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CORE BAND TENSILE TEST

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PURPOSE

This test was conducted to determine the adequacy of the Core Band to withstand the forces imposed upon it during Reactor Operation.

COMPONENTS INVOLVED

Core Band	909E341G01	S/N 1	Titanium
Pin	963B977H01		
Coupling	977D997H01	S/N T1-14	
Locking Clip	945C670H02		

TEST PROCEDURE

A titanium core band was submitted by the Reactor Mechanical Design Section for use in this test. The core band (0.020 in. x 3.35 in. x 37.5 in.) was placed in the tension grips of a Wiedemann Testing Machine and a 3 in. wire strain gage extensometer was attached as shown in Fig. 1. The load was incrementally applied and the corresponding elongation of the core band indicated by the 3 in. extensometer was recorded.

RESULTS

The elongation over a 3 in. length of the core band, which included the coupling, at 4000 lb was approximately 0.028 in. Failure occurred in the locking clip at a load of 4275 lb or a nominal stress of 64,000 psi in the band.

After the locking clip had failed, a sharp drop in load occurred. Upon reloading failure occurred at 4190 lb in the band at a line approximately 1/16 in. above the end as shown in Figs. 1 and 4. Failure of the locking clip and accompanying local deformation are illustrated in Figs. 2 and 3.

Assuming a modulus of elasticity of 17×10^6 for the titanium band, a stress of 64,000 psi will cause a 0.012 in. increase in band length over a 3 in. section. Thus, approximately 0.016 in. displacement occurred in the locking clip joint upon its failure.

The load vs displacement curve in Fig. 1 indicates that linearity exists to a load of 2600 lb. The test exceeded design expectations. Failure occurred approximately 3/8 in. from the weld in the bands.

CONCLUSIONS

A tension test of the core band indicated that its strength is more than adequate for its intended applications.

Fig. 1

Load vs Deflection Characteristics
of Core Band

FAILURE OCCURRED
AT 4275 LBS.

Fig. 2

Failure of Locking Clip and Local Deformation in Core Band.

Fig. 3
Showing Failure of Locking Clip.

Fig. 4

Closeup Showing Displacements in Coupling After Failure of Locking Clip.