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Experimental Investigation on the Performance of Rail Fastening Systems

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Abstract **-** One of the essential concerns in railway systems is the lifetime of rail tracks. The safety of rail fastening systems plays a significant role in rail track longevity. A standardized laboratory test procedure is required to be followed to evaluate the performance of rail fastening systems on the European railways according to EN 13146 standard series. In this study, longitudinal rail restraints and pull-out resistances were experimentally determined following EN 13146-1 and EN 13146-10, respectively. Two different types of prestressed concrete sleepers (namely B320 type and B70 type) having the same concrete quality, design axle load, and design speed but different dimensions and fastening systems were used in the experimental studies. All specimens used in this study were seen to satisfy the conditions given in the standards. It was also observed that the fastening system used in B320 type prestressed concrete sleepers results in slightly higher axial load and pull-out load capacities.

Keywords**:** Prestressed concrete sleepers; Rail fastening; Longitudinal rail restraint; Pull-out resistance; Experimental studies