Imaging
Smaller, faster, higher definition: crash test cameras are more capable than ever

Battery safety
Research into how electric and hybrid vehicle batteries perform in a crash

The future of crash testing at style-led Jaguar Land Rover

CHRYSLER'S SENIOR MANAGER FOR VEHICLE SAFETY ENGINEERING ON THE TRANSATLANTIC COOPERATION WITH FIAT AND THE EMPHASIS ON VIRTUAL TECHNOLOGIES
Crash safety simulation partner

Automotive safety has never been more important. L&T believes that within a decade, crash avoidance technology will be the priority.

Collaborating with various automotive companies, OEMs, and Tier 1 suppliers, L&T Technology Services strives to create products and systems that make vehicles safer. In addition to this, it underpins its clients’ commitment to build high-tech solutions that protect human life and reduce fatalities from traffic accidents.

The company engineers solutions in crash test simulations for full vehicle crash, occupant safety and pedestrian safety through the system- and component-level simulation of body-in-white (BIW) structures, seatbelts, airbags, instrument panels (IP), etc. In parallel, its electronics team supports the development of safety products such as antilock braking systems (ABS), lane departure warning systems and crash avoidance systems, with the use of model-in-the-loop (MIL) to real-time tests with software-in-the-loop (SIL) in a simulated environment.

As an engineering partner, L&T offers expertise in computer-aided engineering (CAE), multibody dynamics, structural simulations and embedded electronics. While CAE tools help improve process efficiencies for OEMs and suppliers with faster-to-market products within budget and to the required quality, the automated simulation techniques help to increase the productivity of virtual simulations.

The company’s engineers analyze customer requirements and execute projects to meet global safety standards using commercially available safety simulation tools such as Visual Crash PAM, LS-DYNA and Mathematical Dynamic Model Solvers. The aim is to develop digital simulation methods and solutions for occupant, driver and pedestrian safety.

Customized occupant safety features are supported for OEMs across the globe. L&T successfully executes simulations of occupant head impact on IP in passenger cars and commercial vehicles. This helps detect sharp edges and corners in a 3D model, while complying with the statutory requirements of different geographies, such as the FMVSS 201 and ECE R-21 and EEC 74/60 regulations.

Virtual simulation tools are used to target the maximum reduction in time-to-market. Additionally, the company provides complete predictive simulations that are important for enhancing material models, material failure predictions, and correlations related to crash tests. Various other crash analyses carried out by L&T concentrate on BIW, roof crush analysis, and rollover protective structure analysis to specific requirements.

The company has completed projects in complex airbag folding and static deployment analysis, integrating the full vehicle systems before the crash test simulation. Engineers use software tools to simulate the effective deployment of airbags and any failure instances. As well as airbag folding and deployment, static and dynamic loading analysis for the seatbelt retractors and pretensions is also carried out through enhanced crash test simulation, thereby shortening the product development cycle and making designs safer.

The L&T Image Processing Centre of Excellence provides optimized algorithms for pedestrian safety through its image processing capabilities and vision-based advanced driver-assistance systems (ADAS). The active safety expertise includes image restoration and enhancement, feature extraction, and 3D structure from motion (SFM). The vision-based ADAS includes support for smart beam control and forward collision warning.