

Report No. 217-NVS-03-06

OFFICE OF VEHICLE SAFETY COMPLIANCE

FMVSS No. 217

"BUS EMERGENCY EXITS AND WINDOW RETENTION AND RELEASE"

**Compliance Test Report
for a
2003 Neoplan, 38 Passenger Bus
NHTSA No. C30801**



**U.S. DEPARTMENT OF TRANSPORTATION
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OFFICE OF VEHICLE SAFETY COMPLIANCE
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Date: June 4, 2003

Technical Report Documentation Page

1. Report No. 217-NVS-03-06	2. Government Accession No. N/A	3. Recipient's Catalog No. N/A	
4. Title and Subtitle FMVSS 217 SAFETY COMPLIANCE TEST: BUS WINDOW RETENTION AND RELEASE 2001 Neoplan, 38-PASSENGER TRANSIT BUS		5. Report Date June 4, 2003	
		6. Performing Organization Code OVSC	
7. Author(s) Amanda Prescott, Compliance Engineer		8. Performing Organization Report No. 217-NVS-03-06	
9. Performing Organization Name and Address U.S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION OFFICE OF VEHICLE SAFETY COMPLIANCE 400 SEVENTH STREET, S.W., ROOM 611 WASHINGTON, D.C. 20590		10. Work Unit No. N/A	
		11. Contract or Grant No. N/A	
12. Sponsoring Agency Name and Address U.S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION SAFETY ASSURANCE OFFICE OF VEHICLE SAFETY COMPLIANCE (NVS-220) 400 SEVENTH STREET, S.W., ROOM 611 WASHINGTON, D.C. 20590		13. Type of Report & Period Covered FINAL TEST REPORT	
		14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes None			
16. Abstract Tests were conducted on a 2001 Neoplan, 38-passenger transit bus, NHTSA No. C10801, in accordance with the specification of the Office of Vehicle Safety Compliance (OVSC) Test Procedure TP-217TB-00 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 217 "Bus Emergency Exits and Window Retention and Release"			
17. Key Words FMVSS 217 Compliance Test Window Release Window Retention		18. Distribution Statement N/A	
19. Security Class. (of this report) UNCLASSIFIED	20. Security Class. (of this page) UNCLASSIFIED	21. No. of Pages 9	22. Price N/A

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SECTION 1.0 – PURPOSE OF COMPLIANCE TEST

Tests were conducted on a model year 2003 Neoplan, 38-passenger transit bus, NHTSA No. C30801, in accordance with the Office of Vehicle Safety Compliance (OVSC) Test Procedure TP-217TB-00 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 217, "Bus Emergency Exits and Window Retention and Release".

SECTION 2.0 – TEST SUMMARY

**DATA SHEET No. 1
TEST SUMMARY**

A 38-passenger, 2003 Neoplan bus (VIN:1N9TA16A73L013069) was tested to the requirements of Federal Motor Vehicle Safety Standard No. 217, "Bus Emergency Exits and Window Retention and Release" on June 3, 2003. The testing was performed by OVSC engineers. The bus was tested in accordance with the OVSC test procedure TP-217TB-00, dated June 25, 2002. The bus is equipped with four (4) emergency exit windows on the right side of the bus, five (5) emergency exit windows on the left side of the bus and one (1) emergency roof exit located in the rear half of the bus. A summary of results is provided in the table below.

Table 1 – Test Summary

Section	Description	Pass/Fail	Reason
S5.2	Provision of Emergency Exits	Indicant Pass	Surrogate data from 1N9TA16A43L013062
S5.3	Emergency Exit Release	Pass	
S5.4	Emergency Exit Opening	Pass	
S5.5	Emergency Exit Identification	Pass	
S5.1	Window Retention	Not Tested	

SECTION 3.0 – COMPLIANCE TEST DATA

DATA SHEET No. 2 PROVISION OF EMERGENCY EXITS Schematic of Bus Floor Plan

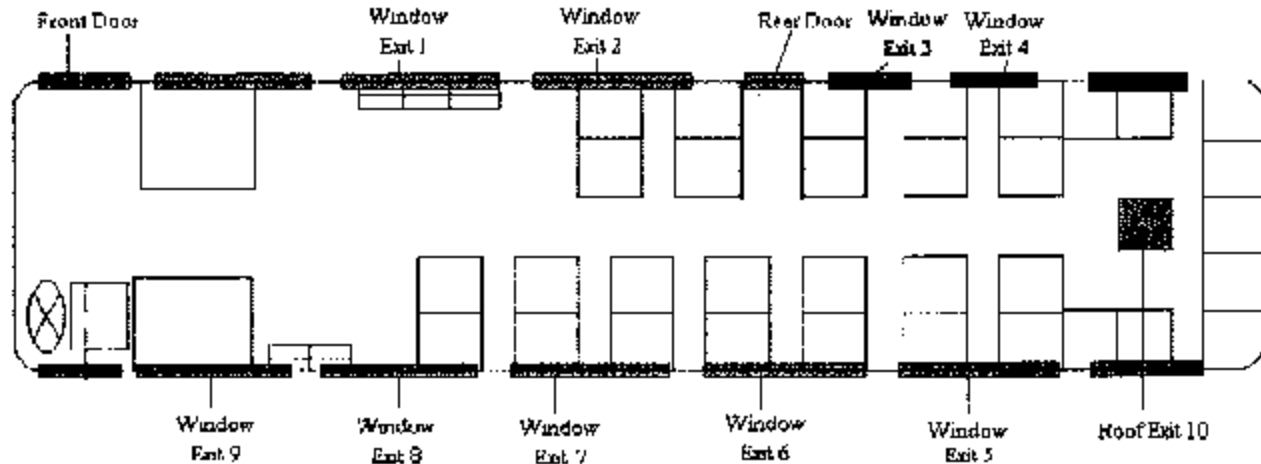


Table 2 - Provision of Emergency Exits

	Emergency Exit Type & Location	Size of Exit Opening (cm)	Actual Exit Area Measured (cm ²)	Maximum Credit Area Allowed (cm ²) (not to exceed 3,458)
1	Window, Right-Front	110 x 107	11,770	3,458
2	Window, Right-Mid-Front	110 x 107	11,770	3,458
3	Window, Right-Mid-Rear	110 x 88	9,460	3,458
4	Window, Right-Rear	110 x 88	9,460	3,458
5	Window, Left-Rear	110 x 86	9,460	3,458
6	Window, Left-Mid-Rear	110 x 86	9,460	3,458
7	Window, Left-Middle	110 x 107	11,770	3,458
8	Window, Left-Mid-Front	110 x 107	11,770	3,458
9	Window, Left-Front	110 x 107	11,770	3,458
10	Roof Exit, Rear	57 x 57	3,249	3,249
				34,371

Total Required Area = 39 Designated Seating Positions (DSPs) X 432 cm² = **16,848 cm²**
 Total Credit Area = **34,371 cm²** (PASS)

Each side of the bus must contain 40% of the Total Required Area
 (.40 X 16,848 cm²) = 6739.2 cm²

Total Credit Area-Left Side (5 windows) = (5 X 3,458 cm²) = 17,290 cm² (PASS)

Total Credit Area-Right Side (4 windows) = (4 X 3,458 cm²) = 13,832 cm² (PASS)

The bus has a rear roof exit and the configuration of the bus appears to produce the installation of an accessible rear exit.

DATA SHEET No. 3

Table 3 - Access Regions and Forces Test to Release Exits

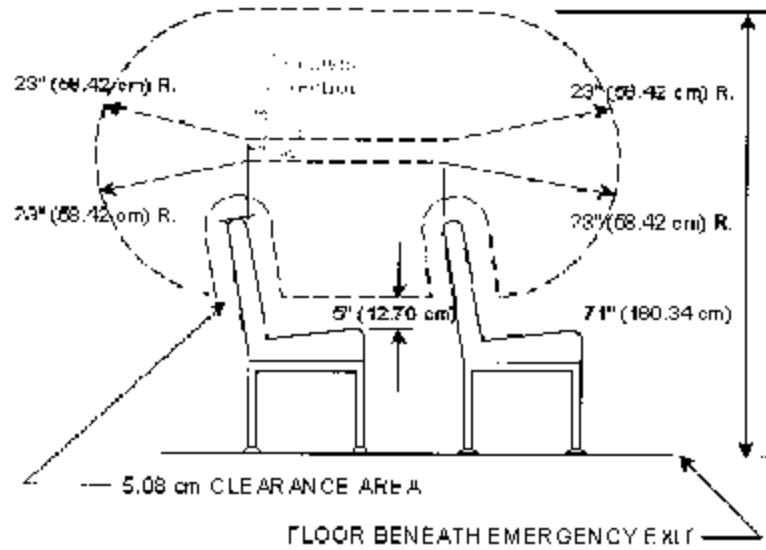
	Emergency Exit Type & Location	No. of Release Mechanisms	HIGH or LOW Access Region	Motions Required In Release Exit	Actual Motions to Release Exit	Peak Force Measured to Release Exit (N)	Max. Force Allowable (N)	Pass	Fail
1	Window, Right-Front Exit 1	1	High + Low	Rotary or Straight	Rotary	1. 24.5	89	X	
						2. 34			
						3. 49			
						Avg. = 35.8			
4	Window, Right-Rear Exit 4	1	High + Low	Rotary or Straight	Rotary	1. 44	89	X	
						2. 44			
						3. 29.4			
						Avg. = 39.1			
6	Window, Left-Mid-Rear Exit 6	1	High + Low	Rotary or Straight	Rotary	1. 63.8	89	X	
						2. 63.8			
						3. 73.6			
						Avg. = 67.1			
9	Window, Left-Front - Exit 9	1	High + Low	Rotary or Straight	Rotary	1. 73.6	89	X	
						2. 49			
						3. 63.8			
						Avg. = 62.1			

Note:

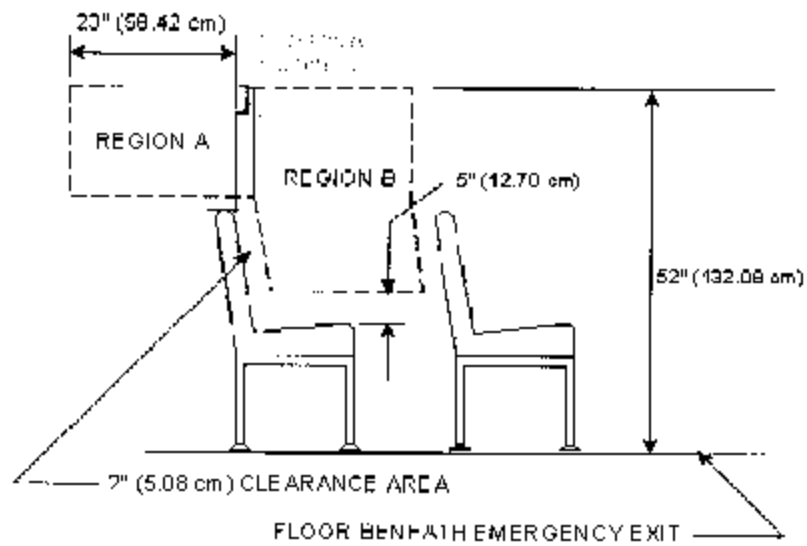
Each release mechanism tested was exercised three times prior to measuring the release force. The term exercised is used to describe the action whereby the release mechanism is released and the window opened and then returned to its original unreleased location.

The forces were measured using a Shimpo MF handheld force gauge. The force gauge has a hook at one end that allows for the attachment of the gauge onto the release mechanism. After the gauge is attached an engineer applies a force to the gauge which is transferred to the release mechanism. The engineer applies increasingly greater force until the release mechanism is released. The force measured is recorded and the gauge is zeroed for the next test.

Access Regions for Low Force



Access Regions for High Force



DATA SHEET No. 4

Table 4 - Access Regions and Forces Test to Open Exits

	Emergency Exit Type & Location	HIGH or LOW Access Region	Motions Required to Open Exit	Actual Motions to Open Exit	Direction of Motion differs 90-180° from Release motion (Yes or No)	Peak Force Measured to Open Exit (N)	Max. Force Allowable (N)	Pass	Fail
1	Window, Right-Front - Exit 1	High + Low	Rotary Or Straight	Straight, Perpendicular to undisturbed surface	Yes	1. 83.4	267	X	
						2. 122.8			
						3. 132.4			
						Avg. = 112.8			
4	Window, Right-Rear - Exit 4	High + Low	Rotary Or Straight	Straight, Perpendicular to undisturbed surface	Yes	1. 83.4	267	X	
						2. 142.2			
						3. 132.4			
						Avg. = 119.3			
6	Window, Left-Mid-Rear - Exit 6	High + Low	Rotary Or Straight	Straight, Perpendicular to undisturbed surface	Yes	1. 176.6	267	X	
						2. 122.8			
						3. 161.9			
						Avg. = 153.7			
9	Window, Left-Front - Exit 9	High + Low	Rotary Or Straight	Straight, Perpendicular to undisturbed surface	Yes	1. 103	267	X	
						2. 112.8			
						3. 108			
						Avg. = 108			

A Shimpo MF handheld force gauge is used to measure the force to open the exit. The force gauge has a flat attachment on one end that provides a surface to place against the exit. The exit is released prior to measuring the force to open the exit. An engineer then applies an increasing force to the force gauge until the exit is opened allowing passage of the 33cm by 50cm ellipsoid. The force is recorded and the gauge is zeroed for the next test.

Data Sheet No. 5

Table 5 - Emergency Exit Identification

	Emergency Exit Type & Location	Description of Designation Label or Placard	Description of Operating Instructions Label or Placard	(For Buses w/ adjacent seats) Description of labels to indicate location of nearest release mechanism
1-9	Window Exits	"Emergency Exit"	"Pull red handle down push window bottom out"	N/A
10	Roof Exit, Rear	"Emergency Exit"	"1 Push Tab, 2 Push Handle Out"	N/A

PASS FAIL

1. Each emergency exit has a permanently affixed, legible label or placard with the designation "Emergency Door" or "Emergency Exit." X
2. Each emergency exit has a permanently affixed, legible label or placard describing the motion necessary to release (unlatch) and open the exit. X
3. The label is within 16 cm of the nearest release mechanism. X
4. For buses equipped with adjacent seats, a permanently affixed, legible label or placard has been placed with the occupant space to indicate the location of the nearest release mechanism. N/A

SECTION 4.0 – INSTRUMENTATION AND EQUIPMENT LIST

INSTRUMENTATION AND EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	SERIAL NO.
Ellipsoid	Minor Axis = 33 cm Major Axis = 50 cm	N/A
Force gauge	Shimpo MF	505110
Craftsman 8m Tape Measure	Tape Measure	N/A