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A LOW FIDELITY NONLINEAR MODEL OF 4WD TORSIONAL STIFFNESS AT TIP-IN/TIP-OUT

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ABSTRACT - This paper describes the effects of torsional stiffness in the vehicle drivetrain on 4WD vehicle drivability during transient drive events. The approach uses acausal modelling methods to create a low fidelity torsional stiffness model for a 4WD vehicle during tip-in/tip-out events in response to torque inputs.

The torsional response during these events is one of the key elements to assess the vehicle driveability. The paper focuses on the torsional frequencies in the range of 2Hz to 10Hz, where the human body is very sensitive to oscillation modes. The low fidelity model is correlated with a full nonlinear model. Real time simulation is included in the experiment to validate the response of the torsional model in real time test.