

UNIVERSAL IMPACT SIMULATION TEST SYSTEM

FMVSS 201 - 226
GTR 9 | EEVC WG17 | ECE R12 - R21

BIA offers the most complete and flexible solution for passenger vehicle and pedestrian impact simulation testing. With a single base unit, BIA solution can fulfill up to 11 interior or pedestrian test requirements.

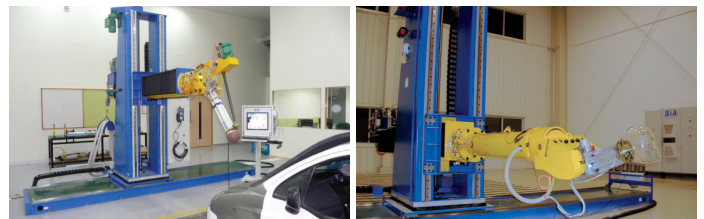
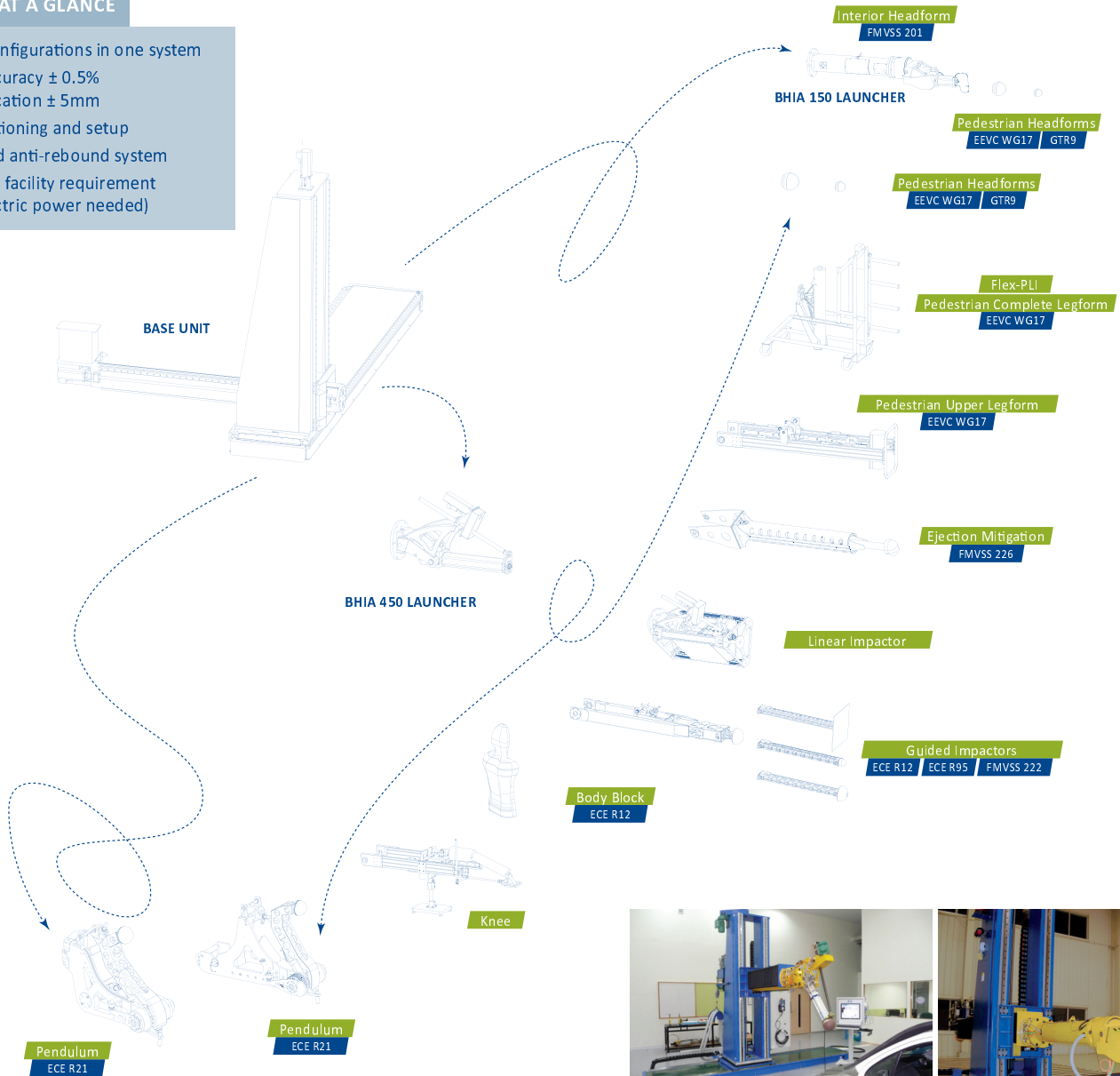
Interchangeable impactors are simply added to the basic unit depending on the test requirement.

To cover all the test configurations, two sizes of servo-hydraulic launchers, regulated by a closed loop system, are available.

BHIA 150 fits interior impact modules demanding flexibility in confined space and a maximum range of motion. BHIA 450 is suitable for heavier modules such as bodyblock and pedestrian impactors.

BENEFITS AT A GLANCE

- 11 test configurations in one system
- Speed accuracy $\pm 0.5\%$
Target location $\pm 5\text{mm}$
- Easy positioning and setup
- Integrated anti-rebound system
- Minimum facility requirement (only electric power needed)

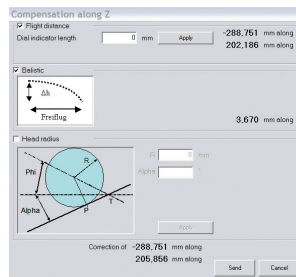


EASIER, FASTER AND PRECISE ADJUSTMENT

BIA solution is the worldwide reference in impact simulation testing with its easier test setup and its unique level of accuracy.

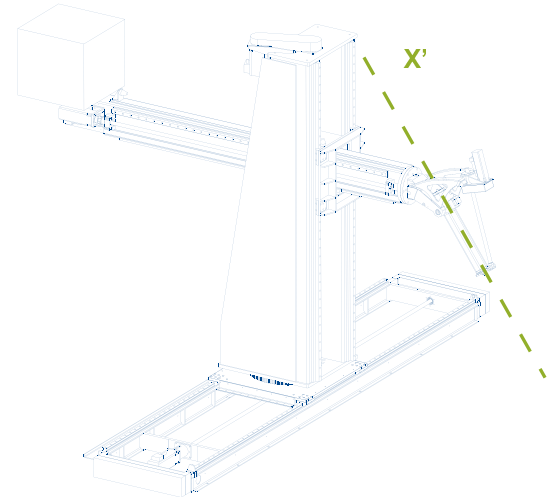
SPEED ACCURACY $\pm 0.5\%$

BIA launcher is a full hydraulic system with closed loop control which allows a perfect speed control until free flight of the impactor. The control feedback is provided through an accelerometer with specific calibration mounted on the launcher's piston rod. The closed loop control system is able to adapt the launching acceleration in real time, making the system not sensitive to the ambient conditions.



TARGET LOCATION $\pm 5\text{mm}$

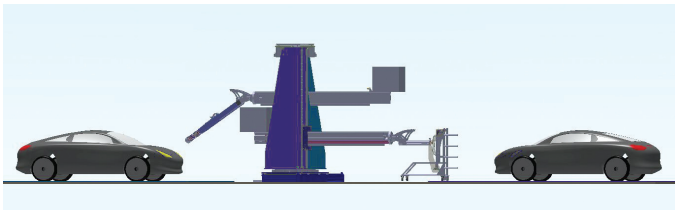
The control software makes automatic compensations to ensure correct impact velocity, angle and location. It takes into account the effect of gravity, the impact angle, the free-flight distance, the headform shape and the angle of the impact surface. The first shot is the good one!



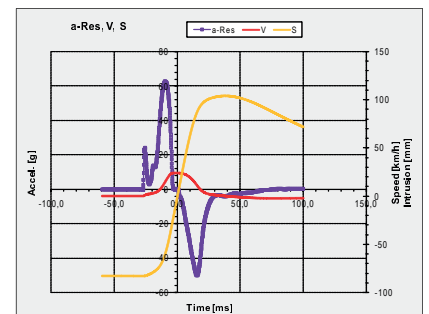
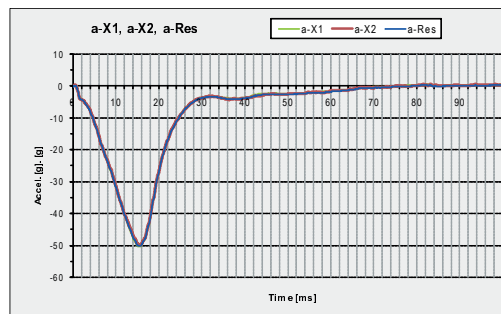
EASY POSITIONING AND SET UP

A wide range of displacement in each axis allows maximum mobility to meet all test conditions. A ball screw system motorized by an asynchronous electric motor provides the displacement of each axis, measured through optical encoder.

The wide vertical rotation of the launcher support (greater than 180°) allows testing on both sides of the machine.



The control system provides assistance with automatic positioning and can record several positions to be replayed. The remote control allows the operator very easy positioning of the impactor in each axis and also in virtual X' axis to adjust free-flight distance.



■ UP TO 11 IMPACTORS EXCEEDING SAFETY STANDARDS ■

■ PEDESTRIAN HEADFORM | EEVC WG17 | GTR 9

Using BHIA450 launcher, this module is capable of launching free-flight EEVCW G17 or any other headforms (Japanese, Australian, etc...) at speeds up to 45 kph.

The coupling system between the headform and the launcher consists of

magnets attached on the fixed part of the launcher. The coupling is disabled at the beginning of the headform displacement while the acceleration is closed loop controlled.

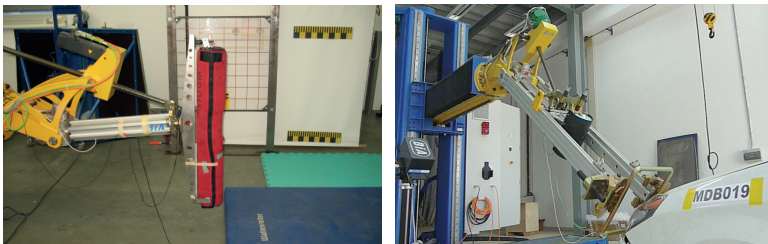
■ PERFORMANCE | CHARACTERISTICS

BHIA450 Launcher Speed : up to 45 kph
Impactor Weight : 20 kg



■ PEDESTRIAN COMPLETE LEGFORM | EEVC WG17

Compliant with Flex-PLI, this impactor can also launch a free-flight EEVC WG17 lower legform. The free-flight is parabolic to guarantee a nil velocity in Z direction at the impact. An anti-rebound protection door avoids any damage on the launcher.



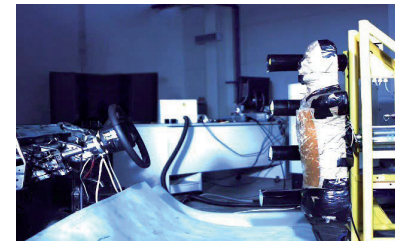
■ BODY BLOCK & GUIDED HEADFORM | ECE R12 | ECE R95 | FMVSS 222

Bodyblock and guided headform impactors can be adapted on BHIA450 launcher. Guided rails for headform allows displacement up to 600 mm.

For body block tests, an anti-rebound protection door avoids any damage on the launcher.

■ PERFORMANCE | CHARACTERISTICS

BHIA450 Launcher Speed : up to 40 kph
Headform Impactor Weight : 6.8kg
Intrusion : up to 600 mm
Bodyblock Impactor Weight : 36 kg

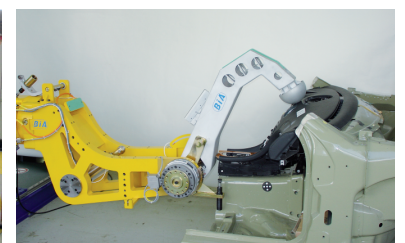
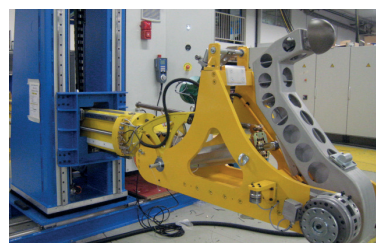


■ PENDULUM | ECE R21

Two configurations are available. One uses existing BHIA 150 launcher. For easier and faster test setup, another configuration integrates its own BHIA 150 launcher. Positioning of the complete module in 3 axes (X,Y,Z) is then possible without moving the specimen.

■ PERFORMANCE | CHARACTERISTICS

BHIA150 Launcher Speed : 15 to 36 kph
Adjustment : 700 to 900 mm





■ INTERIOR HEADFORM | FMVSS 201

The FMH impactor is mounted on a beam extension, so that the system can penetrate 3000 mm inside the vehicle. In addition to BHIA 150 compact design, its small size along with its two rotation axes make convenient its positioning even in confined space. In addition, a transparent headform is provided in order to easily and accurately position the impactor on the target point.

This module can be adapted to any pedestrian headform (European, Japanese, Australian, etc...).

■ PERFORMANCE | CHARACTERISTICS

BHIA150 Launcher Speed : 19 to 40 kph
Impactor Weight : 6.8 kg



■ EJECTION MITIGATION | FMVSS 226

FMVSS 226 is intended to reduce the risk of occupant ejection from side windows in crashes, especially rollovers.

This module exceeds the latest FMVSS specifications in minimal deviation, low coefficient of friction and speed accuracy.

■ PERFORMANCE | CHARACTERISTICS

Static deflection < 15mm with 100 kg load
Friction coefficient < 0.15
Continually adjusted rotation of $\pm 180^\circ$

Speed up to 24 kph
Accuracy better than 1%
Automated control of airbag deployment

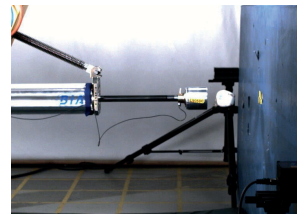
■ ADDITIONAL IMPACTORS DEDICATED TO R&D

■ MISUSE TESTS

Some accessories can be designed in order to launch different parts on vehicle for pedestrian detection investigation, such as to determine precise location of the sensors in Y-and Z-directions.

■ PERFORMANCE | CHARACTERISTICS

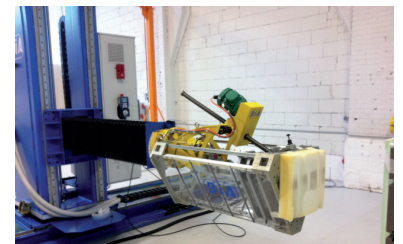
Speed : up to 60 kph



■ LINEAR IMPACTOR

In order to perform tests to limit intrusion or to crash specific parts of the vehicle, this linear impactor allows users to adjust the intrusion by steps of 1 mm. Its front face can accept different shapes depending of the defined tests.

This module is recommended for any test requiring to limit intrusion such as airbag testing or reparability study for insurance costs.



■ KNEE

The purpose of this impactor is to check conformity of vehicles' passenger compartment and safety. The principle is to

launch the knee impactor on low parts of passenger compartment, in guided flight, at 24 kph final speed.

