

HIPOTTING THE A2 DOUBLER STRING

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I. D.C. Hipot of the Entire Bus (Coil plus Return Bus) to Ground

Result - Spark to ground at 400 V from return bus in the area of A25-1.

The spark could be occurring in any of the following places:

1. Downstream end of A24-5 (TA0226)
2. Upstream end of A25-1 (TQ18)
3. Quad spool piece (BC-1)
4. Feed can

We were unable to proceed further on hipotting the entire bus.

II. Pulsed Hipot of Coil-to-Ground

With the return bus grounded, a 3 kV pulse was applied to each magnet coil terminal via the monitor lead, and to each quad spool piece via the safety lead. This test hipots coil-to-ground and coil-to-return bus, but not return bus-to-ground. The voltage pulse is shown in figure 1.

Results - Most terminals withstand the impulse, with the following exceptions:

A. Spool Pieces

A23 (BC-10) - sparks at 2 kV

A24 (BC-6) - sparks at 3 kV (spark is in multipin connector)

A25 (BC-1) - dead short - unfortunately, we caused this while trying to burn-in the return bus sparker at the same location. We applied power through the return bus monitor lead and managed to short out both return bus and coil bus monitor leads.

A26 (BC-4) - sparks at 1 kV

A28 (BC-3) - sparks at 3 kV

Note: It is possible that these sparks are occurring close to the end of either magnet adjacent to the spool piece.

B. Magnets

1. Junction of A27-5 and A28-1 - broke down on 2nd 3 kV pulse and subsequently at voltages ≥ 1 kV. Spark may be located in downstream end of A27-5 (TA0217), the upstream end of A28-1 (TQ13), or in the monitor lead.
2. Junction of A28-5 (TA0248) and A29-1 (TQ19) similar to case 1 above.

III. Doubler Magnet Locations

	TA0234	A26	TQ16
	" 214		BC4
	" 238		TA0245
	" 244		" 246
			" 223
			" 249
A22	TQ15	A27	TQ6
	BC5		BC9
	TA0243		TA0241
	" 221		" 242
	" 219		" 233
	" 203		" 217
A23	TQ10	A28	TQ13
	BC10		BC3
	TA0210		TA0254
	" 224		" 256
	" 207		" 216
	" 222		" 248
A24	TQ14	A29	Q19
	BC6		BC2
	TA0211		
	" 213		
	" 215		
	" 226		
A25	TQ18		
	BC1		
	TA0204		
	" 256		
	" 240		
	" 236		

IV. Patterns

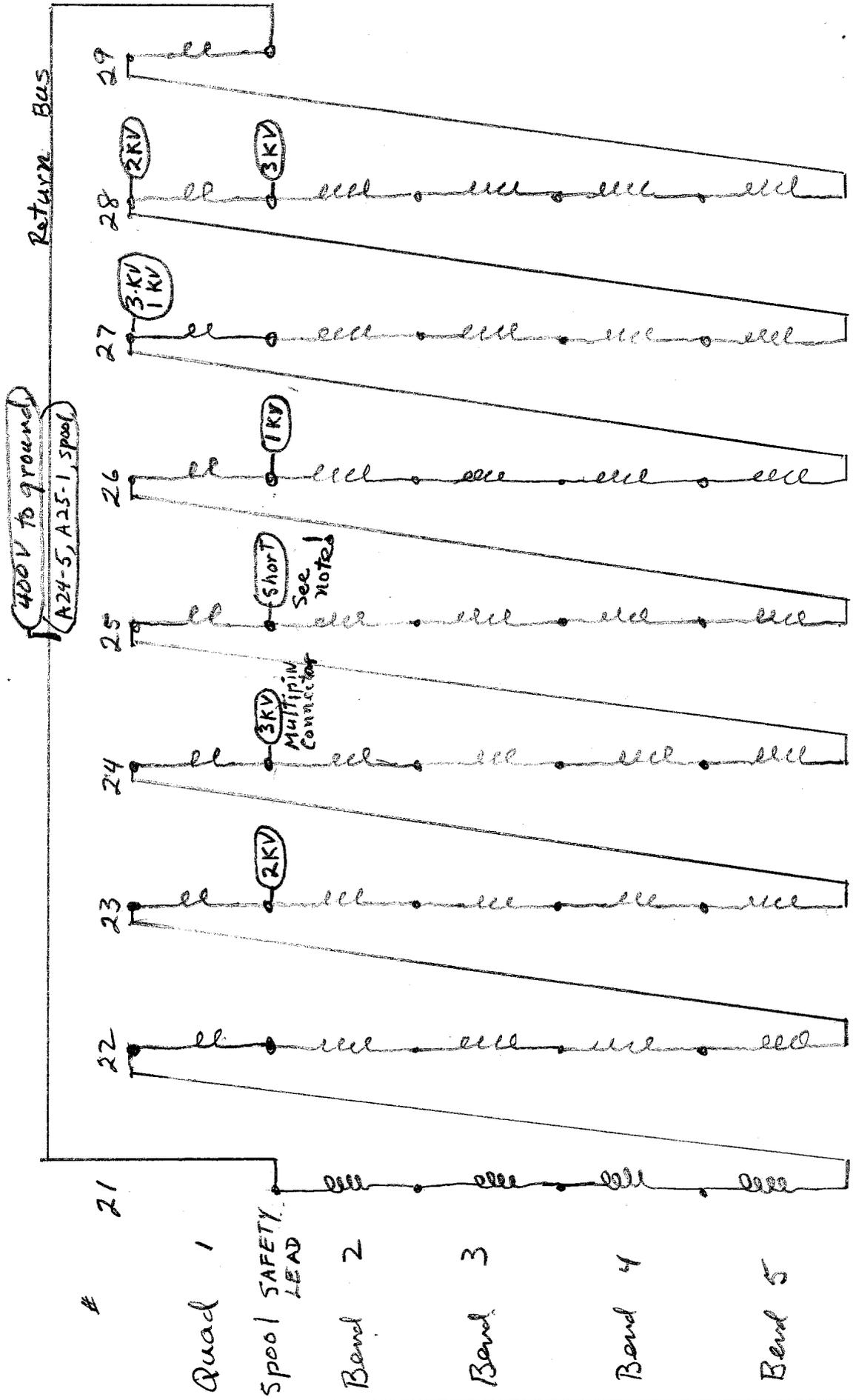
Note that:

1. 6 of 6 breakdowns occur at junctions of quad magnets.
2. 4 of 6 " " " " quad spool pieces.
3. 0 breakdowns occur among the 24 junctions involving strictly dipoles.

This suggests that quads and/or spool pieces, rather than dipoles, may be the source of the breakdowns.

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High Pot DATA
Cold STRING, A-21-A29



Breakdown voltages are indicated
Absence of Note indicates high pot OK at 3KV

Fig. 1 - 1 kV, 2 kV and 3 kV Pulses Applied to Magnet Terminal

