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Hopkinson pressure bar set-up for the measurement of Bauschinger effect under dynamic loading ANDREW RUGGIERO, NICOLA BONORA, University of Cassino and Southern Lazio, GIANLUCA IANNITTI, Techdyn Engineering — Metals and alloys show different stress-strain characteristics under reverse loading cycle (Bauschinger effect). The knowledge of the effective material response is important in impact dynamics where material is subjected to compression-tension loading as a result of stress wave propagation. In this paper an experimental set-up of the Hopkinson pressure bar to characterize the material response under dynamic loading cycle is presented. In the proposed configuration, in one single test, the sample is subjected to tension and compression loading with same absolute stress intensity and duration. Also this solution allows the possibility to select the load cycle sequence (tension-compression or compression-tension). Relationships to determine the stress, strain rate and strain from the elastic signals at the bars which are also effective for the second stress pulse, are presented. The method was verified with FEM and used to determine the Bauschinger effect for AISI 316L stainless steel.

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