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Experimental investigation of Insulated Rail Joint under different bolt preload conditions

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This paper presents an experimental study on the behavior of an insulated rail joint subjected to varying bolt preload conditions. The primary aim of the research is to assess the influence of different preload levels on the joint's mechanical performance, including its stiffness.

Tests were conducted using a series of standardized loading protocols to simulate real-world operating conditions. The joint's response was monitored through LVDT and potentiometer providing a comprehensive analysis of its structural integrity.

Results indicate that preload significantly affects the static response of the joint, with higher preloads leading to increased stiffness.

These findings contribute to a better understanding of the design parameters influencing the performance and longevity of railway joints, offering valuable insights for improving rail infrastructure durability and maintenance strategies. The study also highlights the importance of bolt preload optimization for ensuring safe and efficient railway operations.

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