSEMBLY 2154255

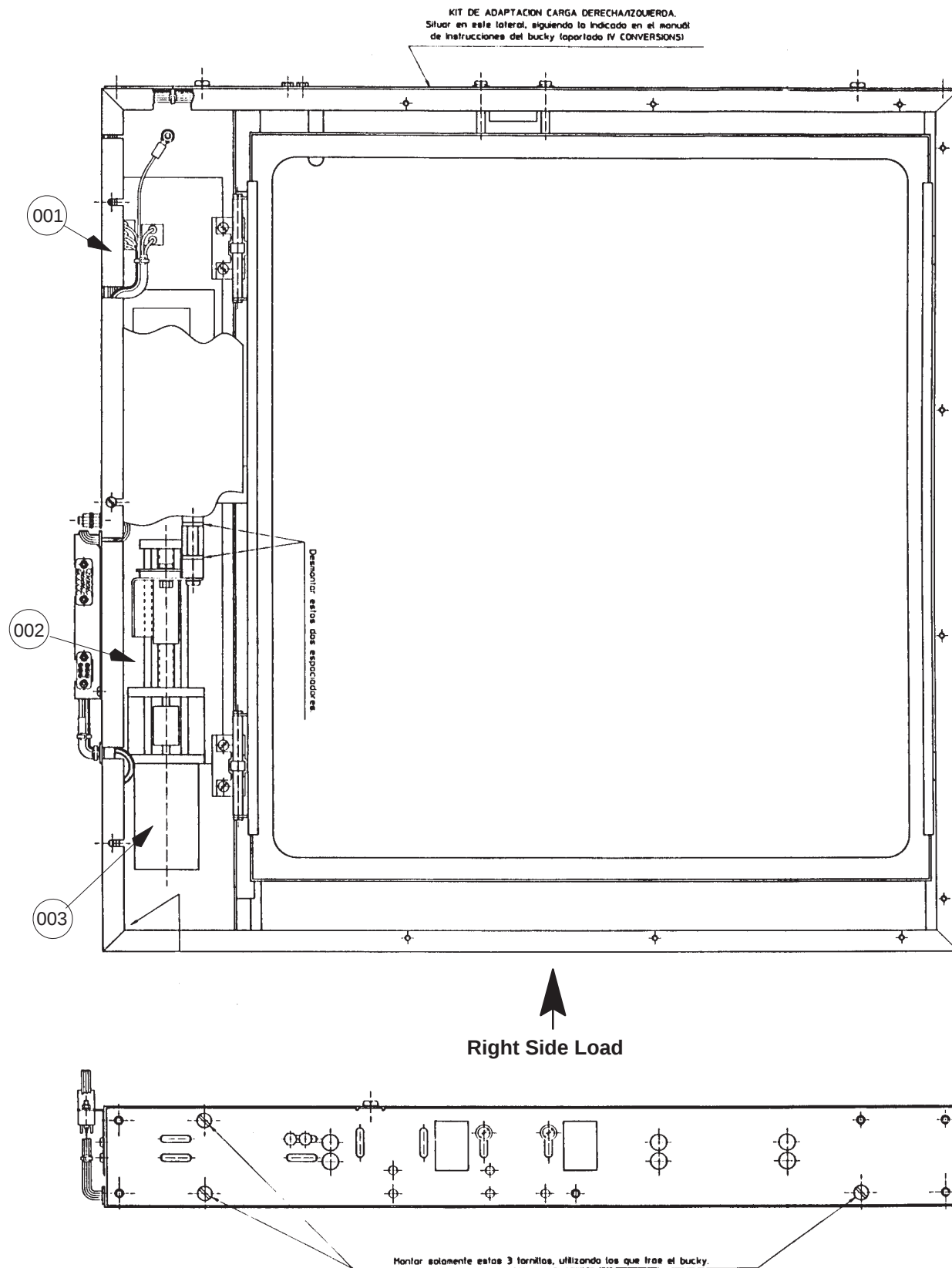


ILLUSTRATION 6-7

LIEBEL BUCKY 248051D RIGHT SIDE LOAD ASSEMBLY 2154255

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
001	2154255	2	N	LIEBEL BUCKY RIGHT SIDE LOAD	1	
002	46-250261P1	1	N	PCB ASSEMBLY BUCKY (LF248257)	1	
003	46-250261P2	2	N	MOTOR DRIVE (LF248300)	1	

ILLUSTRATION 6-8
MEDYS BUCKY LEFT SIDE LOAD ASSEMBLY 2209233

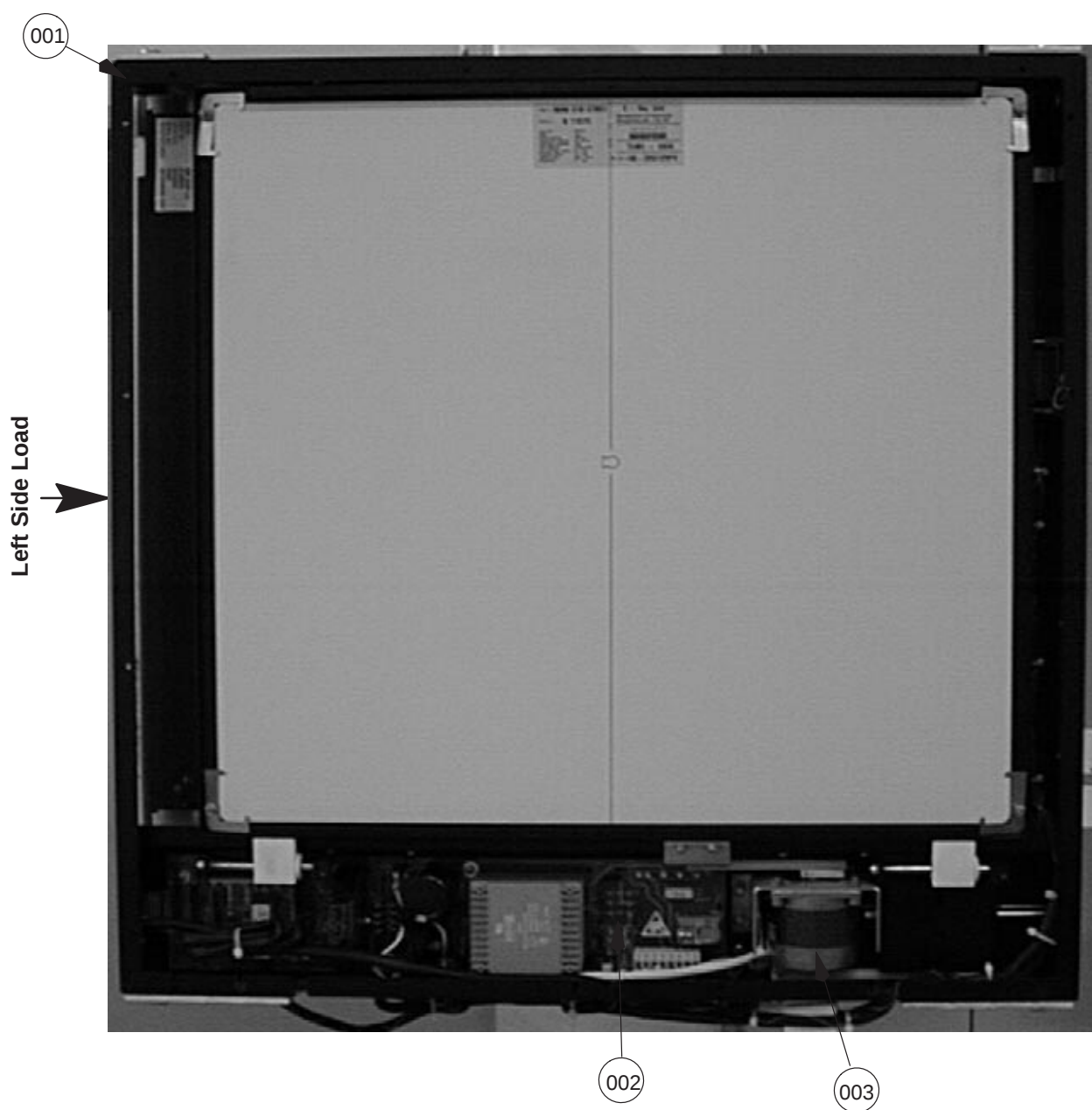


ILLUSTRATION 6-8

MEDYS BUCKY LEFT SIDE LOAD ASSEMBLY 2209233

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
				1 2 3 4 5		
001	2189553	2	N	MEDYS BUCKY LEFT SIDE LOAD (MB 2000 LH)	1	
002	2203422	1	N	BUCKY ASSEMBLY PWD (LEFT-HAND)	1	
003	2203332	1	N	MOTOR & COUNTERWEIGHT ASSEMBLY (LEFT-HAND)	1	
—	2203333	1	N	RAIL	1	
—	2203334	2	N	SENSING CABLE	1	
—	2203421	2	N	POWER SUPPLY CABLE	1	
—	99184141	1	N	FUSE 0.2A SLOW 5X20 250V (230V)	1	
—	607176	1	N	FUSE 0.4A SLOW 5X20 250V (115V)	1	

ILLUSTRATION 6-9
MEDYS BUCKY RIGHT SIDE LOAD ASSEMBLY 2209224

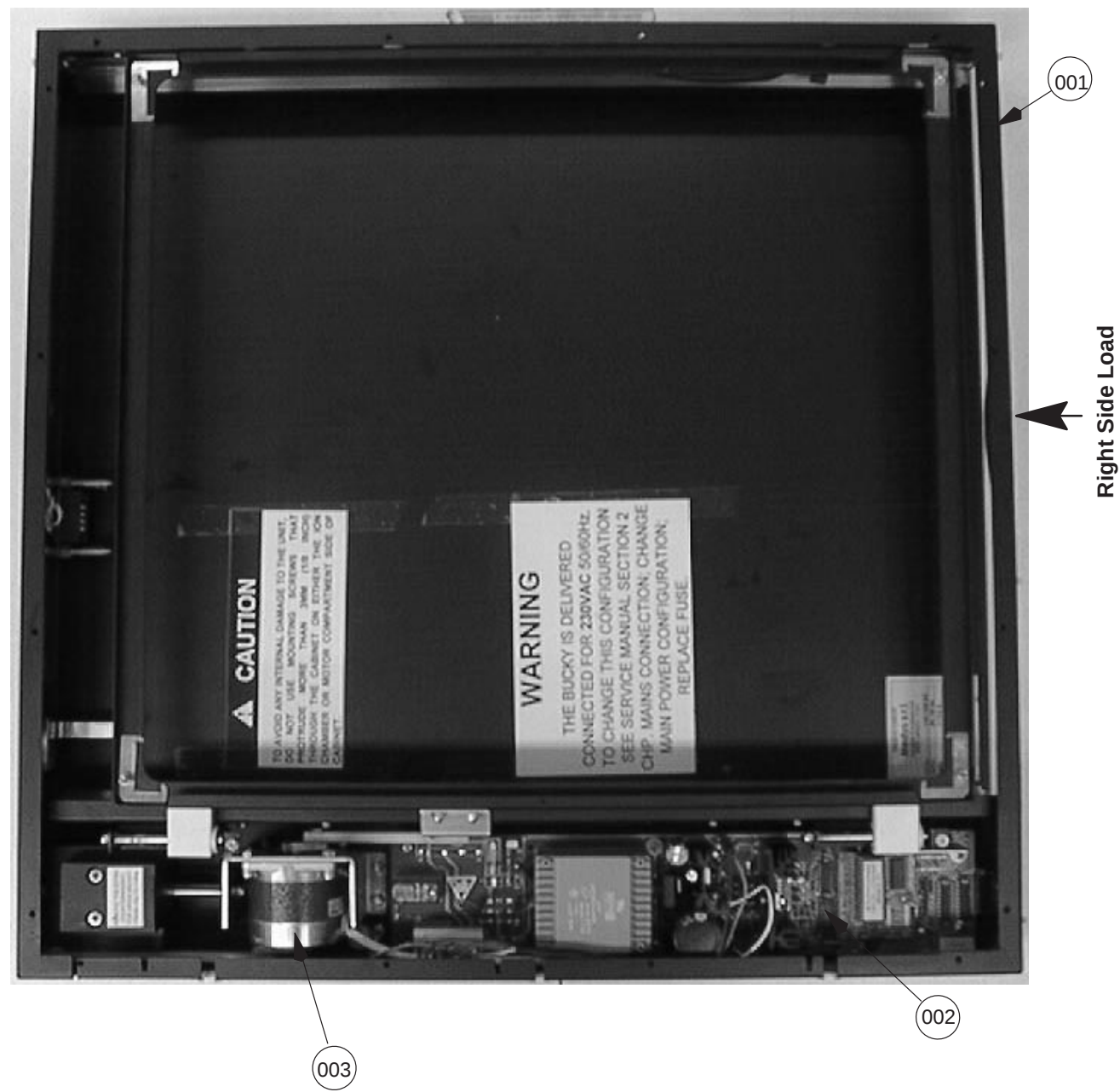


ILLUSTRATION 6–9

MEDYS BUCKY RIGHT SIDE LOAD ASSEMBLY 2209224

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
001	2189553–2	2	N	MEDYS BUCKY RIGHT SIDE LOAD (MB 2000 RH)	1	
002	2207209	1	N	BUCKY ASSEMBLY PWD (RIGHT–HAND)	1	
003	2207210	1	N	MOTOR & COUNTERWEIGHT ASSEMBLY (RIGHT–HAND)	1	
–	2203333	1	N	RAIL	1	
–	2203334	2	N	SENSING CABLE	1	
–	2203421	2	N	POWER SUPPLY CABLE	1	
–	99184141	1	N	FUSE 0.2A SLOW 5X20 250V (230V)	1	
–	607176	1	N	FUSE 0.4A SLOW 5X20 250V (115V)	1	

ILLUSTRATION 6-10
ION CHAMBER (BVM) 845027G055

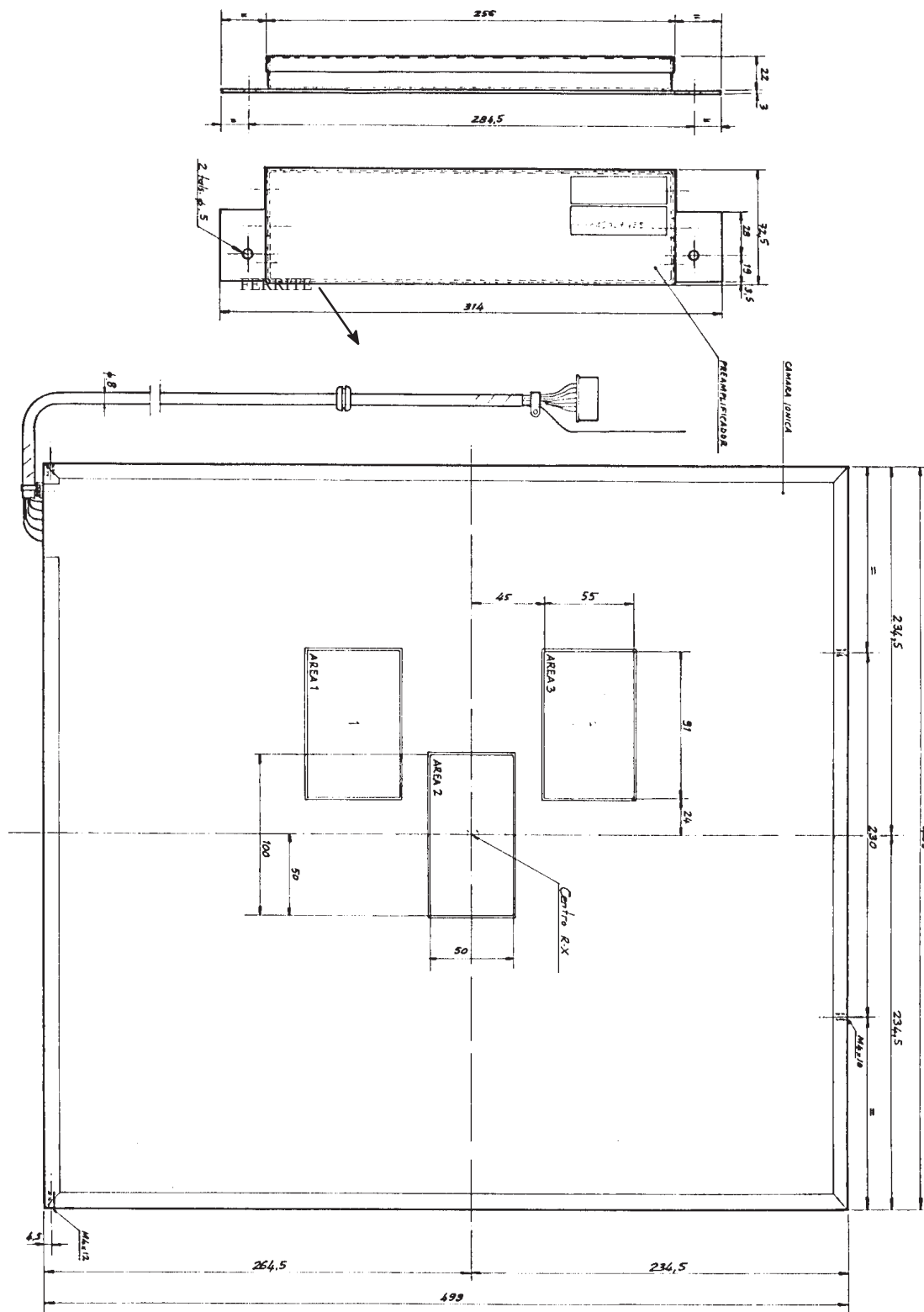


ILLUSTRATION 6–10
ION CHAMBER (BVM) 845027G055

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION					QTY	APP
				1	2	3	4	5		
–	845027G055	1	N	ION CHAMBER, CE MARKED (BVM)					1	

ILLUSTRATION 6-11
AUTOMATIC TRAY (GE) 45435291

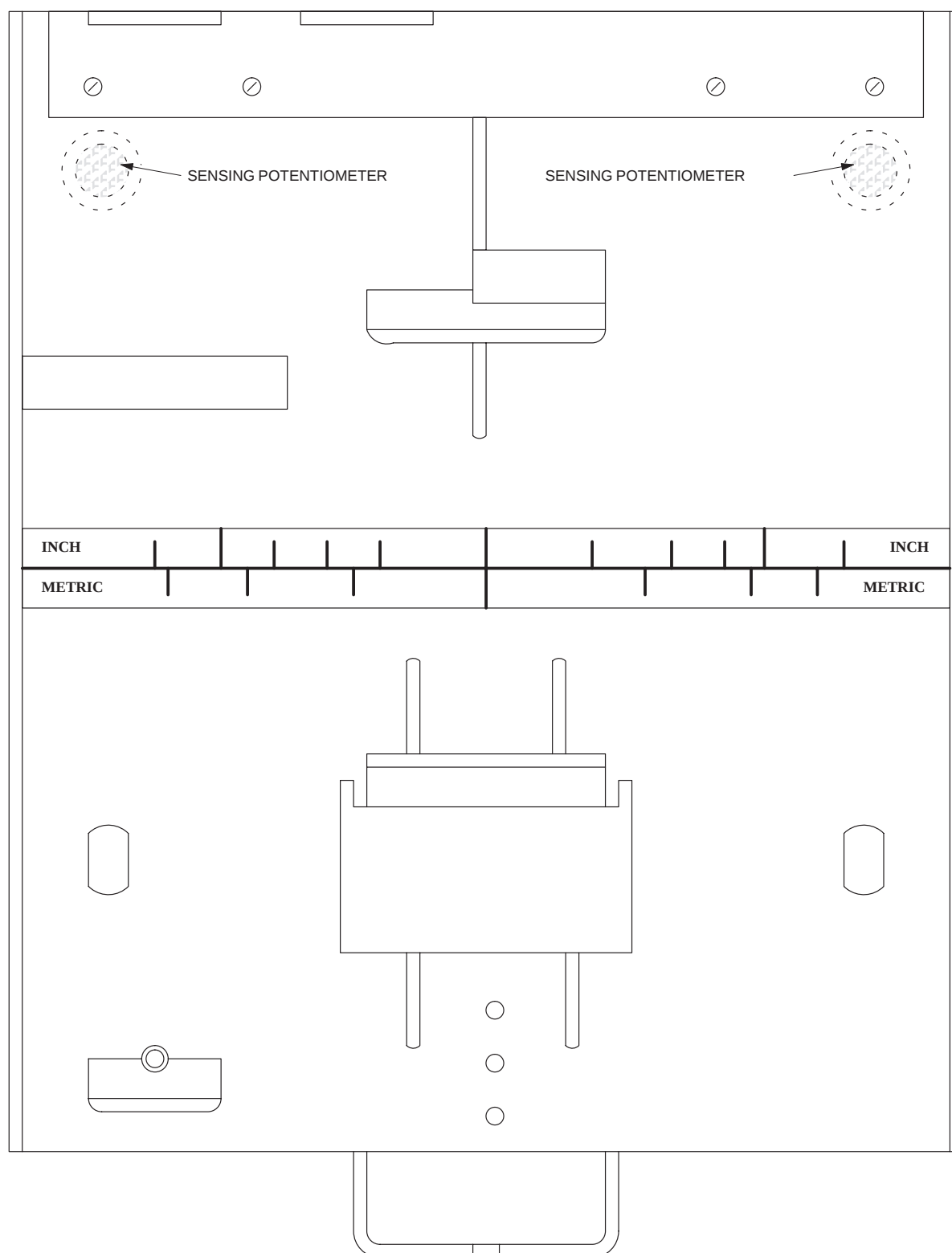
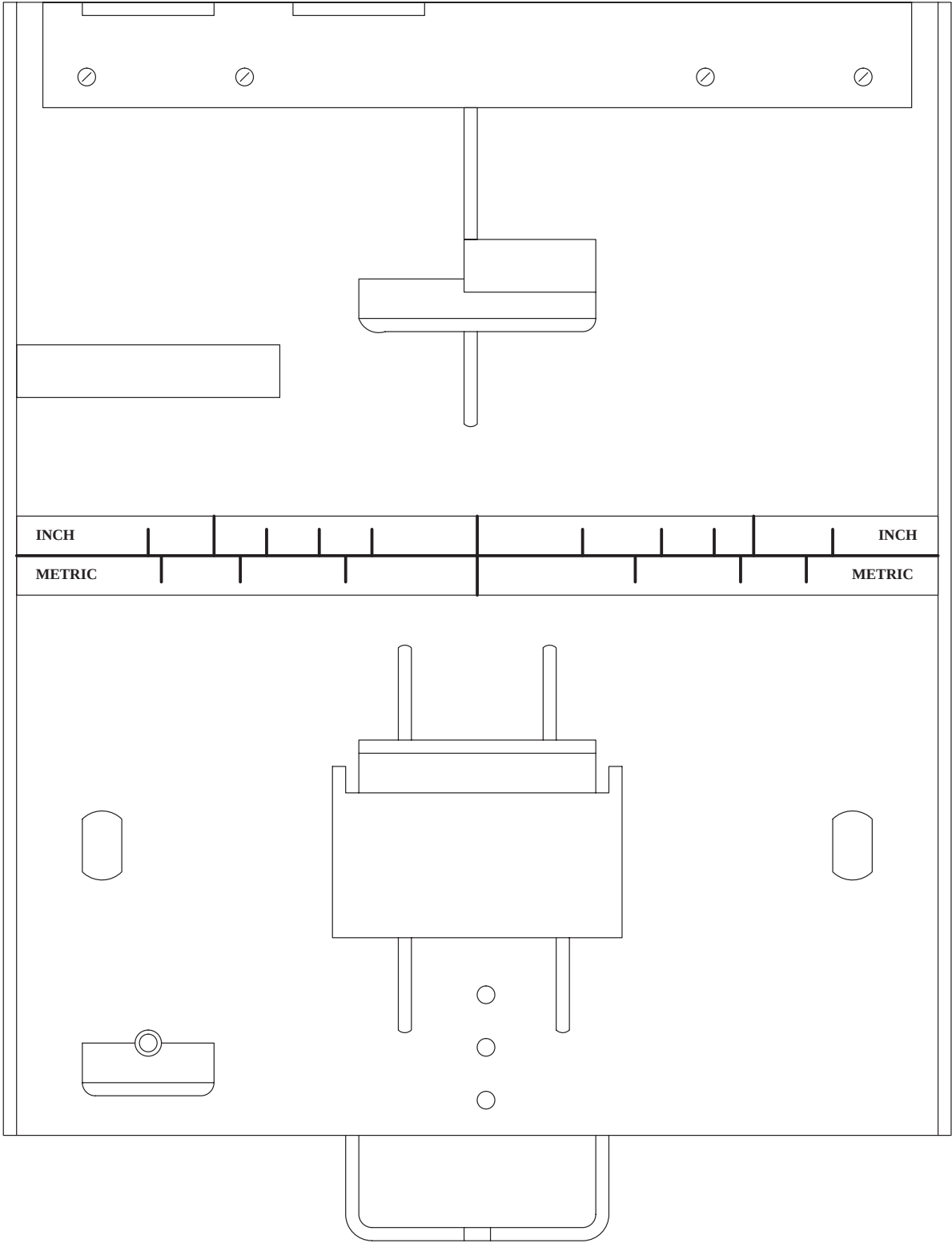


ILLUSTRATION 6-11
AUTOMATIC TRAY (GE) 45435291

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION					QTY	APP
				1	2	3	4	5		
—	45435291	1	Y	AUTOMATIC TRAY (GE)					1	

ILLUSTRATION 6-12
MANUAL TRAY (GE) 45435290



RENEWAL PARTS

ILLUSTRATION 6-12
MANUAL TRAY (GE) 45435290

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION					QTY	APP
				1	2	3	4	5		
—	45435290	1	N	MANUAL TRAY (GE)					1	

ILLUSTRATION 6-13
GRID FOR LIEBEL BUCKY

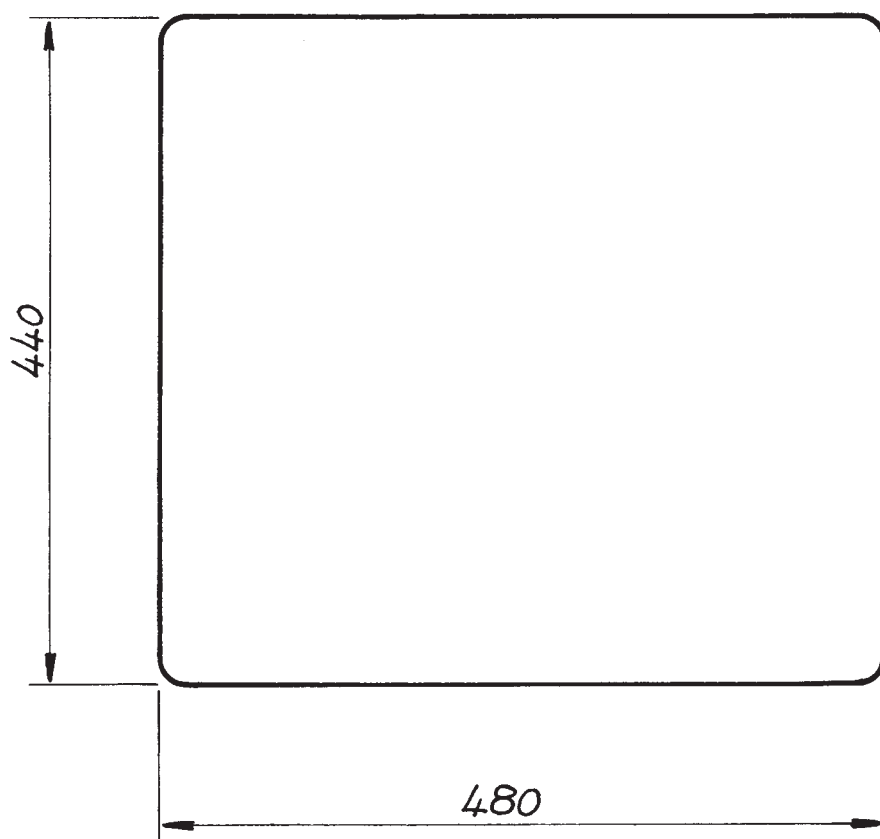


ILLUSTRATION 6-13
GRID FOR LIEBEL BUCKY

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION					QTY	APP
				1	2	3	4	5		
—	2161122	2	N	GRID 12:1 44L/CM F-100					1	
—	2163407	2	N	GRID 10:1 44L/CM F-130					1	
—	2161120	2	N	GRID 12:1 44L/CM F-180					1	
—	2161123	2	N	GRID 8:1 44L/CM F-180					1	

ILLUSTRATION 6-14
GRID FOR MEDYS BUCKY

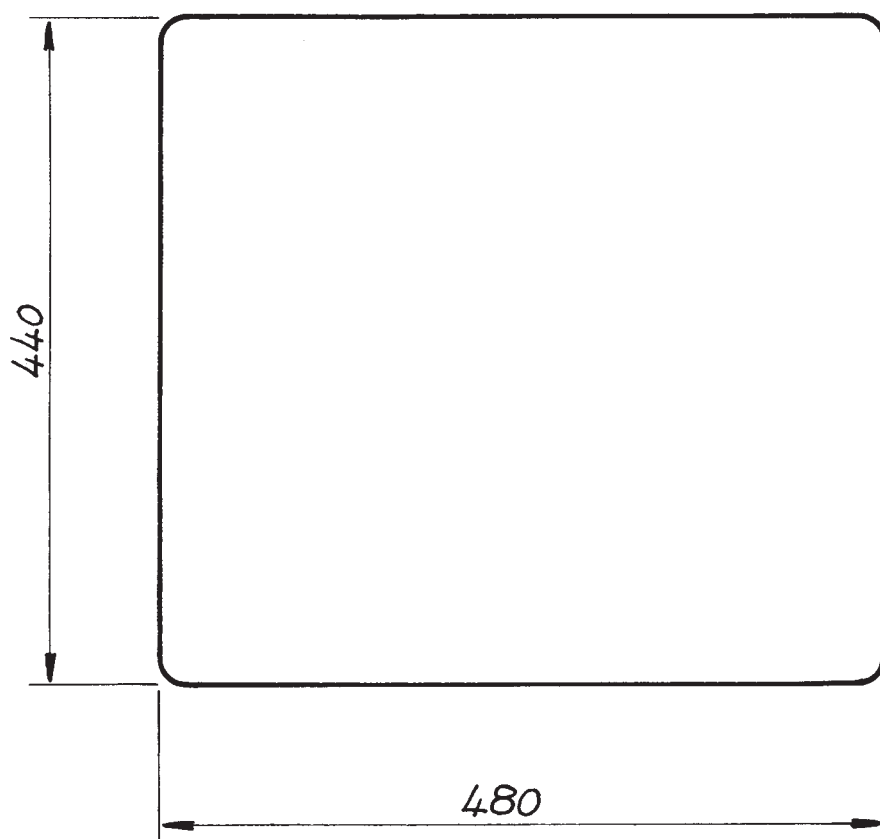


ILLUSTRATION 6-14
GRID FOR MEDYS BUCKY

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION					QTY	APP
				1	2	3	4	5		
–	46-908086P01	2	N	GRID 12:1 36L/CM F-100					1	
–	2228951-2	2	N	GRID 10:1 36L/CM F-130					1	
–	46-909146P01	2	N	GRID 12:1 36L/CM F-180					1	
–	2228951-4	2	N	GRID 8:1 36L/CM F-180					1	

ILLUSTRATION 6-15
COUNTERWEIGHT CHAIN KIT 2230069

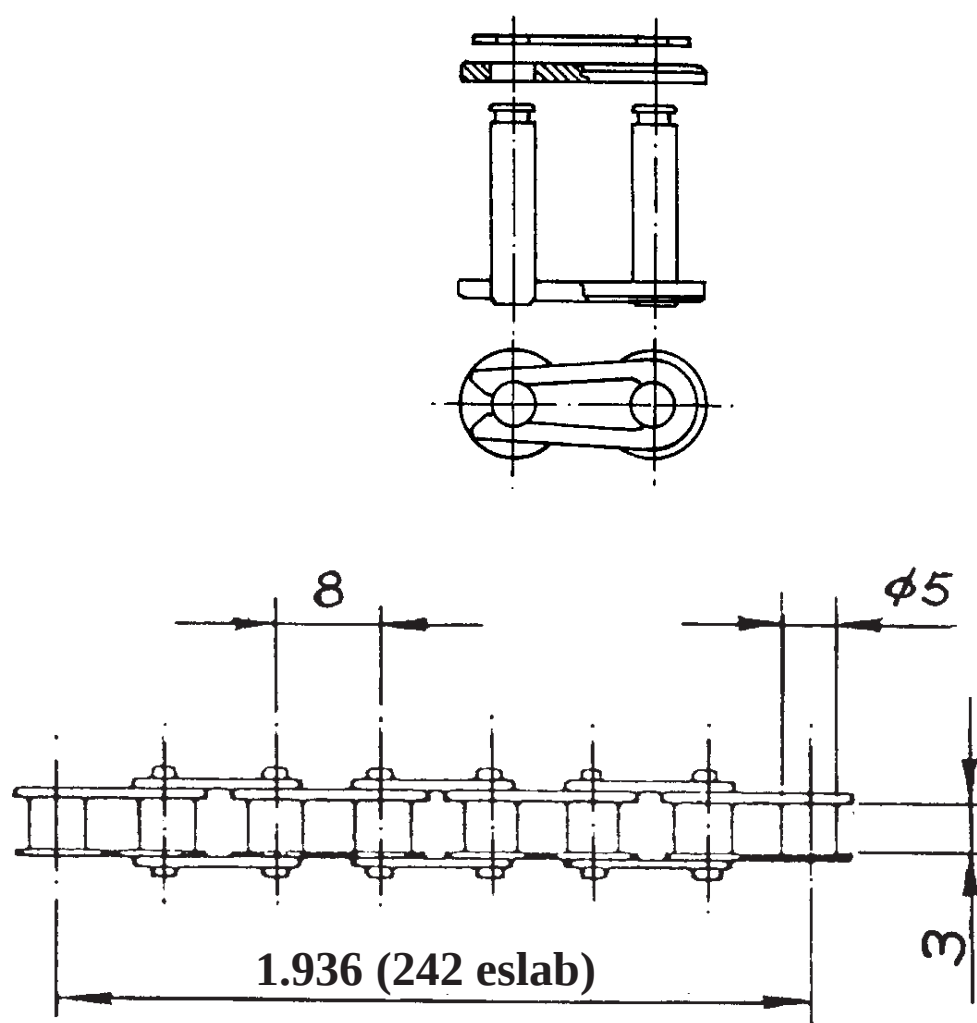


ILLUSTRATION 6-15
COUNTERWEIGHT CHAIN KIT 2230069

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION					QTY	APP
				1	2	3	4	5		
	2230069	1	N	COUNTERWEIGHT CHAIN KIT					1	

ILLUSTRATION 6-16
MECHANICAL BRAKE ASSEMBLY 45432376

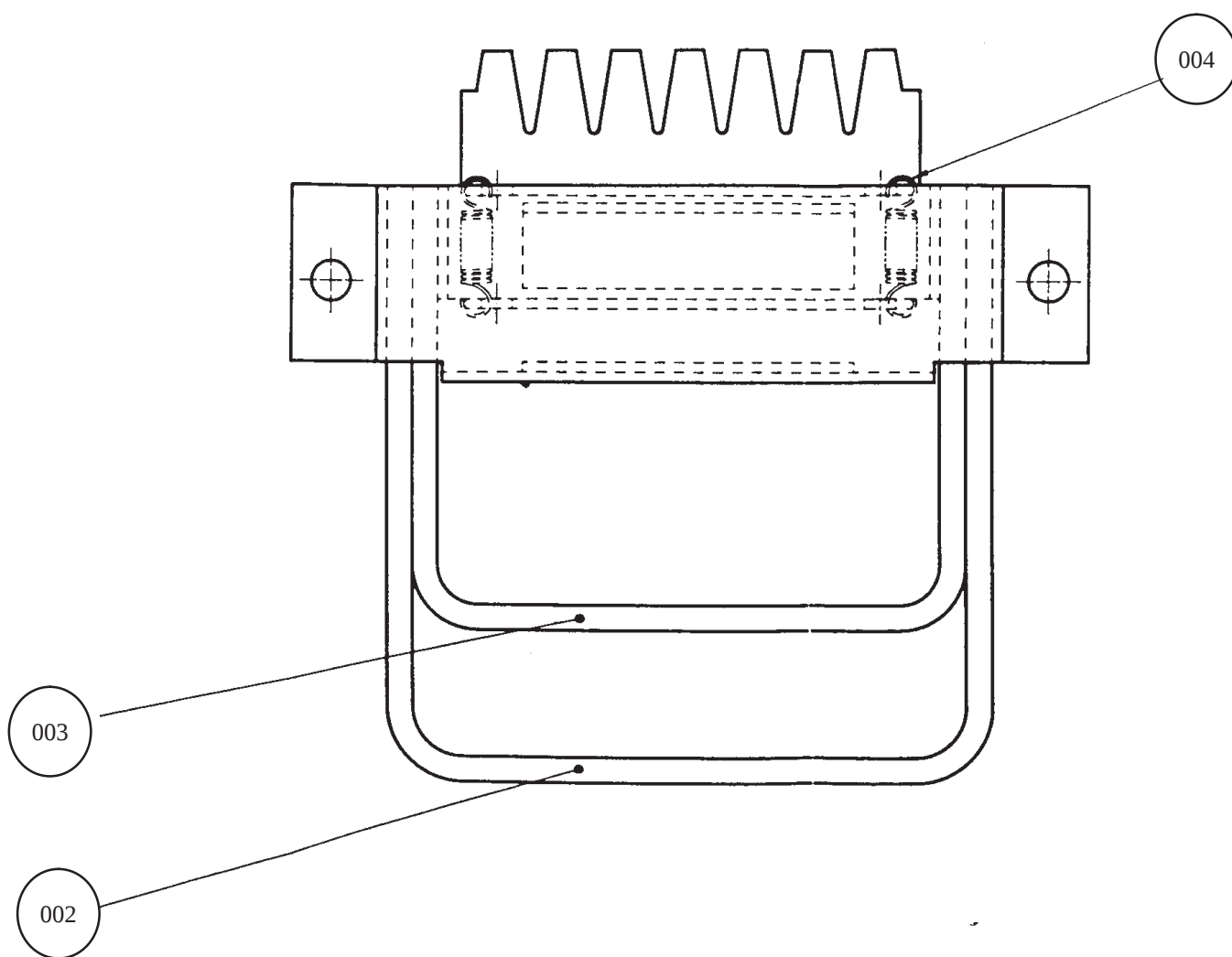


ILLUSTRATION 6-16
MECHANICAL BRAKE ASSEMBLY 45432376

ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
	45432376	1	N	MECHANICAL BRAKE ASSEMBLY	1	
002	45432389	N	N	• BRAKE ASSEMBLY WELDED	1	
003	45432393	N	N	• INTERLOCK ASSEMBLY WELDED	1	
004	45432397	1	N	• BRAKE SPRING	2	

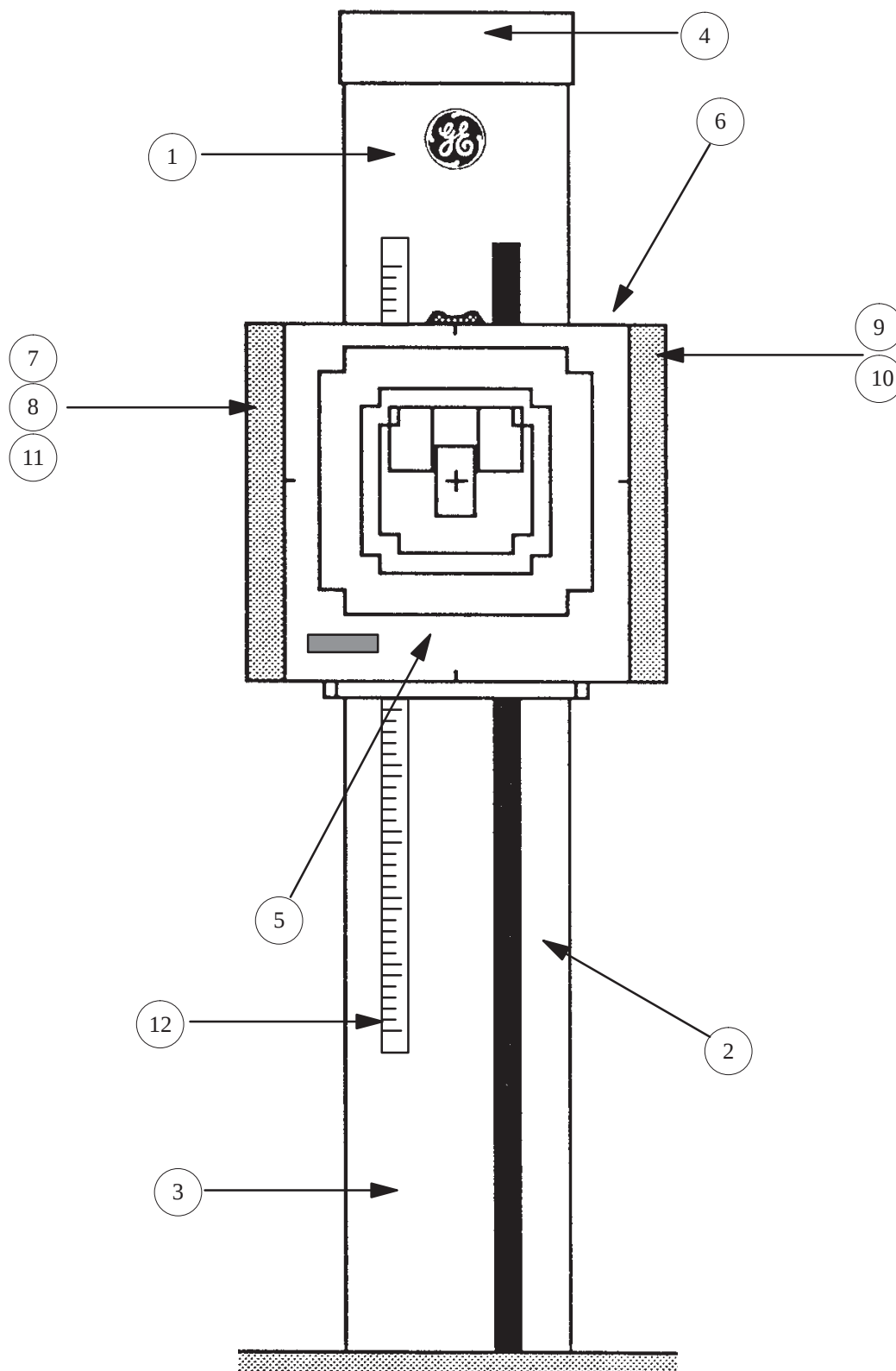
ILLUSTRATION 6-17
SG 60 COVERS

ILLUSTRATION 6-17
SG-60 COVERS

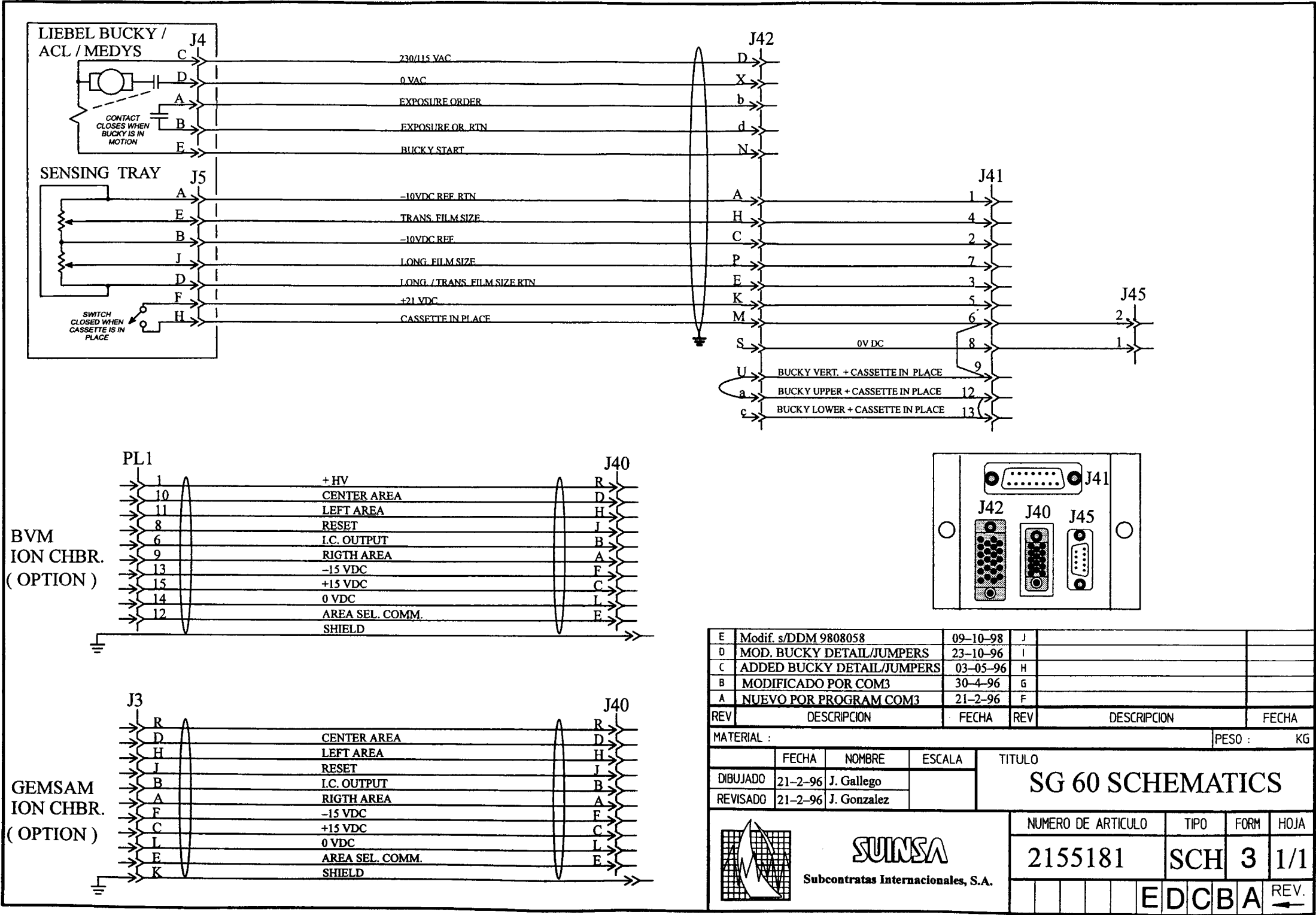
ITEM NO.	PART NO.	FRU	REP	DESCRIPTION	QTY	APP
1	2126451	2	N	• UPPER FRAME COVER	1	
2	45433665	2	N	• LOWER FRAME COVER	1	
3	45433663	2	N	• LOWER FRAME COVER	1	
4	45432375	2	N	• TOP COVER	1	
5	45432299	2	N	• BOTTOM BUCKY COVER	1	
6	45433473	2	N	• TOP LIEBEL BUCKY COVER	1	
7	45433475	2	N	• LATERAL (CASSETTE ENTRANCE) BUCKY COVER (LEFT SIDE LOAD)	1	
8	45433481	2	N	• LATERAL (CASSETTE BOTTOM) LIEBEL/MEDYS BUCKY COVER (LEFT/RIGHT LOAD)	1	
9	45433476	2	N	• LATERAL (CASSETTE ENTRANCE) BUCKY COVER (RIGHT SIDE LOAD)	1	
10	45433635	2	N	• LATERAL (CASSETTE BOTTOM) ULTRAVIT BUCKY COVER (LEFT SIDE LOAD)	1	
11	45433634	2	N	• LATERAL (CASSETTE BOTTOM) ULTRAVIT BUCKY COVER (RIGHT SIDE LOAD)	1	
12	46-919753P01	1	N	• HEIGHT SCALE (INCH)	1	
—	46-919754P01	1	N	• HEIGHT SCALE (CM)	1	

Blank page.

CHAPTER 7 – SCHEMATICS

Blank page.

ILLUSTRATION 7-1
SG-60 I/O PANEL INTERCONNECTIONS



Blank page.