

# **FULL SCALE BEND TEST OF A MULTI STAGE AEROSPACE VEHICLE**

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## **Abstract**

Evaluation of structural integrity of a missile involves sectional and full scale tests. Tests are carried out for transportation, articulation and aerodynamic loads. Uniqueness of carrying full scale bend test of a multi stage aerospace vehicle lies in the qualification of not only structural integrity of different sections but also the joints. Empty missile structure forms the testing frame. A bending moment envelope is simulated using a combination of upward and downward loads. Design and realization of open configuration test rig frames in order to simulate the necessary boundary conditions was executed. The output measurements for the test are strains, deflections and joint rotation constants. Linear Variable Displacement Transducers (LVDTs) measures the deflections normal to the missile axis and help in mapping of the deflection pattern along the length of the missile. CODs (Crack Opening Devices), developed in-house, are used to measure the joint openings during the bend test. The measured Joint Rotation Constants (JRCs) are in-turn used as input to refine the Finite Element (FE) model, thereby improvising the accuracy of the predicted results from the FE model.

**Keywords:** Full Scale Bend Test, Open Configuration Test Rig, COD, JRC, Deflection