TABLE OF CONTENTS

1- OVERVIEW

This section determines the quadrature balance of the quad coil and the phase splitter network. In this test, the Body or Head TLT Sphere phantom is scanned with the quadrature coil connected in two ways. First, an image is taken with the quadrature coil as presently connected. Next, the cables to the quadrature switches are reversed, and the phantom is scanned a second time using the same protocol. The resultant images are analyzed to verify proper quadrature drive function and cable configuration.

1-1 Tools Required

- Body TLT Sphere, 46-265635G6
- Long Body Loader, 46-287902G1 or SPT Body Loader, 2135652-2
- Head TLT Sphere, 46-265826G6
- Head Loader, 46-287899G1

WARNING!

POISON HAZARD! THE PHANTOM CONTAINS NICKEL, A SUSPECT CARCINOGEN. DO NOT INGEST. DISPOSE OF AS A HAZARDOUS WASTE ACCORDING TO STATE AND FEDERAL REGULATIONS.

2- BODY FORWARD/REVERSE QUADRATURE SCANS

2-1 Procedure

CAUTION

Equipment damage possibility. Completely remove the Quad Head Coil from the cradle before performing any body scans. Failure to do so may damage head coil T/R network.

1. At the operator work space, prepare the system for a Body F/R scan using the *Service Protocols* procedure located on the service methods CD-ROM or use the proprietary procedure as shown below.

   Note

   This proprietary procedure is only available for GE use, and to sites with a valid Advanced Service Package Limited License.

   a. Click on **[New Pt]** (or **[New Series]** if the head scan was done first) and enter the following:
      Id: **geservice**
      Name: **body f/r quad**
      Weight (Lb): **111**
   b. Set Patient Protocols to **Service**.
   c. In the Protocol field, type **o.17.1** (o=Other, 1=series number) **<Enter>** to load the protocol.

2. At the scanner, remove the Quad Head Coil from the cradle.

3. Place the Body TLT Sphere Phantom in the SPT Body Loader and place the Body Loader/TLT Phantom in the center of the cradle.

4. Landmark on the center of the sphere; press LANDMARK**,** at the keypad on the front of the magnet enclosure, then press ADV TO SCAN.

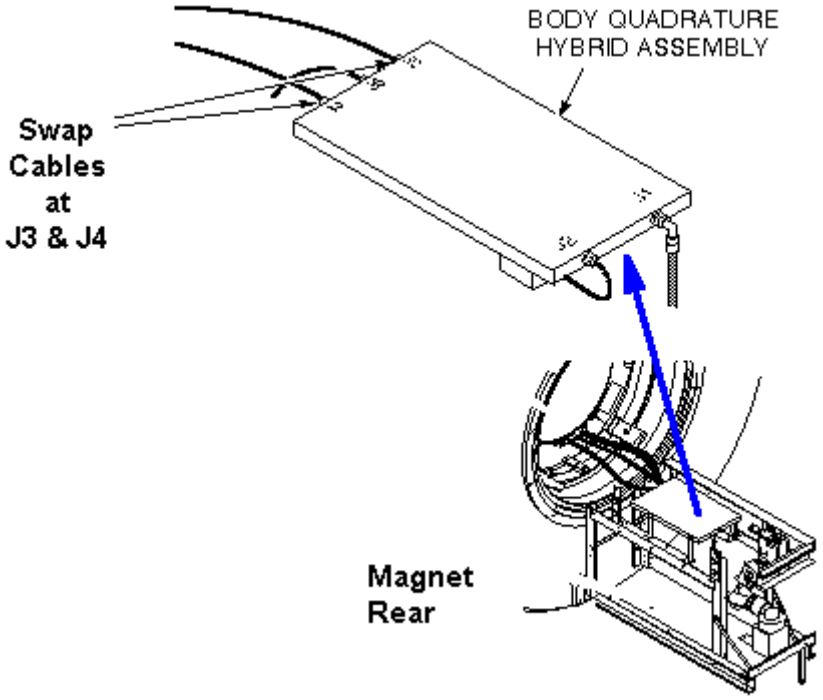
5. Select **[Save Series],** then **[Prepare to Scan]**.

6. Select **[Auto Prescan]**. Jot down the values for R1, R2, TG, and frequency from the prescan, then select **[Scan].**

Note

Prior to reversing the cable connections, note or mark the original connections to ensure that they are reconnected in the original orientation after test is completed.

7. Reverse the RF cables J3 and J4 at the hybrid splitter. (They are connected to the quad coil switch box input connectors J1 and J2.) See Illustration 2-1.



BODY COIL HYBRID SPLITTER
ILLUSTRATION 2-1

8. Without changing the prescan settings, rescan the phantom using the same scan protocol.

9. Restore the system to the original configuration (i.e., return J3 and J4 to their original connection).

10. For analysis, see Section 4, Forward/Reverse Quadrature Test Image Analysis.

3- HEAD FORWARD/REVERSE QUADRATURE SCANS

3-1 Procedure

1. At the operator work space, prepare the system for a Body F/R scan using the *Service Protocols* procedure located on the service methods CD-ROM or use the proprietary procedure as shown below.

Note

This proprietary procedure is only available for GE use, and to sites with a valid Advanced Service Package Limited License.

a. Click on **[New Series]** (or **[New Pt]** if this is the first test) and enter the following:
Id: **geservice**
Name: **head f/r quad**
Weight (Lb): **111**
d. Set Patient Protocols to **Service**.
e. In the Protocol field, type **o.17.2** (o=Other, 2=series number) to load the protocol.

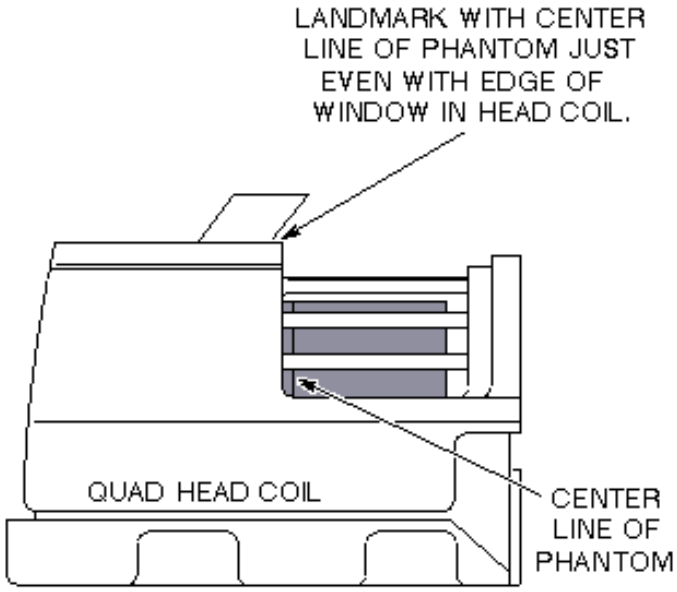
CAUTION

Equipment damage possibility. Be sure that Series 2 is selected before scanning. The coil type in Series 1 is *Body*. Using Series 1 could cause damage to the head coil.

2. At the scanner, place the Quad Head Coil on the cradle.

3. Place the Head TLT Sphere Phantom and the Head Loader in the center of the quadrature head coil.

4. Landmark on the center of the sphere as shown in Illustration 3-1. At the keypad on the front of the magnet enclosure, press LANDMARK**,** then press ADV TO SCAN.



LANDMARKING HEAD TLT SPHERE
ILLUSTRATION 3-1

5. Select **[Save Series],** then **[Prepare to Scan]**.

6. Select **[Auto Prescan]**. Jot down the values for R1, R2, TG, and frequency from the prescan, then select **[Scan].**

Note

Prior to reversing the cable connections, note or mark the original connections to ensure that they are reconnected in the original orientation after the test is completed.

7. Reverse the RF cables at the quick-disconnect adaptor box on the back of the head coil.

8. Without changing the prescan settings, rescan the phantom using the identical scan protocol.

9. Restore the head coil RF cables to the original configuration.

10. For analysis, see the next section.

4- FORWARD/REVERSE QUADRATURE TEST IMAGE ANALYSIS

Note

This analysis procedure applies to either body or head scans.

1. Display the first image.

2. Use a square Region of Interest (ROI) of 4000 mm^2 ± 50 mm^2, located at the center of the image. Measure the mean pixel value (MPV_1). In the viewer, this is shown as m=xxx. Jot down this value.

3. Display the second image.

4. Use the same square Region of Interest (ROI) of 4000 mm^2 ± 50 mm^2, located at the center of the image (see note, below). Measure the mean pixel value (MPV_2). In the viewer, this is shown as m=xxx. Jot down this value.

Note

To use the same ROI box, press **CTRL-C** on the keyboard for the first image. Move the mouse cursor to the second image and click the left button. Finally, press **CTRL-V** on the keyboard. This will copy the ROI to the second image.

5. Use the cable configuration which produced the highest mean value from the ROI.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	Aug 19, 1998	R. Hawthorne	Initial conversion to Word
1	Nov 4, 1998	M. Keber	Removed obsolete 8.1 information, added data sheet, misc. style guide cleanup.
2	Feb. 18, 1999	K. Keshena	Updated per engineering bay validation.
3	May 21, 1999	S.M.Atladottir	Updated Procedure References for New GUI
4	Aug. 4, 1999	R. Kaufman	Deleted data sheet, and changed spec to compare means.
5	Sept. 27, 1999	G. Boerner	Added SPT Body Loader info per SPR MRIge55143.
6	Oct. 18, 1999	G. Boerner	Changed Landmarking info per SPR 56065 and minor fixes.
7	Jan. 9, 2001	M. Jones	Added illustration 3-1; added steps to Sections 2-1 and 3-1 instructing the user to return the cables to their original configuration.