Pre-crash Safety Systems

Nissan develops safety technologies on the basis of analyses of real-world traffic accidents. Development efforts are focused in three areas; information safety to warn the driver of potential danger; control safety to assist the driver in avoiding potential danger; and impact safety to help reduce the risk of occupant injury in an accident. Pre-crash safety systems represent new and intelligent features that are a further advancement over existing safety technologies. Nissan's pre-crash safety systems incorporate advanced safety technologies that detect and warn the driver in advance of a possible collision. Moreover, when a collision is about to occur, these systems activate the necessary safety features in preparation for the impact and thereby help reduce the risk of occupant injuries.

### Position of pre-crash safety systems

<table>
<thead>
<tr>
<th>Safe driving condition</th>
<th>Potentially dangerous condition</th>
<th>Collision</th>
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</thead>
<tbody>
<tr>
<td>Information safety</td>
<td>Control safety</td>
<td>Impact safety</td>
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<tr>
<td>(Detection of potential danger)</td>
<td>(Avoidance of potential danger)</td>
<td>(Injury mitigation)</td>
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**Pre-crash safety systems** (Preparation for collision to mitigate injury)
- Intelligent Brake Assist
- Pre-crash Seatbelt System

Intelligent Brake Assist for reducing the risk of injury in rear-end collisions

Most rear-end collisions are caused by delayed recognition or judgment error by the drivers of following vehicles. Intelligent Brake Assist uses a laser radar sensor to monitor the distance to a preceding vehicle. The system sounds a warning to alert the driver if there is a risk of a rear-end collision and emergency avoidance action is judged to be needed immediately. Moreover, if the system judges that a collision cannot be avoided by the driver's action, it applies the brakes to decelerate the vehicle and help reduce the risk of injury in the ensuing impact.

Brake-operated Pre-crash Seatbelt System installed for front seat occupants

Featured on the Cima, this system detects emergency braking situations and activates electric motors that automatically retract the front seatbelts to restrain occupant movement immediately. Detection is based on the driver's operation of the brake pedal or activation of the brake control by Intelligent Brake Assist. By restraining occupants more quickly and securely in situations where a collision is about to occur, this seatbelt system helps enhance the effectiveness of the airbags and other safety devices. Nissan holds the basic patent rights to this technology and licenses it to other companies in the interest of expanding the use of this advanced safety system.