

Crash Pulse



Seattle Safety Newsletter (SESA) – Volume 2, Issue 1

Special Interest Articles:

- TNO issues contract to Seattle Safety for new ServoSled
- “SESA scored the highest with respect to Technical competency, price and overall product and service value”

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Main Office

822 Third Avenue South
Kent, WA 98032 USA
Tele: 253-395-4321

Metro Detroit Office

3051 Vixen
Wixom, MI 48393
Tele: 248-877-3392
Gordie@seattlesafety.com

TNO awards ServoSled contract to Seattle Safety (SESA)

Recently, SESA participated in the European tender procedure for the delivery of an Inverse Crash Testing Facility for the TNO location in Helmond, the Netherlands.

On February 12, 2007 Seattle Safety received notice from TNO that the offer received from SESA was the most economically advantageous and ended in first place.

The European procedure is a lengthy process that involves meeting strict selection criteria consisting of thorough review of the quality of the technical solution, service level agreement, conformity to the specifications and price.

“We are extremely pleased that our ServoSled will be used at the new TNO Automotive in Helmond and look forward to a very

productive cooperation between SESA and TNO” comments, Brian Coughren, Vice President/Owner of SESA.

The installation will begin in August 2007. The TNO ServoSled will include SESA’s non-destructive side impact system which utilizes the negative-G pulse capability of the standard ServoSled system.

SESA will use the new installation as a key European reference site to showcase their state of the art ServoSled product.

For more information regarding this award please contact, Gordie Morgan, Director Global Sales & Marketing at USA (248)-877-3392.



TNO Automotive new location in Helmond, the Netherlands

Product Update – Autoliv ServoSled Conversion

ServoSled Conversion installation started at Autoliv North America

In February 2007, SESA began work at Autoliv North America in Auburn Hills, Michigan USA to convert Autoliv’s existing HYGE North sled into a servo-brake controlled sled system. SESA’s new product is called, the “ServoSled Conversion or (SSC).”

Recently, SESA sat with Doug Stein, Manager Test Operations for Autoliv North America (ATC) and asked a series of questions regarding Autoliv’s decision to purchase the SESA ServoSled Conversion. Pages 3 and 4 have this in depth conversation.

Continued on page 3 (Product Update)

SESA Exhibits at SIAT 2007 in Pune, India



The highlight of this year's Symposium on International Automotive Technology (SIAT) was its inauguration by His Excellency The President of India.

The Honorable President of India laid the directions for the Indian Automotive Industry for its future course and set goals to reach. He emphasized the need for technology leading to competitiveness with innovation as capital. He also covered the need for protecting the environment and the role of automotive industry towards it.

The Inauguration Ceremony was followed by a panel discussion on the theme of SIAT2007 "Strategy for Global Presence" chaired by Dr. R.C.Panda; Secretary, MoHIPE. The automotive mission plan (AMP 2006-2016) was presented by Dr. Pawan Goenka, Vice President-ARAI, President-SAEINDIA, President-Automotive Sector, Mahindra & Mahindra Ltd. There was a lively discussion identifying the areas to be strengthened to meet the AMP and build "Brand India" image.

More than 750 delegates/invitees from automobile companies and R & D Institutions from India and abroad participated in SIAT 2007, including 100 overseas delegates. With more than 100 stalls, SIAT Expo 2007 was a huge success. Apart from SIAT2007 delegates and invitees, there were around 3000 visitors to SIAT Expo stalls.

For additional information on SIAT 2007 please go to the Automotive Research Association of India (ARAI) web site: <http://www.araiindia.com/siat.htm>



"I challenge you to use your innovative skills as capital in achieving your technology goals."



Gordie Morgan, Seattle Safety's Director of Global Sales & Marketing (Left) with ARAI Deputy Director of Passive Safety, Mr. Mannikar (Right) - Pune, India



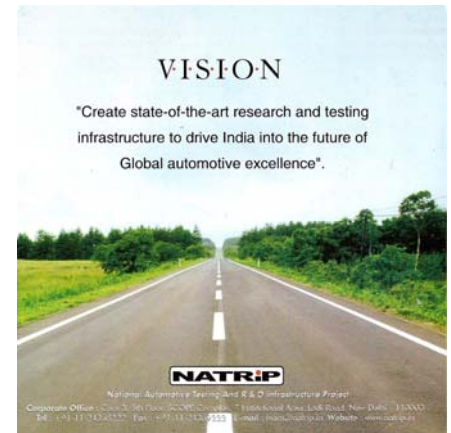
Mrs. Kanti Singh, Minister of State for Heavy Industries and Public Enterprises visits Tesscorn's stall at SIAT to learn about crash test sleds produced by Seattle Safety.

SIAT emphasizes NATRIP agenda

National Automotive Testing and R&D Infrastructure Project (NATRIP), the largest and one of the most significant initiatives in Automotive sector so far, represents a unique joining of hands between the Government of India, a number of State Governments and Indian Automotive Industry to create a state of the art Testing, Validation and R&D infrastructure in the

country.

The Project aims at creating core global competencies in Automotive sector in India and facilitate seamless integration of Indian Automotive industry with the world as also to position the country prominently on the global automotive map.



Product Update - Autoliv ServoSled Conversion - continued from page 1

What was the deciding factor that made Autoliv decide to convert their existing HYPE sled to the SESA ServoSled technology?

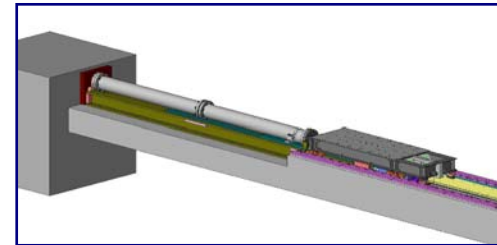
“We were motivated to look at upgrading our sled test capabilities for several reasons. Several OEM's have edged away from the HYPE technology in favor of hydraulic servo-control sleds, primarily due to their demand for better crash pulse matching (particularly the higher frequency content) for belted occupant tests. While investigating the available options, I looked for viable solutions that would minimize the

amount of structural changes to our existing facility, minimize the down-time during construction, and minimize cost. As OEM's begin to replace their HYPE systems with servo-hydraulic sled devices, suppliers may need to upgrade to retain compatibility during the product development cycle. In addition to improving the quality of the test pulse, the newer servo-sled technology also reduces waste by; eliminating the need to design/machine/and pulse new metering pins, and allowing faster turn-over between test programs or pulse changes. Enhanced control of the

sled pulse allows Autoliv to continue to meet the challenges of new and upcoming automotive safety technologies.”

You are familiar with sleds is there something special about the SESA ServoSled that stands out in your mind?

“I think the SESA solution is smart. The brake system requires very little hydraulic fluid flow (not much brake piston motion needed), so the servo system can respond more quickly (higher frequency pulse matching), and avoid a lot of costly components.”



“I think the SESA solution is smart”, Doug Stein, Manager Test Operations Autoliv North America.

Can you comment on crash pulses a bit – are crash pulses more complex today as technology continues to change? Explain.

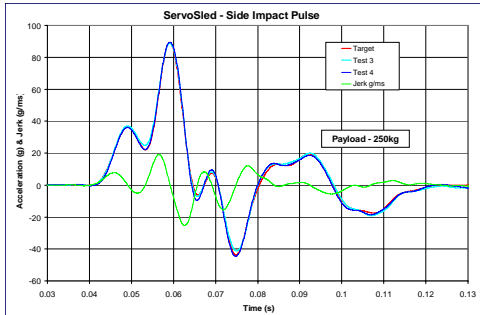
“In some cases the crash pulse has become shorter and stiffer (very small cars), which places a higher demand on the restraint system (less ride-down space). I don't know that I would say that crash pulses are getting more complex, but I can say that the ability to more closely (and Repeatably) match the

crash pulse has become more critical. Regulatory and Ratings programs have increased in numbers and complexity, adding to the number of test conditions that must be considered during development stages. As the number of system design constrains increases, more demand is placed on test accuracy and repeatability. A test device must also be flexible and adaptable as new technologies often demand new test conditions.”



Product Update – continued from page 3

“...A standard acceleration-type sled is designed to produce only one pulse at a time - not 4 or 5, so the ability to simulate this condition requires additional devices.”

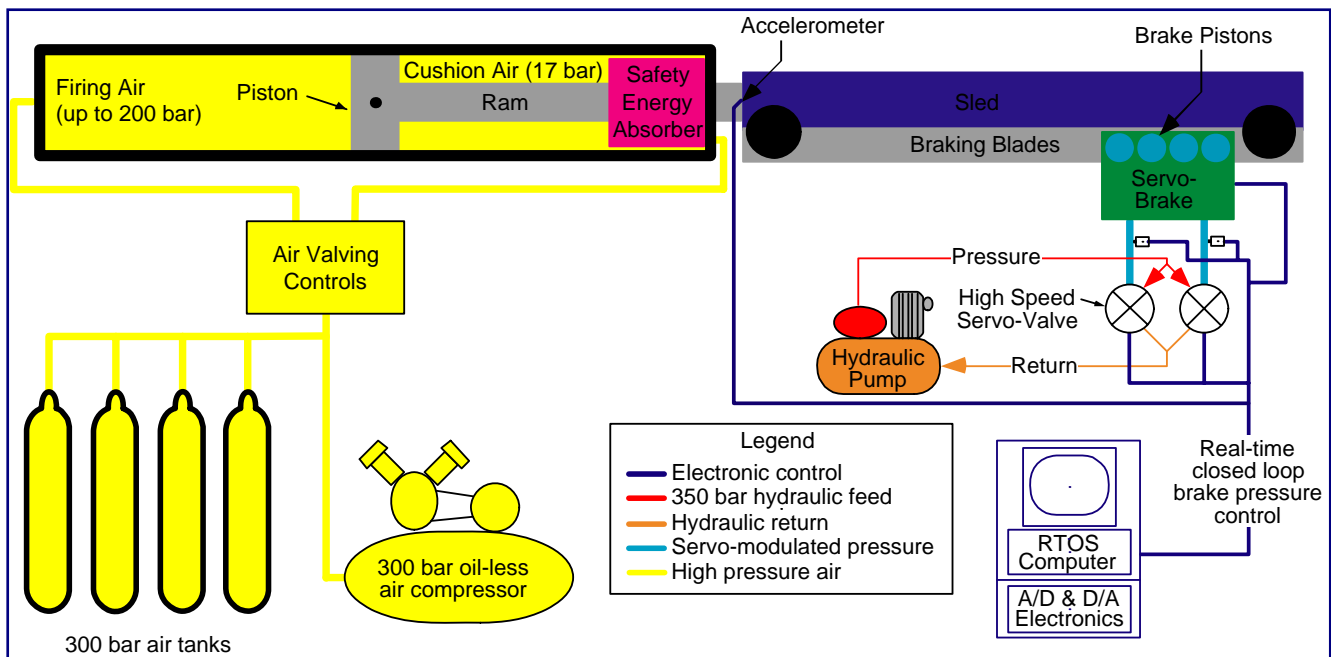


How about side impact? Any comments on this with respect to sled testing?

Side impact sled testing can be split into two basic categories, the MDB test (FMVSS 214, ECE R95, IIHS test) and the pole test (FMVSS 201, proposed FMVSS 214 pole). Each category has its own challenges: In the MDB test, there is a lot going on. There are multiple door parts (upper door trim, armrest, lower door) all potentially striking the dummy at different times and at different velocities. When there is a roof mounted restraint system, there is yet another velocity added. A standard acceleration-type sled is designed to produce only one pulse at

a time - not 4 or 5, so the ability to simulate this condition requires additional devices. The complexity of these devices depends on the vehicle structure and on the test mode (IIHS vs FMVSS 214, etc...). The pole impact is a less complex test condition, as there is really only one significant velocity component - the relative velocity between the occupant and the pole. There is a special challenge here, however, in that the velocity of the pole must remain constant through the first 50-60 milliseconds of the test (during the crash test - the pole is stationary, so velocity is constant at zero). This is a relatively easy test to simulate on a deceleration sled - by

running the test rig into a stationary pole. It is not so easy on an acceleration-type sled, however, to maintain constant velocity for the pole for a sufficient duration. I am not too hopeful that the SESA sled will do much to improve our MDB test capabilities, but have definite hopes that our pole impact simulation will be given new hope. The success here will be dependant on the ability of the device to quickly attain the desired speed and hold it constant for enough time.”



Timing of Airbag Squib Fire and Triggering Outputs – A Technical Insight

Tom Wittmann, President/Owner of SESA recently discussed a key advantage of the SESA ServoSled as it relates to squib firing.

“Old-fashioned sleds do not run with exact timing. For example, a Hyge/Hodogaya/MGA uses a trigger valve to initiate firing, and the repeatability of the firing sequence was not good enough for high precision use such as airbag squib firing, DAS triggering, etc.

In an attempt to address this weakness many triggering systems use an accelerometer to try to

determine when the pulse starts, and use a g threshold to define a “time - zero (T-0).”

Using an accelerometer is also not completely accurate. A vibration in the sled can cause the (T-0) to be read too early. Slight differences in how the sled fires at the very start can cause timing inaccuracies.

Modern sleds like SESA's ServoSled have a very accurate timing sequence. In this case of ServoSled the timing from tests to test differs by less than 0.3ms. This is better than

is obtainable using an accelerometer.

ServoSled has a number of user configurable trigger channels that can fire anywhere from 40ms before the pulse to the end of the pulse. The timing of these triggers are set to a resolution of 0.1ms.

Therefore:
We can trigger strobes or airbags or DAS at any desired time in the test sequence to very high repeatability (<0.3ms) test to test.

Highest accuracy will be achieved when the ServoSled also provides the (T-0) trigger. A trigger provided by the DAS based on an accelerometer reading will be less accurate than the trigger our system can provide.

In summary, conventional triggering, especially triggering of airbag squibs, is based on an obsolete approach held over from the days of mechanical sleds. Seattle Safety offers a more accurate and repeatable triggering system standard with every ServoSled. In addition, Seattle Safety at extra cost offers up to 18 channels of 10,000 hz analog signal monitoring. The customer can use these channels to confirm airbag squib fire amperage and voltage, freeing up expensive DAS channels for more critical uses.

Upcoming Events - 2007

- SAE WorldCongress (April 16-19) Cobo Hall Detroit, MI USA
- Automotive Testing Expo Europe (May 8-10) Messe Stuttgart Killesberg, Germany
- Government/Industry Meeting (May 14-16), L'Enfant Plaza Hotel, Washington, DC, USA
- ISO Meetings, Seoul, Korea (May 14-18)
- JSAE 2007 (May 23-25) Pacifico Yokohama Exhibition Hall, Yokohama, Japan
- SAEDigital Human Modeling for Design and Engineering Conference and Exhibition (June 12-14) Univ. of Washington - Seattle, Washington, USA
- 14th Asia Pacific Automotive Engineering Conference (APAC-14) (August 5-8) Hollywood, California, USA
- Automotive Testing Expo China (September 12-14) The Shanghai Everbright Convention & Exposition Center
- IRCOBI (September 18-21) – Crowne Plaza Maastricht, the Netherlands
- Automotive Testing Expo North America (October 24-26) Rock Financial Showplace, Novi, Michigan
- 45th SAFE Symposium (October 29-31), Grand Sierra Resort Reno, Nevada
- STAPP Car Crash Conference (October 29-31) Catamaran Resort Hotel, San Diego, California USA



Delphi Korea 2.0MN ServoSled includes ServoSled controlled airbag squib firing system



Global Sales & Technical Offices

North America. Europe & Global Sales

Gordie Morgan
Global Sales & Marketing Director
Seattle Safety Metro Detroit Office
PO Box 930459 USA
Wixom, MI 48393
Tel: 248-877-3392
gordie@seattlesafety.com

Japan

FIT Pacific Inc
Kimigayo Bldg 4F3-20-15 Asakusabashi,
Taito-kuTokyo , Japan 111-0053
Phone:+81-3-5820-7021
Fax:+81-3-5820-7027
email: tkasai@fitpacific.com
Web:http://www.fitpacific.com/
Attn: Tsunemasa Kasai -
Sr. Managing Director

Korea

Hunik Inc.
Room 201, Jungpyung Building
319-2 Yangjae-Dong, Seocho-Ku
Seoul , Korea
Tel : 82-2-575-3189, 3190
Fax : 82-2-575-3790
Email : nick@hunik.co.kr
Cellular: 82-11-723-7983
Home: 011-822-579-9754
Website: http://www.hunik.co.kr
Attn: Nicholas Park , President

China , including Hong Kong

UTC (ULTITECH CORP.)
Main Office
50977 Drakes Bay Dr .
Novi, MI 48374
Tel: (734) 717 - 4380
Fax: (248) 348 - 2506
Email: sales@ultitechcorp.com
Web: http://www.ultitechcorp.com
Attn: Jerry Wang, Chairman

UTC BEIJING OFFICE
Building F, Suite 2101
Tong Dian Ming Ju
1 Tongzhou Baiyuan Rd.
Beijing , P. R. China 101100
Tel: + 86 (10) 60530749, 60530789
Fax: +86 (10) 60530789
Email: beijing@ultitechcorp.com

UTC SHANGHAI OFFICE
Building 22, Suite 201
1800 Dongfeng Rd.
Shanghai, P. R. China 200010
Tel: +86 (21) 50893530, 50893531
Fax: +86 (21) 50893532
Email: shanghai@ultitechcorp.com

Germany, Switzerland, Austria

ZSE Electronic Mess-Systeme &
Sensortechnik GmbH
In den Fressaeckern 28
D -74321 Bietigheim - Bissingen
phone: 0049 (0) 7142 - 6845
fax: 0049 (0) 7142 - 6997
e-mail: instruments@zse.de
Internet: www.zse.de
Attn: Uwe Ziessnitz, Managing Director

India

Tesscorn Systems India
587 Cross, 3rd Block, Koramangala,
Sarjapur Road
ngalore 560 034 India
Tel: +91-80-25502308
Fax: +91 80 2550 2358
Email: info@tesscorn.com
Web: http://www.tesscorn.com
Attn: Gopakumar Chandran President

South America

Werner Nopper
Rua Antonio Das Chagas, 1683-B
Chac. Sto. Antonio 04714-002
Sao Paulo-SP
Brazil
Phone/Fax: +55 (11) 5181 7474
Mobile phone : 55-11-94464494
Email: wnopper@uol.com.br



Attention Editor:
Metro Detroit Office
PO Box 930459
Wixom, MI 48393

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