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Increasing Operator Comfort with Custom Rubber Solutions

Whether a vehicle is used in agriculture, mining, power sports or another industry, providing driver/ operator comfort is a priority for manufacturers. However, the definition of comfort will vary depending on each application. In certain powersport applications, the operator needs responsiveness, and won't want to sacrifice speed. For agriculture, heavy machinery needs to be able to maneuver in a wet, muddy, rocky field as well as on hard-packed dirt or even pavement.

The length of time a driver will be operating the vehicle also matters. In vehicles where a driver will be seated and driving all day such as trucks and agricultural equipment, comfort levels play a critical role in reducing fatigue and improving operator satisfaction.

When designing a new piece of equipment or redesigning existing machinery to optimize comfort, manufacturers of agricultural equipment can take advantage of engineered rubber parts to minimize noise, vibration, and harshness (NVH).

Keep reading to discover multiple ways that rubber solutions make a difference in operator comfort.

Minimizing Vibration

One of the first steps in optimizing user comfort is to evaluate the transmission path between the sources of vibration and the user. Source of vibration would likely be from the following: **engine, terrain, moving parts.**

The next step is to evaluate how that vibration noise affects every part of the user's body from head to toe. The designer also needs to consider the cabin or the area where the operator is located: the seat, the instrument panel, the control wheel, the floor, and anywhere else that the user is in contact with potential vibration.

All of that information is part of the modal analysis to develop an understanding of how the system responds to different inputs. Whether it's for driver comfort in agricultural machinery or another application, the approach that an engineer will take includes simulation, structural analysis, modal analysis and system modeling to understand what is happening and what is needed in each specific application.



Using rubber bump stops for shock absorption

When a vehicle encounters what engineers like to call a "shock or an unexpected event," rubber bump stops can help absorb the shock. Bump stops make a significant difference in a suspension system, and turn a bumpy ride into a smooth ride.

Multiple factors play into the design of each bump stop, including the type of terrain, the degree of comfort needed, and durability requirements. Rubber is ideal for bump stops due to the flexibility available for the formulation and shape of each component. The wide range of formulations available allows designers to customize an ideal blend.

Each custom rubber bump stop will combine compressibility, resistance to stand up to the expected environment, and strength to last as long as possible. An optimized design will also allow bump stops to be produced efficiently while meeting or exceeding quality requirements.





Evaluating a project

The best time to get input on optimizing user comfort is early in the development process. Including custom rubber solutions from the beginning will result in best outcomes for overall design and production efficiency. Consulting experienced rubber solutions engineers is the best first step to determine the suitability of rubber components to provide the desired results.

Soucy Baron has over 50 years of experience designing, testing, and producing custom-engineered rubber parts for new vehicles and machinery. Soucy Baron engineers have helped develop computerized seating systems that optimize driver comfort by keeping the seat level in varying road conditions. With our technical dominance in materials engineering and experience working directly with OEMs, we provide quality, high-performance compounds for your component needs.

We can work with you at every step of the process, from firming up initial ideas to minimizing production costs, and ensuring compliance with applicable regulations.

To learn more about how to improve operator comfort using custom rubber solutions, <u>contact us</u>.

