

Side Impact Airbag OOP Evaluation

Nissan Motor Co., Ltd.
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Side Airbag OOP Injury Technical
Working Group



Overview

- ❑ Nissan Background for OOP Test Procedure
- ❑ Development Approach to Help Reduce Risk of OOP Injuries
- ❑ OOP Evaluation Results
- ❑ Field Experience
- ❑ SRS Side Impact Airbag System
- ❑ Application Status of TWG Voluntary Standard
- ❑ Communication with Customers
- ❑ Comment on TWG Test Procedure
- ❑ Conclusion

Nissan Background of OOP Test Procedure

- ❑ Public presentation at 1998 ESV Conference
 - ñ Shared results of development of head and thorax airbag including OOP testing
 - ñ Providing as a supplemental system could help to further mitigate head and thorax injuries

- ❑ Active participation to help establish OOP evaluation procedures using Nissan in house evaluation tests
 - ñ ISO Test procedure
 - ñ TWG test procedure

Nissan's Development Approach to Help Minimize the Risk of OOP Occupant Injuries

□ Before TWG

- In-house design guideline based on draft ISO Test Procedure TR 14933
- Evaluation using in-house design guideline

□ TWG and After

- Participate in procedure development
- Children volunteer evaluation for positioning procedure
- In-house design guideline was changed to TWG procedure

Nissan Volunteer Evaluation

Reported at TWG meeting on August 19 1999



Nissan Volunteer Evaluation

Reported at TWG meeting on August 19 1999



Field Experience with Side Airbags

- ❑ Nissan data and experience with our SRS side airbags indicate that the side airbags are performing well in the field

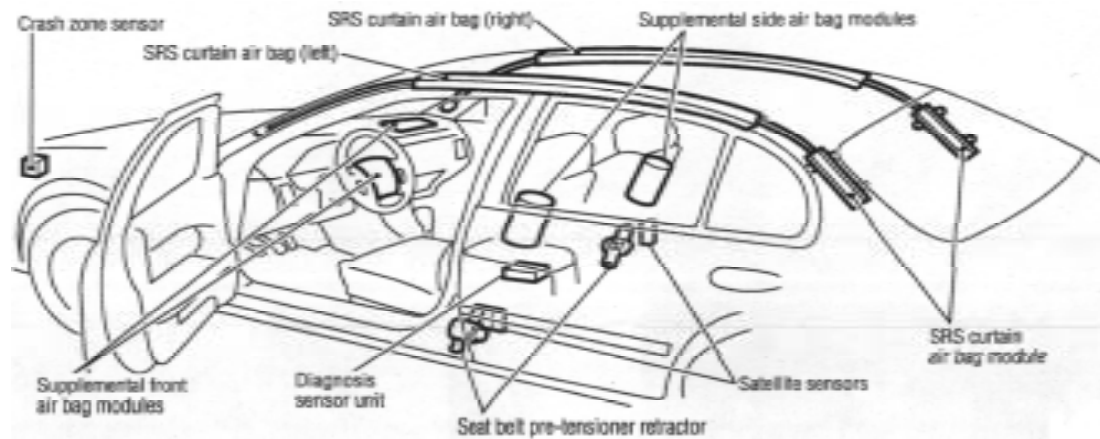
- ❑ To date Nissan is not aware of any child OOP issues with our SRS side impact airbags

Nissan Side Impact Protection

- ❑ Primary protection is the vehicle side structure
- ❑ Provide SRS side impact airbag system to help protect occupants in severe side impacts and to help reduce the risk of injuries for OOP occupants
 - ñ SRS Front Seat Thorax Side Impact Airbag started from INFINITI Q45 1997 MY, and for Nissan, Maxima 1998 MY
 - ñ SRS Front Seat Head and Thorax Side Impact Airbag started from INFINITI G20 1998 MY, Q45 2000 MY, and for Nissan, Pathfinder 1999.5 MY (phased into other models)
 - ñ SRS Front Seat Thorax Side Impact airbag and Curtain Airbag for front and rear occupants started from INFINITI Q45 2002 MY, and for Nissan, Altima 2002 MY

Nissan Side and Curtain Airbag System

Nissan Side and Curtain Airbag system



Nissan Side and Curtain Airbag System

Nissan Side and Curtain Airbag system



Application Status of the TWG Voluntary Standard to Nissan Models

❑ Satisfied TWG Requirement:

ñINFINITI Q45 2002 MY

ñNissan Altima 2002 MY

ñNew models will be designed to meet the TWG requirement, however, further research is needed for the development of future Side Impact Airbag Systems for severe impacts

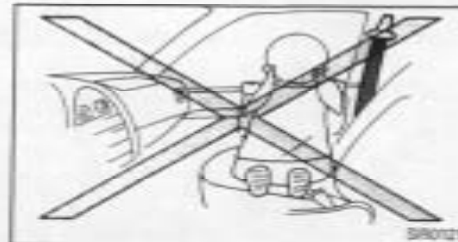
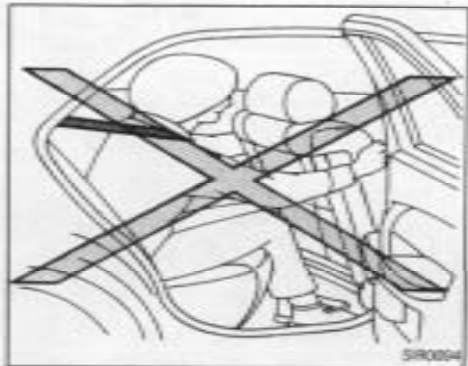
Communications with Customers

- Owners Manuals
- Airbag/Seatbelt Safety Pamphlet
- Sales Brochures

Communications with Customers

Communication with Customers

SEATS, RESTRAINTS AND SUPPLEMENTAL AIR BAG SYSTEMS



WARNING

Supplemental side air bag and curtain air bag:

- The supplemental side air bag

and curtain air bag ordinarily will not inflate in the event of a frontal impact, rear impact, rollover or lower severity side collision. Always wear your seat belts to help reduce the risk or severity of injury in various kinds of accidents.

- The seat belts and the supplemental side air bag and curtain air bag are most effective when you are sitting well back and upright in the seat. The side air bag and curtain air bag inflate with great force. Do not allow anyone to place their hand, leg or face near the side air bag on the side of the seatback of the front seat or near the side roof rails. Do not allow anyone sitting in the front seats or rear outboard seats to extend their hand out of the win-

Nissan's Comments on the TWG Procedure

- ❑ Well developed procedure and Nissan applauds the effort and cooperation that has been shown by all parties
- ❑ However, Nissan notes due to variable factors, the results for test to test may vary:
 - ❑ Dummy positioning and posture-minor differences test to test can influence dummy kinematics, although injury values are acceptable
 - ❑ The shape and soft seat material of the seat back and cushion makes it difficult to maintain the dummy in position (i.e. positioned on seat bolster) during the test and this can affect test to test repeatability
 - ❑ It is difficult to position the dummy always in the same exact position especially in rotation and orientation resulting in the same affect as above
 - ❑ Although every effort is made to duplicate the dummy position test conditions, it should be realized that the above factors can influence dummy kinematics
- ❑ The injury test results meet the IARV and dummy positioning uses the best engineering practices to control these variances. It is unrealistic to standardize the dummy positioning any further

Conclusion

- ❑ SRS side impact airbag primary function is high-speed impact occupant protection
- ❑ Nissan will continue to study whether OOP is an issue in the field
- ❑ Nissan will continue to evaluate its side impact airbag systems with the voluntary TWG OOP guidelines
- ❑ The TWG OOP procedure may need to be reviewed depending on future side impact airbag systems that are developed for severe side impacts (e.g. broader protection airbag, longer pressure retention airbag)