Nissan takes a real-world approach to safety, using actual crash data as its first step in new development. The quest is to develop safer vehicles through the analysis of this accident data, with the goal of reducing by half the number of fatal and severe injuries.

The Quest for Real World Safety

Active Head Restraint System

Nissan’s policy toward safety is a quest for Real World Safety. Nissan has long worked to create safer vehicles; the company has been analyzing actual accident data involving Nissan vehicles in Japan. This data is the base for Nissan’s development of safety technologies, with the goal to cut the number of fatal and severe injuries in Nissan vehicles to half the level of 1995. Ongoing Nissan research has resulted in the adoption of the Active Head Restraint System, effective in rear-end collisions, and the SRS Curtain Airbag System, designed to protect vehicle occupants in side collisions. About 50 percent of all accidents involve rear-end collisions; neck injuries account for more than 90 percent of all injuries incurred in rear-end collisions. In a rear-end collision, Nissan’s active head restraint system moves the headrest forward, reducing rearward rotation and motion of the head and neck. The result is an approximate 45 percent reduction of neck motion, and an estimated 60 percent reduction of rotation of the head to the rear—and greatly reduced neck loading. The Active Head Restraint System will be standard equipment on all Nissan passenger cars and RVs by fiscal year 2004.

Fatalities and injuries involving automobiles, 2000

Injuries caused by rear impact

- Neck and head: 21.8% (22,083)
- Other: 5.1% (5,310)
- Head, face: 2.6% (2,705)
- Torso: 0.1% (104)

Fatalities caused by rear impact

- Neck and head: 4.5% (4,665)
- Other: 0.8% (823)
- Head, face: 1.7% (1,776)
- Torso: 0.1% (103)
- Other: 0.1% (10)

Source: Institute for Traffic Accident Research and Data Analysis

SRS Curtain Airbag System

Nissan Hello Safety Campaign

Three times annually, Nissan and Nissan dealerships in Japan hold this campaign to encourage the proper use of child seats by kindergarten children and their parents and to increase safety awareness. Activities include the distribution of safety posters and banners, and coloring books and games with traffic safety themes.

Creating Unique Technologies

Nissan has completed development of a Brake-Operated Pre-crash Seatbelt System that helps mitigate occupant injury in the event of a collision. The system will be introduced in 2003, and is effective in about 25 percent of all serious and fatal accidents. This technology is patented by Nissan and is available to competitors through a licensing process.

The brake-operated pre-crash seatbelt system is one result of Nissan Advanced Safety Vehicle (ASV) research activities. Other advanced ASV technologies include the world’s first Lane-Keeping Support system featured on the Cima, and the Adaptive Cruise Control (ACC) system currently available on medium-size and larger Nissan models.

In its new Far-Infrared Imaging Sensor, Nissan succeeded in creating a system that can detect pedestrians at night at distances up to 50 meters. The headlamp illumination pattern is controlled to illuminate the pedestrian and alert the driver. Another application of infrared sensor technology is Intruder Warning. An infrared sensor embedded in an A-pillar detects the entrance of an intruder into the vehicle and issues a warning.

Far-Infrared Imaging Sensor

Brake Operated Pre-crash Seatbelt System

Vehicle condition and occupant kinematics are predicted by the speed and amount of brake pedal operation. Driver and front seat passenger motion is reduced by the retraction of the seatbelt by a motorized seatbelt retractor. By helping to minimize the occupants’ motion during sudden braking, this helps the driver control the vehicle in an emergency situation. If the crash is unavoidable, early seatbelt restraint can help maximize the effectiveness of other occupant protection devices such as airbags.

Brake Operated Pre-crash Seatbelt System

Pedal stroke sensor

Motorized pre-tension belt

Control unit

Laser radar sensor

The system can detect pedestrians at night at distances up to 50 meters. The headlamp illumination pattern is controlled to illuminate the pedestrian and alert the driver.
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Fatalities and injuries involving automobiles, 2000

<table>
<thead>
<tr>
<th></th>
<th>Casualties by impact area</th>
<th>Injuries caused by rear impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>26.6% (18,437)</td>
<td>8.5% (5,751)</td>
</tr>
<tr>
<td>Back</td>
<td>46.6% (194,437)</td>
<td>15.1% (10,314)</td>
</tr>
<tr>
<td>Other</td>
<td>22.6% (14,353)</td>
<td>17.3% (11,962)</td>
</tr>
<tr>
<td>Trunk</td>
<td>4.1% (2,815)</td>
<td>3.5% (2,363)</td>
</tr>
<tr>
<td>Neck and head</td>
<td>0.5% (335)</td>
<td>0.5% (335)</td>
</tr>
</tbody>
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Source: Institute for Traffic Accident Research and Data Analysis


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