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This procedure applies only to 1.5T and 1.0T systems.

Description - This basic test checks the tuning of the head coil. It measures the tune frequency in four different planes. Head coil tuning can not be adjusted; this is only a functional check.

An alternative proprietary procedure is available for GE use and to sites with a valid Advanced Service Package Limited License. Refer to procedure for RFT.

1- TOOLS REQUIRED

See Table 1

Table 1
Tools and Instruments Required

Item	Description	Part Number	Quantity
1.	Vector impedance meter, HP Model 4193A (or equivalent) with probe adapter for BNC and N type connectors	46-255836P40	1
2.	Spectrum Analyzer (Quad II) (not standard GE service tool)	HP 8568A	1
3.	Tracking Generator (Quad II) (not standard GE service tool)	HP 8444A	1
4.	Sense Coil Holder (for Head Coil)	46-287006P1	1
5.	90 ft. Coax Cables	46-251710G8	2
6.	Body Sense Coil Holder	46-287027P1	2
7.	Digital multimeter, Beckman RMS 3030 or equivalent	46-194427P49	1
8.	N shorting caps (optional)	46-265916P1	2
9.	Sense Coils (8 ft. (2.4m) cable lengths) **(1.0T)**	46-321434G1	2
	Sense Coils (8 ft. (2.4m) cable lengths) **(1.5T)**	46-288446G1	2

2- INITIAL HEAD COIL SETUP

1. Perform the following steps on the head coil:

   a. Disconnect Quad Head Coil assembly from Head T/R Assembly.

   b. Disassemble head coil by removing six brass screws from underside.

c. Locate two Isolation Network boards inside head coil. See Illustration L2373A .

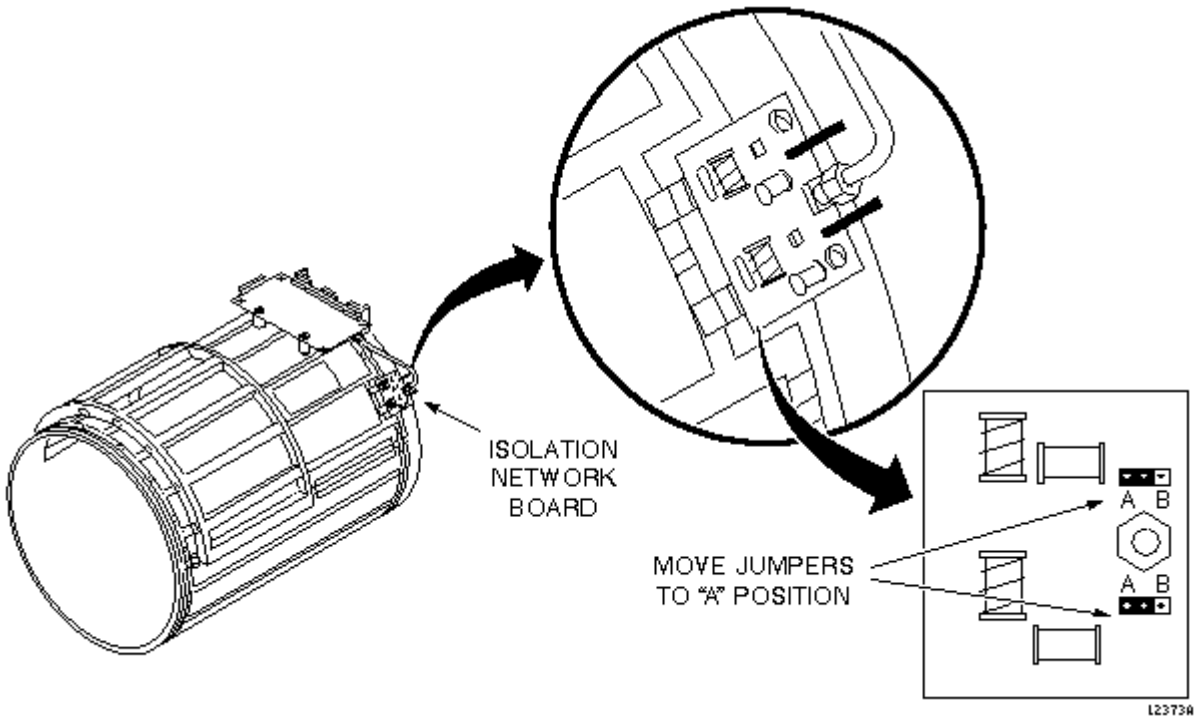


ILLUSTRATION L2373A
QUAD HEAD COIL TUNING PREPARATION (G2)

d. Locate and move both jumpers on each Isolation Network Board to the "A" (tune) position.

Note

The Isolation Network Boards and Hybrid Assembly should not be removed.

e. Assemble head coil with the jumpers set to "A".

3- QUAD HARDWARE PREPARATION

1. Place foam head piece into front of head coil.

2. Place Sense Coils at #1 positions. See Illustration L2770A . Be sure that you are using the correct Sense Coils (1.5T or 1.0T).

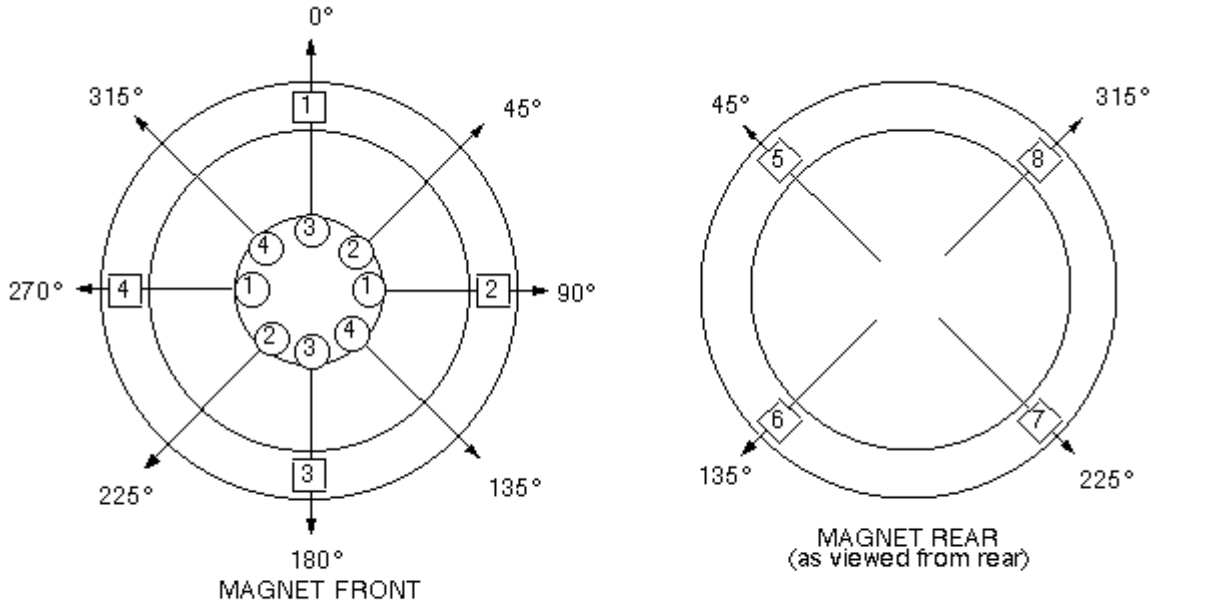


ILLUSTRATION L2770A
QUAD HEAD SENSE COIL PLACEMENT

3. Place Sense Coils into foam positioner as far as they will go.

4. Place head coil on cradle.

5. Dock patient transport to magnet.

6. Latch cradle to Head Coil Carriage. **Do not connect head coil to Head Coil Carriage.**

7. Landmark at isocenter, and advance the cradle into bore of magnet using ADV TO SCAN.

8. Lift flipper at rear of table (see Illustration L2771A) to allow undocking of table without the cradle at home position position. Withdraw patient transport, and roll it well clear of magnet.

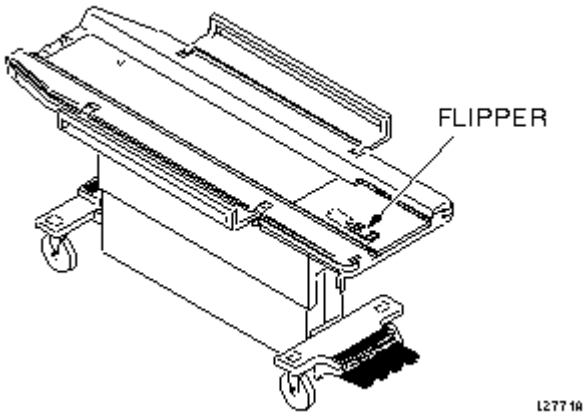


ILLUSTRATION L2771A
CRADLE POSITION INDICATOR VALVE FLIPPER LOCATION

9. Unlatch front and rear magnet enclosure covers, and slide open to gain access to the Dynamic Disable Switch Boards (four on front and four on rear).

10. Connect the Spectrum Analyzer, Tracking Generator, and Sense Coils. See to Illustration L2772A .

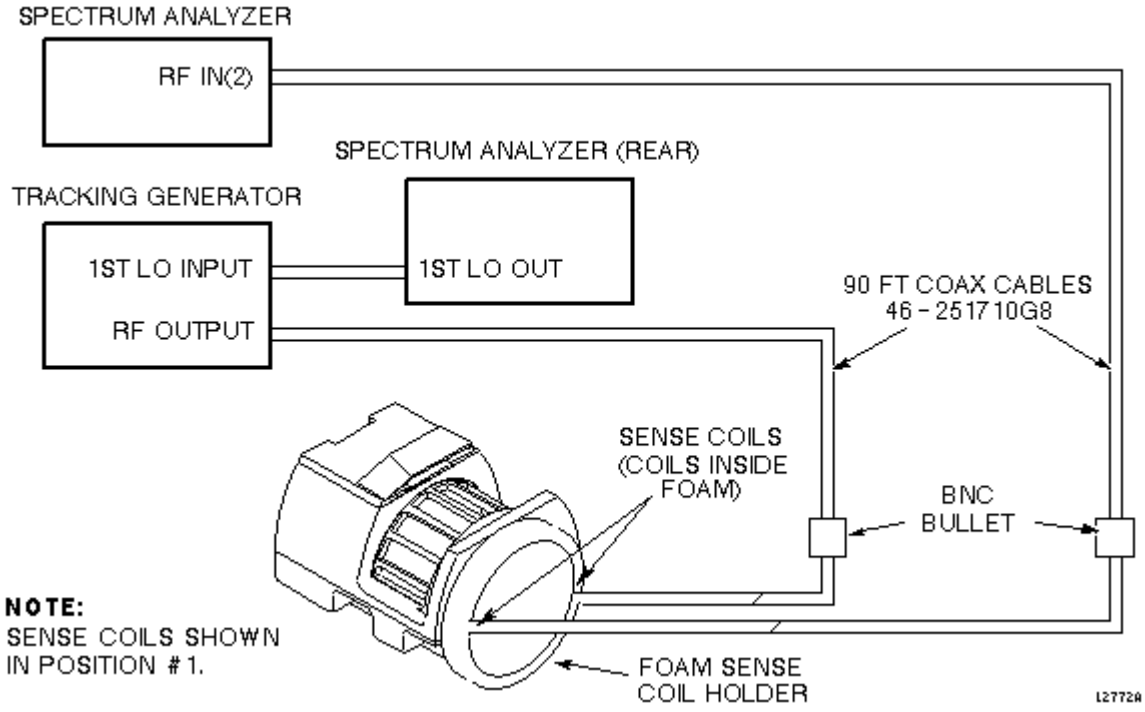


ILLUSTRATION L2772A
QUAD HARDWARE SET UP

11. Set Spectrum Analyzer:

    a. [REFERENCE LEVEL] 0 [DBM].

    b. [CENTER FREQ] 63.86 [MHZ] **(1.5T)**
    [CENTER FREQ] 42.68 [MHZ] **(1.0T)**

    c. [FREQUENCY SPAN] 5 [MHZ].

    d. [ENTER DB/DIV] 10 [-DBM].

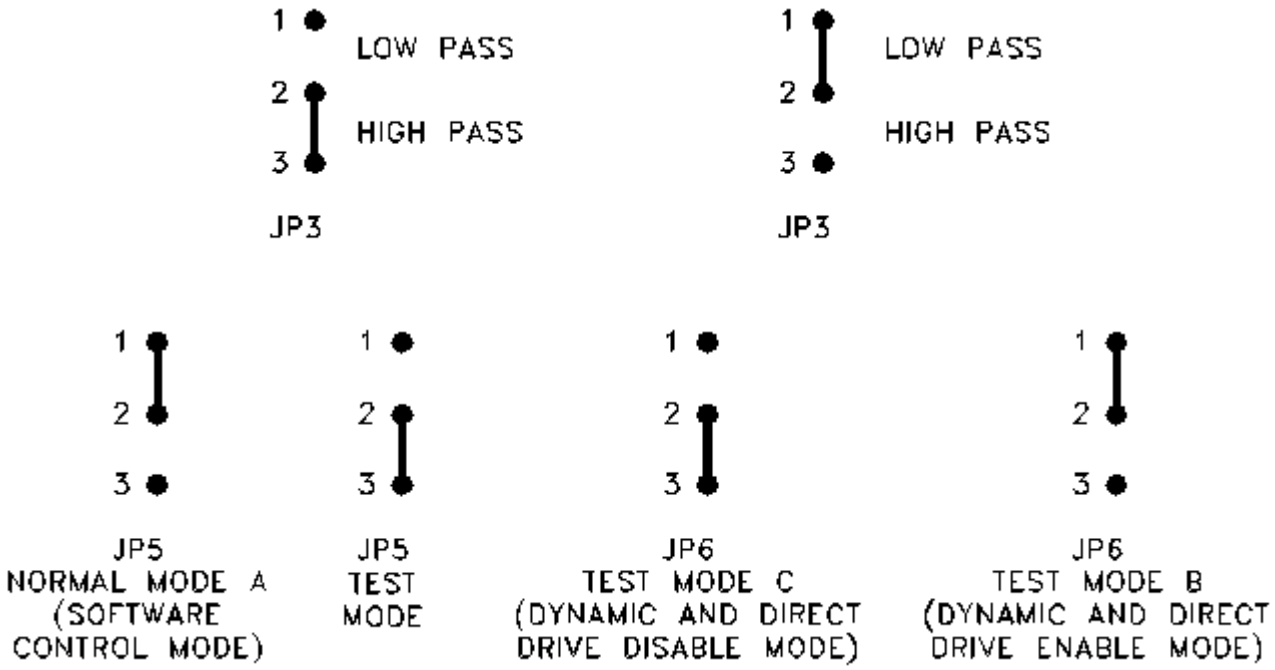
12. Adjust Tracking Generator level fully CW (0 dBm).

WARNING!

POSSIBLE ELECTRIC SHOCK! USE EXTREME CARE WHEN REMOVING OR REPLACING JUMPERS OR MEASURING VOLTAGES IN THE MODULE. THERE IS 1000 VDC AND 120 VAC PRESENT INSIDE THE MODULE. THE HV INTERLOCK WILL SHUT OFF HIGH VOLTAGE WHEN THE RF SYSTEM CONTROLLER MODULE TOP COVER IS OPENED. VERIFY THAT "HV ON" LED IS OFF.

13. Open up the top cover of the RF System Controller Module.

14. On the Pin Switch Driver Board, place JP5 in the Test Mode position, See Illustration L2352A . The following step electrically shorts the direct drives. When power is applied to the chassis, the green Direct Drive LED should remain off.



SEE ILLUSTRATION L2352A
JUMPER JP5, JP6, AND JP3 MODE POSITIONS

(The Direct Drive Assembly must be installed.)

16. Put Dynamic Disable Switches into Head mode. Place JP6 in position "C" on the Pin Switch Driver Board. See Illustration L2352A . On the combined RF/Pen Cabinet, set the T/R Bias bypass toggle switch, on the front of the RF System Controller Module, to Service Mode (T/R-DD Faults Disable ON) in order to bypass T/R Bias error reporting. See Illustration L3167A.

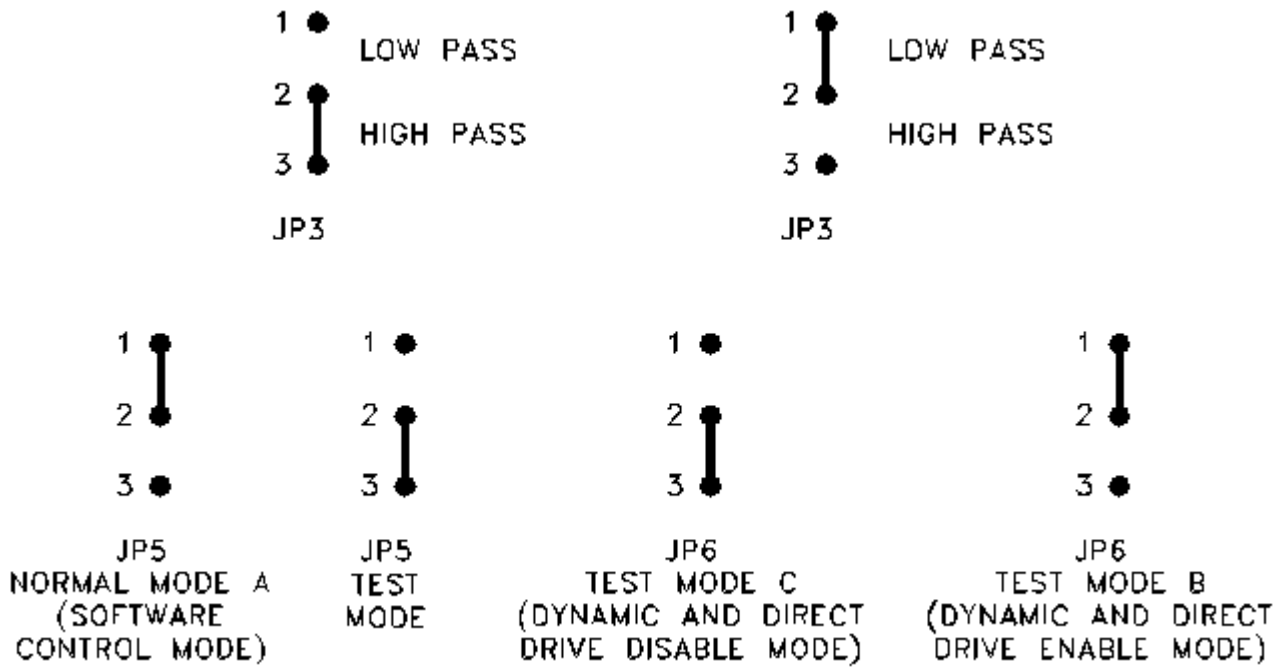


ILLUSTRATION L2352A
JUMPER JP5, JP6, AND JP3 MODE POSITIONS

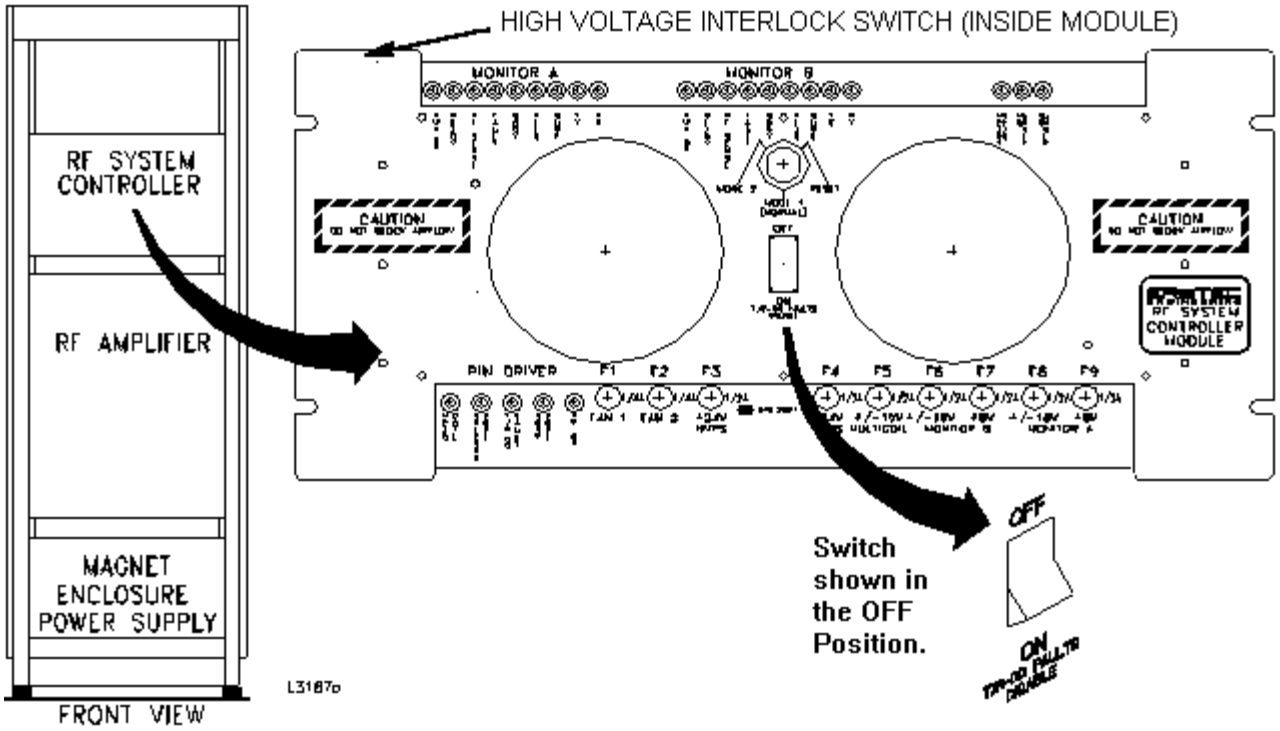


ILLUSTRATION L3167A
DYNAMIC DISABLER/TR DRIVER IN NORMAL POSITION

17. Power ON the Pin Switch Driver Board by closing the RF System Controller Module Top Cover.

18. Verify Dynamic Disable Switch Board Bias voltage at TP9 in the RF System Controller, on the Pin Switch Driver Board. The Dynamic Disable Switch Bias voltage For Head coil, should be approximately –13.5 Vdc (unloaded), or –5.2 Vdc (loaded). If the correct voltages are not present, see Procedure Pin Diode Test.

19. Verify the Direct Drive Disable Switch Bias voltage at TP16 in the RF System Controller, on the Pin Switch Driver Board. The Direct Drive Disable Switch Bias voltage should be approximately –13.5 Vdc (unloaded), or –5.2 Vdc (loaded).

20. From now on, the Sense Coils are referred by the "planes" that they lie in (i.e., probes that line up with Dynamic Disable Boards 1 & 3 correspond to the 0º plane). Refer to Table 2. However, the planes that the Dynamic Disable Boards affect, are 90 degrees from the plane that the probes lie in (i.e., a failure on Dynamic Disable Board 1 or 3 affects readings taken by the Sense Coils in the 90º plane).

TABLE 2

PLANE/SENSE COIL CROSS REFERENCE

Designator	Boxes To Adjust (Viewed from magnet front)
↔ 90º	↔ 1,3
⇗ 45º	⇗ 6,8
↕ 0º	↕ 2,4
⇘ 315º	⇘ 5,7

All arrows, which represent planes, are shown as viewed from of the magnet

Note

Always look at a 10-mHz frequency span after changing either probe position and/or making adjustments. Ensure that you are on the main peak, and not a second smaller peak.

Note

The tracking adjustment requires periodic adjustment due to drift. Adjust the Tracking Adjustment until the received signal is peaked.

4- QUAD COIL TUNING

Refer to the appropriate Tuning Check Flowchart Illustration L2353A (1.5T) or Illustration L2387A (1.0T) for a procedure overview.

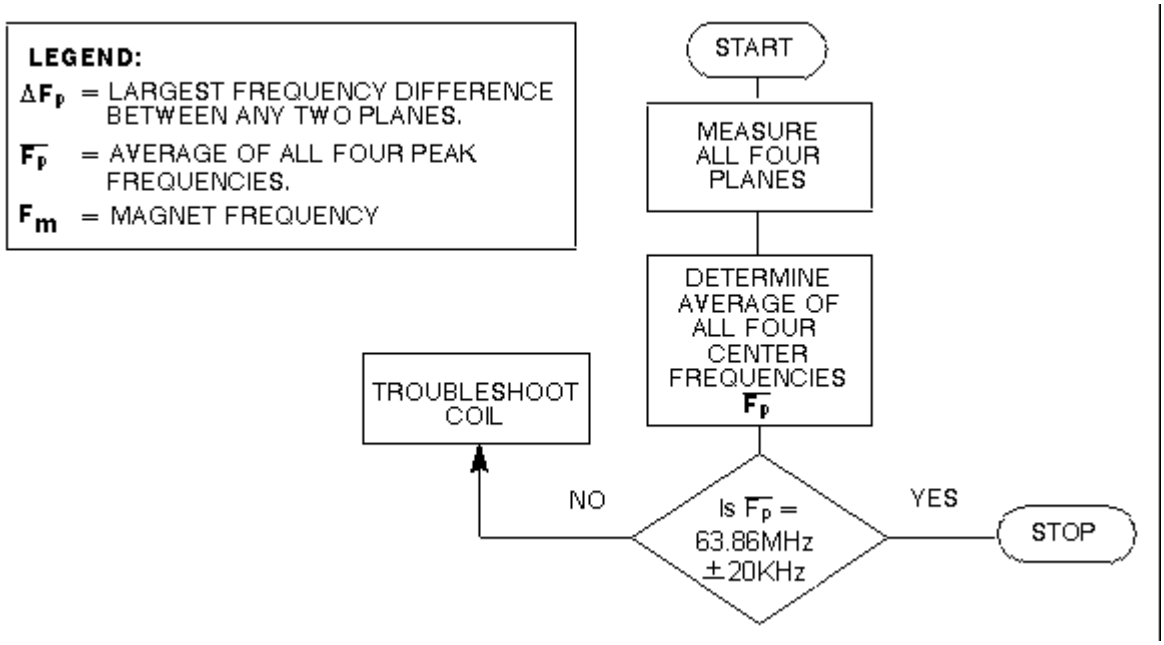


ILLUSTRATION L2353A
TUNING CHECK FLOWCHART (1.5T)

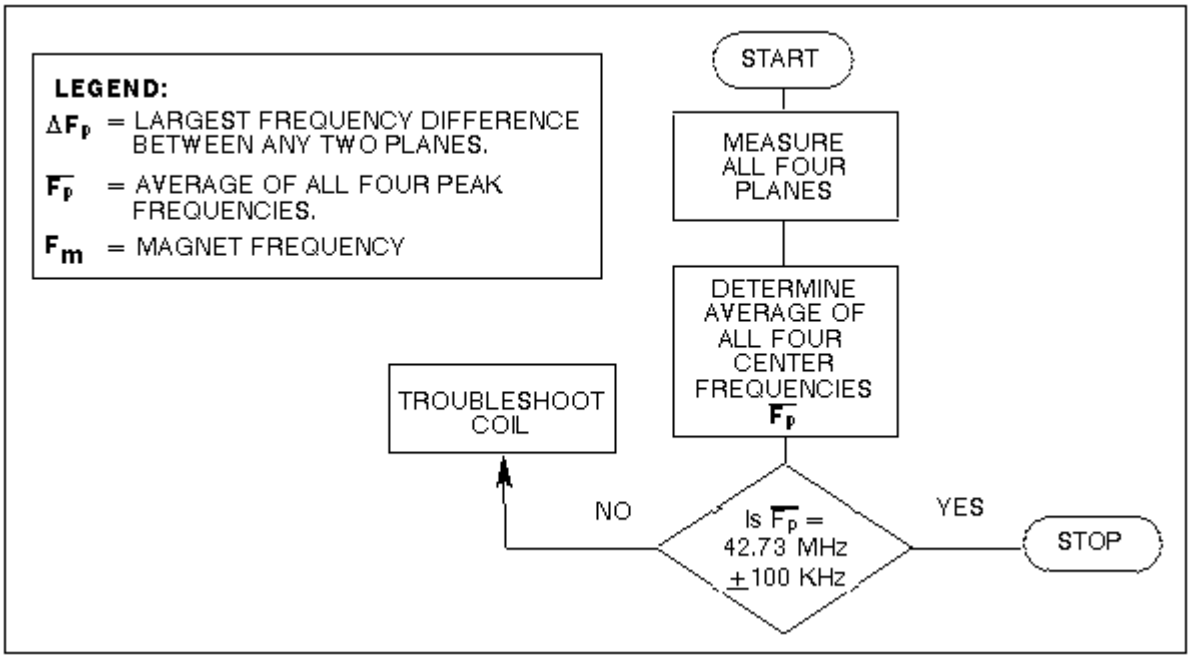


ILLUSTRATION L2387A
TUNING CHECK FLOWCHART (1.0T)

1. Adjust Spectrum Analyzer Frequency Bandwidth for 1 mHz, [FREQUENCY SPAN] 1 [MHZ].

2. Adjust center frequency to center response in display.

3. Adjust the display bandwidth, [FREQUENCY SPAN] 50 [KHZ].

4. Adjust Spectrum Analyzer Center Frequency to center peak of display, [PEAK SEARCH] [MKR CF].

5. Record Center Frequency displayed (top right corner of Spectrum Analyzer) in Table 3 (print Table 3 first).

TABLE 3
QUAD II BODY COIL TUNING DATA (PRINT FOR WORKSHEET

Window	Frequency	Specification
↔ 90°		63.86 MHz ± 40 KHz **(1.5T)** 42.73 MHz ± 100 KHz **(1.0T)**
↗ 45°		63.86 MHz ± 40 KHz **(1.5T)** 42.73 MHz ± 100 KHz **(1.0T)**
↕ 0°		63.86 MHz ± 40 KHz **(1.5T)** 42.73 MHz ± 100 KHz **(1.0T)**
↘ 315°		63.86 MHz ± 40 KHz **(1.5T)** 42.73 MHz ± 100 KHz **(1.0T)**
PEAK ($\overline{F_P}$) AVERAGE		63.86 MHz ± 40 KHz **(1.5T)** 42.73 MHz ± 100 KHz **(1.0T)**
PEAK (ΔF_p) DIFFERENCE		< 40 KHz **(1.5T)** < 100 KHz **(1.0T**

6. Move the Sense Coils to next plane position (see Illustration L2770A).

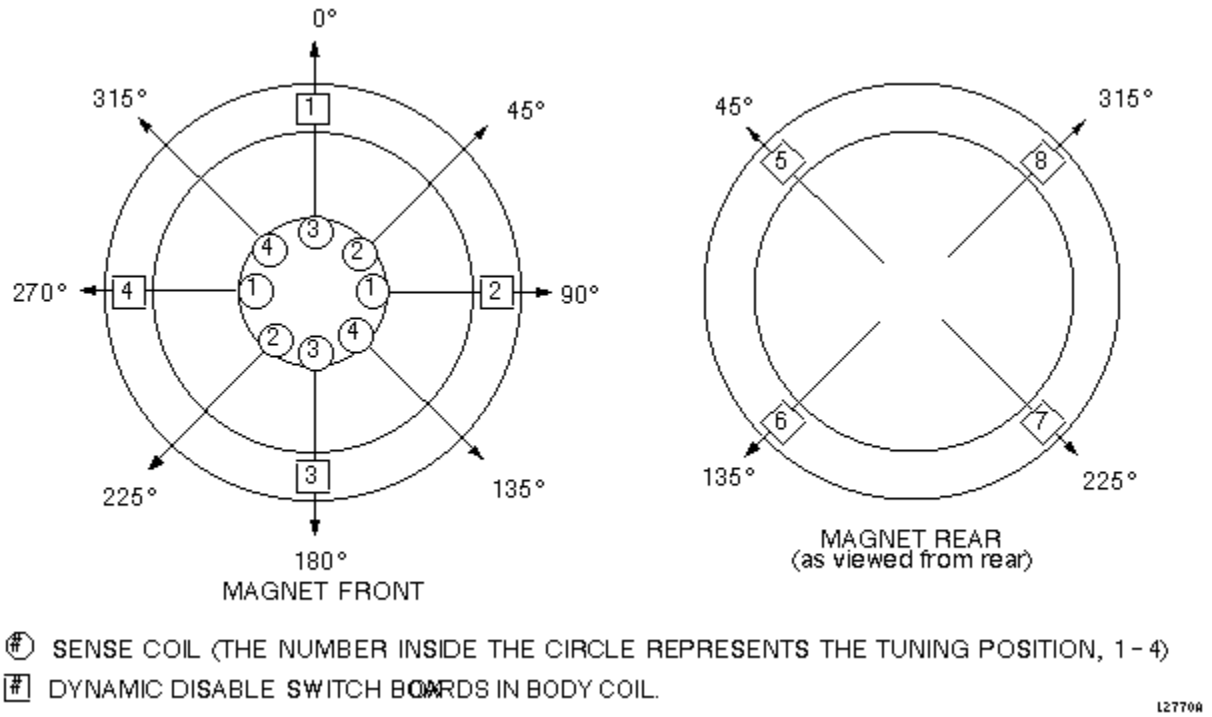


ILLUSTRATION L2770A
QUAD HEAD SENSE COIL PLACEMENT

7. Repeat steps 1 to 6 for all four planes. Record center frequency of each plane in Table 3.

8. After all four planes are completed, calculate the average of all four center frequencies. Record value in Table 3 as PEAK AVERAGE.

9. Calculate the difference between the minimum and maximum center frequencies. Record value in Table 3 as PEAK DIFFERENCE.

5- QUAD COIL RESTORATION CHECK LIST

CAUTION

The HV Interlock shuts off high voltage when the RF System Controller top cover is opened. Verify tht the "HV ON LED is OFF. See Illustration L3167a .

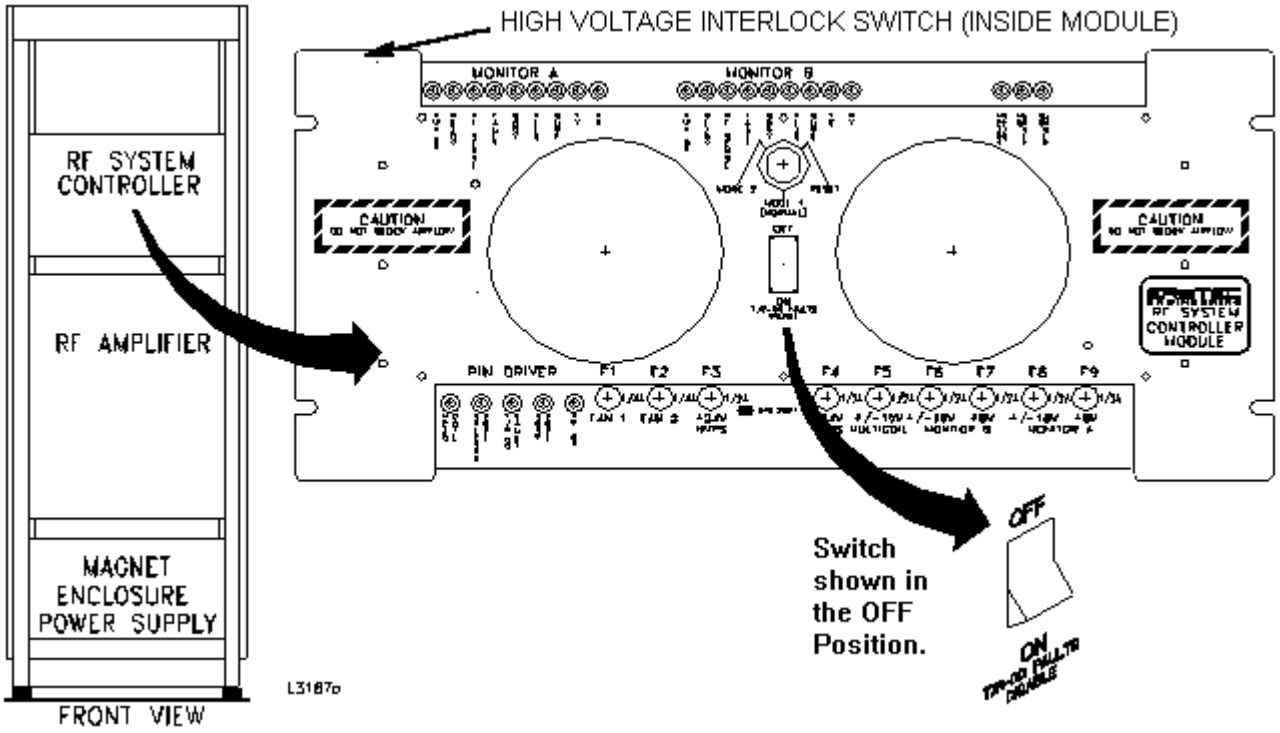


ILLUSTRATION L3167A
DYNAMIC DISABLER/TR DRIVER IN NORMAL POSITION

❑ Enable Direct Drive Box by moving JP5 to Mode "A."

❑ Move JP6 to Mode "C."

❑ Power on the Pin Switch Driver Board by closing the Top Cover of the RF System Controller Module.

❑ Remove Sensor Coils from inside of head coil.

CAUTION

Equipment damage possibility. Application of RF energy to TR Switches with Isolation Board jumpers in "A" (tune) position can cause permanent damage or destruction of components. The Isolation Board jumpers must be in "B" (normal) position.

❑ Reinstall jumpers on Isolation Board in "B" (normal) position. See Illustration L2373A .

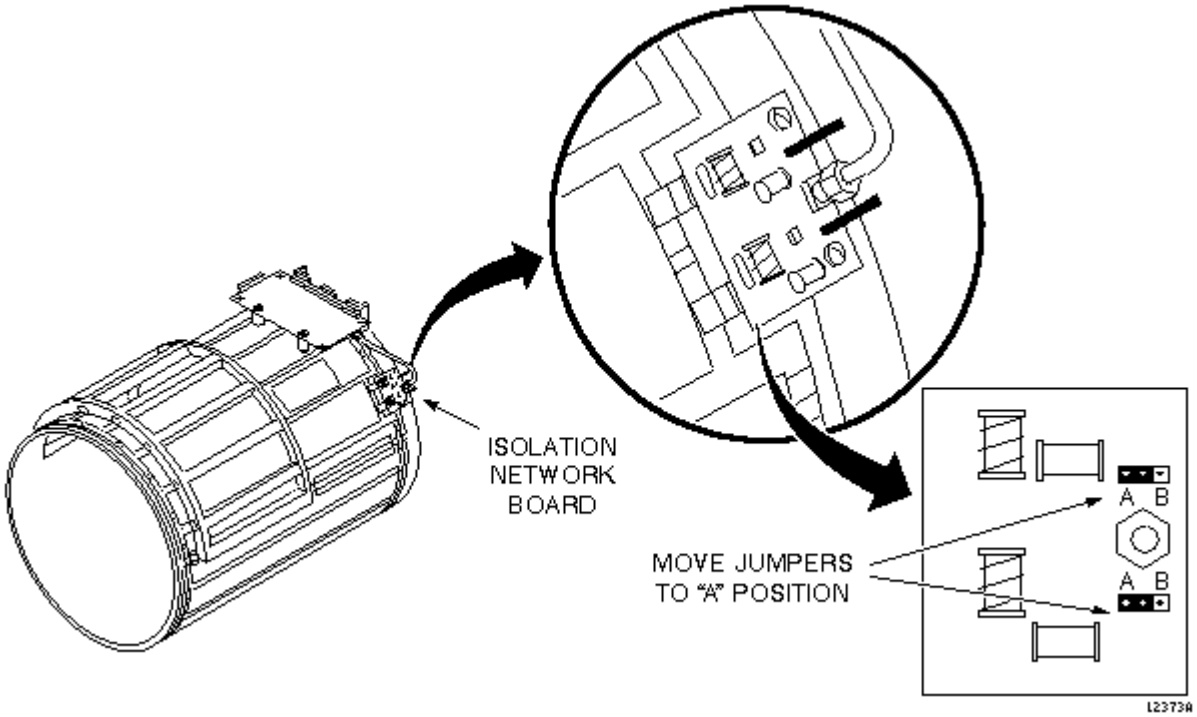


ILLUSTRATION L2373A
QUAD HEAD COIL TUNING PREPARATION (G2)

❑ Reinstall Dynamic Disable Switch Board covers on body coil.

❑ Reinstall the HMV cable at Penetration Panel, J46.

❑For Installation, continue with next installation procedure, otherwise perform one successful head scan first and then a body scan to verify properly operating system.

REVISION HISTORY

REV	DATE	AUTHOR	PRIMARY REASONS FOR CHANGE
0	Aug 27, 1998	R. Hawthorne	Initial conversion to Word