RAMSIS Industrial Vehicles

HUMAN SOLUTIONS ASSYST AVM

Digital ergonomics

Working comfortably in heavy vehicles

YOUR BUSINESS FIRST

Ergonomics as a competitive advantage

If a vehicle is a workplace, it pays to make high demands on its ergonomic design – because after a long day in the cab, it's not just about comfort and health… safety is also a key issue.

With RAMSIS, you can design heavy construction machinery in such a way that the vehicles can be fully controlled – so safety will remain at the same high standard, even if the operators change – because the machine *itself* reduces the risk of accidents which cause damage and production delays. This is not only beneficial for you – it's good for your customers as well.

And you're also creating important statistics for your product development, because ergonomic analysis at the computer model saves you time and money – but at the same time it ensures high process quality, because tests carried out with RAMSIS are not weather-dependent, so your results can be repeated at any time. This means that you can compare the ergonomic aspects of different design options – and that contributes to innovation in your product portfolio.

Your advantages

- Optimization of view and reachability in the cabin
- High level of product maturity as early as the design phase
- Reduction of development costs and timeframes
- More safety for drivers and the environment
- Improved operability of vehicle controls
- Easier execution of maintenance and repair work
- More productivity on the job

ERGONOMICS FOR CONSTRUCTION AND HEAVY MACHINERY

Develop faster and better

RAMSIS Industrial Vehicles is a three-dimensional manikin for ergonomic design in agricultural vehicles and construction and heavy machinery. Even as early as the strategy and concept stage, RAMSIS will enable you to respond to all issues that could affect your product quality in terms of driver comfort and safety or the operation of the vehicle.

International standards are adhered to. And the results of your ergonomic studies can be reproduced easily – all your employees can access them and analyze the data for their own work, creating more effective inter-departmental cooperation.

RAMSIS' virtual ergonomics control prevents costly post-design phase developments. This eradicates planning errors, so your vehicles' level of market readiness will be well above average, even before your first production series is ready to roll.

RAMSIS also enhances ergonomics expertise in the product development process. The results of your studies can be determined quickly, reliably and objectively. An in-depth knowledge of ergonomics is not necessary.

MANIKIN AND POSITIONING

Model structure

RAMSIS Industrial Vehicles offers you a sophisticated ergonomic simulation environment. The software works with grid, shading and surface models, imaging the motions of the manikin... and includes physiological joint simulation. The starting point for positioning is the eye point.

Anthropometric database

With RAMSIS Industrial Vehicles you can generate any target group and specify height, gender, population and age-specific characteristics. The elaborate model structure and the comprehensive ergonomic international databases are derived from documented and replicable sources. These include notable research projects and serial measurement surveys in European, North American, South American and Asian countries.

Automatic posture calculation

RAMSIS Industrial Vehicles automatically calculates statistically the most probable posture and movement behavior of drivers, passengers and mechanics while they are carrying out their individual tasks – and these tasks can be interactively defined and quickly transmitted to more manikins by means of the simple fixation and orientation of body parts. Even the postures of entire test collectives can be calculated on this basis. The latest ergonomic studies form the foundation for the realistic behavior of the virtual test persons in sitting or standing postures.


Fig. 1 Reachability


Fig. 2: Field of vision

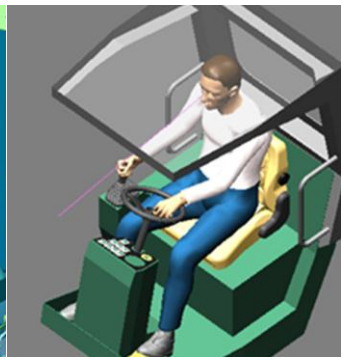
Fig. 3: Task analysis

Animation and motion

RAMSIS motions can be recorded for the easy simulation of processes, enabling the analysis of spatial coordinates and joint angles. Typical examples are the translation/rotation of the manikin, joint movement and the self-running animation of freely definable body part chains. The animations are carried out either interactively or numerically. Body part chains can also be interactively moved. To achieve this, RAMSIS provides you with standard animation and advanced animation functions. The motion sequences can also be exported to AVI.

ERGONOMIC ANALYSES

Comfort and the need for space

The more effort it takes to command a vehicle, the faster the test person will get tired. RAMSIS gives you absolutely optimal product design – even for international markets – enabling you to clarify important points right from the beginning. For example: “How comfortable or uncomfortable are the various seating positions? Can customers from China, U.S. and Europe also get into the cab? Do very tall or obese individuals have enough freedom of movement?”

Direct vision and mirror view

In heavy vehicles, fields of vision have a huge impact on safety during operation. Even during the early concept phase, RAMSIS lets you analyze the field of vision directly and via mirrors (planar/spherical), perform analyses in and outside the vehicle and ergonomically evaluate existing fields of view for size and quality. Eye movements are incorporated in the automatic calculation of posture; and the eye position, including head and neck movements is calculated automatically – so important questions can be answered, like, for example, “Is the driver’s field of vision sufficient to spot small persons or low-lying objects in the vicinity of the vehicle?” And “How good is the view of the instruments?”

Reachability

“Are all the controls and pedals positioned correctly? Can a mechanic access the parts which require repair and maintenance?” RAMSIS provides answers to these questions as early as the digital model stage: Accessibility areas and reach envelopes can be calculated for user-defined parts of the body and body part chains – to test the reachability of pedals for the leg and foot, for example, or the operation of buttons on the steering wheel with the fingers.

Posture-contingent maximum force

Industrial vehicles require intensive maintenance. Levers or screws can perhaps be reached, but maybe they cannot be opened or closed because the amount of force required to do this is too high. To verify this, RAMSIS lets you evaluate posture-contingent force (hand-arm system).

SPECIFICATION

Availability and platforms

RAMSIS is available as a stand-alone version for Windows and as a fully integrated ergonomic tool in Catia V5. RAMSIS (or RAMSIS ergonomic data) can be directly integrated into other established systems within the design environment. The import and export of geometries is also possible via various formats, such as IGES, VDA and SAT. We also offer CATIA V5 and JT interface as an optional add-on.

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