

**Fermi National Accelerator Laboratory
Batavia, IL 60510**

**LARGE HADRON COLLIDER
MAGNET ASSEMBLY TRAVELER**

**Reference Drawing(s)
Cold Mass Coil Insulation Assembly
MC-369582**

Scannable Pages 52

Budget Code: LPT

Project Code: LHC

Released by:

Date: 21 AUG 01

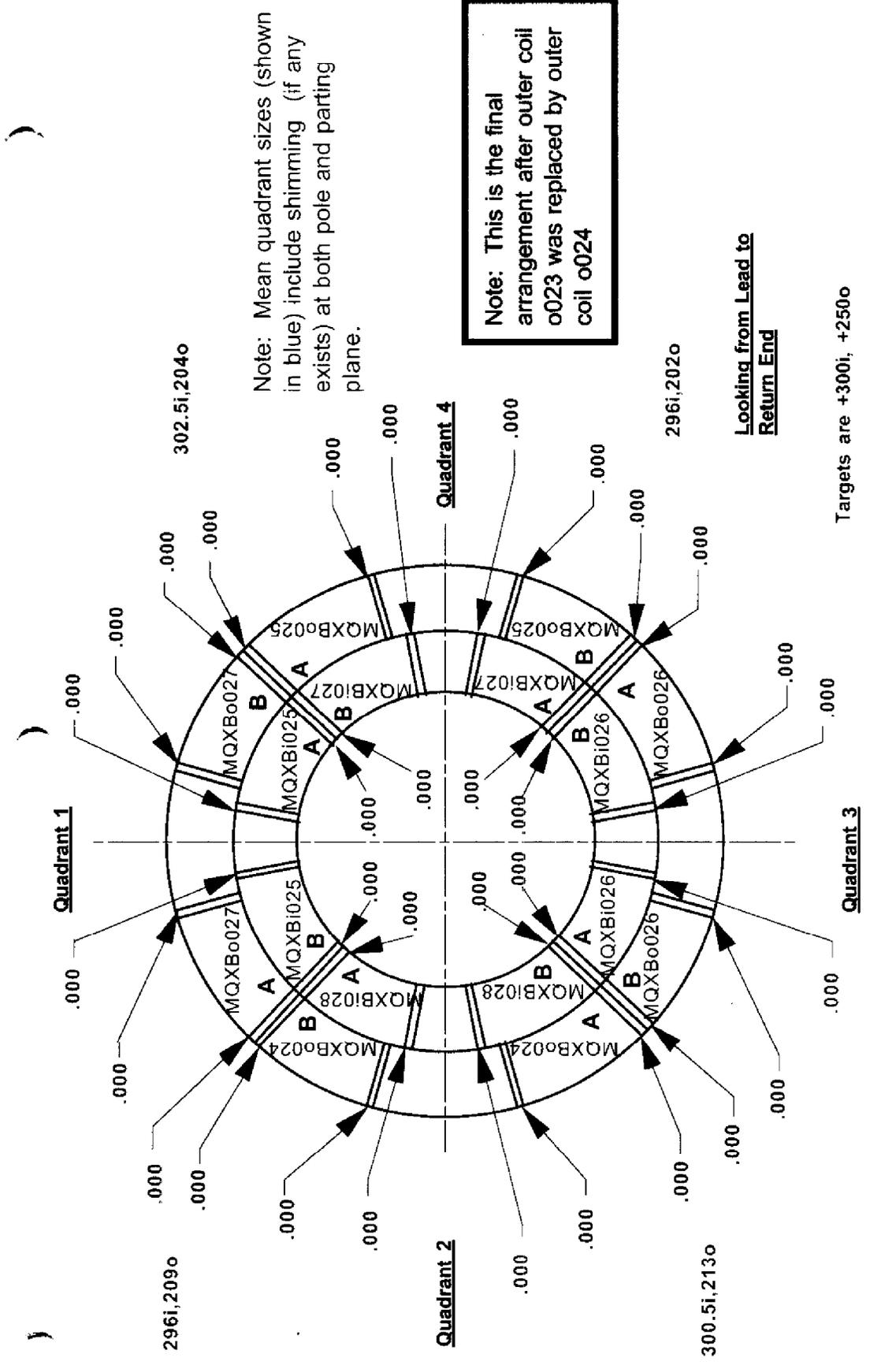
Prepared by: M. Cullen

| Title | Signature | Date |
|------------------------------|-----------------------------|---------|
| TD/E&F Process Engineering | Bob Jensen / Designee | 08SEP01 |
| TD/LHC Production Supervisor | Jim Knie / Designee | 9-5-01 |
| TD/LHC Production Engineer | Roger Bosart / Designee | 9-5-01 |
| TD/LHC Tooling Engineer | John Crago / Designee | 9/5/01 |
| TD / LHC Program Manager | Jim Kerby / Designee | 9/5/01 |

Revision Page

| Revision | Step No. | Revision Description | TRR No. | Date |
|-----------------|-----------------|---|----------------|-------------|
| None | N/A | Initial Release | N/A | 9/29/00 |
| A | 4.0 | Changed assembly order to Q1 I, O then Q2 I, O then Q3 I, O then Q4 I, O. | 1179 | 5/25/01 |
| | 5.0 | Added Limits | | |
| | 6.0 | Added Space for Volt Tap Drawing, and Spot heater Number, Resistance. | | |
| | 9.4 | Added Limits. | | |
| B | 6.0 | Modify Preform Length as needed to fit inside of the Lead End outer Keys | 1199 | 9/5/01 |
| | 6.0 | Removed Spot Heaters and Volt Taps | | |
| | 4.0 | Changed assembly order to all Inners, then all outers. | | |
| | 5.1 / 9.4 | Removed electrical limits, and added Engineer signoff. | | |
| | 4.10 | Added engineer sign off for the Coil length. | | |
| | 8.0 | Changed the assembly process to by Quadrant instead of by product | | |

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Note: Mean quadrant sizes (shown in blue) include shimming (if any exists) at both pole and parting plane.

Note: This is the final arrangement after outer coil o023 was replaced by outer coil o024

Looking from Lead to Return End

Targets are +300i, +250o

| | |
|---|----------------|
| Drawing Name: MQXB02 Coil Arrangement and Shim Size | |
| Date: 9-28-2001 | Rev. A |
| R. Bossert | Dwg. No. RB178 |

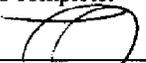
Ensure appropriate memos and specific instructions are placed with the traveler before issuing the sub traveler binder to production.

1.0 General Notes

- 1.1 White (Lint Free) Gloves (Fermi stock 2250-1800) or Surgical Latex Gloves (Fermi stock 2250-2494) shall be worn by all personnel when handling all product parts after the parts have been prepared/cleaned.
- 1.2 All steps that require a sign-off shall include the Technician/Inspectors first initial and full last name.
- 1.3 No erasures or white out will be permitted to any documentation. All incorrectly entered data shall be corrected by placing a single line through the error, initial and date the error before adding the correct data.
- 1.4 All Discrepancy Reports issued shall be recorded in the left margin next to the applicable step.
- 1.5 All personnel performing steps in this traveler must have documented training for this traveler and associated operating procedures.
- 1.6 Personnel shall perform all tasks in accordance with current applicable ES&H guidelines and those specified within the step.
- 1.7 Cover the product/assembly with Green Herculite (Fermi stock 1740-0100) when not being serviced or assembled.

2.0 Parts Kit List

- 2.1 Attach the completed Parts Kit for this production operation to this traveler. Ensure that the serial number on the Parts Kit matches the serial number of this traveler. Verify that the Parts Kit received is complete.



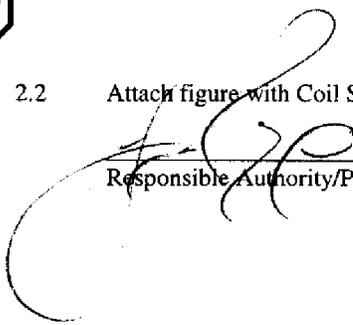
 Process Engineering/Designee

21 Aug 01

 Date



- 2.2 Attach figure with Coil Serial Numbers, Locations and Shimming Dimensions.



 Responsible Authority/Physicist

8-24-01

 Date

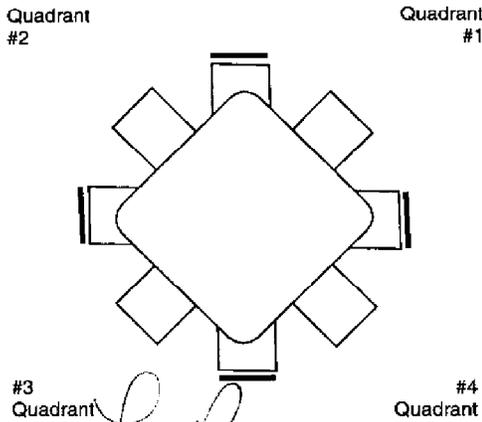
3.0 Mandrel Preparation

- 3.1 Clean the Coil Assembly/Collaring Mandrel (ME-369016) using lint free Heavy Duty Wipers (Fermi stock 1660-0450) and Isopropyl Alcohol (Fermi stock 1920-0300) or equivalent, and install in the Coil Assembly and Rollover Fixture.

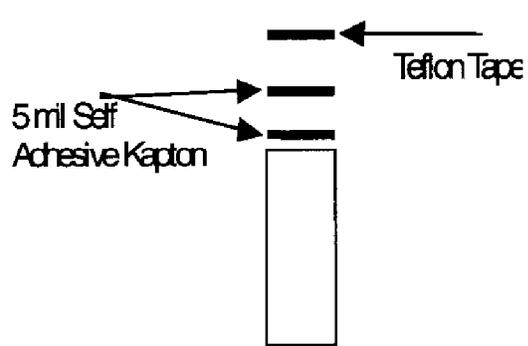
L. Ruiz
Technician(s)

8/21/01
Date

- 3.2 Shim the length of the Mandrel with 2 layers of 5 mil self adhesive Kapton, and 1 layer of 2", 3mil Teflon tape (MA-116533) or equivalent on the Parting Plane of the Mandrel.

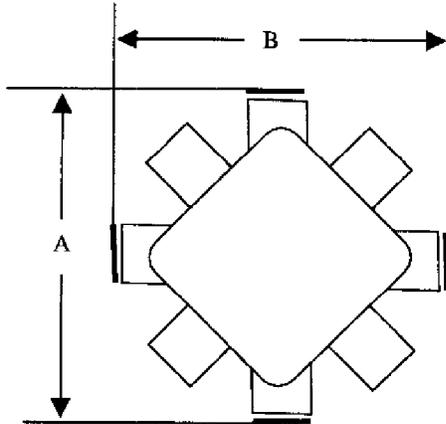


L. Ruiz
Technician(s)



8/21/01
Date

X 3.3 Measure the Mandrel Shimming.



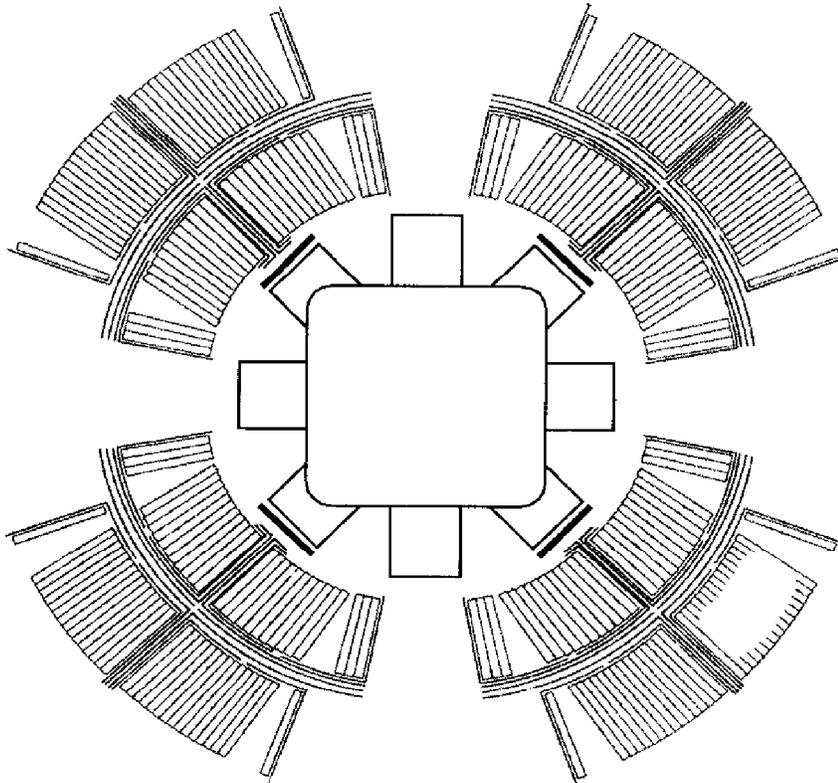
| | Limits | Lead End | Middle | Return End |
|---|----------|----------|--------|------------|
| A | < 2.740" | 2.740 | 2.739 | 2.736 |
| B | < 2.740" | 2.737 | 2.739 | 2.739 |

J. Gould Inspector 8/31/01 Date

3.4 Mark the Mandrel at 25.5" from the Return End of the Mandrel for all four quadrants.

J. Gould Technician(s) 8/31/01 Date

TRR #
1199



4.8 Install the Coil per Figure in Step 2.2 in to Quadrant #3 Outer Coil as per the Rollover and Assembly Station Operating Procedure (OP-333505), using the Insertion/Extraction Fixture (MC-344719) as per the Insertion/Extraction Fixture Operating Procedure (OP-333504).

[Signature]
Technician(s)

9/4/01
Date

X 4.9 Verify the Coils are properly installed per the engineers diagram in step 2.2 and that all Inner Lead End Keys are Coplanar.

[Signature]
Crew Chief

9/4/01
Date

4.10 Verify the Inner to Outer Coil lengths are acceptable.

[Signature]
Responsible Authority

9/4/01
Date

5.0 Assembly Inspection

X 5.1 Perform an electrical inspection on each of the individual Inner Coils, Outer Coils and Quadrants. Refer to the Valhalla and Leader Free Standing Coil Measurement Procedure (ES-292306), and the Procedure for Electrical Inspection of Voltage Taps (ES-301383).

DR #
 HGQ-Ø250

Note(s):
Ensure that all measurements are recorded correctly, and have the proper value and symbol (i.e., mΩ, mH, etc.).

Caution:
During testing, ensure that the test current is off and the disconnect status safe light is lit while connecting and disconnecting test leads from the Coil Assembly.

Valhalla 4300B settings:

| | | |
|-------------------------|-------|-------------------|
| Test current | _____ | Off (not testing) |
| Power | _____ | On |
| Full scale voltage | _____ | 20mv |
| Amp selector knob | _____ | 1 A |
| Temperature compensator | _____ | On |
| Test current | _____ | On (testing) |

Hp 4263 B:

Function _____ "Ls-Q" selected

Record the Serial Number of the test equipment used.

Valhalla 32-858
 HP 4263b 2848500912

| Resistance | | Inner | Outer | Pass | Fail |
|------------|-------|------------------|------------------|------|------|
| Nominal | | 240 mΩ to 265 mΩ | 310 mΩ to 340 mΩ | | |
| Quadrant 1 | Inner | 256.4 mΩ | | | |
| | Outer | | 317.9 mΩ | | |
| Quadrant 2 | Inner | 257.4 mΩ | | | |
| | Outer | | 317.6 mΩ | | |
| Quadrant 3 | Inner | 257.1 mΩ | | | |
| | Outer | | 317.7 mΩ | | |
| Quadrant 4 | Inner | 257.1 mΩ | | | |
| | Outer | | 317.8 mΩ | | |

| Inductance | | Inner | Outer | Pass | Fail |
|------------|-------|--------------------|------------------|------|------|
| Nominal | | 560 to 625 μ H | 1.120 to 1.17 mH | | |
| Quadrant 1 | Inner | 610.093 μ H | | | |
| | Outer | | 1.09285 mH | | |
| Quadrant 2 | Inner | 602.337 μ H | | | |
| | Outer | | 1.07901 mH | | |
| Quadrant 3 | Inner | 596.004 μ H | | | |
| | Outer | | 1.0764 mH | | |
| Quadrant 4 | Inner | 599.664 μ H | | | |
| | Outer | | 1.0785 mH | | |

| Q-Factor | | Inner | Outer | Pass | Fail |
|------------|-------|--------------|--------------|------|------|
| Nominal | | 3.30 to 3.75 | 4.80 to 5.85 | | |
| Quadrant 1 | Inner | 3.30 | | | |
| | Outer | | 3.81 | | |
| Quadrant 2 | Inner | 3.33 | | | |
| | Outer | | 3.76 | | |
| Quadrant 3 | Inner | 3.32 | | | |
| | Outer | | 3.76 | | |
| Quadrant 4 | Inner | 3.31 | | | |
| | Outer | | 3.80 | | |

A. Gould
Inspector

9/5/01
Date



- 5.2 Check the readings in Step 5.1 for acceptability, consistency and compare the readings to the Inspection Traveler Readings. Verify the Coil Positioning (Quadrant to Quadrant, and Inner to Outer) is acceptable. Approved for next major assembly procedure.

Ray B.
Responsible Authority/Physicist

9-5-01
Date

6.0 Splice Joints

6.1 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #1 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

[Signature]
Technician(s)

9-5-01
Date

6.2 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

[Signature]
Technician(s)

9-5-01
Date

6.3 Install the Quadrant #1 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

[Signature]
Technician(s)

9/19/01
Date

6.4 Modify Preform Length as needed to fit flush to $-1/16"$, inside of the Lead End Outer Keys.

[Signature]
Technician(s)

9/18/01
Date

6.5 Insulate the bare areas of the Quadrant #1 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

[Signature]
Technician(s)

9-6-01
Date

6.6 Install the Voltage Tap Iors for Quadrant #1 per Outer Coil Voltage Tap Drawing (MD-369584).

[Signature] 266argl
Technician(s)

9-19-01
Date

X 6.7 Verify the Quadrant #1 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

[Signature]
Crew Chief

9/6/01
Date

6.8 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #2 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

[Signature] Technician(s) 9-5-01 Date

6.9 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

[Signature] Technician(s) 9-5-01 Date

6.10 Install the Quadrant #2 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

[Signature] Technician(s) 9/18/01 Date

6.11 Modify Preform Length as needed to fit flush to -1/16", inside of the Lead End Outer Keys.

[Signature] Technician(s) 9/18/01 Date

6.12 Insulate the bare areas of the Quadrant #2 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

[Signature] Technician(s) 9-6-01 Date

6.13 Install the Voltage Tap Iors for Quadrant #2 per Outer Coil Voltage Tap Drawing (MD-369584).

[Signature] Technician(s) 9-19-01 Date

X 6.14 Verify the Quadrant #2 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

[Signature] Crew Chief 9/19/01 Date

- 6.15 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #3 Leads into the soldering jig. attach the Leads from the jig to the Soldering Station Controller.

[Signature] Technician(s) 9-5-01 Date

- 6.16 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

[Signature] Technician(s) 9-5-01 Date

- 6.17 Install the Quadrant #3 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

[Signature] Technician(s) 9/18/01 Date

- 6.18 Modify Preform Length as needed to fit flush to $-1/16"$, inside of the Lead End Outer Keys.

[Signature] Technician(s) 9/18/01 Date

- 6.19 Insulate the bare areas of the Quadrant #3 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

[Signature] Technician(s) 9-6-01 Date

- 6.20 Install the Voltage Tap Iors for Quadrant #3 per Outer Coil Voltage Tap Drawing (MD-369584).

[Signature] Technician(s) 9-19-01 Date

- X 6.21 Verify the Quadrant #3 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

[Signature] Crew Chief 9/6/01 Date

- 6.22 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #4 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

D Murgyl Technician(s) 9-6-01 Date

- 6.23 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

D Murgyl Technician(s) 9-6-01 Date

- 6.24 Install the Quadrant #4 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

M Gould Technician(s) 9/18/01 Date

- 6.25 Modify Preform Length as needed to fit flush to $-1/16"$, inside of the Lead End Outer Keys.

J Ace Technician(s) 9-6-01 Date

- 6.26 Insulate the bare areas of the Quadrant #4 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

J Ace Technician(s) 9-6-01 Date

- 6.27 Install the Voltage Tap Ions for Quadrant #4 per Outer Coil Voltage Tap Drawing (MD-369584).

J Ace Technician(s) 9-19-01 Date

- X 6.28 Verify the Quadrant #4 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

M Gould Crew Chief 9/6/01 Date

7.0 Return End Key Modification

7.1 Shim the Outer Return End Keys as needed using Kapton Tape till the Keys are coplanar $\pm 1/32"$.

[Signature]
Technician(s)

9-6-01
Date

7.2 Measure the distance from the Outer Return End Key to the End of the Mandrell for each of the coils and record below. Verify the Outer Return End Keys are coplanar with the other Outer Return End Keys $\pm 1/32"$.

Quadrant 1:

31.291

Quadrant 2:

31.302

Quadrant 3:

31.277

Quadrant 4:

31.309

[Signature]
Technician(s)

9-6-01
Date

7.3 Scribe, remove and cut the Modified Inner Return End Keys (MA-369098).

Note(s):

Ensure the Keys are marked with the serial number of the coil.

[Signature]
Technician(s)

9-6-01
Date

7.4 Reinstall the Modified Inner Return End Keys (MD-369098).

[Signature]
Technician(s)

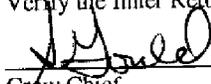
9-6-01
Date

7.5 Measure the distance between the Modified Inner Return End Keys and the end of the Inner Saddle, and the Outer Return End Key and the end of the Inner Saddle. Calculate the difference in the Inner Return End Keys and the Outer Return End Keys.

| | Inner | | Outer | | Difference |
|-------------|-------|---|-------|---|------------|
| Quadrant #1 | 6.869 | - | 6.886 | = | .017 |
| Quadrant #2 | 6.899 | - | 6.914 | = | -.015 |
| Quadrant #3 | 6.885 | - | 6.865 | = | .020 |
| Quadrant #4 | 6.913 | - | 6.920 | = | -.007 |

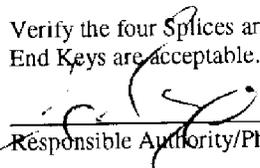
[Signature]
Technician(s)

9-6-01
Date

X 7.6 Verify the Inner Return End Key and the Outer Return End Keys are co-planer $\pm 1/32"$.


Crew Chief
Date 9/6/01



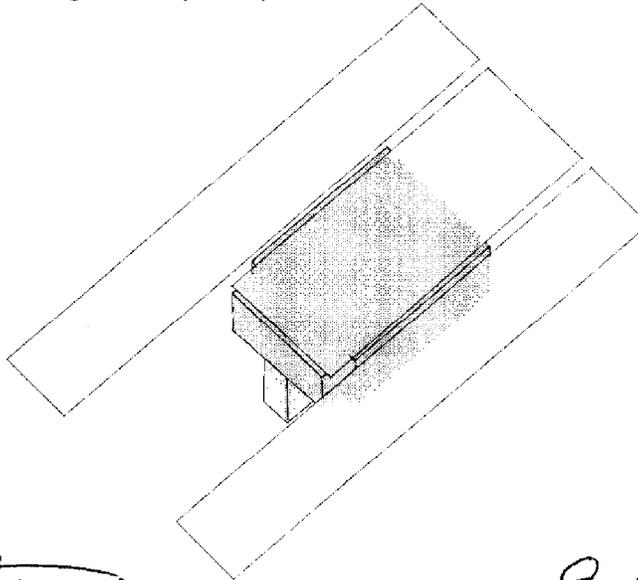
7.7 Verify the four Splices are acceptable. Verify the Inner Return End Key and the Outer Return End Keys are acceptable. Approved to continue with processing.


Responsible Authority/Physicist
Date 9-6-01

8.0 Ground Wrap and Quench Protection Heater Installation for Quadrant #1

8.1 Clean the Quench Protector Heaters (MD-369619) (Qty 2) for Quadrant #1-2 and Quadrant #4-1 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Quench Protector Heaters (MD-369619) (Qty 2) on Quadrant #1-2 and Quadrant #4-1 using .5 mil Kapton Tape Stainless side towards the coils, and Copper side out.

TRR#
1245



| | | |
|-----------------|------|--------|
| Q1/4 | Q1/2 | mar 07 |
| Q2/3 | Q2/3 | mar 03 |
| Q3/4 | Q3/4 | mar 01 |
| Q4/1 | Q4/1 | mar 04 |

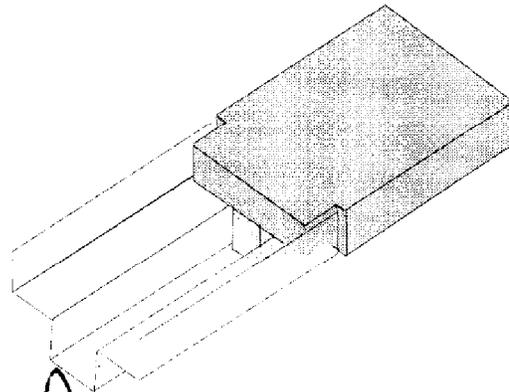
[Signature]
Technician(s)

9-6-01
Date

8.2 Clean and modify the Pole Ground Wrap 1 (MC-369623) for Quadrant #1 with Isopropyl Alcohol (Fermi Stock 1920-0300) and Lint Free Wipers (Fermi-Stock 1660-0150) or equivalent. Install the Pole Ground Wrap 1 (MC-369623) on Quadrant #1. See Coil Insulation Assembly (MC-369582).

Note(s):

Ensure the Ground Wrap is inserted between the Key and Coil for .3/8"

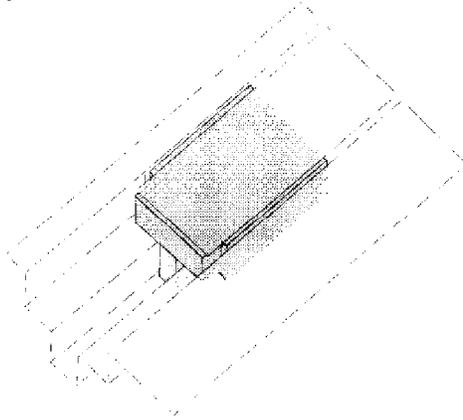


[Signature]
Technician(s)

9/10/01
Date

Dr
HGA 0252

6. Clean and modify the Pole Ground Wrap 2 (MC-369582) for Quadrant #1 using Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 2 (MC-369624) on Quadrant #1 to extend to back of Saddles. See Coil Insulation Assembly (MC-369582).



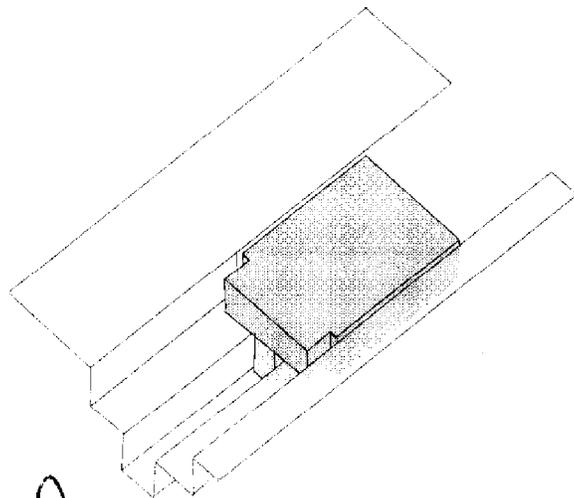
[Signature]

Technician(s)

9/10/01

Date

8.4 Clean and modify the Pole Ground Wrap 3 (MC-369625) for Quadrant #1 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 3 (MC-369625) on Quadrant #1. See Coil Insulation Assembly.



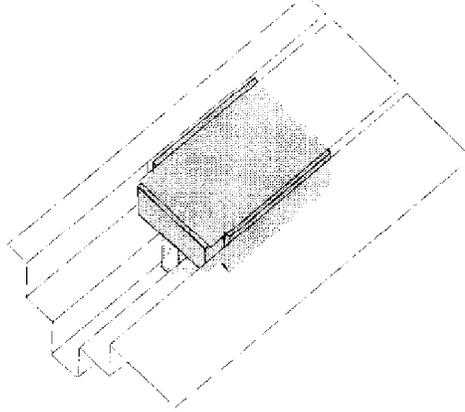
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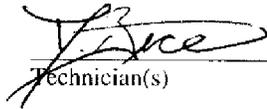
Technician(s)

9/10/01

Date

- 8.5 Clean the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) for Quadrant #1 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) on Quadrant #1 2 at the Lead End and 2 at the Return End. See Coil Insulation Assembly (MC-369582).





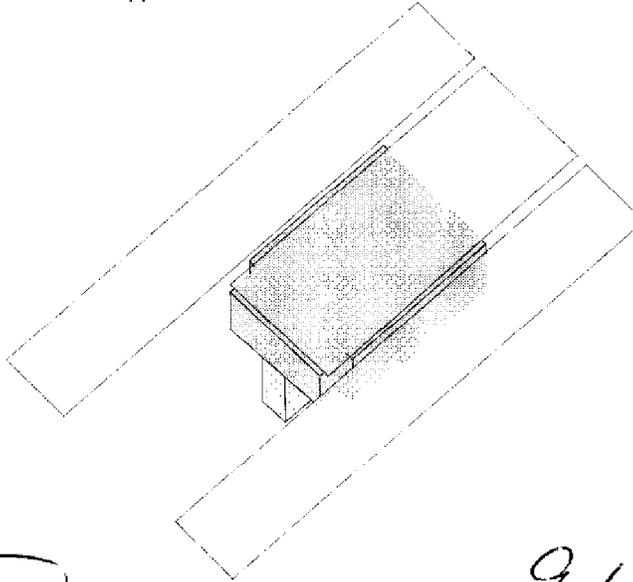
Technician(s)

9-20-01

Date

9.0 Ground Wrap and Quench Protection Heater Installation for Quadrant #2

- 9.1 Clean the Quench Protector Heaters (MD-369619) for Quadrant #2-3 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Quench Protector Heaters (MD-369619) on Quadrant #2-3 using .5 mil Kapton Tape Stainless side towards the coils, and Copper side out.



J. Rice

 Technician(s)

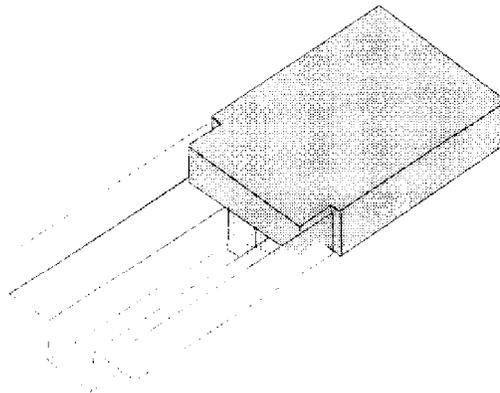
9-6-01

 Date

- 9.2 Clean and modify the Pole Ground Wrap 1 (MC-369623) for Quadrant #2 with Isopropyl Alcohol (Fermi Stock 1920-0300) and Lint Free Wipers (Fermi-Stock 1660-0150) or equivalent. Install the Pole Ground Wrap 1 (MC-369623) on Quadrant #2. See Coil Insulation Assembly (MC-369582).

Note(s):

Ensure the Ground Wrap is inserted between the Key and Coil for .3/8"



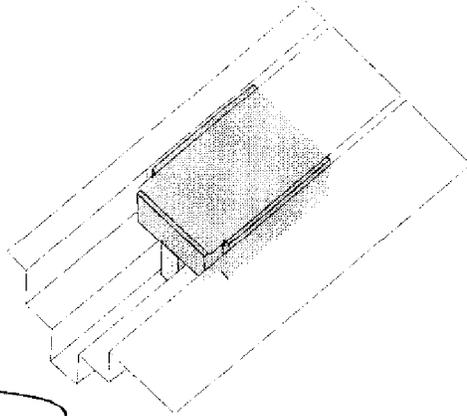
J. Rice

 Technician(s)

9-7-01

 Date

- 9.3 Clean and modify the Pole Ground Wrap 2 (MC-369582) for Quadrant #2 using Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 2 (MC-369624) on Quadrant #2 to extend to back of Saddles. See Coil Insulation Assembly (MC-369582).



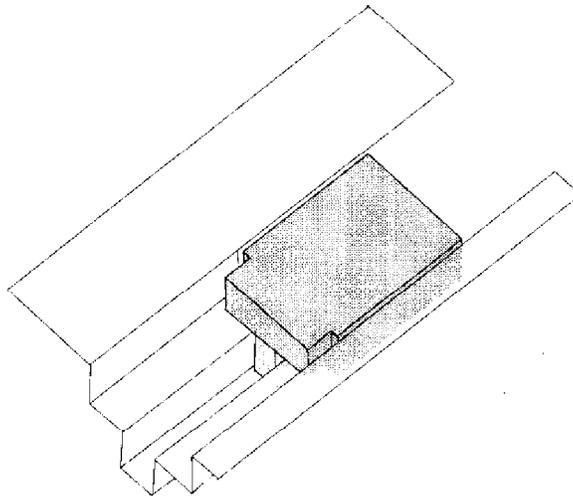
J. Rice

Technician(s)

9-7-01

Date

- 9.4 Clean and modify the Pole Ground Wrap 3 (MC-369625) for Quadrant #2 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 3 (MC-369625) on Quadrant #2. See Coil Insulation Assembly.



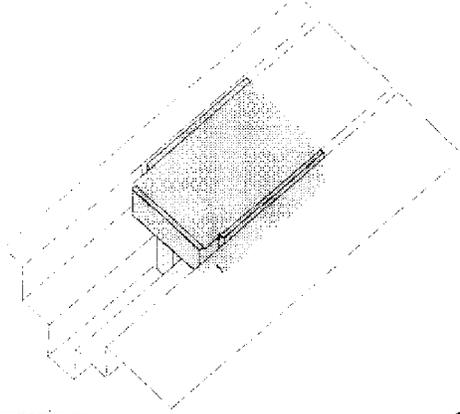
J. Rice

Technician(s)

9-7-01

Date

- 9.5 Clean the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) for Quadrant #2 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) on Quadrant #2, 2 at the Lead End and 2 at the Return End. See Coil Insulation Assembly (MC-369582).

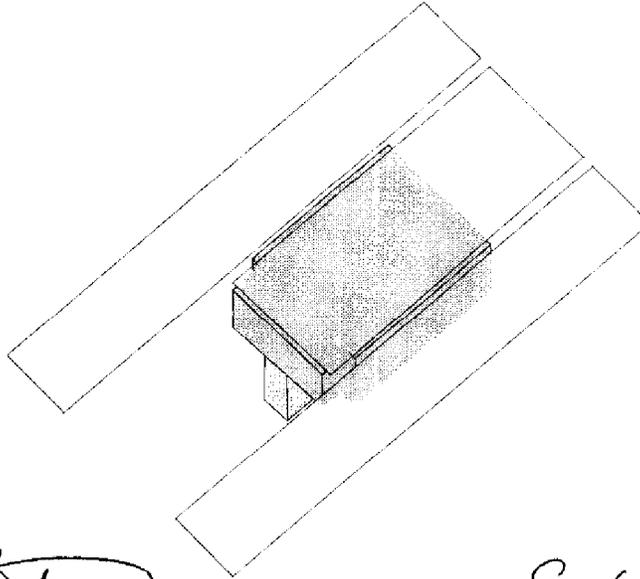


[Handwritten Signature]
Technician(s)

9-20-01
Date

10.0 Ground Wrap and Quench Protection Heater Installation for Quadrant #3

- 10.1 Clean the Quench Protector Heaters (MD-369619) for Quadrant #3-4 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Quench Protector Heaters (MD-369619) on Quadrant #3-4 using .5 mil Kapton Tape Stainless side towards the coils, and Copper side out.



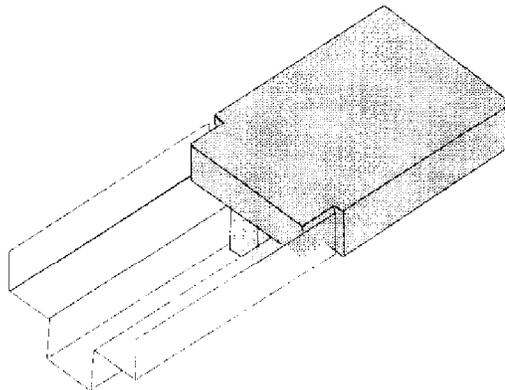
J. Rice
Technician(s)

9-6-01
Date

- 10.2 Clean and modify the Pole Ground Wrap I (MC-369623) for Quadrant #3 with Isopropyl Alcohol (Fermi Stock 1920-0300) and Lint Free Wipers (Fermi-Stock 1660-0150) or equivalent. Install the Pole Ground Wrap I (MC-369623) on Quadrant #3. See Coil Insulation Assembly (MC-369582).

Note(s):

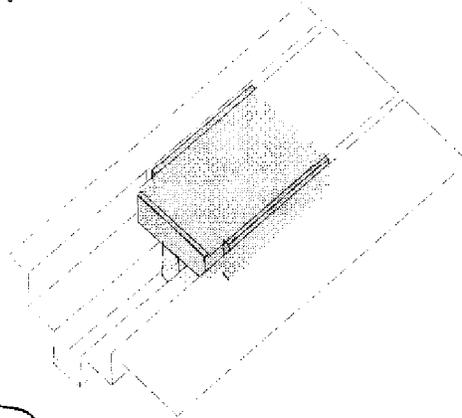
Ensure the Ground Wrap is inserted between the Key and Coil for .3/8"



J. Rice
Technician(s)

9-7-01
Date

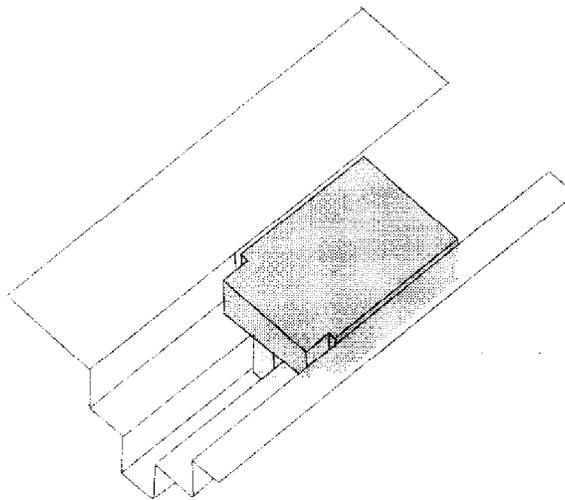
- 10.3 Clean and modify the Pole Ground Wrap 2 (MC-369582) for Quadrant #3 using Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 2 (MC-369624) on Quadrant #3 to extend to back of Saddles. See Coil Insulation Assembly (MC-369582).



J. Price
Technician(s)

9-7-01
Date

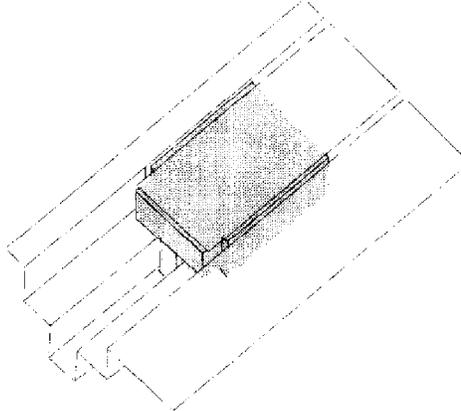
- 10.4 Clean and modify the Pole Ground Wrap 3 (MC-369625) for Quadrant #3 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 3 (MC-369625) on Quadrant #3. See Coil Insulation Assembly.



J. Price
Technician(s)

9-7-01
Date

- 10.5 Clean the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) for Quadrant #3 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) on Quadrant #3 2 at the Lead End and 2 at the Return End. See Coil Insulation Assembly (MC-369582).



J. B. [Signature]
Technician(s)

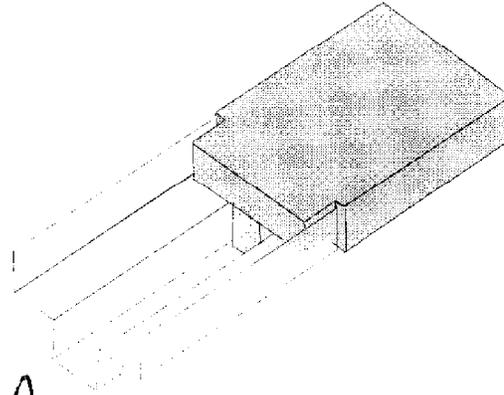
9-20-01
Date

11.0 Ground Wrap and Quench Protection Heater Installation for Quadrant #4

- 11.1 Clean and modify the Pole Ground Wrap 1 (MC-369623) for Quadrant #4 with Isopropyl Alcohol (Fermi Stock 1920-0300) and Lint Free Wipers (Fermi-Stock 1660-0150) or equivalent. Install the Pole Ground Wrap 1 (MC-369623) on Quadrant #4. See Coil Insulation Assembly (MC-369582).

Note(s):

Ensure the Ground Wrap is inserted between the Key and Coil for .3/8"



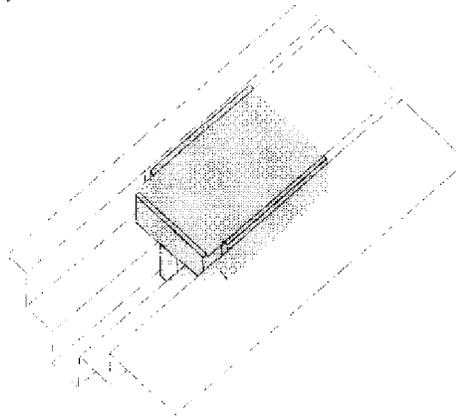
[Handwritten Signature]

 Technician(s)

9/10/01

 Date

- 11.2 Clean and modify the Pole Ground Wrap 2 (MC-369582) for Quadrant #4 using Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 2 (MC-369624) on Quadrant #4 to extend to back of Saddles. See Coil Insulation Assembly (MC-369582).



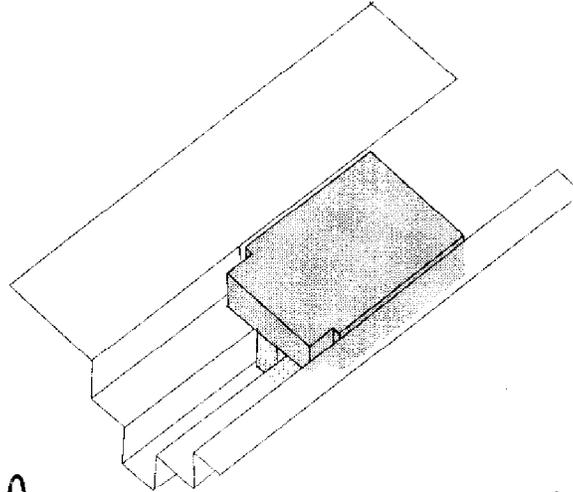
[Handwritten Signature]

 Technician(s)

9/10/01

 Date

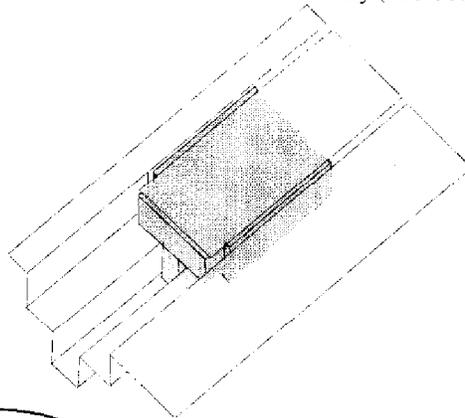
- 11.3 Clean and modify the Pole Ground Wrap 3 (MC-369625) for Quadrant #4 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Pole Ground Wrap 3 (MC-369625) on Quadrant #4. See Coil Insulation Assembly.



[Signature]
Technician(s)

9/10/01
Date

- 11.4 Clean the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) for Quadrant #4 with Isopropyl Alcohol (Fermi stock 1920-0300) and Lint Free Wipers (Fermi stock 1660-0150) or equivalent. Install the Outer Coil Heater Strip Filler (MC-369632) (Qty 4) on Quadrant #4 2 at the Lead End and 2 at the Return End. See Coil Insulation Assembly (MC-369582).



[Signature]
Technician(s)

9-20-01
Date

DR
HCO
#0253

Electrical Inspection

12.1 Apply Shrink-Wrap Mylar (MC-106937) on the entire length of the Collared Coil Assembly.

[Signature]
Technician(s)

9/21/01
Date

12.2 Shim the Return End Saddles coplanar $\pm 1/32"$.

Note(s):

Use Teflon Tape on the Saddles and Green Putty (Green Putty is temporary, and will be removed after Collaring).

[Signature]
Technician(s)

9-19-01
Date

X 12.3 Verify the Saddles are coplanar $\pm 1/32"$.

[Signature]
Crew Chief

9/21/01
Date

X 12.4 Perform an electrical inspection on each of the individual Inner Coils, Outer Coils, Quadrants and Voltage Taps. Refer to the Valhalla and Leader Free Standing Coil Measurement Procedure (ES-292306), and the Procedure for Electrical Inspection of Voltage Taps (ES-301383).

TRR#
1245

Note(s):

Ensure that all measurements are recorded correctly, and have the proper value and symbol (i.e., mΩ, mH, etc.).

Valhalla 4300B settings:

| | | |
|-------------------------|-------|-------------------|
| Test current | _____ | Off (not testing) |
| Power | _____ | On |
| Full scale voltage | _____ | 20mv |
| Amp selector knob | _____ | 1 A |
| Temperature compensator | _____ | On |
| Test current | _____ | On (testing) |

Hp 4263 B:

Function _____ "Ls-Q" selected

Record the Serial Number of the test equipment used.

Valhalla 32-858

HP 4263b 2848500912

| Resistance | | Inner | Outer | Total | Pass | Fail |
|------------|-------|------------------|------------------|---------------|------|------|
| Nominal | | 345 mΩ to 390 mΩ | 410 mΩ to 455 mΩ | 560 to 585 mΩ | | |
| Quadrant 1 | Inner | .2567 mΩ | | | | |
| | Outer | | .3183 mΩ | | | |
| | Total | | | .5753 mΩ | | |
| Quadrant 2 | Inner | .2579 mΩ | | | | |
| | Outer | | .3183 mΩ | | | |
| | Total | | | .5761 mΩ | | |
| Quadrant 3 | Inner | .2579 mΩ | | | | |
| | Outer | | .3184 mΩ | | | |
| | Total | | | .5761 mΩ | | |
| Quadrant 4 | Inner | .2572 mΩ | | | | |
| | Outer | | .3171 mΩ | | | |
| | Total | | | .5734 mΩ | | |

TRR
→

TOTAL 2.305 Ω

| Inductance | | Inner | Outer | Total | Pass | Fail |
|------------|-------|-----------------|------------------|-------------------|------|------|
| Nominal | | 620-650 μ H | 1.120 to 1.17 mH | 2.880 to 2.935 mH | | |
| Quadrant 1 | Inner | 1.05955 μ H | | | | |
| | Outer | | 1.41157 mH | | | |
| | Total | | | 2.88748 mH | | |
| Quadrant 2 | Inner | 1.00026 μ H | | | | |
| | Outer | | 1.44361 mH | | | |
| | Total | | | 2.95232 mH | | |
| Quadrant 3 | Inner | 1.00781 μ H | | | | |
| | Outer | | 1.45487 mH | | | |
| | Total | | | 2.94931 mH | | |
| Quadrant 4 | Inner | 987.701 μ H | | | | |
| | Outer | | 1.44355 mH | | | |
| | Total | | | 2.97689 mH | | |

TRR

→ TOTAL 17.138 mH

| Q-Factor | | Inner | Outer | Total | Pass | Fail |
|------------|-------|------------|------------|------------|------|------|
| Nominal | | 3.0 to 3.5 | 4.3 to 5.0 | 4.5 to 5.2 | | |
| Quadrant 1 | Inner | 1.84 | | | | |
| | Outer | | 2.35 | | | |
| | Total | | | 3.98 | | |
| Quadrant 2 | Inner | 1.98 | | | | |
| | Outer | | 2.41 | | | |
| | Total | | | 4.00 | | |
| Quadrant 3 | Inner | 2.01 | | | | |
| | Outer | | 2.43 | | | |
| | Total | | | 4.00 | | |
| Quadrant 4 | Inner | 1.97 | | | | |
| | Outer | | 2.42 | | | |
| | Total | | | 3.94 | | |

JAL

J. Howard
 Inspector

9/24/01
 Date

→ TOTAL 4.33 @

| Electrical Test | Limit | Actual Measurement | Pass | Fail |
|------------------------------|----------------|--------------------|------|------|
| Heater Strips 1/2 Resistance | 9.20 to 9.60 Ω | 9.221 Ω | | |
| Heater Strips 2/3 Resistance | 9.20 to 9.60 Ω | 9.264 Ω | | |
| Heater Strips 3/4 Resistance | 9.20 to 9.60 Ω | 9.252 Ω | | |
| Heater Strips 4/1 Resistance | 9.20 to 9.60 Ω | 9.191 Ω | | |

HGR
 DR # 0255

| Voltage Taps | Iors (ramp splice) 1/8 Coil Taps | Pass | Fail |
|--------------|----------------------------------|------|------|
| Quadrant 1 | .2105 mV | | |
| Quadrant 2 | .2090 mV | | |
| Quadrant 3 | .2058 mV | | |
| Quadrant 4 | .2067 mV | | |

W. Gould
 Inspector

9/24/01
 Date



12.5 Check the readings in Step 12.4 for acceptability, consistency and compare to the readings to step 5.1. Approved for next major assembly procedure.

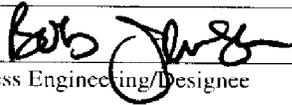
Rodge Bent
 Responsible Authority/Physicist

9/24/01
 Date

13.0 Production Complete

13.1 Process Engineering verify that the LHC Coil Insulation and Assembly Traveler (333494) is accurate and complete. This shall include a review of all steps to ensure that all operations have been completed and signed off. Ensure that all Discrepancy Reports, Nonconformance Reports, Repair/Rework Forms, Deviation Index and dispositions have been reviewed by the Responsible Authority for conformance before being approved.

Comments:



Process Engineering/Designer

11/29/01

Date

TD/ENGINEERING & FABRICATION

PARTS KIT REQUEST

ORIGINAL

IMPORTANT NOTES:

- 1) MAGNET NUMBER MUST BE FILLED IN.
- 2) ONLY ONE FORM PER MAGNET.
- 3) PARTS COORDINATOR OR DESIGNEE MUST SIGN THIS FORM.
- 4) MATERIAL CONTROL WILL ISSUE PARTS AND RECORD ROUTING NUMBER.
- 5) ANY QUANTITIES NOT AVAILABLE WILL HAVE COMMENTS RETURNED TO THE PARTS COORDINATOR FOR REVIEW.

DELIVER TO _____ ICB

BUDGET CODE: 169B

COIL NUMBER: MOXBc-002

RELEASED BY: _____ PRODUCTION SIGNATURE: T J Gardner

TODAYS DATE: 10-Aug-01

NEED DATE: 14-AUG-01

ISSUE VERIFICATION

MATERIAL CONTROL SIGNATURE: Manisha Sharma

DATE ISSUED TO STOCKROOM: 8/10/01

THIS KIT LIST IS FOR: LHC ASSEMBLED COIL INSULATION

| PART NUMBER | REV | DESCRIPTION | REQUIRED QTY/ASSY |
|-------------|-----|------------------------------|-------------------|
| 116530 | B | 1" SHRINK MYLAR | 2 RL |
| 369619 | | QUENCH HEATER STRIP ASSEMBLY | ICB HAS |
| 369623 | | POLE GROUND WRAP LAYER #1 | 4 EA |
| 369624 | NR | POLE GROUND WRAP LAYER #2 | 4 EA |
| 369625 | | POLE GROUND WRAP LAYER #3 | 4 EA |
| 369632 | A B | END FILLER-HEATER | 12 EA |

| MATERIAL | | CONTROL | | PROD | | SUPT. | |
|------------|------------|------------|------------|-------------|-------------|-------------|-------------|
| QTY ISSUED | ROUTE FORM | DATE AVAIL | DATE AVAIL | VERIFY PART | VERIFY PART | VERIFY PART | VERIFY PART |
| 2 | 70872 | 8/10/01 | 8/10/01 | | | | |
| 4 | 74324 | 8/10/01 | | | | | |
| 4 | 74325 | | | | | | |
| 4 | 74326 | | | | | | |
| 12 | 75012 | | | | | | |

TRAVELER NO. TR-333494 KIT IS COMPLETE (PARTS COORDINATOR SIGNATURE): [Signature] STOCKROOM SIGNATURE AND DATE: [Signature] 8/14/01

DATE: 14 Aug 01

BADGE # 4529

Page 1 of 1

Traveler Title:

LHC Coil Insulation/Assembly Traveler

Specification No:

5520-TR-333494

Revision:

A

DR No:

HGQ-0250

Step No:

5.1

Drawing No:

MC-369582

Routing Form No:

Serial No:

MQXBC-002

Discrepancy Description:

The Inductance and Q readings for the outer coils are out of range. The Amp selector knob setting is wrong. It should be 1A.

Originator:

Steve Gould

Date:

9/5/2001

Cause of Nonconformance:

Traveler Limits we recorded incorrectly in traveler.

Responsible Authority:

Rodger Bossert

Date:

9/5/2001

Disposition:

Electrical characteristics are acceptable. Use as is.

Responsible Authority:

Rodger Bossert

Date:

9/5/2001

Corrective Action to Prevent Recurrence:

Change traveler to make amp selection 1A. Remove L & Q limits and make it an Engineer signoff. (TRR No. 1199) (Entered into database on 5/29/02 - John Szostak)

Responsible Authority:

Rodger Bossert

Date:

9/5/2001

Corrective Action/Disposition Verified By:

Rodger Bossert

Date:

9/5/2001

Will Configuration be affected?: YES NO

Identified problem area:

- Material Manpower Method Machine Measurement

Reviewed By:

Bob Jensen

Date:

9/5/2001

Traveler Title:

LHC Coil Insulation/Assembly Traveler

Specification No:

5520-TR-333494

Revision:

B

DR No:

HGQ-0252

Step No:

8.3

Drawing No:

MC-369582

Routing Form No:

Serial No:

MQXBC-002

Discrepancy Description:

Incorrect part number called out in steps 8.3, 9.3 and 10.3 for Pole Ground Wrap Layer #2. Part number should be (MC-369624).

Originator:

Jim Rife

Date:

9/10/2001

Cause of Nonconformance:

Traveler was not updated to reflect the correct part number.

Responsible Authority:

Bob Jensen

Date:

10/1/2001

Disposition:

Update Traveler with correct part number.

Responsible Authority:

Bob Jensen

Date:

10/1/2001

Corrective Action to Prevent Recurrence:

Stress to Traveler Coordinators that travelers need to show correct part number. ER's / ECO's shall be reviewed for possible updating in a more timely manner. (Entered into database on 5/29/02 - John Szostak)

Responsible Authority:

Bob Jensen

Date:

10/1/2001

Corrective Action/Disposition Verified By:

Bob Jensen

Date:

10/1/2001

Will Configuration be affected?: YES NO

Identified problem area:

- Material Manpower Method Machine Measurement

Reviewed By:

Bob Jensen

Date:

10/1/2001

Traveler Title:

LHC Coil Insulation/Assembly Traveler

Specification No:

5520-TR-333494

Revision:

B

DR No:

HGQ-0253

Step No:

12.2

Drawing No:

MC-369582

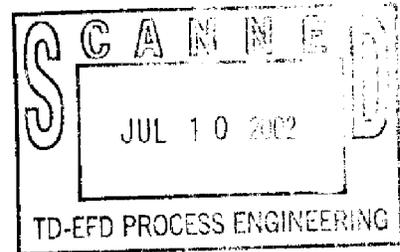
Routing Form No:

Serial No:

MQXBC-002

Discrepancy Description:

While inserting the Outer Lead End Keys, there was a gap found to be between the G-11 Outer Lead End Spacer and the Ramp Splice that could not be taken out.



Originator:

Steve Gould

Date:

9/11/2001

Cause of Nonconformance:

Unknown.

Responsible Authority:

Rodger Bossert

Date:

9/11/2001

Disposition:

Re-do splices to remove gap, then continue. (Re-issue Step Nos. 6.1 to 6.28 - John Szostak)

Responsible Authority:

Rodger Bossert

Date:

10/5/2001

Corrective Action to Prevent Recurrence:

None at this time. When MQXB03 splices are made, the crew and project Engineers will observe the setup and analyze the procedure. (Entered into database on 5/29/02 - John Szostak)

Responsible Authority:

Rodger Bossert

Date:

10/5/2001

Corrective Action/Disposition Verified By:

Rodger Bossert

Date:

10/5/2001

Will Configuration be affected?: YES NO

Identified problem area:

Material Manpower Method Machine Measurement

Reviewed By:

Bob Jensen

Date:

10/8/2001

6.0 Splice Joints

6.1 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #1 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

[Signature]
Technician(s) 9-13-01
Date

6.2 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

[Signature]
Technician(s) 9-13-01
Date

6.3 Install the Quadrant #1 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

[Signature]
Technician(s) 9-13-01
Date

6.4 Modify Preform Length as needed to fit flush to $-1/16"$, inside of the Lead End Outer Keys.

[Signature]
Technician(s) 9-13-01
Date

6.5 Insulate the bare areas of the Quadrant #1 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

[Signature]
Technician(s) 9-14-01
Date

6.6 Install the Voltage Tap Iors for Quadrant #1 per Outer Coil Voltage Tap Drawing (MD-369584).

[Signature]
Technician(s) 9-19-01
Date

X 6.7 Verify the Quadrant #1 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

[Signature]
Crew Chief 9/19/01
Date

- 6.8 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #2 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

J. Rice Technician(s) 9-13-01 Date

- 6.9 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

J. Rice Technician(s) 9-13-01 Date

- 6.10 Install the Quadrant #2 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

A. Gould Technician(s) 9/18/01 Date

- 6.11 Modify Preform Length as needed to fit flush to -1/16", inside of the Lead End Outer Keys.

A. Gould Technician(s) 9/18/01 Date

- 6.12 Insulate the bare areas of the Quadrant #2 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

J. Rice Technician(s) 9-14-01 Date

- 6.13 Install the Voltage Tap Iors for Quadrant #2 per Outer Coil Voltage Tap Drawing (MD-369584).

J. Rice Technician(s) 9-19-01 Date

- X 6.14 Verify the Quadrant #2 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

A. Gould Crew Chief 9/19/01 Date

- 6.15 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #3 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

J. Price Technician(s) 9-13-01 Date
- 6.16 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

J. Price Technician(s) 9-13-01 Date
- 6.17 Install the Quadrant #3 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

J. Gould Technician(s) 9/18/01 Date
- 6.18 Modify Preform Length as needed to fit flush to -1/16", inside of the Lead End Outer Keys.

J. Gould Technician(s) 9/18/01 Date
- 6.19 Insulate the bare areas of the Quadrant #3 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

J. Price Technician(s) 9-14-01 Date
- 6.20 Install the Voltage Tap Iors for Quadrant #3 per Outer Coil Voltage Tap Drawing (MD-369584).

J. Price Technician(s) 9-19-01 Date
- X 6.21 Verify the Quadrant #3 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

J. Gould Crew Chief 9/19/01 Date

6.22 Using the Soldering Jig (MD-344703), Kester Flux (MC-106761) and 1 layer 4.5" of 5 mil Kester Solder tape (MA-344821) or equivalent, position the Quadrant #4 Leads into the soldering jig, attach the Leads from the jig to the Soldering Station Controller.

[Signature] _____ Date 9-14-01 _____
 Technician(s)

6.23 Set temperature controllers to 550°F (288 °C) and monitor temperature. When the Soldering Fixture attains 550°F (288 °C) shut down the soldering station and allow the Conductor to cool. Once the Conductor has cooled, remove the soldering jig. Using Scotch Brite 7447 (Fermi stock 1202-2020) or equivalent, clean the area that has just been soldered.

[Signature] _____ Date 9-14-01 _____
 Technician(s)

6.24 Install the Quadrant #4 Outer Lead End Keys Parts C, D and E (MA-369646/MA-369647/MA-369648).

[Signature] _____ Date 9/18/01 _____
 Technician(s)

6.25 Modify Preform Length as needed to fit flush to -1/16", inside of the Lead End Outer Keys.

[Signature] _____ Date 9/18/01 _____
 Technician(s)

6.26 Insulate the bare areas of the Quadrant #4 Conductor as per the Inner Insulated Cable Assembly (MB-369691), stopping at the end of the Splice.

[Signature] _____ Date 9-14-01 _____
 Technician(s)

6.27 Install the Voltage Tap Ions for Quadrant #4 per Outer Coil Voltage Tap Drawing (MD-369584).

[Signature] _____ Date 9-18-01 _____
 Technician(s)

X 6.28 Verify the Quadrant #4 Outer Lead End Keys and the Inner Lead End Key are coplanar $\pm 1/32"$.

[Signature] _____ Date 9/19/01 _____
 Crew Chief

Traveler Title:

LHC Coil Insulation/Assembly Traveler

Specification No:

5520-TR-333494

Revision:

B

DR No:

HGQ-0255

Step No:

12.4

Drawing No:

MC-369582

Routing Form No:

Serial No:

MQXBC-002

Discrepancy Description:

All electrical results are out of the limits set for them.

Originator:

Steve Gould

Date:

9/24/2001

Cause of Nonconformance:

Inappropriate Limits in traveler.

Responsible Authority:

Rodger Bossert

Date:

10/5/2001

Disposition:

Continue with Magnet. Magnet characteristics are within acceptable criteria.

Responsible Authority:

Rodger Bossert

Date:

10/5/2001

Corrective Action to Prevent Recurrence:

Modify traveler to make limits nominal and have Engineer Signoff. (TRR No. 1199) (Entered into database on 5/29/02 - John Szostak)

Responsible Authority:

Rodger Bossert

Date:

10/5/2001

Corrective Action/Disposition Verified By:

Rodger Bossert

Date:

10/5/2001

Will Configuration be affected?: YES NO

Identified problem area:

- Material Manpower Method Machine Measurement

Reviewed By:

Bob Jensen

Date:

10/8/2001

Revision Request Control Number: 1199

Specification Number: 5520 - TR - 333494 Current Revision: A

Traveler or Document Title LHC Coil Insulation/Assembly Traveler

Step #/Description of Revision:

- 4.0 Changed assembly order to all Inners, then all outers. DR No. HGQ-0227.
- 4.10 Added engineer sign off for the Coil length.
- 5.1 Removed electrical limits, 10 mA to 1A, and added Engineer signoff. DR No. HGQ-0250.
- 6.0 Modify Preform Length as needed to fit inside of the Lead End outer Keys.
Removed Spot Heaters and Volt Taps.
- 8.0 Changed the assembly process to by Quadrant instead of by product.
- 9.4 Removed electrical limits, 10 mA to 1A, and added Engineer signoff. DR No. HGQ-0250.

Rodger Bossert

Originator

Matt Cullen

Responsible Authority

7/3/2001

Date

Revision Incorporated into the Traveler:

Yulia Klyukhina

Revision Incorporated By

9/5/2001

Date

Process Engineering Final Review:

Bob Jensen

Process Engineering/Designee

9/5/2001

Date

Instructions for the completion of the Revision Request Form

Note(s):

Multiple steps may be effected by one Revision Request Form but only one specific Traveler or Document may be effected by each Revision Request Form.

If completing this form by hand, a Revision Request Control Number must be obtained before processing.

If completing this form entirely by electronic means, the printed copy to be filed in the Process Engineering Office is to be initiated by the individual incorporating the Revision Request and the individual who reviewed the Traveler or Document.

Originator Instructions:

- 1) Specification Number: - Enter the Specification Number of the Traveler or Document to be revised. (Document title is inserted automatically from the spec. #)
- 2) Current Revision: - Enter the Revision of the Traveler or Document to be revised.
- 3) Step# / Description of the Revision: - Enter a description of the revision to be made and the step# it applies to, if applicable. If needed to describe the revision attach a copy of the page(s). If the revision is coming from a related document such as a Discrepancy Report or an Engineering Order attach a copy of that document to the Revision Request Form.
- 4) Originator: - Originator is the person generating the form. (Select Name from List)
- 5) Responsible Authority: - Responsible Authority is person responsible for the process in question. (Select Name from List)

Process Engineering Office Instructions:

- 1) Revision Incorporated into the Traveler: - Signature of the individual who incorporated the revision.
- 2) Process Engineering Final Review: - Review the Traveler or Document revised, sign and date the form. The original completed Revision Request Form will be retained by the Process Engineering Office in the Revision Request Binder.

Revision Request Control Number:

Specification Number: Current Revision:

Traveler or Document Title

Step #/Description of Revision:

Part number in Steps 8.3, 9.3 and 10.3 are suppose to be (MC-369624).
6.5 Change Wire spec to 26 gauge (MA-369832).

THIS TRR IS OBSOLETE.

THE DECISION BY THE PRODUCTION ENGINEERS TO DELETE THE VOLTAGE TAPS WAS MADE BEFORE THESE CHANGES COULD BE MADE. THE VOLTAGE TAPS WERE DELETED PER DR No. HGQ-0229 AND THE CHANGES WERE IMPLEMENTED ON TRR No. 1245.

Originator

Responsible Authority

Date

Revision Incorporated into the Traveler:

Revision Incorporated By

Date

Process Engineering Final Review:

Process Engineering/Designee

Date

Instructions for the completion of the Revision Request Form

Note(s):

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- 4) Originator: - Originator is the person generating the form. (Select Name from List)
- 5) Responsible Authority: - Responsible Authority is person responsible for the process in question. (Select Name from List)

Process Engineering Office Instructions:

- 1) Revision Incorporated into the Traveler: - Signature of the individual who incorporated the revision.
- 2) Process Engineering Final Review: - Review the Traveler or Document revised, sign and date the form. The original completed Revision Request Form will be retained by the Process Engineering Office in the Revision Request Binder.

Revision Request Control Number: 1245

Specification Number: 5520 - TR - 333494 Current Revision: B

Traveler or Document Title LHC Coil Insulation/Assembly Traveler

Step #/Description of Revision:

- 4.9 Added Step. "Measure From the Inner Lead End Key to the End of the Mandrel at the Lead End. Record the measurements for each Quadrant in the Table below."
- 6.6 Deleted Step. No Voltage Taps. DR No. HGQ-0229.
- 6.13 Deleted Step. No Voltage Taps. DR No. HGQ-0229.
- 6.20 Deleted Step. No Voltage Taps. DR No. HGQ-0229.
- 6.27 Deleted Step. No Voltage Taps. DR No. HGQ-0229.
- 7.4 Added Step. "Install Pins into the Modified Inner Return End Keys."
- 7.7 Added Step. "Align the Midplanes of the Inner & Outer Coils in reference to each other."
- 8.0 Added Step(s). Added New Electrical Step.
- 9.1 Modified Step. Added quadrants and line for serial numbers for Heaters. (New step 10.1)
- 12.4 Modified Step. Added Total Magnet Resistance box to tables. Deleted Voltage Taps Chart. Removed Inner and Outer Columns for R, Ls, and Q. (New step 13.4)

Rodger Bossert

Originator

Matt Cullen

Responsible Authority

10/10/2001

Date

Revision Incorporated into the Traveler:

John Szostak

Revision Incorporated By

2/8/2002

Date

Process Engineering Final Review:

Bob Jensen

Process Engineering/Designee

2/8/2002

Date