ABSTRACT

An investigation was carried out on tractor seat design for better operator comfort. The project objectives were mainly aimed at increasing the ride comfort by improving the design of seat pan and backrest with regard to Indian operators. Anthropometric data of Indian operators were obtained. Tests were conducted in laboratory on a mechanical exciter with four different existing tractor seats using representative subject masses, to select the best suspension, based on vibration transmissibility performance.

Initially, the performance of the four tractor seats were assessed based on vibration transmission performance of suspension at seat cushion-operator interface. The seat with spring and damper mounted suspension system selected. The was seat pan and backrest of the seat were tested on the suitably seat. A three degrees of freedom (DOF) designed test seat-operator model was developed and validated with selected seat in the laboratory on mechanical exciter. The performance of the seat pan and backrest were judged on the basis of pressure distribution pattern and subjective perceived comfort rating. Based on these, optimum seat pan and backrest profiles were also obtained. The performance of the seat suspension parameters were evaluated and optimum seat suspension parameters were determined.

On the basis of the optimization result, а new seat with optimum values of suspension design parameters and seat profiles was fabricated and tested in field for different tractor operations. The developed seat attained better vibration attenuation and provided better ride comfort compared with the existing seats.

Key words: Tractor, seat, seat pan, backrest, static comfort, vibration, seat-operator model, spring, damper, cushion material.