Technical Publications

Direction 2319685
Revision 1

BRM RF Shield Grounding Upgrade

Installation Manual

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

REVISION HISTORY

REV	DATE	PRIMARY REASON FOR CHANGE
0	March 12, 2002	Initial release.
1	February 20, 2006	Add step and illustration showing ground strap installation on CX Magnet

PAGE	REV	PAGE	REV	PAGE	REV	PAGE	REV
Title……..	**0**						
Pg 2-18……	**1**						

* This revision/letter corresponds to the indicated document's revision control system.

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EFFECTIVITY:

All Signa® Systems with LCC, CX, Magnex 3t/94 and S series magnets, BRM, TRM and CRM gradient coils and ACGD gradient drivers. Also SGD, GRAM when done as Infinity H/W upgrade.

PURPOSE:

The purpose of this upgrade is to improve image quality in off-center extremity coil scanning.

RELATED MODIFICATIONS:

(This kit does not require the mods below, it will be packaged with them for efficiency)

- Signa Cx/K4 Magnet Wide Open Enclosure Bridge Support Upgrade
- Gradient Radial Support Upgrade

OVERVIEW:

This upgrade installs a grounding cable between the resonance module RF shield and magnet.

Before You Begin

You should run a pass of SPT white pixel test (head only, Whole only if TRM) and record the results before beginning this procedure. After finishing the upgraded and all covers have been restored, run SPT white pixel test again and the results should be the same as the first pass.

Summary of Procedure

1. Remove front end-bell from magnet.
2. On TRM and CRM remove body RF coil.
3. Lift first shield strap from inside the resonance module.
4. Prepare shield surface and connect with silver epoxy a ground wire to shield.
5. Secure ground wire to resonance module and magnet.
6. Snap shield strap back in place.
7. Install body coil and end-bell, and test system IQ.

MANPOWER REQUIREMENTS:

One Service Engineer for three (3) hours, plus travel.

FURNISHED MATERIALS:

Service kit 2320728 consisting of the following parts.

Item	Description	GE PN	Qty
1	Ground Lead for RF Shield Ground Kit Document	2320729	1
2	Ground Lead Strain Relief, M10X15	2320730	1
3	7.32” X .184” Self – Locking Cable Tie	46-208758p3	8
4	7.81" X .184" Screw Mount Cable Tie	46-208759P6	1
5	CABLE TIE MOUNT, PANDUIT 1.5” square	46-252283P70	4
6	SCREW HEXAGON SOCKET 10 MM 16 MM	2109867-21	1
7	2-PART, SILVER EPOXY ADHE 1.5 GRAM TWIN PACK	46-278535P1	1
8	SCREW PAN HEAD 4 MM 16 MM	2109873-16	1
9	CLOTH DUCT TAPE W/ SOLVENT RESISTANT ADHESIVE	2322944	1
10	HEAT PACK, MEDI-FIRST HOT COMPRESS	2326207	1
11	EXTENSION WIRE, LONG BORE MAGNET SHEILD GRD	2326654	1
12	AMP PART #35244 (BUTT SPLICE)	511A590P416	1
13	SCREW	46-208737P47	1
14	NUT HEXAGON 8 MM	2109875-7	1

FIELD SUPPLIED MATERIALS:

Cleaning Fluids

Tools for removing the end-bell (all systems) and body RF coil (TRM and CRM only).

SPECIAL TOOLS AND TEST EQUIPMENT:

None

IMPORTANT NOTES:

- If shield strap fails to lift from inside surface of resonance module, or if there are questions on procedure, call MKE engineering for assistance. T. Skloss (262)521-6263

WARNING!

- **Understand these instructions thoroughly before beginning work.**
- **Due to the type of work involved in this project, there is a chance of creating a white pixel source. Therefore it is important to run a few passes of white pixel tests (head only, in EPT test) before and after installing this kit.**
- **You must make every effort to ensure that the fragile RF shield does not get damaged. Any damage to the shield will require immediate replacement of the resonance module.**
- **Do not use sharp, metal tools to separate the shield strap from the shield.**
- **Be careful not to pull the grounding wire free of the epoxy before it sets up. If the wire is pulled free before the epoxy sets completely (3 hours), the epoxy will have to be sanded away and this instruction repeated.**

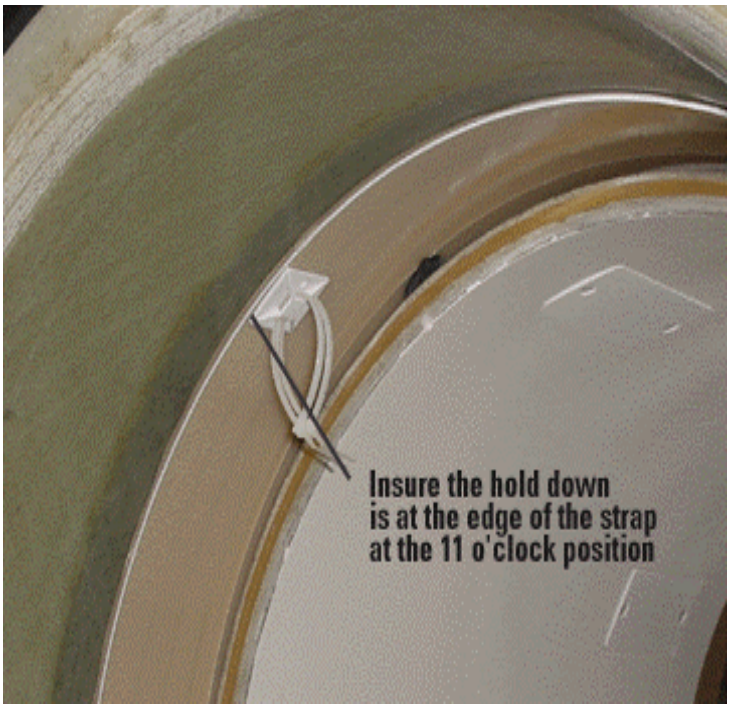
PROCEDURE

Section 1 – Strap Lifting

Instructions for removing covers and coils can be found on LX Service Methods CD 2160623.

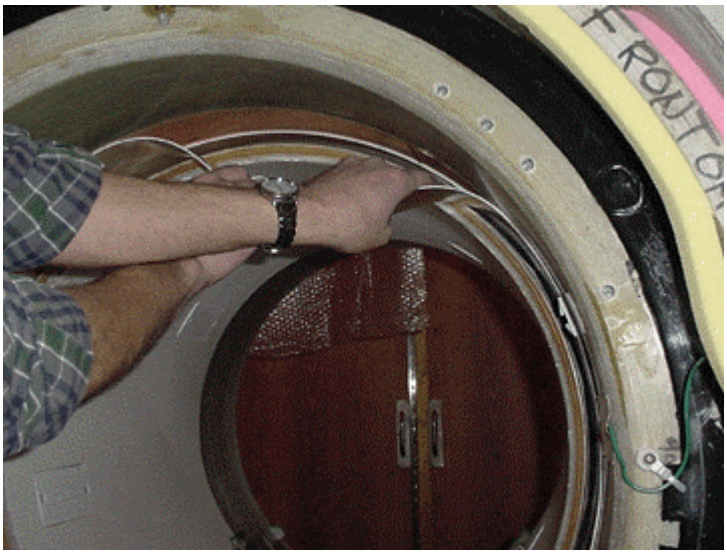
1. Remove front end-bell from magnet.
2. On TRM and CRM equipped systems, remove the body RF coil.
3. On TRM systems remove the aluminized mylar sheet on the front-end of the gradient coil.
4. Shown on right is the front-side of a BRM. Remove the tape securing the right G10 RF coil alignment strip if present.
5. At the 315 degree (11 o'clock) position use alcohol or suitable cleaner to thoroughly clean the glazed surface of the G10 shield strap.
6. Be sure the surface is clean and dry before proceeding.

7. At the 315 degree point (11 o'clock position when looking into front of resonance module) place a wire tie hold-down pad on the cleaned surface near the front edge of the shield strap.
8. Press down firmly to ensure a good seal.
9. If prepared properly, the pad will adhere very strongly to the shield strap.
10. Additional hold-down pads are provided if the first one fails.
11. Insert a heavy duty 0.3" wide by 14.5" long wire tie through the hold-down pad and lock into a loop as shown.



12. Use a nonmagnetic screw driver or similar tool to function as a handle. Insert the tool through the wire tie loop.
13. Carefully and slowly pull on the handle to raise the shield strap. Alternatively, use a long rod with a fulcrum to leverage against the pull of the shield strap. Using a lever will give you more control.
14. The shield strap will pop up from the inside surface of the resonance module and form a bubble as shown.

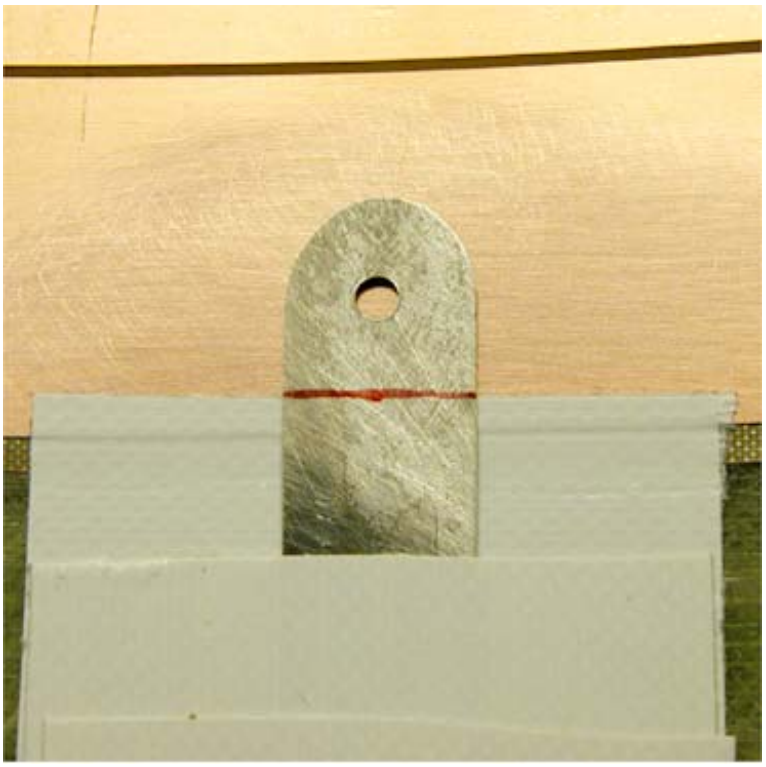
15. Once the strap is pulled away from the bore, carefully pull it around going hand over hand until the bubble in the strap is at the 90 degree (3 o'clock) position.



Section 2 – Wire Installation

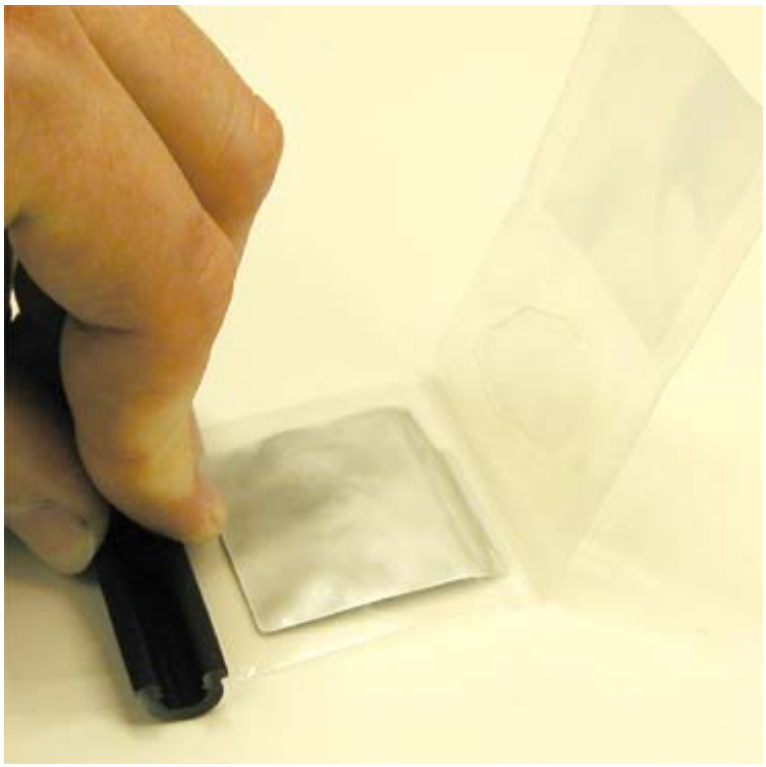
1. Use ScotchBrite or fine (400) sandpaper to clean a 4 cm square area under the bubble at the 90 degree point as shown.
2. Clean and dry the area with an alcohol wipe or other suitable cleaning fluid and cloth.
3. Use ScotchBrite or fine sandpaper to clean the top and bottom surface of the tinned copper strip on the ground wire harness.
4. Use a marker to make a mark on the tinned copper strip 15 mm from the end of the strip. This mark will be the depth of overlap between the ground wire harness and the RF shield.

5. Cut a piece of cloth tape 50 mm long and carefully position under the shield “bubble” so that the long, smooth edge of the tape overlaps the copper edge of the shield by 2-4 mm. Press the tape into place. This piece of tape will protect the edge of the shield from excess silver epoxy.
6. Position the ground wire harness along the 90 degree axial line so that the end with the copper strip overlaps the RF shield to the 15mm mark as shown. The wire should stretch from the RF shield to the M10 threaded hole on the edge of the resonance module at the 90 degree position.
7. Use small pieces of cloth tape to hold the wire in this location.

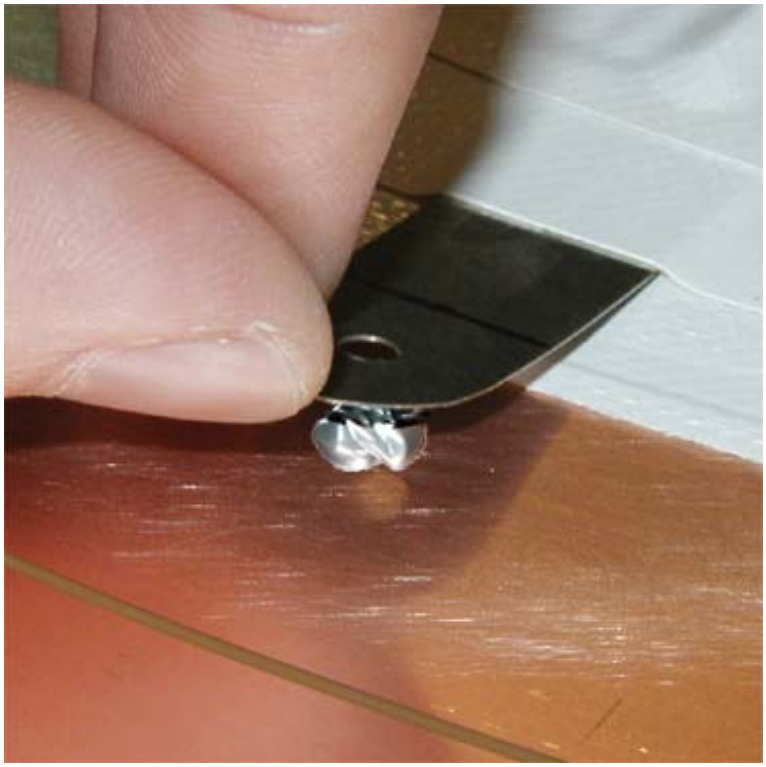


8. Remove the heat pad from the box and inspect for premature activation. Hold the pack at the top and gently shake the crystals to the bottom of the packet. The crystals should be easily felt at the bottom of the bag. Check that the water packet at the top of the pack is still firm when squeezed gently. Find a suitable replacement if the pack has been damaged in shipping. Place pack to the side for later use.

9. Carefully open the silver plastic bag containing the silver epoxy. Cut along the edge opposite the bulge. Be sure not to damage the epoxy packet inside.
10. Remove the plastic divider in the middle of the epoxy packet.
11. Place the epoxy packet on a smooth, hard surface and use the black portion of the divider to push the silver epoxy resin across the center barrier in the packet.
12. Mix the resin and hardener very well. Use the plastic divider as a tool to push the resin across the inside of the packet about 40 times. Be sure the epoxy is well mixed before proceeding.

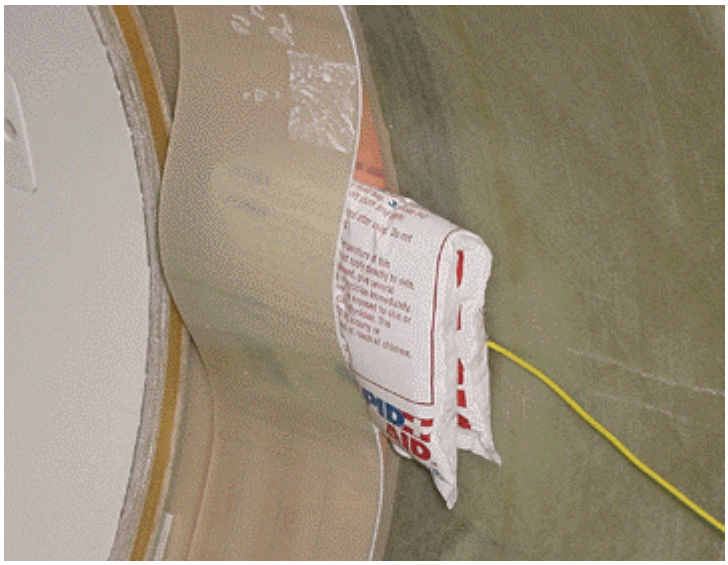


13. Cut a corner off the epoxy packet to make a 1 to 2 mm wide opening.
14. Gently lift the edge of the tinned copper strip that overlaps the RF shield and apply a small amount of silver epoxy between the strip and shield.
15. Only a small amount is necessary! A 5 mm diameter drop is enough. The epoxy packet contains much more than is required.
16. Release the copper strip and allow to settle into the epoxy. Gently press the copper strip against the shield until epoxy can be seen around the edges of the strip.



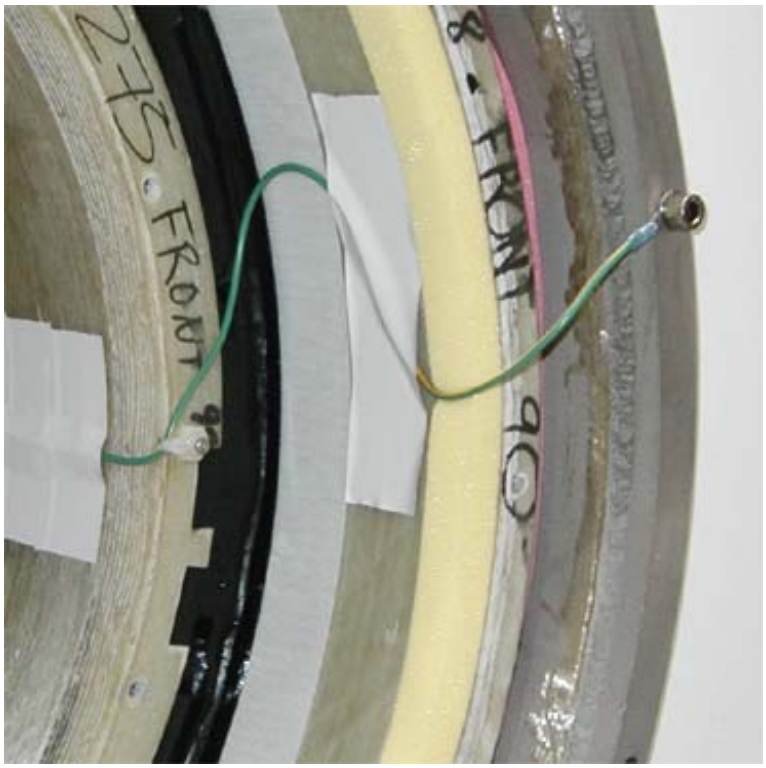
17. Cut a 50 mm square strip of cloth tape and apply to epoxy joint. Center the tape on the hole in the strip.
18. Carefully smooth the tape down over the epoxy joint so that no epoxy leaks out from under the tape.
19. The tape should hold the copper strip in place while the epoxy sets.
20. Activate the heat pad by squeezing the water packet at the top of the pad until it bursts. Shake the water and crystals at the bottom of the pad until well mixed.
21. Fold the top half of the pad over (the top half has built-in insulation) and place over the epoxy joint.

22. The bubble in the shield strap can be enlarged by slowly and carefully pulling the strap away from the inside of the resonance module. Only pull far enough to fit the folded heat pad between the shield strap and the epoxy joint.
23. Allow the shield strap to hold the heat pad against the epoxy joint for one hour.

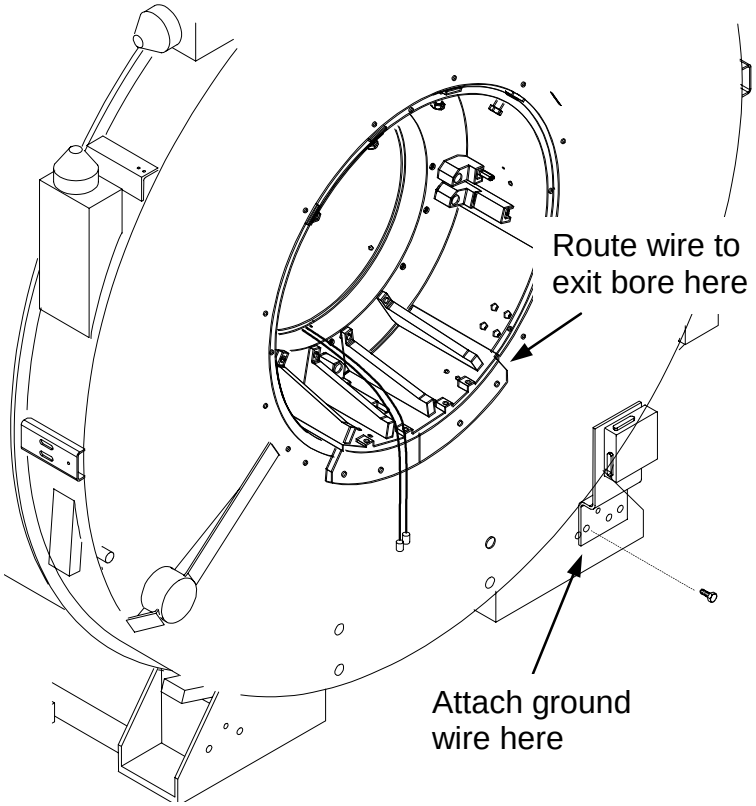


24. While the epoxy is setting, install the wire anchor.
25. Install the nylon M10 bolt in the threaded hole at the 90 degree point and tighten until seated firmly.
26. Attach the nylon wire tie with the anchor ‘eye’ to the nylon bolt using the stainless M4 screw. Make a loop in the wire tie.
27. Run the ground wire harness through the loop in the wire tie.

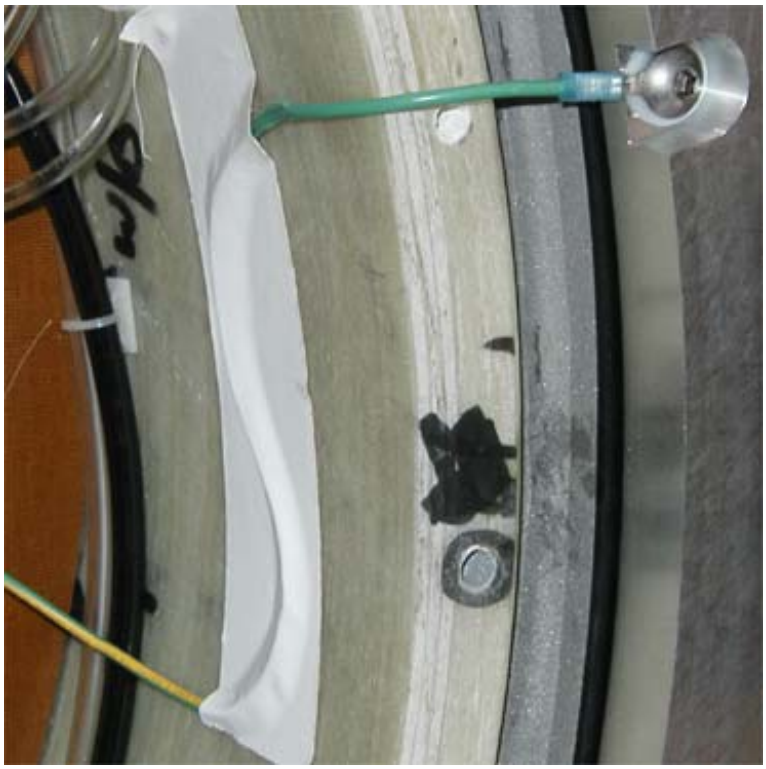
28. Attach the ring terminal end of the ground wire harness to the magnet interface ring. On BRM and CRM systems shown here, choice of hole on interface ring is not important as long as ground wire does not bind against a sharp surface. Use an M10 hex-cap screw and lock washer to attach to magnet interface ring.



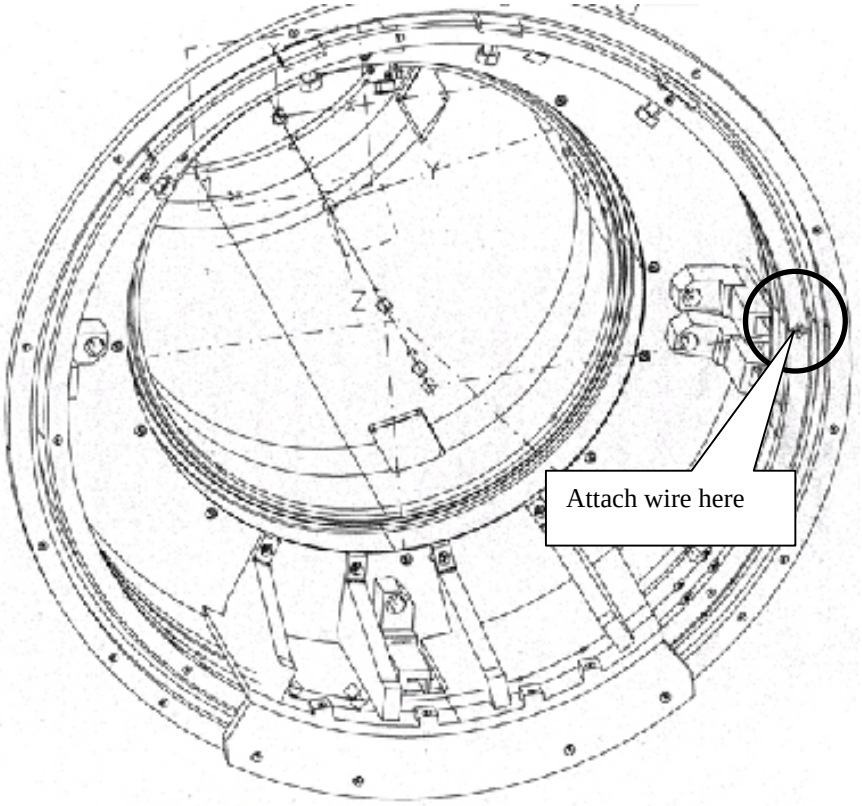
28b. For CX magnets - cut off the ring terminal from the ground wire. Use the extension wire and butt splice provided to extend the grounding wire. Route the ground wire so it will exit the bore around the 135-degree location. Route the ground wire down to the dock power supply located on the magnet foot. Remove one of the dock power supply bracket bolts and use it to attach the ground wire at this location.



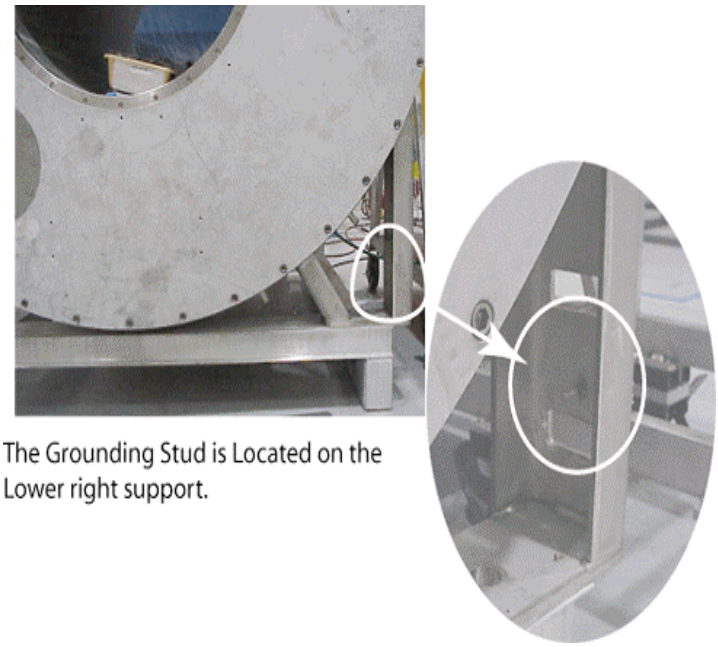
29. On TRM systems, attach the ring terminal to the aluminum ring-retaining bolt that is nearest the 90 degree position as shown on right. Do not use a lock washer on TRM ground attachment.
30. On ALL systems, tape the ground wire harness to the inside of the resonance module so that no portion is allowed to move during scanning.



31. For S Series magnets attach the ring terminal to the aluminum inner ring-retaining bolt that is nearest the 90-degree. As shown to the right.



32. For Magnex 3t/94 Series magnets, the only grounding spot is a stud in the lower right support. The grounding wire has to be lengthened. Cut the terminal ring off the wire. Use the extension wire and butt splice provided to extend the grounding wire. Attach to the grounding stud using the 8 MM nut provided.



The Grounding Stud is Located on the Lower right support.

SECTION 3 – STRAP SEATING

33. One hour from placing the heat pad in place on the epoxy joint, remove the heat pad.
34. Finish applying cloth tape on ground wire from shield joint to anchor point. DO NOT MOVE THE COPPER STRIP IN THE EPOXY JOINT.
35. Use firm, controlled force to push the bubble in the strap back down against the inside of the resonance module.
36. Pry the adhesive pad from the shield strap with a non-magnetic screwdriver or other suitable tool.
37. Replace the tape that holds the RF coil alignment guides in place, if present.
38. On TRM and CRM systems, replace RF body coil.
39. Replace enclosures.
40. Run EPT White Pixel Test (head only) as before. Verify that WPs have not increased.
41. On TRM and CRM systems, run Body coil quick check to verify proper operation of the body coil.