

TS-SSC 92-079  
July 25 1992  
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### DSA323B QUENCH HISTORY

To remind you all, DSA323 displayed unusual quench behavior (i.e. down ramp quench after exceeding 7kA many times without quenching), during previous tests. Recently this magnet was reassembled with Aluminum end can, +5/-5 mil inner/outer pole shims were added and intermediate keying method was used in collar assembly. The average prestress on inner coils was doubled (from 5880 to 11600 psi) and it was reduced for outer coils (from 9940 to 5530 psi). After making these changes, DSA323 was cold tested and it did not experience any down ramp quenching. To ramp the magnet we used similar sawtooth ramps as before (Fermilab TS-SSC 91-094) and successfully completed 10 ramp cycles between 50 - 7200 A (at 25 A/s), and same number of ramp cycles (10) at 100 A/s, between 50 - 7000 A with 60 sec dwell at peak current, were also completed without quenching the magnet. The exact cause of downramp quenching is not clear. It could be because of either end clamp or lower coil prestress. One can safely say that proper assembly of a magnet is the key to its satisfactory performance. The quench summary for the latest cold test is given below.

### Quench File Summary

#### DSA323

Q#	File	I-mm	Idot	I-t	Idot	QDC	MITs	t-Q	V-max	Coil	t(H)	V(H)	T(t)	T(m)	T(b)	P	Location
1	243	1013.	0.	0.0	0.0	0.0	0.0	0.000	-8.	UI	0.000	0.	4.36	4.32	4.32	58.	Manual Dump to check s. ckt's
2	244	6810.	0.	0.0	0.0	0.0	0.0	0.018	-38.	UI	0.000	0.	4.36	4.32	4.32	70.	near vtap 20A
3	245	6889.	18.	0.0	0.0	0.0	0.0	0.018	-39.	UI	0.000	0.	4.36	4.32	4.32	76.	near vtap 20A
4	246	7035.	18.	0.0	0.0	0.0	0.0	-0.017	-38.	UI	0.000	0.	4.36	4.32	4.32	863.	near vtap 20A
5	247	7177.	18.	0.0	0.0	0.0	0.0	-0.015	-37.	UI	0.000	0.	4.36	4.31	4.31	882.	near vtap 20A
6	248	7281.	18.	0.0	0.0	0.0	0.0	-0.016	-37.	UI	0.000	0.	4.36	4.32	4.32	887.	near vtap 20A
7	249	7324.	18.	0.0	0.0	0.0	0.0	-0.014	-38.	UI	0.000	0.	4.35	4.31	4.32	880.	near vtap 20A
8	250	7412.	18.	0.0	0.0	0.0	0.0	-0.015	-37.	UI	0.000	0.	4.35	4.31	4.31	862.	near vtap 20A
9	251	7437.	18.	0.0	0.0	0.0	0.0	-0.014	-38.	UI	0.000	0.	4.36	4.32	4.32	886.	near vtap 20A
10	252	7478.	18.	0.0	0.0	0.0	0.0	-0.011	-32.	LI	0.000	0.	4.36	4.32	4.31	888.	near vtap 20A
11	253	7478.	18.	0.0	0.0	0.0	0.0	-0.010	-29.	LI	0.000	0.	4.36	4.32	4.31	884.	near vtap 20A
12	254	7476.	18.	0.0	0.0	0.0	0.0	-0.011	-29.	UI	0.000	0.	4.36	4.32	4.32	887.	near vtap 20A
13	255	7481.	18.	0.0	0.0	0.0	0.0	-0.011	-29.	LI	0.000	0.	4.37	4.31	4.32	871.	near vtap 20A
14	256	7486.	20.	0.0	0.0	0.0	0.0	-0.010	-28.	UI	0.000	0.	4.36	4.32	4.32	882.	near vtap 20A
15	257	7491.	20.	0.0	0.0	0.0	0.0	-0.010	-27.	UI	0.000	0.	4.37	4.33	4.33	867.	near vtap 20A
16	258	7510.	75.	0.0	0.0	0.0	0.0	-0.009	-25.	UI	0.000	0.	4.36	4.32	4.32	883.	near vtap 20A
17	259	7488.	100.	0.0	0.0	0.0	0.0	-0.008	-23.	LI	0.000	0.	4.39	4.35	4.34	881.	near vtap 20A
18	260	7368.	150.	0.0	0.0	0.0	0.0	-0.017	-29.	LI	0.000	0.	4.36	4.32	4.33	862.	near vtap 20A
19	261	7199.	200.	0.0	0.0	0.0	0.0	-0.019	-30.	LI	0.000	0.	4.34	4.31	850.	near vtap 20A	
20	262	8830.	250.	0.0	0.0	0.0	0.0	-0.023	-31.	LI	0.000	0.	4.35	4.29	4.29	868.	near vtap 20A
21	263	6570.	300.	0.0	0.0	0.0	0.0	-0.028	-32.	LI	0.000	0.	4.35	4.29	4.29	866.	near vtap 20A
22	264	7488.	8.	0.0	0.0	0.0	0.0	-0.011	-29.	LI	0.000	0.	4.35	4.32	4.33	853.	near vtap 20A
23	265	7442.	8.	0.0	0.0	0.0	0.0	-0.012	-29.	UI	0.000	0.	4.36	4.32	4.33	859.	near vtap 20A
24	266	7657.	8.	0.0	0.0	0.0	0.0	-0.010	-29.	UI	0.000	0.	4.21	4.18	4.18	752.	near vtap 20A

----- QSUMMARY V03.14 -----

FORMAT:

Q#	File	I-mm	Idot	I-t	Idot	QDC	MITs	t-Q	V-max	Coil	t(H)	V(H)	T(t)	T(m)	T(b)	P	LL	Location
A5,	I5,	F8.0,F5.0,F5.1,F5.1,	A5,F5.1,F6.3,F6.3,	A4,F6.3,F5.0,F5.2,F5.2,F5.0,2X,A38														

NOTATION KEY

Q# Quench number or Spot heater number (e.g. 24 is spot heater 4)

F# File

I-m Main coil current at quench

I-dot Main coil dI/dt at quench

I-t Trim coil current at quench

I-dot Trim coil dI/dt at quench

QDC Name of quench detection circuit which tripped:

Distribution:

S. Delchamps

A. Devred

J. Jayakumar

M. Iamm

B. Schermer

J. Strait

J. Tompkins

M. Wake