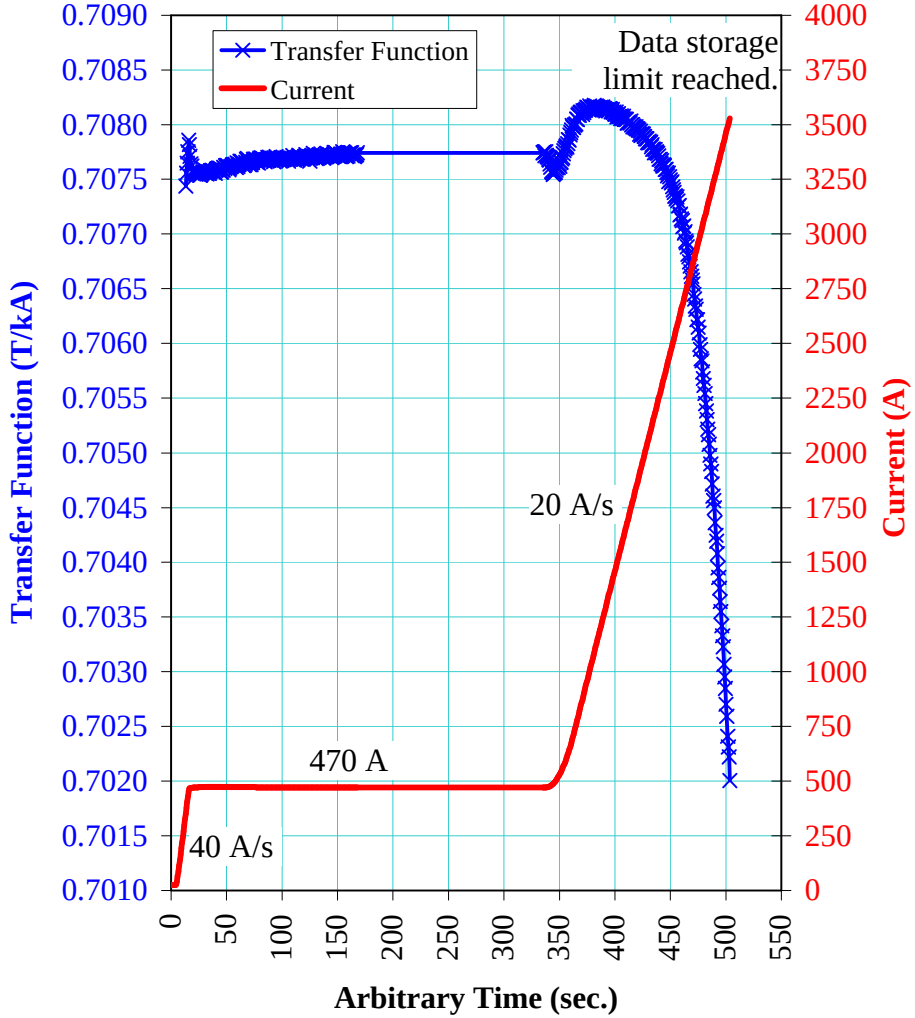
Snap-back on Ramping from 470A to 5100A in D96525

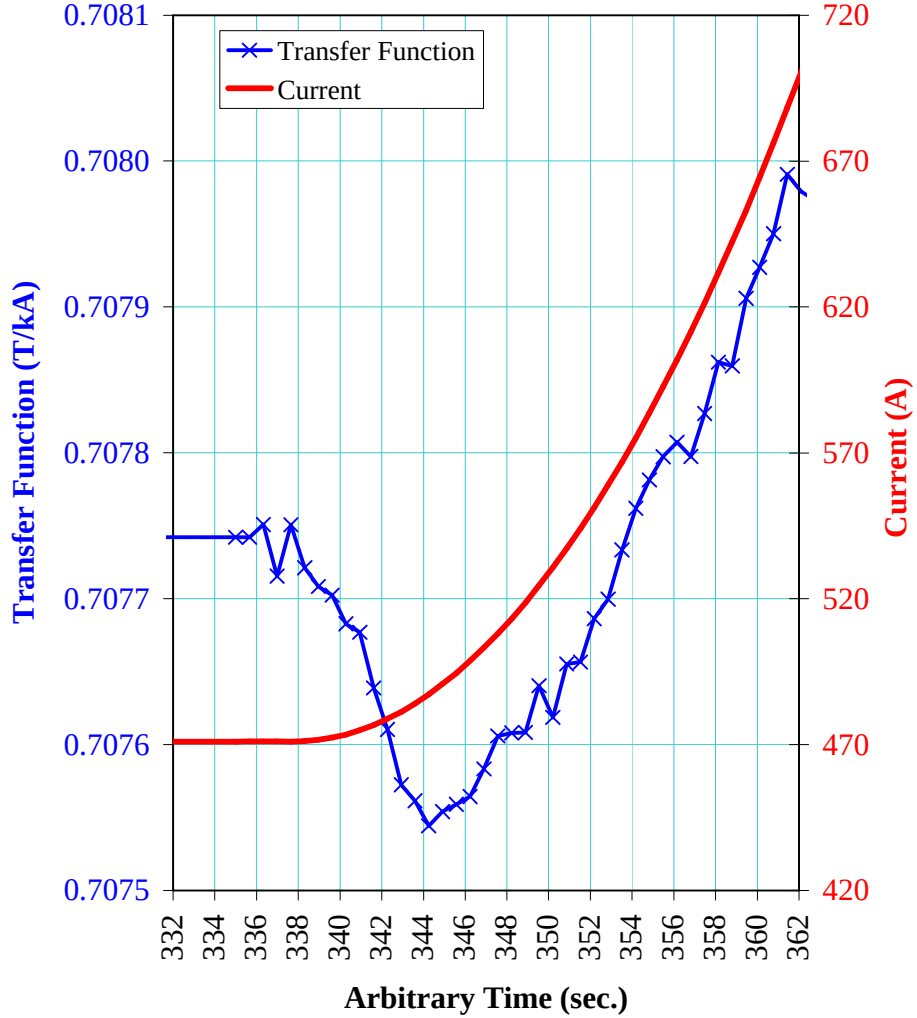
- Measurements are in the straight section with a 1 meter long coil.
- Measurements are with a time resolution of ~0.66 second.
- An AC cycle was done from 25 A to 5100 A and back at 60 A/s. The magnet was then ramped from 25 A to 470 A at 40 A/s. The current was held at 470 A for approx. 300 s during which time decay measurements were made (results distributed on March 24, 2000). Finally, the current was ramped from 470 A to 5100 A at a ramp rate of 20, 40, 60 or 70 A/s. Measurements were made again during this final ramp. The initial few readings in these measurements give information about snap-back behaviour.
- Smooth current ramp profile with quadratic time dependence at the beginning and the end of the ramp.
- An extra long flat top (~510 s) at 470 A was used in the case of final ramp at 40 A/s in order to acquire time decay data over an extended period.
- The left hand figures in the following pages show the transfer function or the normal sextupole measured over the entire ramp sequence from 25 A to 5100 A. These figures show both the initial time decay at 470 A and the snap-back at the final ramp. The time is measured from the very first reading taken at 25 A.
- Both the transfer function and the sextupole return quickly to their initial values as soon as the final ramp is started. The right hand figures in the following pages show the snap-back behaviour in detail. A time resolution of 0.66 s is seen to be adequate. The snap-back is faster at higher ramp rates. The snap-back time is ~5-6 s at 20 A/s, and reduces to ~2 s at 70 A/s. Irrespective of the ramp rate, snap-back to the full initial value occurs when the current has increased from 470 A to ~498 A.

Transfer Function Snap-back in D96525 on Ramp from 470A
(470A to 5100A at 20A/s; Runs 165 and 166)

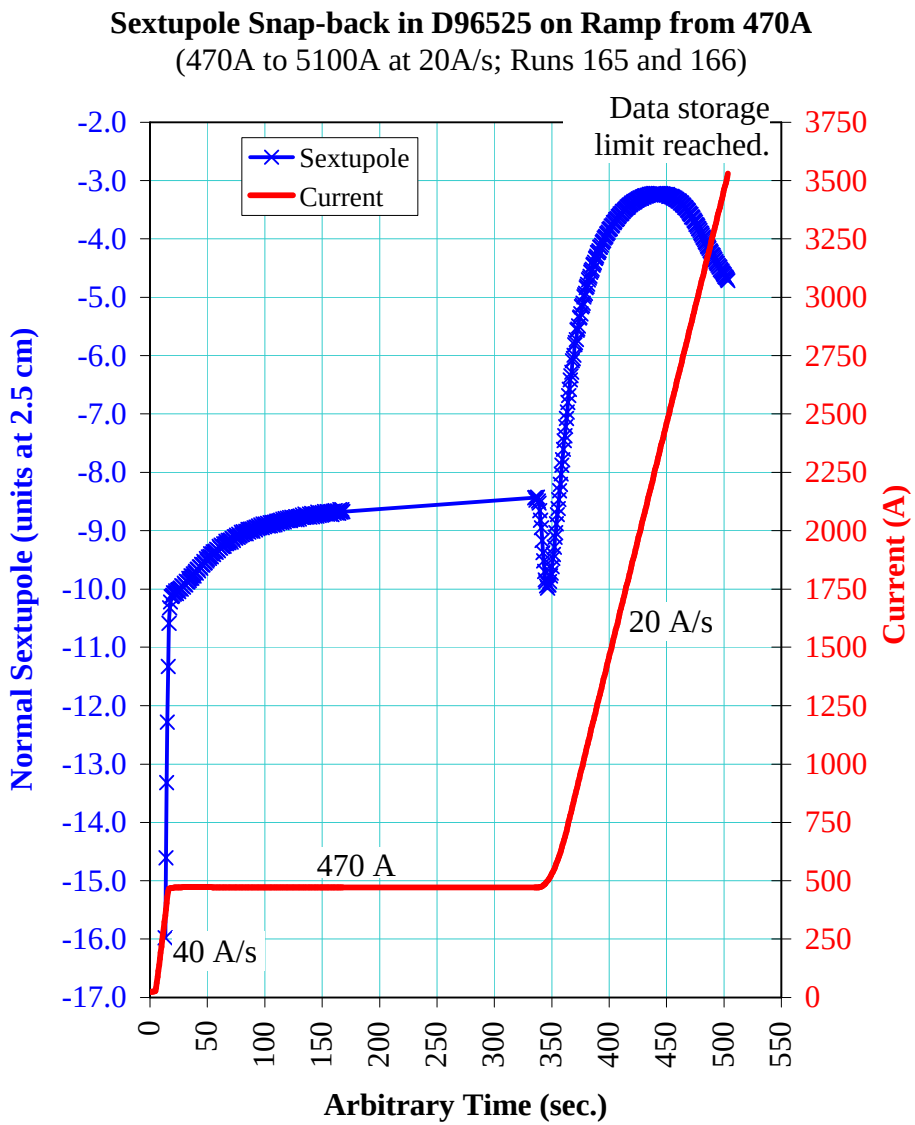


Complete ramp from 25A to 470A to 5100A

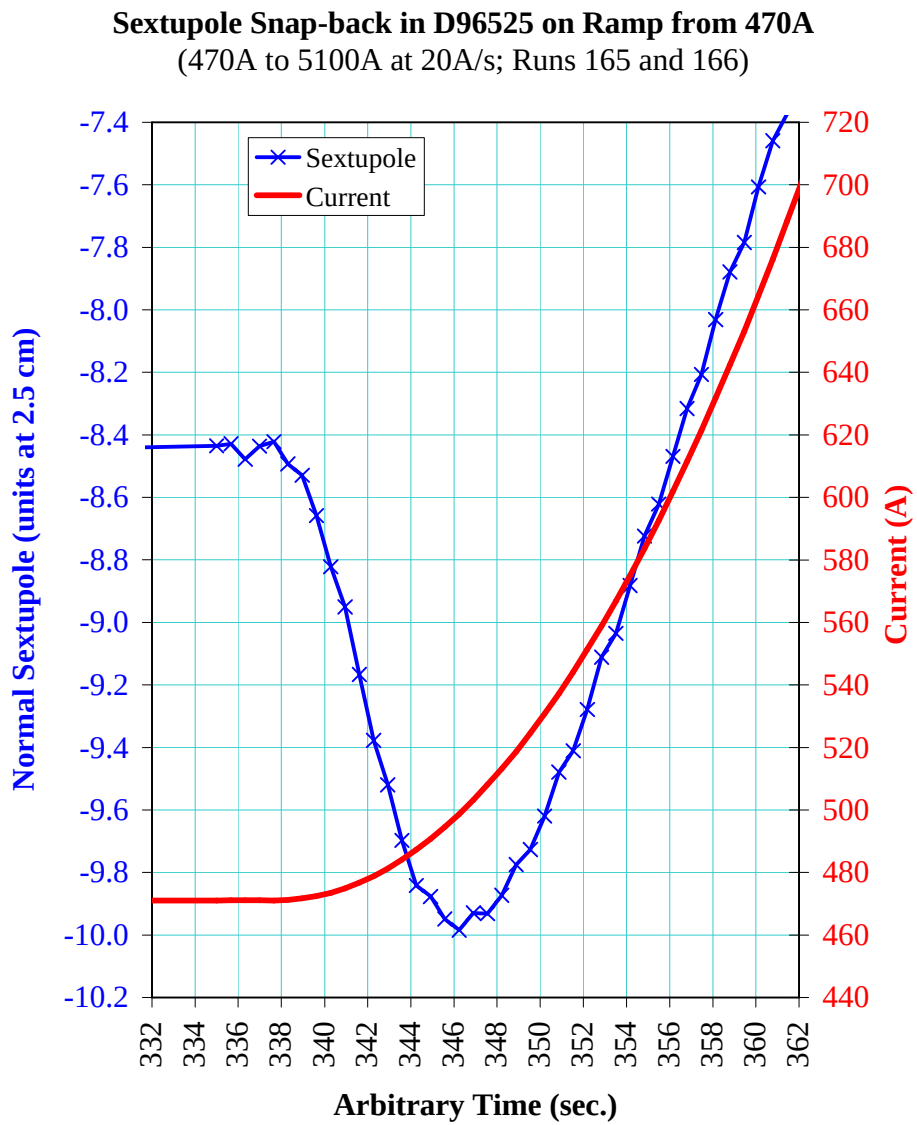
Transfer Function Snap-back in D96525 on Ramp from 470A
(470A to 5100A at 20A/s; Runs 165 and 166)



Details of snap-back at 20 A/s

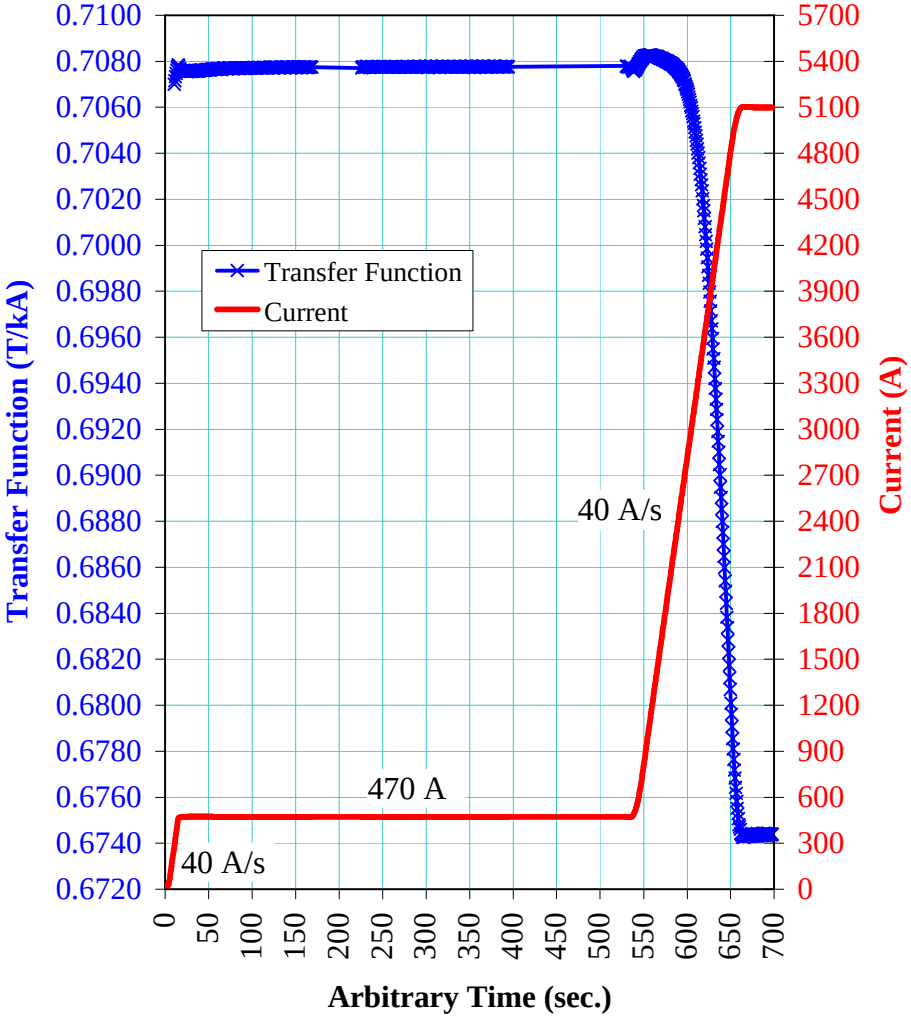


Complete ramp from 25A to 470A to 5100A



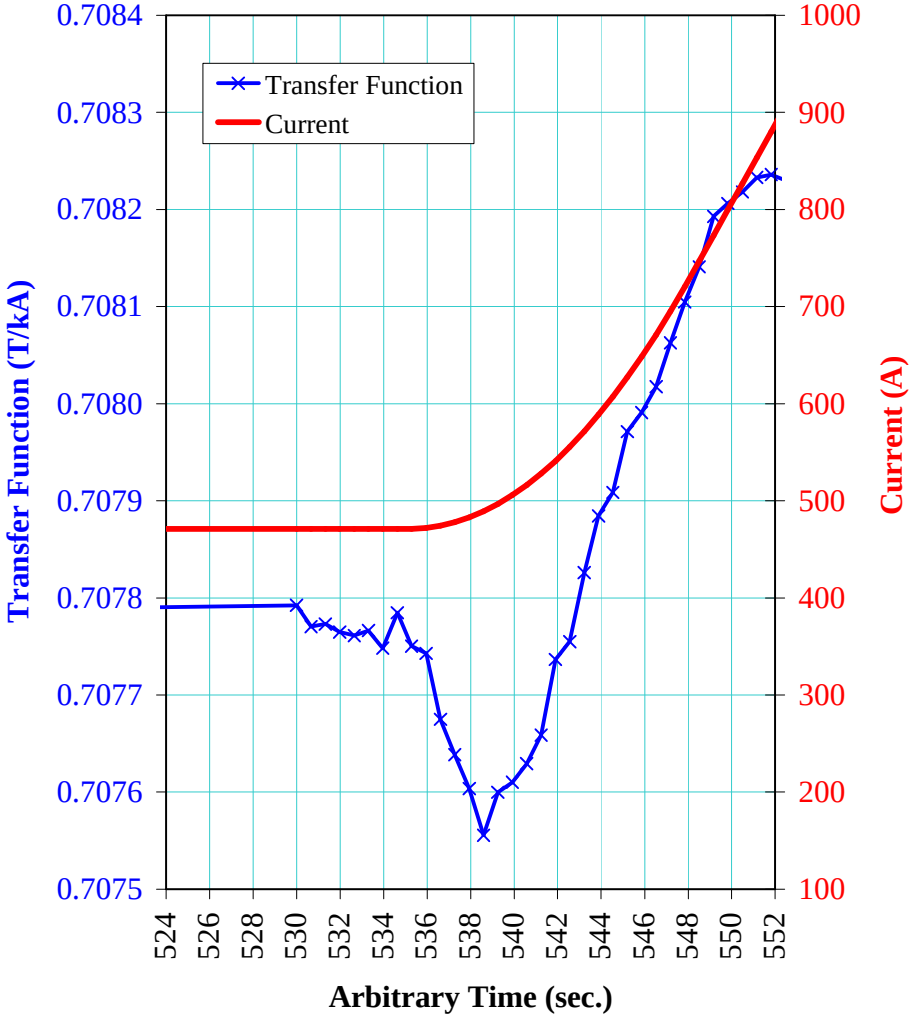
Details of snap-back at 20 A/s

Transfer Function Snap-back in D96525 on Ramp from 470A
(470A to 5100A at 40A/s; Runs 169 and 170)

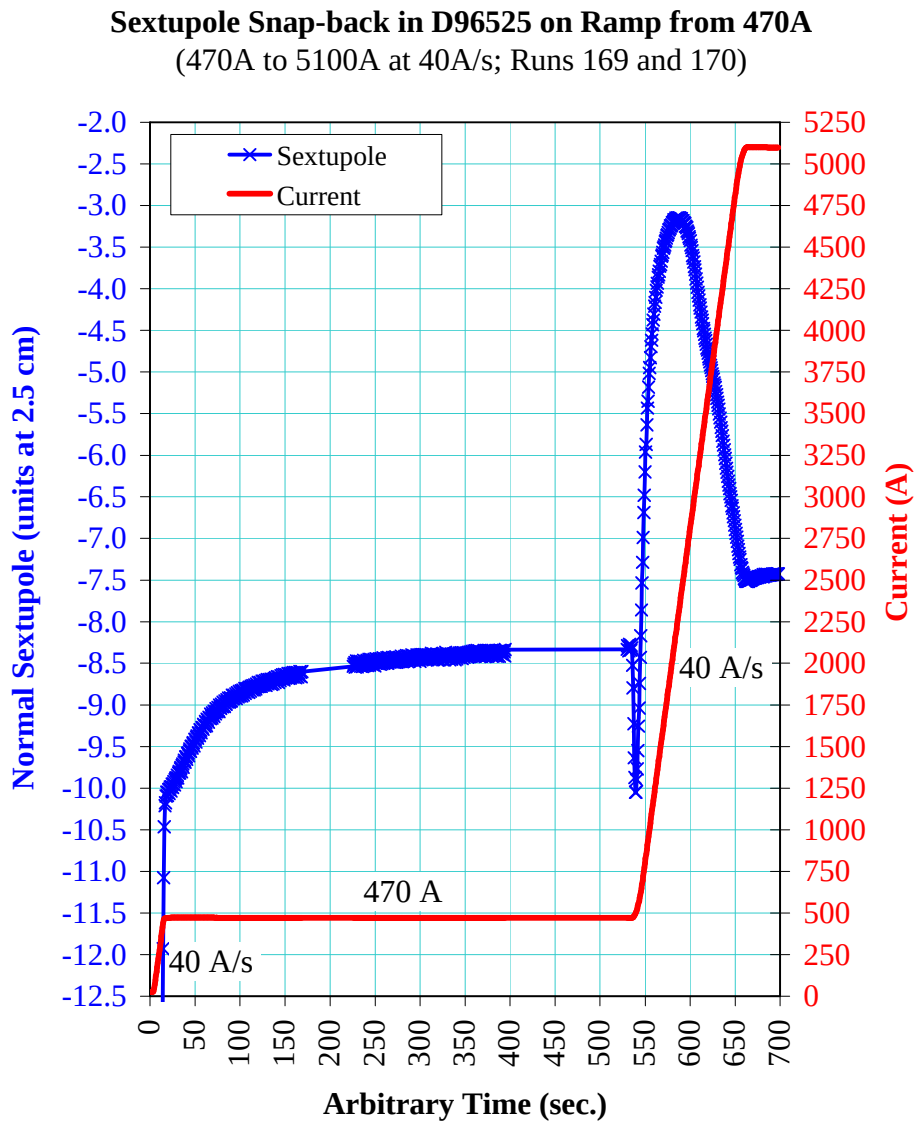


Complete ramp from 25A to 470A to 5100A

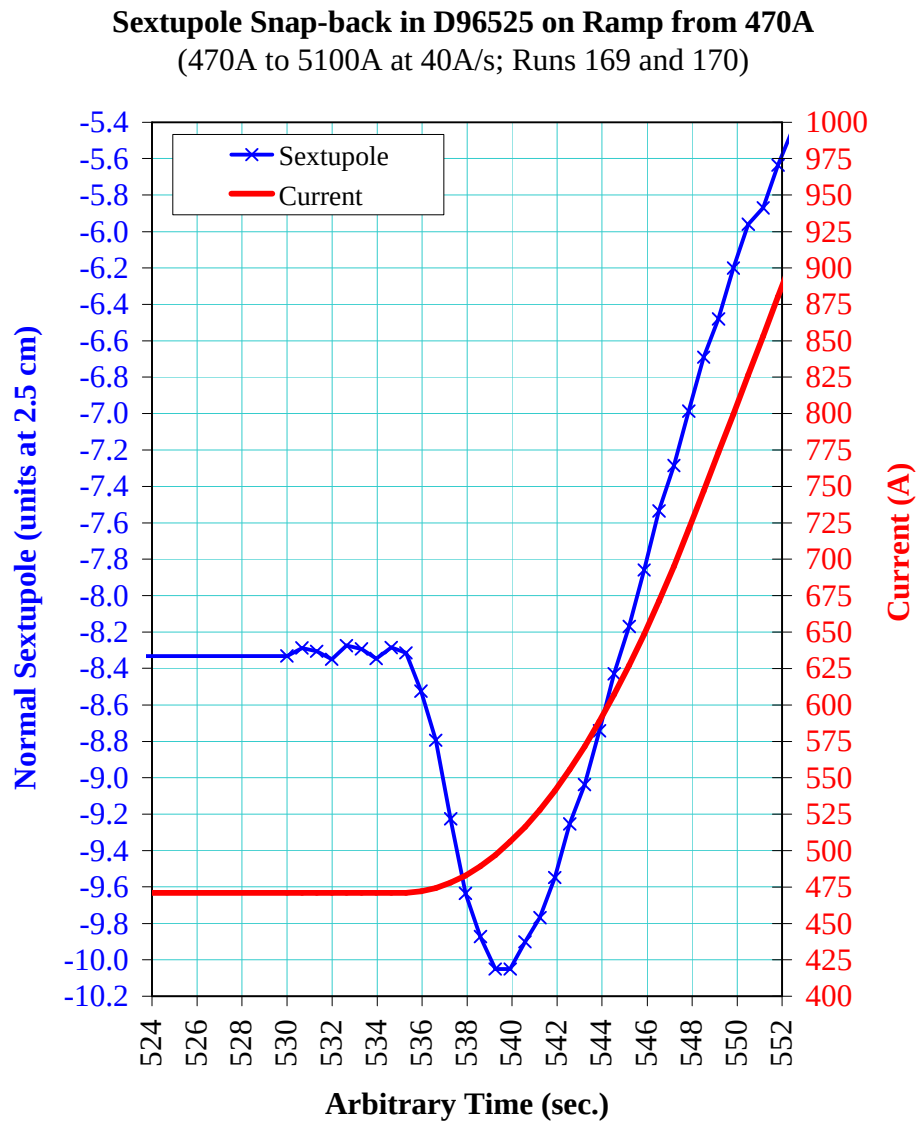
Transfer Function Snap-back in D96525 on Ramp from 470A
(470A to 5100A at 40A/s; Runs 169 and 170)



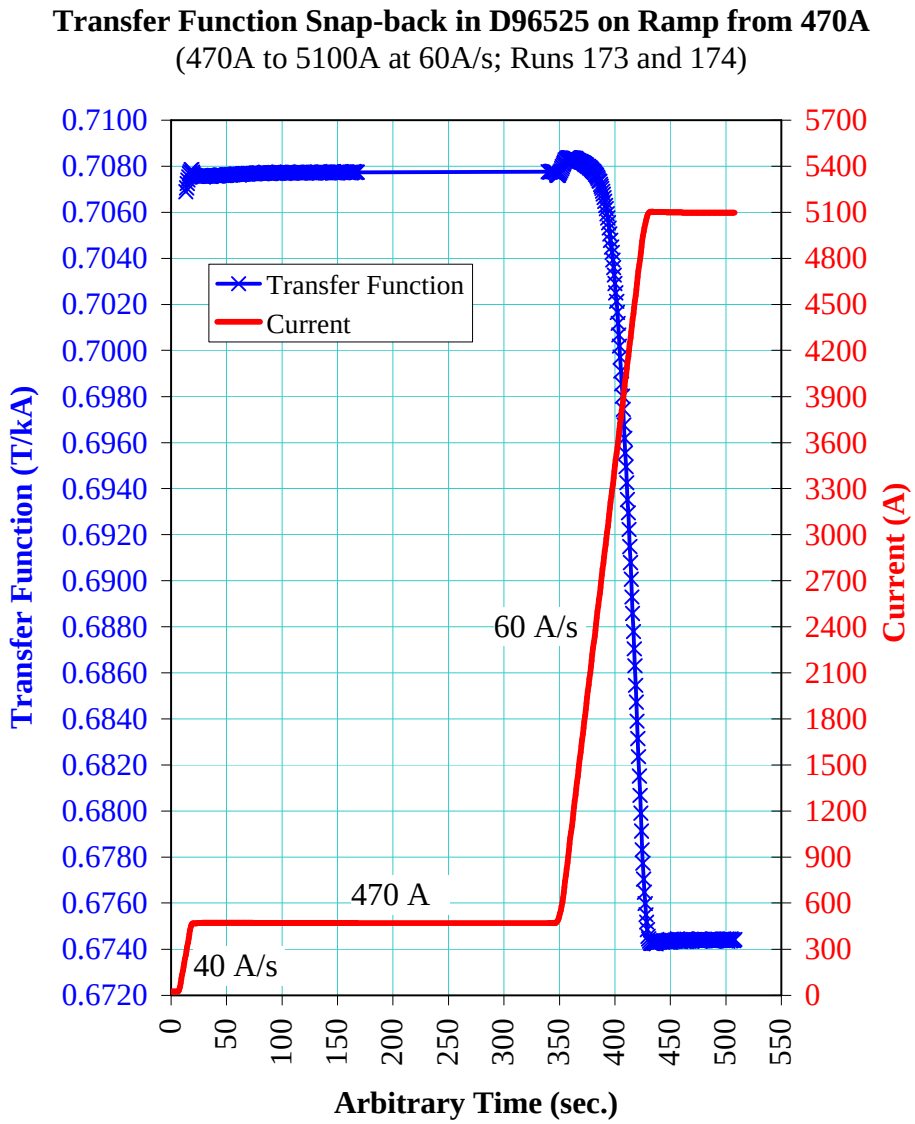
Details of snap-back at 40 A/s



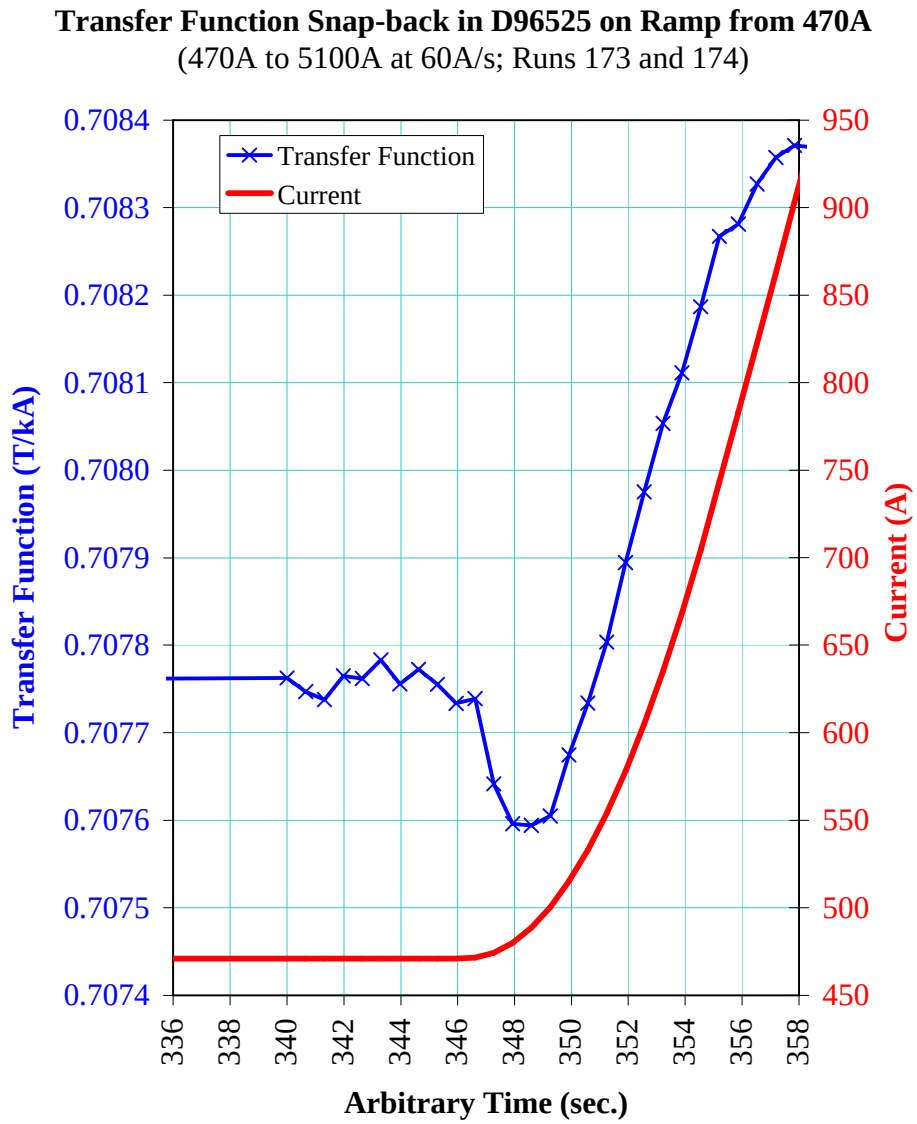
Complete ramp from 25A to 470A to 5100A



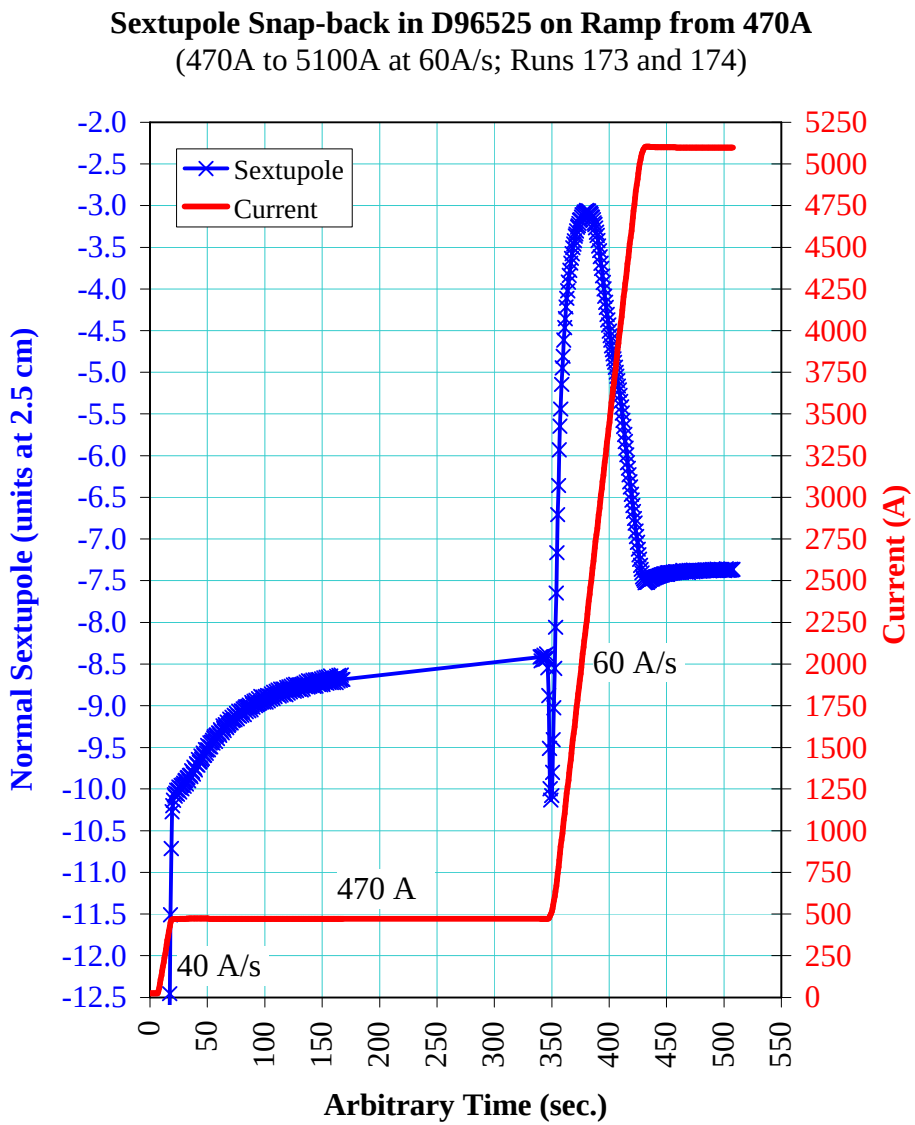
Details of snap-back at 40 A/s



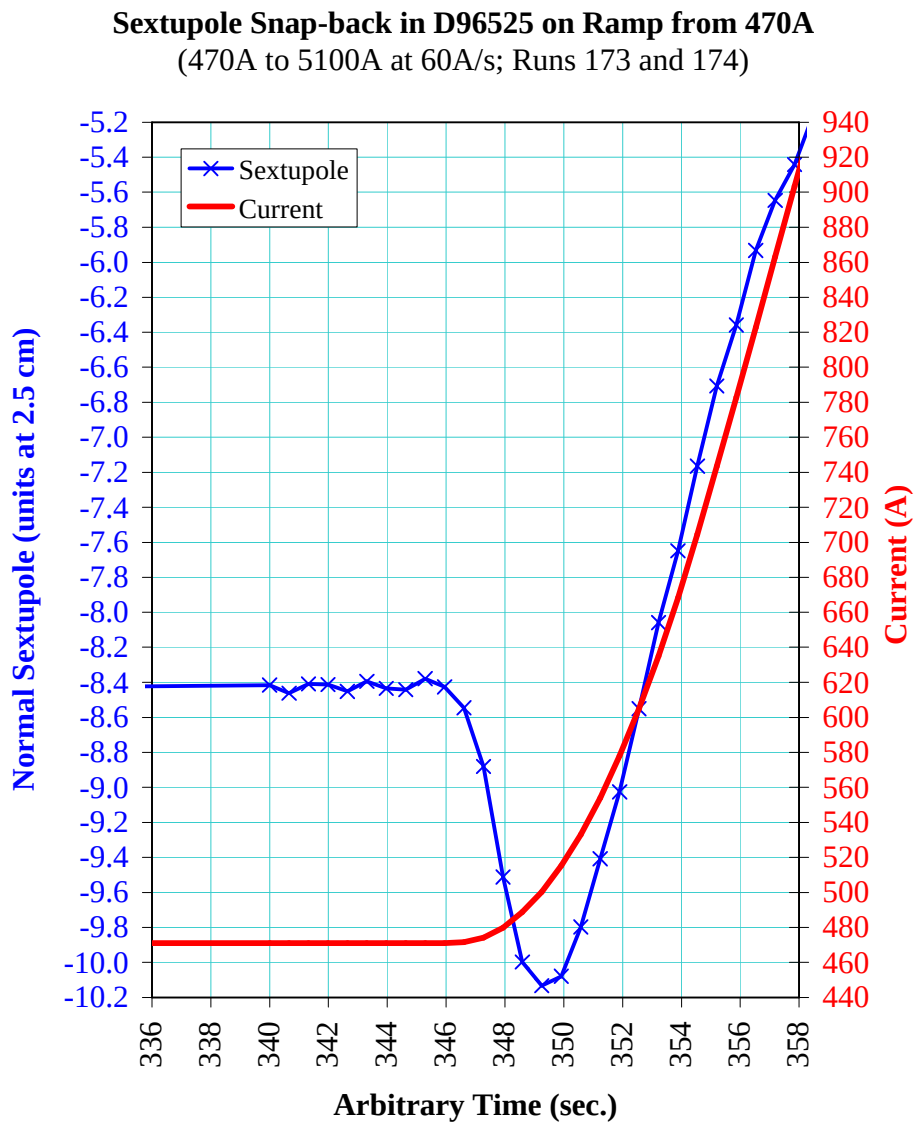
Complete ramp from 25A to 470A to 5100A



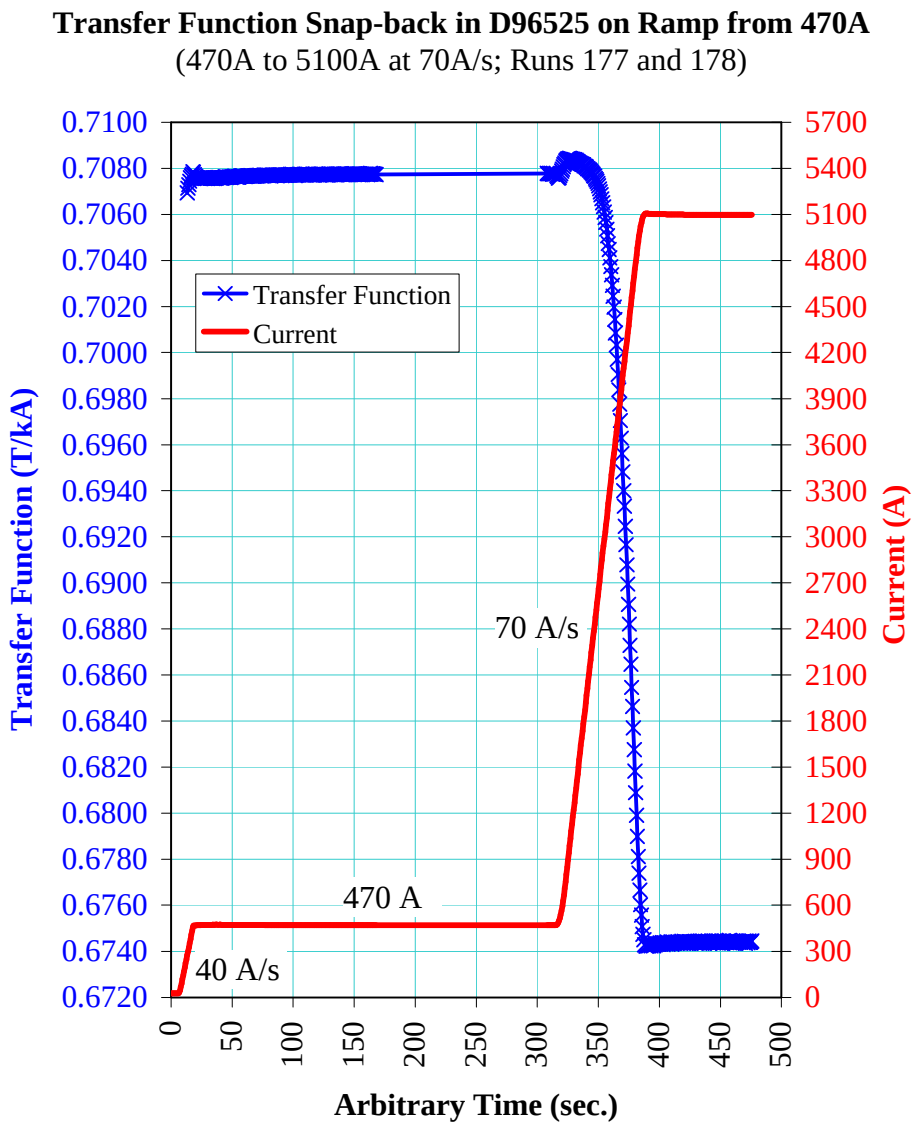
Details of snap-back at 60 A/s



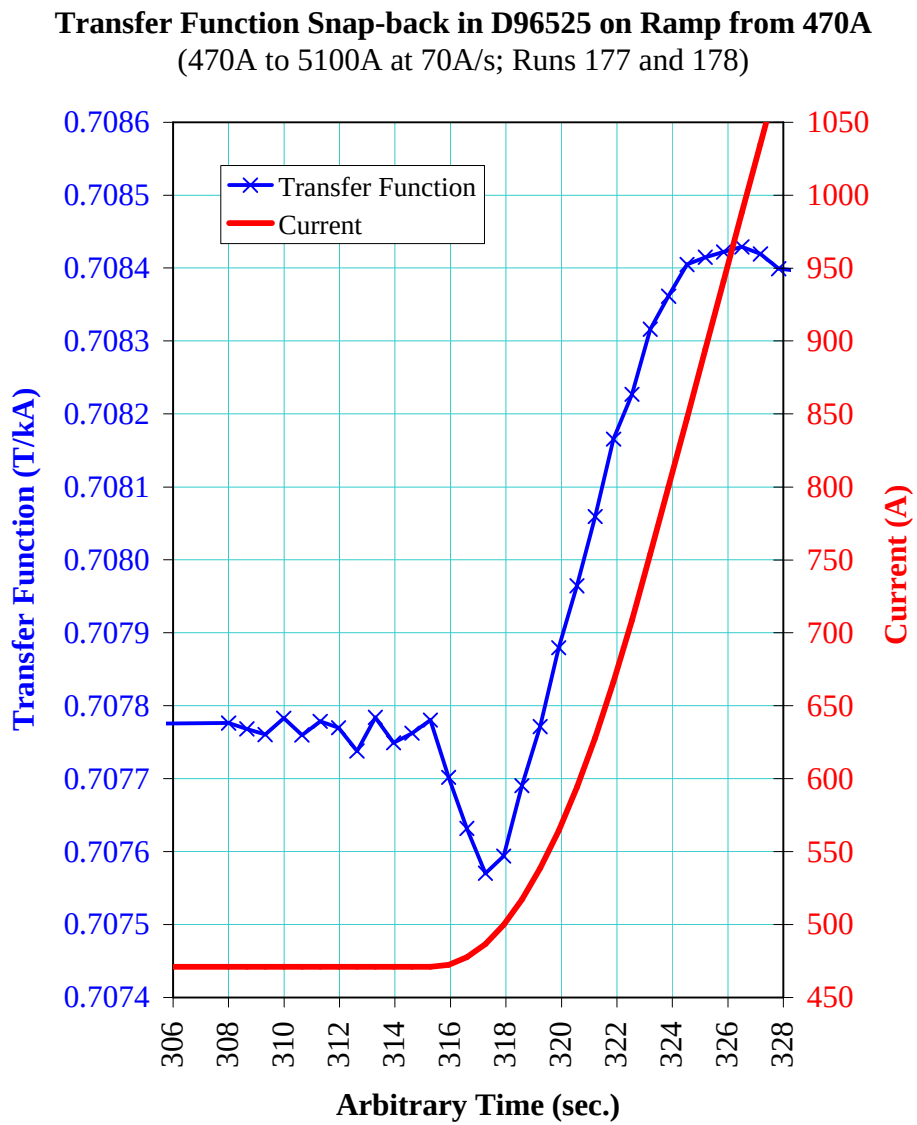
Complete ramp from 25A to 470A to 5100A



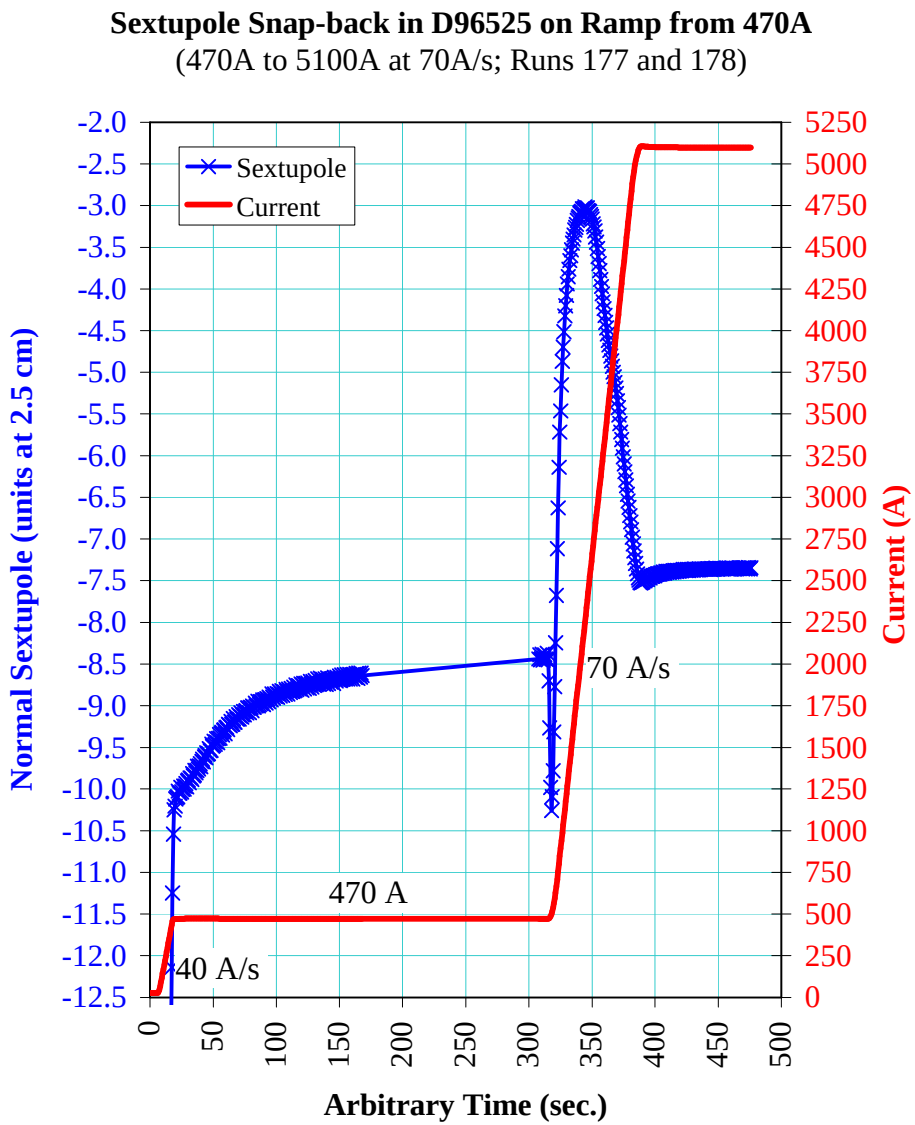
Details of snap-back at 60 A/s



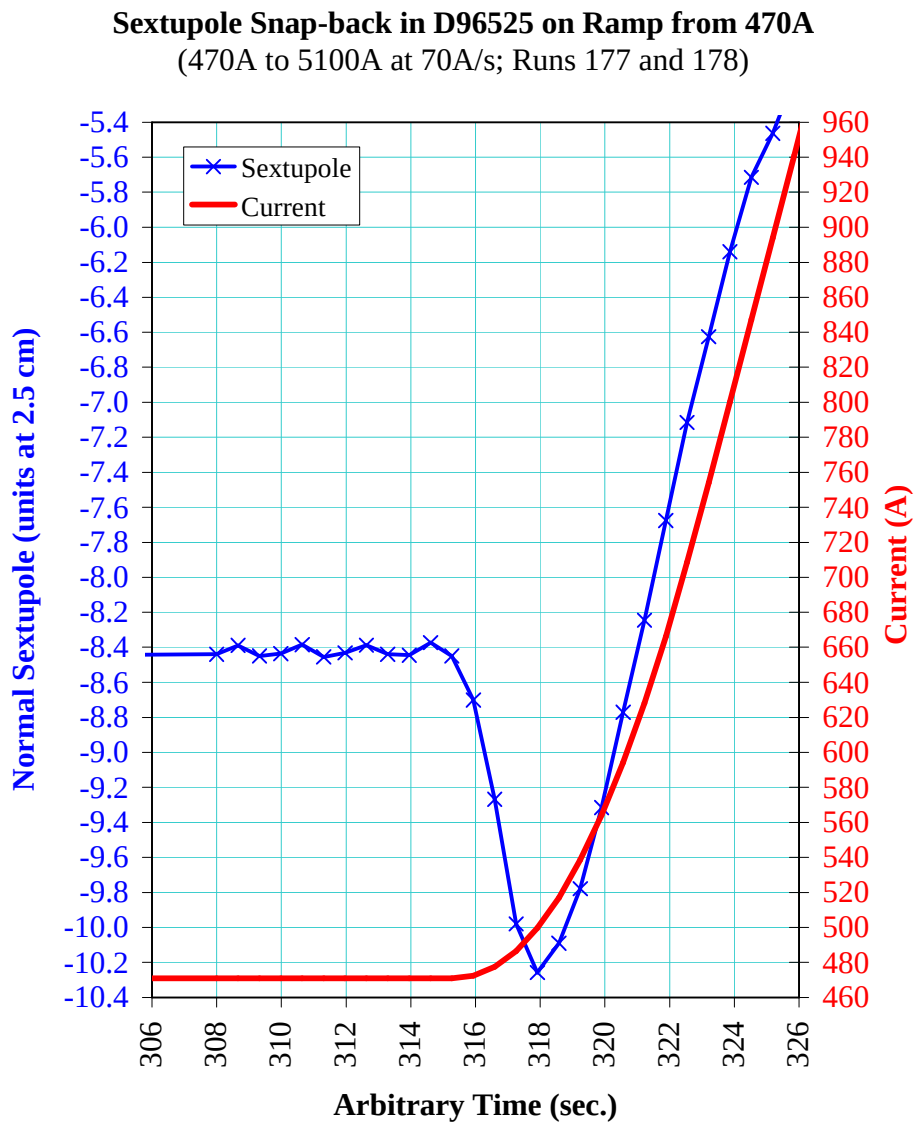
Complete ramp from 25A to 470A to 5100A



Details of snap-back at 70 A/s



Complete ramp from 25A to 470A to 5100A



Details of snap-back at 70 A/s