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1 Comments

• <u>Hipot tests</u>:

- Power the component listed first, keep untested components floating.
- Test each Quench Heater separately.
- Connect the 11 pole segments together to perform Coil to Pole Hipot. Be sure that Inner and Outer pole segments are connected.
- Set the maximum leakage current threshold to $1 \mu A$ (10 μA when 1 μA does not work). The maximum leakage current must not be exceeded neither during Ramp up nor at Plateau.

• <u>Impulse tests</u>:

- Impulse tests with direct polarity (High Outer Layer Ground Inner Layer) at 1000 V, 1500 V, 2000 V and 2500 V
- Impulse tests with reversed polarity (High Inner Layer Ground Outer Layer) at 1000 V, 1500 V, 2000 V and 2500 V

<u>Electrical Measurements:</u>

- Coil inductance (LQ) measurements at 20 Hz (unless otherwise specified)
- Coil resistance (R) and VT measurements at 1 A. After Impregnation, connect Multimeter Terminals at **7 inches from the Splice Blocks**.

3800 V

2 Fabrication Process

Pre-Fabrication Tests

1. Trace Hipot after receiving:

Coil Fabrication Tests:

2. Coil winding:

·Real-time monitoring of continuity between coil, parts and mandrel

3. After curing, coil on curing mandrel, OD up:

•Coil RLQ R: (520.00 -540.00 mV) Ls: (10.40 – 11.00 mH) Q: (2.20 – 2.50) •Continuity check: coil-to-RE saddles, coil-to-LE saddles, saddle-to-saddle, coil-to-end spacers, coil to pole



4.	Before reaction, fixture open, w/o mold blocks and SS shell, OD up:	·Coil RLQ R: (520.00 -540.00 mV) Ls: (6.10 – 6.80 mH) Q: (1.40 – 1.60) ·Continuity checks: coil-to-RE saddles, coil-to-LE saddles, saddle-to-saddle, coil-to-end spacers, coil to pole
5.	Before reaction, After close and flip, fixture open, ID up:	•Coil RLQ R: (520.00 - 540.00 mV) Ls: (6.20 - 6.40 mH) Q: (1.40 - 1.50) •Continuity checks: coil-to-RE saddles, coil-to-LE saddles, saddle-to-saddle, coil-to-end spacers, coil to pole
6.	After reaction, fixture open, OD up:	·Coil RLQ R: (590.00 -610.00 mV) Ls: (6.10 – 6.40 mH) Q: (1.20 – 1.30) ·Continuity checks coil-to-RE saddles, coil-to-LE saddles, saddle-to-saddle, coil-to-end spacers, coil to pole
7.	After splicing, OL trace installed, OD up:	 •Coil RLQ R: (590.00 -610.00 mV) Ls: (6.00 - 6.40 mH) Q: (1.10 - 1.30) •OL Voltage tap B1: 590.00 - 610.00 mV B2: 590.00 - 610.00 mV B3: 490.00 - 430.00 mV B4: 260.00 - 280.00 mV B5: 260.00 - 280.00 mV B6: 260.00 - 280.00 mV B7: 260.00 - 280.00 mV B8: 260.00 - 280.00 mV



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	·OL Heater R B01: $1.70 - 2.20 \Omega$ B02: $1.70 - 2.20 \Omega$ B03: $1.70 - 2.20 \Omega$ B04: $1.70 - 2.20 \Omega$
8. After fixture bolted closed, OD up:	•Coil RLQ R: (590.00 -610.00 mV) Ls: (6.50 - 6.90 mH) Q: (1.20 - 1.40) •Continuity checks coil-to-OL Heaters
9. After flip, fixure open, ID up:	·Coil RLQ R: (590.00 -610.00 mV) Ls: (6.50 – 6.80 mH) Q: (1.20 – 1.40) ·Continuity checks: coil-to-RE saddles, coil-to-LE saddles, saddle-to-saddle, coil-to-end spacers, coil to pole
10. After IL trace installed, ID up:	•Coil RLQ R: $(590.00 - 610.00 \text{ mV})$ Ls: $(6.50 - 6.80 \text{ mH})$ Q: $(1.20 - 1.40)$ •IL Voltage tap A1: $0.00 - 1.00 \text{ mV}$ A2: $0.00 - 1.00 \text{ mV}$ A3: $190.00 - 210.00 \text{ mV}$ A3: $190.00 - 260.00 \text{ mV}$ A4: $240.00 - 260.00 \text{ mV}$ A5: $240.00 - 260.00 \text{ mV}$ A5: $240.00 - 260.00 \text{ mV}$ A6: $250.00 - 270.00 \text{ mV}$ A7: $250.00 - 270.00 \text{ mV}$ A8: $260.00 - 280.00 \text{ mV}$ ·IL Heater R A01: $3.40 - 3.70 \Omega$ A02: $3.40 - 3.70 \Omega$
11. After fixture bolted closed, ID up:	• Coil RLQ R: (590.00 -610.00 mV) Ls: (7.20 – 7.50 mH) Q: (1.30 – 1.50) •Continuity checks coil-to-IL Heaters



12. After impregnation, fixture open, OD up:	•Coil RLQ R: $(590.00 - 620.00 \text{ mV})$ Ls: $(6.60 - 6.90 \text{ mH})$ Q: $(1.30 - 1.50)$ •Continuity checks: coil-to-RE saddles, coil-to-LE splice blocks, coil-to-OL Heaters, saddle-to-saddle, OL Heaters-to-saddles, coil to pole, pole segm to pole segm •OL Voltage tap B1: 590.00 - 610.00 mV B2: 590.00 - 610.00 mV B3: 190.00 - 430.00 mV B3: 190.00 - 280.00 mV B5: 260.00 - 280.00 mV B5: 260.00 - 280.00 mV B7: 260.00 - 280.00 mV B8: 260.00 - 280.00 mV B8: 260.00 - 280.00 mV COL Heater R B01: 1.70 - 2.20 Ω B03: 1.70 - 2.20 Ω B03: 1.70 - 2.20 Ω
13. After flip, ID up:	 •Coil RLQ R: (590.00 -620.00 mV) Ls: (6.10 - 6.50 mH) Q: (1.20 - 1.50) •Continuity checks: coil-to-RE saddles, coil-to-LE splice blocks, coil-to-IL Heaters, saddle-to-saddle, IL Heaters-to-saddles, coil to pole, pole segm to pole segm •IL Voltage tap A1: 0.00 - 1.00 mV A2: 0.00 - 1.00 mV A3: 190.00 - 210.00 mV A4: 240.00 - 260.00 mV A5: 240.00 - 260.00 mV A6: 250.00 - 270.00 mV A7: 250.00 - 270.00 mV A8: 260.00 - 280.00 mV •IL Heater R



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A01: 3.40 – 3.70 Ω A02: 3.40 – 3.70 Ω

/* Steps 12 and 13 can be reverse depending on the process*/

14. Before shipping, coil on bench and on shipping Mandrel, OD up:

 \cdot Coil RLQ (20 Hz, 100 Hz, 1 kHz)

@ 20 Hz R: (590.00 -610.00 mV) Ls: (4.80 - 5.10 mH) Q: (0.80 - 0.90)

@ 100 Hz Ls: (3.20 – 3.50 mH) Q: (1.50 – 1.70)

@ 1k Hz Ls: (1.80 - 2.00 mH)Q: (1.90 - 2.10)·Continuity checks: coil-to-structure, heaters-to-structure, coil-to-RE saddles, coil-to-LE splice blocks, coil-to-heaters, saddle-to-saddle, heaters-to-saddles, coil to pole, pole segm to pole segm ·Voltage tap A1: 0.00 - 1.00 mVA2: 0.00 - 1.00 mV A3: 190.00 - 210.00 mV A4: 240.00 - 260.00 mV A5: 240.00 - 260.00 mV A6: 250.00 - 270.00 mV A7: 250.00 - 270.00 mV A8: 260.00 – 280.00 mV B8: 260.00 - 280.00 mV B7: 260.00 – 280.00 mV B6: 260.00 – 280.00 mV B5: 260.00 – 280.00 mV B4: 260.00 - 280.00 mV



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B3: 410.00 - 430.00 mV		
B2: 590.00 – 610.00 mV		
B1: 590.00 – 610.00 mV		
·Heater R		
A01: $3.40 - 3.70 \Omega$		
A02: $3.40 - 3.70 \Omega$		
B01: $1.70 - 2.20 \Omega$		
B02: $1.70 - 2.20 \Omega$		
B03: $1.70 - 2.20 \Omega$		
B04: $1.70 - 2.20 \Omega$		

•Hipots:

QH to Coil	3680 V
Coil to Pole	500 V
Coil to Endshoes (all)	1000 V
QH IL to Endshoes IL	2500 V
QH OL to Endshoes OL	2500 V
Endshoes IL to Endshoes OL	1000 V

·Impulse tests (Direct and Reverse)

15. After receiving, coil in the crate on shipping Mandrel, OD up:

Coil RLQ (20 Hz, 100 Hz, 1 kHz)
Continuity checks:

coil-to-structure,
heaters-to-structure,
coil-to-RE saddles,
coil-to-LE splice blocks,
coil-to-heaters,
saddle-to-sadle,
heaters-to-saddles,
coil to pole,
pole segm to pole segm

Voltage tap & Heater R.

16. After receiving, coil on Wooden Table

•Hipots:

QH to Coil	3680 V
Coil to Pole	500 V
Coil to Endshoes (all)	1000 V
QH IL to Endshoes IL	2500 V
QH OL to Endshoes OL	2500 V
Endshoes IL to Endshoes OL	1000 V

·Impulse tests (Direct and Reverse)