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Mon-Mo-Po1.05-09 [62]: Mechanical Compress Process for Pre-compression of JT-60SA Central Solenoid

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The construction of a full-superconducting tokamak referred as JT-60 Super Advanced (JT-60SA) is in progress under the JA-EU broader approach projects. The magnet system of JT-60SA consists of 18 toroidal field (TF) coils, 4 modules of central solenoid (CS) and 6 equilibrium field (EF) coils.
CS modules are manufactured one by one, then 4 modules are stacked. Finally, the pre-compression are conducted as a final process of CS manufacturing.
There are two methods for pre-compression, one is shrink fitting method, and the other is mechanical compress method. The shrink fitting method is simple method for pre-compression because it is not needed additional jig. However it is difficult to control compress load because the height and the amount of shrinkage by compress load of CS module is not completely uniform. In addition, if compress load become reduced, re-compress will be required after starting operation, but re-compress is impossible with the shrink fitting method.
Mechanical compress process was selected for pre-compression of JT-60SA CS to avoid above problems. Nine sets of hydraulic jacks and compress jigs, and stainless steel shims were used for pre-compress process to subject compress load by mechanically. Compress load of each sector can be controlled independently with this method. And re-compress after starting operation can be conducted. It means hydraulic jacks and compress jigs can be inserted from manhole of cryostat.
Pre-compression of CS module was successfully performed using mechanical compress process. The compress load of each sectors measured by strain gauges on tie plates was more than requirement of 4.2 MN/sector.
In this paper, procedure and result of pre-compression with mechanical compress process will be described.

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