

PYRO ACTUATORS

AUTOMOTIVE SAFETY PRODUCTS



Whenever an application has to be moved or activated in a few milliseconds, pyrotechnics are the method of choice.

Hirtenberger is the market leader for pyrotechnic actuators for crash-active head restraint systems and for pedestrian safety systems.

Other possible fields of application are pyrotechnic switches in steering columns or actuators for pedal release-, battery disconnection or roll over protection-systems.

PEDESTRIAN PROTECTION

Pedestrian Protection

Active hood systems provide space between bonnet and engine in the event of a pedestrian collision by lifting the bonnet. The generated space grants that the head does not hit rigid components. The actuators rise the bonnet directly or can be installed within the hinges or latches.

Hirtenberger optimizes development time and costs for the car manufacturer in the course of system development, based on Hirtenberger's past experience, the in-house test center and simulations as well.

FUNCTIONS								
	FIXATION STARTING POSITION	NVH CONFORMITY	DEFINED RETENTION FORCE OVER TIME	RESETTING AFTER REACHING END POSITION	RESETTING WITH DEFINED FORCE	DAMPING HEAD IMPACT	OSCILLATION DAMPING	FIXATION END POSITION
fixation starting position		✓	✓	✓	✓	✓	✓	✓
NVH conformity	✓		✓	✓	✓	✓	✓	✓
defined retention force over time	✓	✓		✓	✓	X	✓	X
resetting after reaching end position	✓	✓	✓		X	X	✓	X
resetting with defined force	✓	✓	✓	X		✓	X	X
damping head impact	✓	✓	X	X	✓		✓	X
oscillation damping	✓	✓	✓	✓	X	✓		✓
fixation end position	✓	✓	X	X	X	X	✓	

Hirtenberger is the market leader for pyrotechnic actuators for pedestrian protection systems and provides solutions for:

- Varying bonnet weights
- 1-joint and 4-joint hinge kinematics
- Combined activation of lock and hinge
- Absorption, retraction, mechanical connection etc.
- Actuator families for different car models

COMPETITIVE SOLUTIONS FOR FAST AND RELIABLE ACTIVATION



HIRTENBERGER TEST CENTER

Benefits

- State-of-the-art testing
- Extreme fast modifications possible
- Testing in system environment
- Immediate analysis after testing



PUSHING ACTUATORS

Hirtenberger produces pushing actuators with a piston travel from 5 - 130 mm in pintype and leadwire versions.



CHARACTERISTICS

actuator type	pushing piston
activation time	2 - 40 ms
piston travel	5 - 130 mm
F max	7500 N
fixation forces start position end position	1000 N 5000 N
design	linear or right-angled, housing (steel or Zinc diecast)
interfaces	pintype (11 mm interface) or leadwire (cable length up to 1500 mm)
noise	< 95 dB
BAM approval	CE-Conformity acc. EU-Pyrotechnical Directive 2007 / 23 / EG
specification	according customers demand



Numerous functions may be integrated into the actuator design, such as

- Locking in initial position
- Retention force over time
- Easily resettable after ventilation
- Adjustable damping characteristics
- Oscillation absorption

Benefits

- Extreme fast reaction times
- Very stable and reliable performance
- Over lifetime
- Compact design and low weight
- No flaming and no hot gases
- Various connection options possible



RETRACTING ACTUATORS

- Solution for quick and reliable unlock operations
- Cost effective design

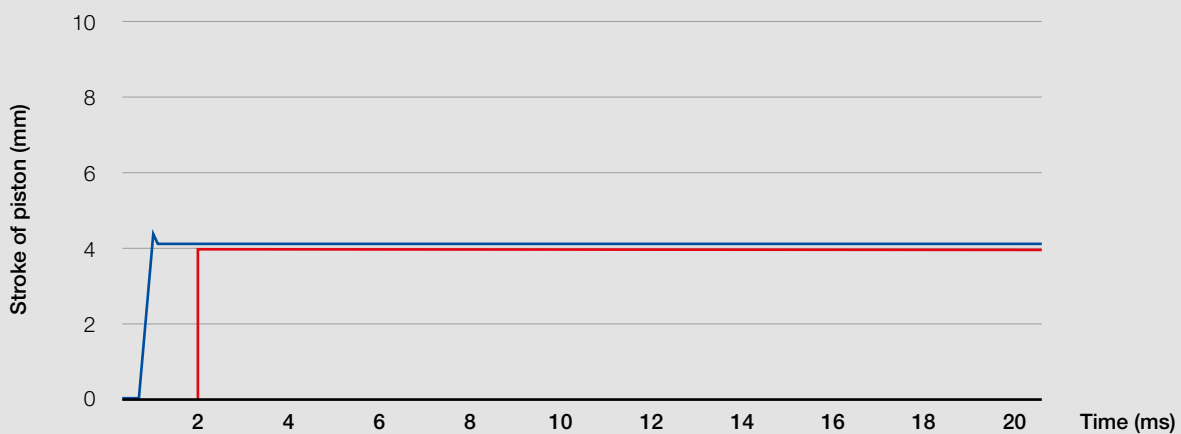
Retracting actuators are mainly used in crash-active head-rest systems and adaptive steering columns. The piston with a travel of 5-15 mm is retracted within 2-4 ms and releases a system (e.g. springs).



CHARACTERISTICS

actuator type	retracting piston
activation time	2-4 ms
piston travel	5-15 mm
F max	1500 N
fixation forces start position end position	500 N -
design	linear or right-angled, housing (steel or Zinc diecast)
interfaces	pintype (11 mm interface) or leadwire (cable length up to 1500 mm)
noise exposure	< 90 dB
BAM approval	CE-Conformity acc. EU-Pyrotechnical Directive 2007/23/EG
specification	according customers demand

PISTON MOVEMENT OF LINEAR RETRACTING ACTUATOR



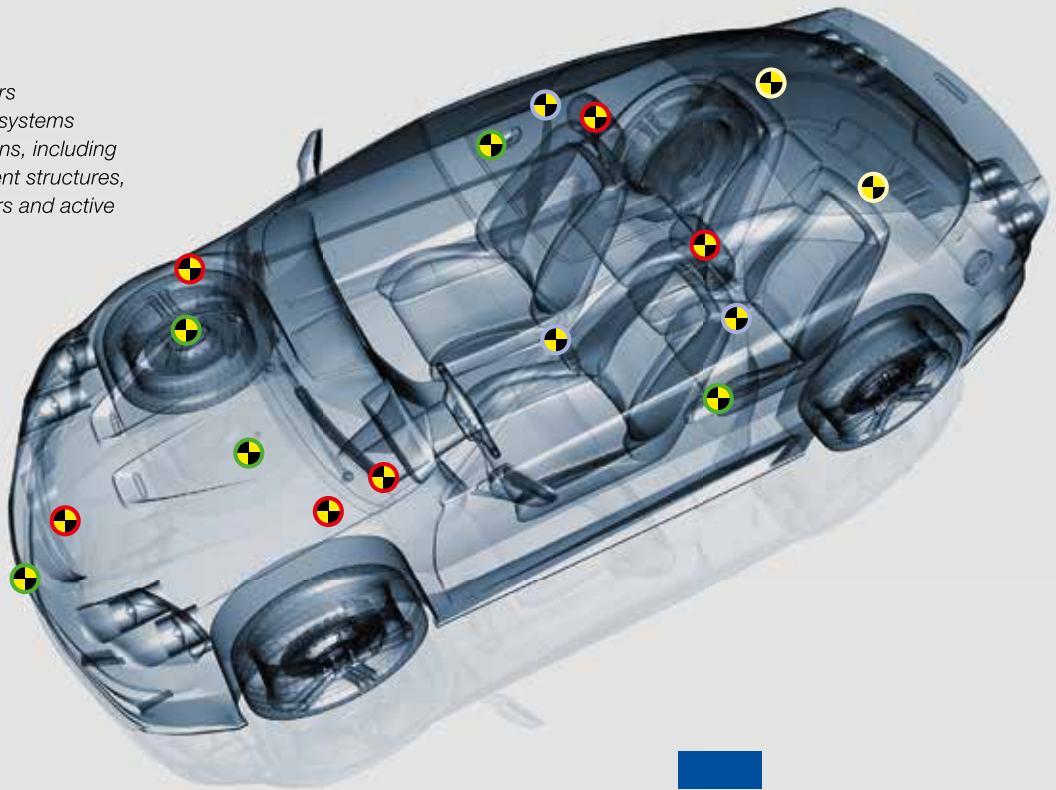


PROTECTING PEOPLE

Hirtenberger solutions

Actuators for pedestrian-protection systems, crash-active headrests, active hood locks, adaptive steering columns, pedal releases **Micro Gas Generators** for belt and buckle pretensioners and adaptive airbags.

- Actuators
- Micro Gas Generators
- Roll-over protection systems
- Various other solutions, including pipe cutters, intelligent structures, battery disconnectors and active door locks



Various other solutions, including roll-over protection systems, pipe cutters, intelligent structures, battery disconnectors and active door locks.