FIA Institute
for Motor Sport Safety

Research Projects

The research work undertaken by the FIA Institute covers a wide range of motor sport activities and is focused to improve the safety of competitors, officials and spectators. Current research programmes include:

Circuit Safety Analysis

The FIA has developed the Circuit Safety Analysis System (CSAS) to enable the analysis of speeds at any part of a circuit allowing the calculation and visualisation of run-off areas and energy dissipating barrier systems. The data for this analysis is collected from Accident Data Recorders installed in-car.

The FIA Institute is working on the continuing development of the CSAS system to investigate extreme accident trajectories and accident severity probability for given circuits as well as accident severity prediction.

Debris Fences

Circuit debris fencing is of crucial importance in the protection of circuit personnel and the public. Both permanent circuit and temporary circuit debris fences have been modelled and tested when impacted by a car and a wheel.

The FIA Institute is supporting validation testing to evaluate different fence configurations to determine if they can provide enhanced protection.

Accident Database

The FIA Institute is developing a database of accident information from a range of international disciplines to include photographs, videos and incident reports. The data will be analysed by leading safety and medical expert Dr Terry Trammel to determine the causes of injuries in high-energy impacts.

It is hoped that the analysis of this data will not only have potential applications in motor sport but could potentially influence safety design in motoring.

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Closed Car Occupant Safety

The FIA Institute is working to improve the safety of rally car crews and through new research conducted at the Delphi Laboratory in the United States, is evaluating a number of measures including neck and head restraints, the optimisation of seats, harnesses and the general safety of the cockpit environment.

In-Ear Accelerometers

It is important for the FIA Institute's work on head injury prediction and prevention that the data used in accident analysis accurately relates accelerations of the head to those recorded in data recorders in the chassis.

The FIA Institute is working with the Transport Research Laboratory in the UK to measure driver head accelerations by using small triaxial accelerometers in the earpieces worn by drivers.

High Speed Barrier

Many of the potentially most severe impacts in racing occur from high speeds on circuit straights, either due to component failure at high loads, or car-to-car impacts under braking. Research has already demonstrated that the energy from a 160kph impact can be safely managed within 5 metres with optimised barriers and guardrails.

The latest research will assess the management of car impacts at speeds in excess of 200kph. This work is being carried out by DEKRA.

Helmets For Young Drivers

The FIA Institute is conducting a new research programme to develop a safer, lighter and more affordable helmet designed specifically to meet the requirements of younger drivers.

It is hoped that this research could lead to a new Certification Standard for helmet technology.