



Honda R&D

Wheel Stiffness and Stability

This technology studies various wheel stiffness configurations, with the aim of enhancing driving stability while minimizing the increase in weight associated with an increase in stiffness. Reinforcement was added to the wheel disk and the wheel rim of standard aluminum wheels for passenger vehicles in order to produce four wheels with different stiffness configurations. The effects of disk stiffness and rim stiffness on tire contact patch profiles and driving stability were quantitatively evaluated. From the results of tests with the four wheels, it was observed that disk stiffness and rim stiffness have differing effects on tire contact patch profiles, and on driving stability.

Disk stiffness influences especially tire contact patch length, and tire contact patch length influences especially maneuverability in driving stability. Rim stiffness influences especially tire contact patch area, and tire contact patch area influences especially stability in driving stability. The investigation also confirmed the effectiveness of using contact patch shape factors as intermediate indices in a method for analyzing the relationship between wheel stiffness and driving stability. In addition, it was demonstrated that driving stability can be increased with a minimum increase in weight by optimizing the ratio between disk stiffness and rim stiffness. A method for optimizing wheel stiffness is presented in this technology.

Category:
**Enabling
Technology**

Application:
2013-present Honda JADE

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