SAREX

Squeak & Rattle Exciting Shaker-Systems

A new and mobile system for testing car bodies in white and complete cars

Target application

- Annoying noises like squeak and rattle
- Prototype testing
- Complete vehicles
- Production start-up testing
- Production testing

Target Market

- Automotive - OEM
- 1st tier supplier
- 2nd tier supplier
- Body in white
- Systems
- Components
- Complet vehicles

For maximum torsion, the body in white is connected at the extreme outer corners

Mobile and reasonable-priced testing system

Check car bodies in white under torsion and road excitation

Saves rework and warranty cost

The causes of annoying noise are in the body in white

Vibration and noise not matching the pattern the customer expects impair the product quality perceived by the buyer. The cause of annoying noise is already in the body in white. Here, noise is particularly dangerous because noise propagates at high speed in metal and is extremely difficult to locate. A customer feels annoyed when the noise is coming from below because he is afraid it might be a safety risk. Besides, bodies in white are completed very early in the genesis of a car and therefore can be tested very early.
Parts such as instrument panel and seats installed in the body early can also be tested at that stage.

Annoying noise at start of series production
The test rig can also be used for basic studies or for tests in connection with the start of series production. In that case, the car is moved on the test rig via ramps and can be tested for torsion and different road profiles can be simulated.

Drive files

Numerous different road profiles were recorded on many test grounds and included in the ZINS “DRV” database. The profiles include different types of cobblestone roads, poor condition routes, country roads, motorways, road holes and many other profiles.

simplifying technology

SAREX body in white

Technical Data

Torsion

- Dimension blocks and slabs
  - blocks:
  W400xL 500xH510 mm
- slabs:
  W450xL 450xH250 mm

- Torsion bei applying a moment in y- direction: 21 mm, in z-direction with blocked back-part

- Velocity: 10 s

Airbag

- Diameter: 325 mm
- Hub: 95 mm
- Force: 2 bis 45kN with 1-8 bar pre-pressure, decreasing with increasing Hub height

Shaker

- Noise emission smaller than NR 35
- Rigid suspension increase the resistance against shear force
- Hub up to 30 mm
- Frequency up tp 2000 Hz
- Force up to 640N rms
- No Oil, no compressed air, no 3-phase current
- no foundation work

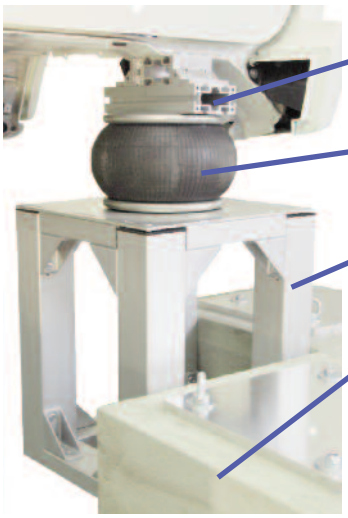
IMO and MIMO-Controller

- SIMO:
  Single in und mutiple out
- MIMO:
  multiple in und multiple out

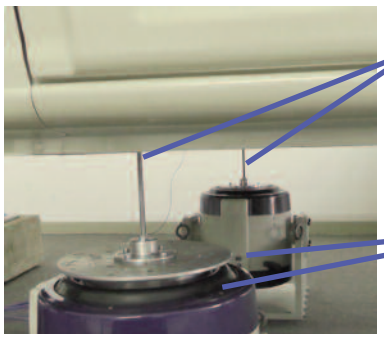
Solution approach / test method

Torsion simulates vehicle events such as driving over the edge of a kerb on one side or over strong undulations of the ground. This form of excitation is of very low frequency and very slow. Road excitation simulates driving, e.g., on cobblestone road, motorway or poor condition routes. These signals are of high frequency. Both types of excitation are critical to the analysis of noise because torsion involves fairly extensive twisting movement and a high level of relativization whereas road excitation means high relative speed over short distances. During the test, the test engineer can board the car or body-in-white without problem.

Torsion system components



- Nonpositive elements fixing the body in white
- Inflatable airbags with airbag controller
- Mobile blocks take up the body in white
- Weights on mobile concrete slabs
- PC to control the airbag controller



- DBE (direct body excitaiton)
- SIMO (single in mutible out)
- MIMO (mutiple in mutiple out)

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