Rollover Occupant Protection System

SEI Safety Engineering International

SEI and HALO logos are trade marks of Safety Engineering International
©2017 ALL RIGHTS RESERVED
3. HALO™ Rollover Protection
4. Safety By Design
5. Dynamic Testing
6. Manufacturers
7. HALO™ Approvals
8. Nissan NP300 Dual Cab
9. Toyota Land Cruiser 79 Single Cab
10. Toyota Hilux Dual Cab
11. Mitsubishi Triton L200 Dual Cab
12. Toyota Hilux Single Cab
13. Isuzu KB Single Cab
14. Isuzu KB Dual Cab
15. Ford Ranger Dual Cab
16. Toyota Prado
17. Toyota Land Cruiser
18. Retrofit Vans/Buses
19. Real World Results
20. Contact Information
The HALO™ was developed to be the most effective and economical means of mitigating deaths and injuries in rollover crashes.

The HALO™ is a comprehensive design which consists of an optimized tubular structure mounted on the vehicle roof similar to a roof rack in combination with internal pillar reinforcements that stay within the Original Equipment Manufacturer (OEM) plastic trim to maintain the interior space and appearance.

The HALO™ functions by tying all of the underlying vehicle’s vertical pillars together and reforming the vehicle’s trapezoidal cross-sectional shape while drawing on the internal reinforcement’s added vertical support.

The HALO™ is a dynamically tested ROPS that maintains the Major Radius and minimizes Roof Crush and Occupant Injury.
The HALO™ was extensively tested on the JRS Dynamic Rollover test rig. Four prototype designs were developed and tested to optimize the structure.

The resulting design outperformed the Volvo XC90 and minimized intrusion speed and roof crush in all locations to less than 2 mph and less than 1” of crush.
Dynamic Testing

Finite Element Analysis: OEM vs. HALO™

HALO™ Dolly Rollover Testing at 42 MPH - 2 Roll Event

Launch off Dolly
Airborne Pre-Roll 2
Driver’s Touchdown Roll 2
Passenger’s Touchdown Roll 3
Manufacturers

SAFETY ENGINEERING INTERNATIONAL
www.safetyei.com
Tel: +1 805 895 5192

DUYS COMPONENT MANUFACTURERS
www.duys.co.za
Tel: +27 31 713 1700

SEI and HALO logos are trade marks of Safety Engineering International
©2017 ALL RIGHTS RESERVED
Advantages of a HALO™ ROPS System include:

- Dynamically tested to optimize rollover performance.
- Reduced point load impacts to front roof corners.
- Allows deployment of seat and window curtain airbags.
- Light weight design minimally effects CG or payload capacity.
- Enhanced Side Impact Protection from reinforcements.
- Limits roof crush and crush speed to maintain Occupant Survival Space and restraint function.
- Unique cross member and roll hoop design join the structural components together to:

  **MINIMIZE ROOF CRUSH and OCCUPANT INJURY**

**HALO™ is approved by:**
HALO™ is fitted on a 2013 Nissan NP300 Dual Cab

Item Number: H13AKIT
HALO™ Dimensions: 51 x 42 x 8 inches  
1305 x 1065 x 203 mm

Weight: 51 lbs (23 kg)
HALO™ is fitted on a 2013 Land Cruiser 79 Series Single Cab

Item Number: H14AKIT
HALO™ Dimensions: 40 x 50 x 10 inches  Weight: 75 lbs (34 kg)
1016 x 1270 x 243 mm
HALO™ is fitted on a 2012 and 2016 Toyota Hilux Dual Cab

Item Number: H6AKIT (2012) and H16AKIT (2016)

HALO™ Dimensions: 55 x 45 x 8 inches
1397 x 1143 x 203 mm

Weight: 47 lbs (21 kg)
Product Details:

**HALO™ is fitted on a 2012 and 2016 Mitsubishi Triton**

- **Item Number:** H5AKIT (2012) and H51AKIT (2016)
- **HALO™ Dimensions:** 58 x 49 x 8 inches  
  1473 x 1245 x 203 mm  
- **Weight:** 47 lbs (21 kg)
Hilux Single Cab

Product Details:

HALO™ is fitted on a 2013 Toyota Hilux Single Cab

<table>
<thead>
<tr>
<th>Item Number:</th>
<th>H10AKIT (&lt;2016) and H17AKit (2016+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALO™ Dimensions:</td>
<td>36 x 57 x 8 inches</td>
</tr>
<tr>
<td></td>
<td>911 x 1465 x 190 mm</td>
</tr>
<tr>
<td>Weight:</td>
<td>65 lbs (29 kg)</td>
</tr>
</tbody>
</table>

SEI and HALO logos are trade marks of Safety Engineering International
©2017 ALL RIGHTS RESERVED
KB Single Cab

HALO™ is fitted on a 2013 Isuzu KB Single Cab

<table>
<thead>
<tr>
<th>Item Number:</th>
<th>H11AKIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALO™ Dimensions:</td>
<td>36 x 57 x 8 inches</td>
</tr>
<tr>
<td></td>
<td>911 x 1465 x 190 mm</td>
</tr>
<tr>
<td>Weight:</td>
<td>65 lbs (29 kg)</td>
</tr>
</tbody>
</table>

SEI and HALO logos are trade marks of Safety Engineering International
©2017 ALL RIGHTS RESERVED
Product Details:

HALO™ is fitted on a 2013 Isuzu KB Dual Cab

<table>
<thead>
<tr>
<th>Item Number:</th>
<th>H12AKIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALO™ Dimensions:</td>
<td>55 x 45 x 8 inches</td>
</tr>
<tr>
<td></td>
<td>1397 x 1143 x 203 mm</td>
</tr>
<tr>
<td>Weight:</td>
<td>52 lbs (24 kg)</td>
</tr>
</tbody>
</table>
HALO™ is fitted on a 2013 Ford Ranger

Item Number: H9AKIT
HALO™ Dimensions: 60 x 49 x 8 inches
                  1524 x 1245 x 203 mm
Weight: 50 lbs (23 kg)

Product Details:

Ford Ranger
HALO™ is fitted on a 2010 Toyota Prado Wagon

Item Number: H4AKIT
HALO™ Dimensions: 62 x 49 x 8 inches
(1570 x 1240 x 200 mm)

Weight: 56 lbs (25 kg)
Product Details:

HALO™ is fitted on a 2012 Toyota Landcruiser 200

Item Number: H8AKIT
HALO™ Dimensions: 88 x 50 x 9 inches  Weight: 64 lbs (29 kg)
(2230 x 1270 x 230 mm)
Our investigation of passenger vans and buses revealed that the roof structure, including the support pillars, are very weak, as shown in the accident photo below. HALO™ has been developed for these vehicle types and includes interior reinforcement pillars that are added to the existing structure to minimize the distance between supports. As with all HALO™ ROPS, our reinforcements are hidden under the OEM trim and not visible inside the vehicle.

Placement of added Reinforcement Pillars Behind D Pillar filling Ten Foot Gap

D-Pillar

False Pillar

Ten Foot Gap

New Covers with Air-Gap Padding

Gap Where Pillar Should Be

OEM Trim in place after install.
HALO™ SAVING LIVES!

With more than 1000 HALO™ ROPS installed worldwide, it's successfully protected occupants in more than 40 Rollover events. Below are photos of the vehicles equipped with the HALO™ in real world rollover accidents. There were no serious injuries or fatalities from roof crush.
## Contacts

### Safety Engineering International

**Corporate Headquarters:**
5949 Hollister Ave, Suite A.
Goleta, California.
USA 93117
info@safetyei.com

- Delivery Time Frames
- Quantity Discounts
- New Vehicle Types
- Heavy Trucks
- Mini-Busses
- Crash Analysis
- ROPS Analysis
- Engineering Services

### General Manager

**Susie Bozzini**

Phone: +1 805-895-5192

Email: Susie@safetyei.com

Website: www.safetyei.com

### Bilingual Contacts:

**Spanish/French**

info@safetyei.com

---

SEI and HALO logos are trade marks of Safety Engineering International

©2017 ALL RIGHTS RESERVED