

Earthing tests of the AAC elements

D. Berlin, J. Buttkus, S. Maury and B. Williams

When OP 8 is implemented it is required that the AAS and the OP technician earth the AA and AC magnet circuits. This is done by bridging the magnet coil connections to the ring earthing bar.

Some 5 elements are involved in this manoeuvre, they are:-

in the AA: the QD circuit - (via QDN 1701)
the QF circuit - (via QFW 1801)
the Bending circuit - (via BST1704)

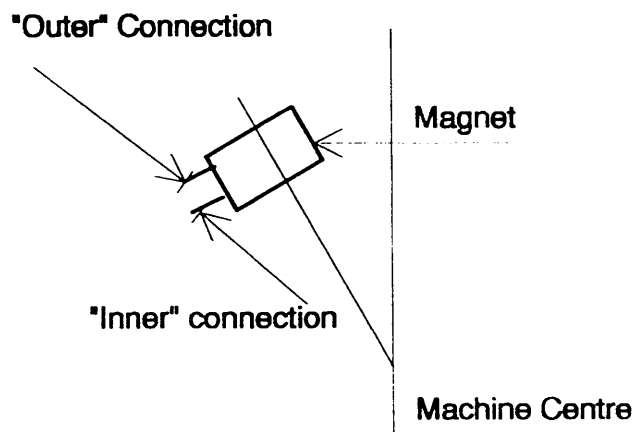
in the AC: the Quadrupole circuit - (via QFW 38)
the Bending circuit - (via BHW 37)

To check the validity of this procedure it was decided to make a series of tests to determine at what levels of current and tension the earthing system, as presently practiced, becomes effective, and to check whether differences in these values would be observed if the "inner" or "outer" connection was used.

The tests were carried out on Wednesday the 23 June 1993 by Messrs. Maury & Williams PS/AR; Berlin & Buttkus PS/PO.

Due to limitations of the Test Power Supply only the AA circuits were tested on this occasion - it is expected that the AC circuits will be tested in the September shutdown.

The convention used to determine the inner/outer connections was:-



The following results were noted:

Circuit	Current	Voltage	Level of shorting current (% of nominal)
QD-AA (Inner)	18 A	5 V	
QD-AA (Outer)	11 A	2/3 V*	1%
QF-AA (Inner)	2 A	0.6 V*	0.14%
QF-AA (Outer)	3 A	0.9 V	
Bending AA (Inner)	4 A	2.7 V*	0,21%
Bending AA (outer)	10 A	5.5 V	

Shorting to ground occurred at very low levels- less than 1% of the nominal currents with voltages less than 3V. The maximum tension at the earth connections is less than the 50 volts upper limit of the "Classe T.B.T.(très basse tension)". Consequently, according to the norme NF C13-100, the protection against electrical shock is considered as assured.

Those connections giving least resistance to ground, (marked with an asterisk above), were identified on the magnets QDN 1701; QFW 1801; and BST 1704, by the addition of GREEN " Scotch" tape just adjacent to the bridging clamp areas

Hence, for future implementations of procedure OP8, the magnet earthing cables are to be clamped in the areas thus marked.

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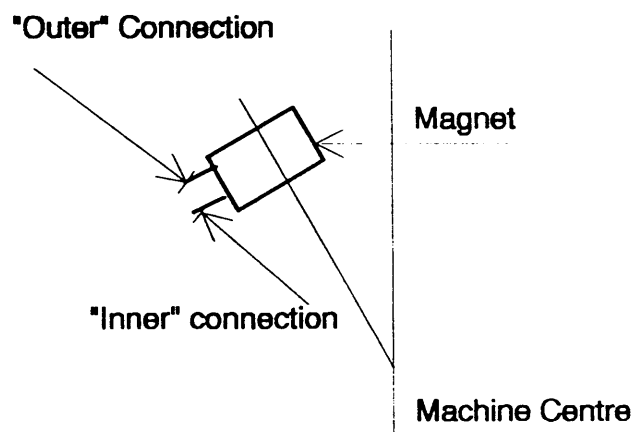
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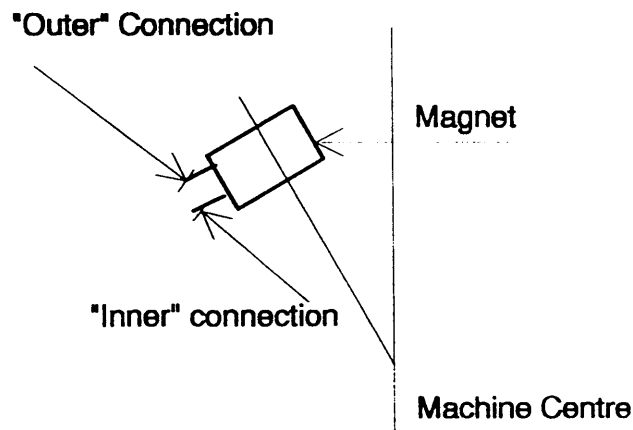
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