

**SSC Dipole Magnet Bullet Preloading Procedure  
(3/4 - 16 UNF Setscrews)**

**TS-SSC 91-160  
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This TS is simply a transcription of a FAX that was sent to Lab 2 from BNL back in March of 1990.

1) Check that each of the four setscrews thread into the end plate easily throughout their entire length of travel. There should be no evidence of binding. This is most conveniently checked before the end plate is installed during which the setscrews should be able to be threaded completely through the end plate by hand (no tools.)

2) Assuming that the bullet assembly and end plate are installed, lubricate the setscrew threads sparingly with Silver Goop or a similar anti-galling compound which is relatively tolerant towards cryogenic conditions. The purpose of the lubricant is primarily to help minimize the variation in the applied torque vs. preload characteristics of the screws thereby facilitating the preloading operation.

3) Take three strain gauge scans while the bullets are completely unloaded.

4) Thread the four setscrews until each of them lightly contacts a bullet transducer.

5) With a 3/8 in. drive torque wrench, load each setscrew to a maximum of 30 in-lbs in 10 in-lb increments. The tightening pattern should alternate in a crosswise sequence and be repeated at least three times before proceeding to the next load level. Always take a strain gauge reading before increasing the load.

6) The goal is to load the magnet end to between 800 and 1500 lbs total. Therefore, each bullet should be loaded to between 200 and 375 lbs. It is recommended that for a given magnet end, the bullet-to-bullet load variation not exceed 50 lbs. Some small final adjustments to individual setscrews may be necessary to accomplish this.

7) After bullet preloading is complete, bring the four 3/8 in. setscrews into light contact with the bonded stainless steel yoke end block. This will help relieve some of the axial compressive load at the extreme coil end during cooldown and magnet excitation.