

**REPORT NO. 111-KAR-10-005**

**SAFETY COMPLIANCE TESTING  
FOR FMVSS 111**

**REARVIEW MIRRORS  
(Other Than School Buses)**

**2010 NISSAN CUBE 1.8S**

**5-DOOR MPV**

**NHTSA NO: CA5203**

**PREPARED BY:  
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**JULY 14, 2010**


**FINAL REPORT**


**PREPARED FOR:  
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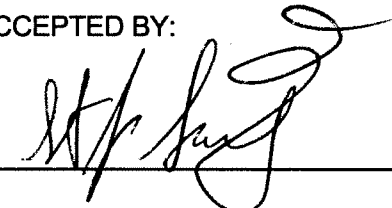
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## 1. PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2010 Nissan Cube 1.8S 5-Door MPV, manufactured by Nissan Motor Company LTD., to determine compliance with FMVSS 111, "Rearview Mirrors (Other than School Buses)". The purpose of this standard is to reduce the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

All tests were conducted based on the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP111V-00, dated October 28, 1999, and corresponding KARCO Engineering test procedure KTP-111, dated April 18, 2001. Detailed procedures for receiving, inspecting, testing and reporting of test results are described in the test procedures and are not repeated in this report.

This report is organized in sections containing pertinent test information and data tables as follows:

Section 1	Purpose of Compliance Test
Section 2	Compliance Test Procedure and Data Summary
Section 3	Test Results
Appendix A	Photographs
Appendix B	Data Plots
Appendix C	Test Equipment List and Calibration Information
Appendix D	Eyeline Location Supplied By Manufacturer

## **2. COMPLIANCE TEST PROCEDURE AND DATA SUMMARY**

A 2010 Nissan Cube 1.8S 5-Door MPV was subjected to FMVSS 111 compliance testing. The tests were conducted at KARCO Engineering LLC. in Adelanto, California on July 09, 2010 through July 14, 2010. Summary data is shown on page 24, Data Sheet No. 8. The following tests were performed:

- Inspection
- Mounting Adequacy Test
- Field-of-View Test, Inside Rearview Mirror
- Field-of-View Test, Driver's Side Outside Mirror
- Reflectance Test
- Breakaway Test
- Unit Magnification and Convex Mirror Tests

The tests were conducted per the FMVSS 111 test procedure. The significant aspects of the test procedure are described in the following paragraphs.

### **A. INSPECTION**

Inspect the installation of the inside and outside rearview mirrors.

### **B. MOUNTING ADEQUACY TEST – ALL REARVIEW MIRRORS**

#### **B.1 INSIDE MIRROR (S5.1.2)**

Determine that the mirror is securely mounted and determine the positive and negative angles of adjustment for both the vertical and horizontal directions.

#### **B.2 OUTSIDE MIRROR(S) (S5.2.2 and S5.3)**

Determine that the mirror(s) is (are) securely mounted. Determine that the driver's side mirror can be tilted in both horizontal and vertical directions from the driver's seated position. Determine that the passenger's side mirror is capable of adjustment by tilting in both the horizontal and vertical directions. Determine the positive and negative angles of adjustment for both horizontal and vertical directions for all outside mirrors. Determine that all outside mirrors are free of sharp points or edges that could contribute to pedestrian injury.

**C. FIELD-OF-VIEW TEST – INSIDE REARVIEW MIRROR**

**C.1 REQUIREMENTS (S5.1.1)**

The mirror shall provide a field of view with an included horizontal angle measured from the projected eye point of at least 20 degrees, and sufficient vertical angle to provide a view of a level road surface extending to the horizon beginning at a point not greater than 61m (200 feet) to the rear of the vehicle when the vehicle is occupied by the driver and four passengers or the designated occupant capacity, if less. The line of sight may be partially obscured by seated occupants or by head restraints.

Each car whose inside mirror does not meet the field of view requirements of S5.1.1 shall have an outside mirror of unit magnification or a convex mirror installed on the passenger's side. (S5.3)

**D. FIELD-OF-VIEW TEST, DRIVER'S SIDE OUTSIDE REARVIEW MIRROR**

**D.1 REQUIREMENTS (S5.2)**

Each passenger car shall have an outside mirror of unit magnification. The mirror shall provide the driver a view of a level road surface extending to the horizon from a line, perpendicular to a longitudinal plane tangent to the driver's side of the vehicle at the widest point, extending 2.4 meters (8 feet) out from the tangent plane 10.7 meters (35 feet) behind the driver's eyes, with the seat in the rearmost position. The line of sight may be partially obscured by rear body or fender contours. (S5.2.1)

Neither the mirror nor the mounting shall protrude farther than the widest part of the vehicle body except to the extent necessary to produce a field of view meeting or exceeding the requirements of S5.2.1. The mirror shall not be obscured by the un-wiped portion of the windshield. (S5.2.2)

**E. REFLECTANCE TEST – ALL MIRRORS**

**E.1 REQUIREMENT (S11)**

All single reflectance mirrors shall have an average reflectance of at least 35 percent. If a mirror is capable of multiple reflectance levels, the minimum reflectance level in the day mode shall be at least 35 percent and the minimum reflectance level in the night mode shall be at least 4 percent. The average reflectance of any mirror required by this standard shall be determined in accordance with SAE Recommended Practice J964, OCT 84.

**F. BREAKAWAY TEST – INSIDE REARVIEW MIRROR**

**F.1 REQUIREMENTS (S5.1.2)**

If the mirror is in the head impact area, the mounting shall deflect, collapse, or break away without leaving sharp edges when the reflective surface of the mirror is subjected to a force of 400 N (90 lb) in any forward direction that is not more than 45 degrees from the longitudinal direction.



## **G. UNIT MAGNIFICATION AND CONVEX MIRROR TESTS**

### **G.1 REQUIREMENTS FOR PASSENGER CARS (S5.3 and S5.4)**

The driver's side rearview mirror and the inside rearview mirror shall be unit magnification. If the field-of-view requirements are not met with the inside rearview mirror then the passenger's side rearview mirror is required. It can be either unit magnification or convex.

If the passenger's side mirror is convex, the average radius of curvature shall be not less than 889 mm (35 inches) and not more than 1651 millimeters (65 inches) and shall not deviate from the average by more than plus or minus 12.5 percent. The convex mirror shall have permanently and indelibly marked at the lower edge of the mirror's reflective surface in letters not less than 4.8 mm (3/16 inch) nor more than 6.4 mm (0.25 inch) high the words, "**Objects in Mirror Are Closer Than They Appear.**"

### **3. TEST DATA**

The results of FMVSS 111 compliance tests that were conducted on the 2010 Nissan Cube 1.8S 5-Door MPV on July 09, 2010 through July 14, 2010 to determine compliance with FMVSS 111, "Rearview Mirrors (other than School Buses)" are presented in this section.

**DATA SHEET NO. 1**  
**VEHICLE INSPECTION AND IDENTIFICATION**

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	CA5203
Make	Nissan
Model	Cube 1.8S
Body Style	5 Door MPV
Vin No.	JN8AZ2KR6AT151088
Color	Grey
Delivery Date	6/25/2010
Odometer (Miles)	259
Dealer	Town North Nissan
Transmission	Auto
Final Drive	Front
Type/No. Cyl.	Inline 4
Engine Disp. (L)	1.8
Engine Placement	Transverse
Tire Press./ Max (Front)	350 kPa
Tire Press./ Max (Rear)	350 kPa
Recommended Tire Size	P195/60R15
Tire Size on vehicle	P195/60R15
Air Conditioning	Yes
Disc Brakes (Front)	Yes
Disc Brakes (Rear)	Yes

Anti-Lock Brakes	Yes
All Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Side Airbag	Yes
Driver Head Airbag	No
Driver Curtain Airbag	Yes
Pass. Airbag	Yes
Pass. Side Airbag	Yes
Pass. Head Airbag	No
Pass. Curtain Airbag	Yes
Pre-Tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Cold Tire Press. (Front)	230 kPa
Cold Tire Press. (Rear)	230 kPa
Tilt Steering	Yes
Automatic Door Locks	Yes
Power Windows	Yes
Power Seats	No
Other	N/A

**DATA FROM MANUFACTURER**

Manufactured By	Nissan Motor Company LTD.
Date of Manufacture	Oct-09

GVWR (kg)	1750
GAWR Front (kg)	900
GAWR Rear (kg)	860

**TEST VEHICLE ATTITUDES (mm)**

ATTITUDE	LF	RF	LR	RR
As Delivered	675	680	675	675
As Tested	659	665	625	626
Rearview Mirror	1381			

**DATA SHEET NO. 1... (Continued)**

Vehicle Information			
<b>Year</b>	2010	<b>Make</b>	Nissan
<b>Model</b>	Cube 1.8S	<b>Body Style</b>	5-Door MPV
<b>NHTSA No.</b>	CA5203	<b>VIN</b>	JN8AZ2KR6AT151088
<b>Test Date</b>	7-09-10	<b>Temperature</b>	82

LEGEND: LE = Left Eye; RE = Right Eye; P = Neck Pivot Point, SRP = Seating Reference Point

COORDINATE SYSTEM:

- X = Longitudinal Dimension
- Y = Lateral Dimension
- Z = Vertical Dimension

Positive Values are as follows:

- X = Forward of Reference Point
- Y = Outboard of Reference Point (to driver's side)
- Z = Above Reference Point

Provide Reference Point or Body Fiducial Point that dimensions below are measured from. (Point should be usable by laboratory personnel, i.e., center of an anchorage bolt, door jam latch, etc.).

COORDINATES	LEFT SIDE MIRROR			INSIDE MIRROR			RIGHT SIDE MIRROR			SRP
	P1	LE1	RE1	P2	LE2	RE2	P3	LE3	RE3	
<b>X</b>		-1260.8	-1260.8		-1260.8	-1260.8		-1260.8	-1260.8	
<b>Y</b>		297.5	362.5		297.5	362.5		297.5	362.5	
<b>Z</b>		1085.0	1085.0		1085.0	1085.0		1085.0	1085.0	
<b>Mirror Mfr., Model And Part No.</b>	Magna Mirrors 96302 1FC0A 96302 1FC0C			Magna Mirror 96321 1FC0C			Magna Mirrors 96301 1FC0A 96301 1FC0C			
<b>SRP Travel and Eye-ellipse</b>										

Reference Point – Driver door switch located on the B-pillar and near the door latch. (X:-1371.3, Y:690.1, Z:464.5)

**DATA SHEET NO. 1... (Continued)**

<b>Date of Inspection/Identification</b>		7-09-10
<b>Types of Rearview Mirrors</b>		
	<b>Inside Rearview</b>	Unit Magnification
	<b>Driver' Side Outside</b>	Unit Magnification
	<b>Passenger's Side Outside</b>	Convex
<b>Location and Description of Fiducial Marks</b>		See previous page
<b>Maximum Number of Occupants</b>		5

**RESULTS OF RECEIVING INSPECTION:**

TEST STATUS	PASSED —	<b>X</b>	FAILED —	
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**CONDITIONS:**

**DISPOSITION/ACTION:**

**REMARKS:**

RECORDED BY: Mr. Jonathan F. Williams DATE: 7-09-10

APPROVED BY: Mr. Michael L. Dunlap DATE: 8-04-10

**DATA SHEET NO. 2**  
**MOUNTING AND TILTING ADEQUACY TEST**

Vehicle Information			
Year	2010	Make	Nissan
Model	Cube 1.8S	Body Style	5-Door MPV
NHTSA No.	CA5203	VIN	JN8AZ2KR6AT151088
Test Date	7-09-10	Temperature	82

MIRROR MOUNTING PROVIDES A STABLE SUPPORT	PASS	FAIL	CONDITIONAL
INSIDE REARVIEW MIRROR	X		
DRIVER SIDE OUTSIDE MIRROR	X		
PASSENGER SIDE OUTSIDE MIRROR	X		

OUTSIDE MIRRORS FREE OF SHARP POINTS OR EDGES	PASS	FAIL
DRIVER SIDE OUTSIDE MIRROR	X	
PASSENGER SIDE OUTSIDE MIRROR	X	

MIRROR IS ADJUSTABLE VERTICALLY & HORIZONTALLY	PASS	FAIL	CONDITIONAL
INSIDE REARVIEW MIRROR	X		
DRIVER SIDE OUTSIDE MIRROR	X		
PASSENGER SIDE OUTSIDE MIRROR	X		

DRIVER'S OUTSIDE MIRROR ADJUSTABLE FROM THE DRIVER'S SEATED POSITION	PASS	FAIL
DRIVER SIDE OUTSIDE MIRROR	X	

MIRROR ADJUSTMENT ANGLE	V+	V-	H+	H-
INSIDE REARVIEW MIRROR	33.1	-28.9	32	-33
DRIVER SIDE OUTSIDE MIRROR	12.2	-14.7	-60	-28
PASSENGER SIDE OUTSIDE MIRROR	12.5	-14.9	32	19

THIS SECTION IS RESERVED FOR MPVs, TRUCKS AND BUSES, OTHER THAN SCHOOL BUSES, NOT CONFORMING TO PASSENGER CAR REQUIREMENTS

MIRROR PROVIDES A VIEW TO THE REAR ALONG BOTH SIDES OF THE VEHICLE	PASS	FAIL	CONDITIONAL
DRIVER SIDE OUTSIDE MIRROR	X		
PASSENGER SIDE OUTSIDE MIRROR	X		

TEST STATUS	PASSED —	X	FAILED —	
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RECORDED BY: Mr. Jonathan F. Williams DATE: 7-09-10

APPROVED BY: Mr. Michael L. Dunlap DATE: 8-04-10

**DATA SHEET NO. 3**  
**FIELD OF VIEW TEST - INSIDE REARVIEW MIRROR**

Vehicle Information			
Year	2010	Make	Nissan
Model	Cube 1.8S	Body Style	5-Door MPV
NHTSA No.	CA5203	VIN	JN8AZ2KR6AT151088
Test Date	7-09-10	Temperature	82

- E Distance from center of mirror to projected eye point location = 643 mm
- A Distance from rear of vehicle to projected eye point location = 3176 mm
- X1 Distance from rear of vehicle to field of view grid = 8784 mm
- Z1 Vertical distance to lowest point of field of view at distance X1 = 289 mm
- Z2 Height of center of mirror = 1381 mm
- X2 Distance from rear of vehicle where the road surface is first visible  
 $X2 = [(Z2 \times X1) + (Z1 \times A)] / (Z2 - Z1) =$   
(S111 REQUIREMENT = 61m maximum) 11.949 m

EYE LOCATION	MONOCULAR DATA (ALR & ARL ARE ANGLES)			
	YL (mm)	YR (mm)	ALR (°)	ARL (°)
LEFT EYE POINT	YLL =1366	YRL =2228		10.6
RIGHT EYE POINT	YLR =1858	YRR =1308	8.8	

CALCULATED HORIZONTAL AMBINOCULAR VIEW ANGLE (AB)

ANGLE AB = ANGLE ALR + ANGLE ARL

$ALR = \tan^{-1} [YLR / (X1 + A)]$        $ARL = \tan^{-1} [YRL / (X1 + A)]$

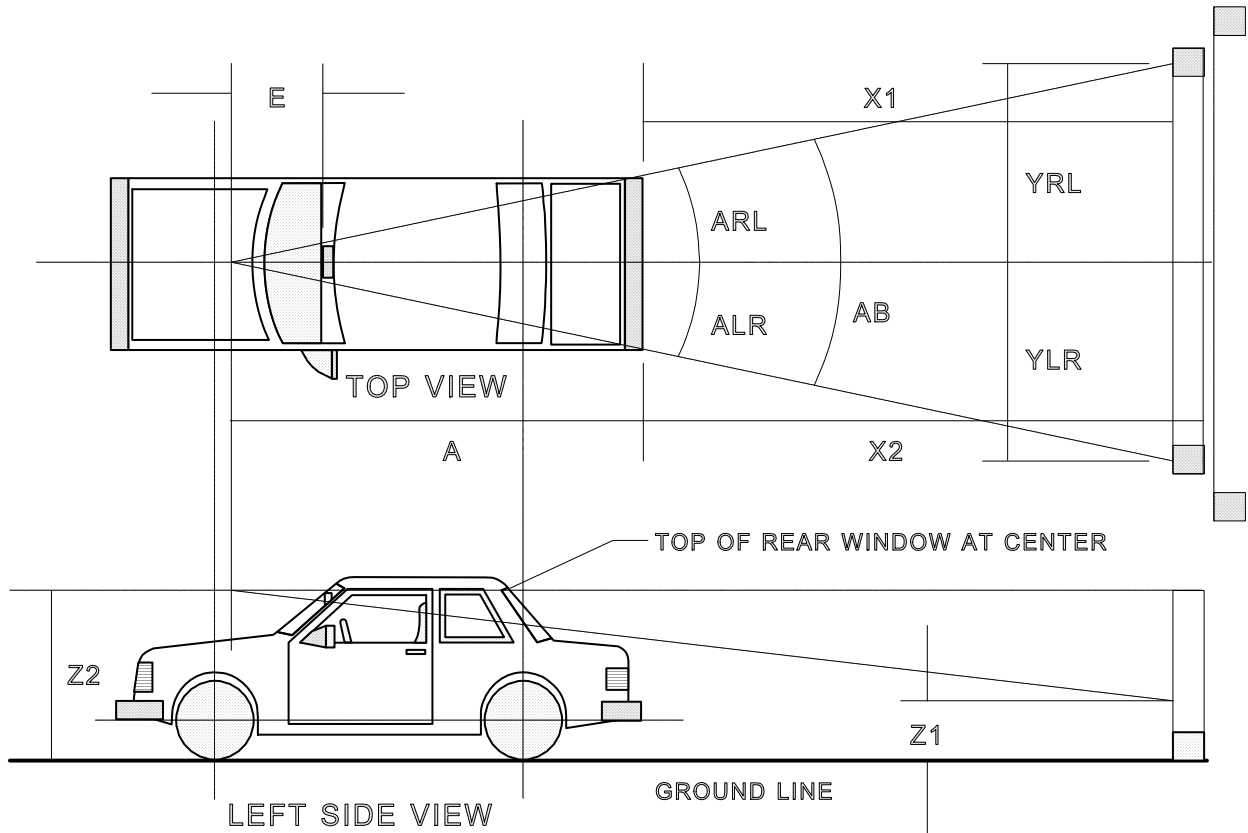
ANGLE AB = 19.4° (S111 REQUIREMENT = 20 degrees minimum)

Note: Has a passenger side mirror (S5.3)

TEST STATUS	PASSED —	<b>X</b>	FAILED —	
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DATA SHEET NO. 3... (Continued)

INSIDE REARVIEW MIRROR FIELD OF VIEW  
TEST GRID AND MARKER SETUP





DATA SHEET NO. 3... (Continued)

DRIVER SIDE MIRROR (S5.2)

MIRROR OBSCURED BY UNWIPED PORTION OF WINDSHIELD YES \_\_\_\_\_ NO  X

HEIGHT OF TARGET DISC ON MIRROR  1139 mm

DISTANCE OF TARGET DISC ON MIRROR FROM VEHICLE TANGENT PLANE  32 mm

TARGET DISC LOCATION RELATIVE TO VEHICLE TANGENT PLANE  Outboard   
(Inboard or Outboard)

ENTIRE TRIANGULAR TEST TARGET AREA ON SCREEN VISIBLE YES  X  NO \_\_\_\_\_

MIRROR PROTRUDES BEYOND VEHICLE TANGENT PLANE YES  X  NO \_\_\_\_\_

PROTRUSION REQUIRED TO MEET FIELD OF VIEW REQUIREMENT YES  X  NO \_\_\_\_\_

TEST STATUS:	PASSED —	X	FAILED —	
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PASSENGER SIDE MIRROR (S5.3 or MFG. OPTION) REQUIRED PER S5.3. INSIDE REARVIEW MIRROR HORIZONTAL ANGLE LESS THAN 20 DEGREES.

PASSENGER SIDE MIRROR TYPE (convex or unit magnification)  Convex

REMARKS:

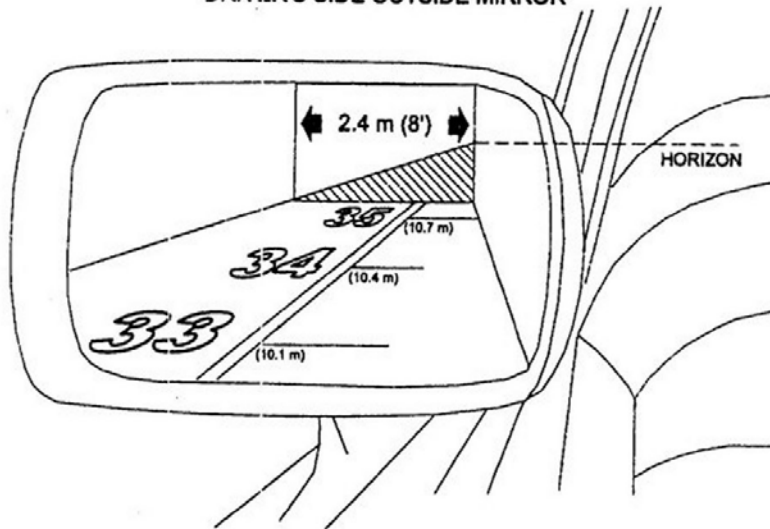
**VEHICLE ATTITUDE AND GROUND LEVEL WERE RAISED 4" (101.6) TO PERFORM THE TEST.**

RECORDED BY:  Mr. Jonathan F. Williams  DATE:  7-09-10

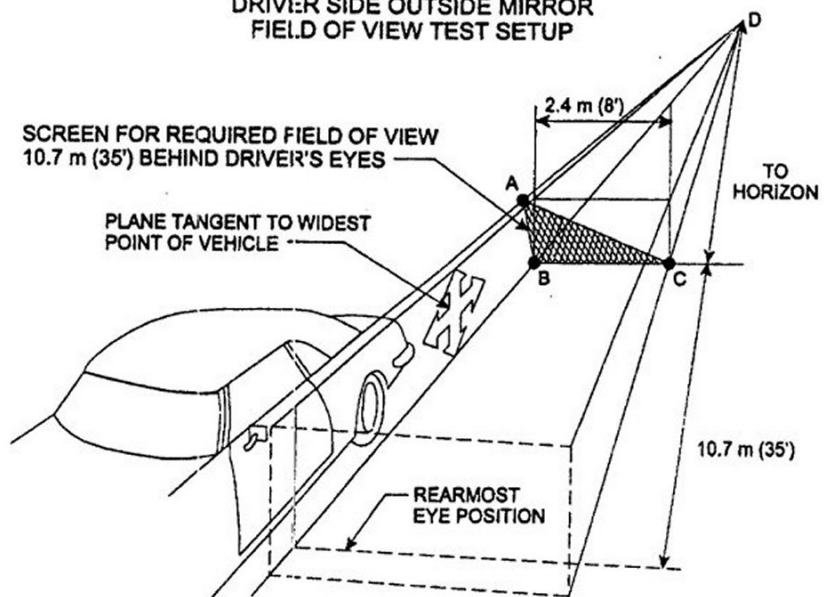
APPROVED BY:  Mr. Michael L. Dunlap  DATE:  8-04-10

DATA SHEET NO. 3... (Continued)

REQUIRED FIELD OF VIEW AS SEEN IN DRIVER'S SIDE OUTSIDE MIRROR

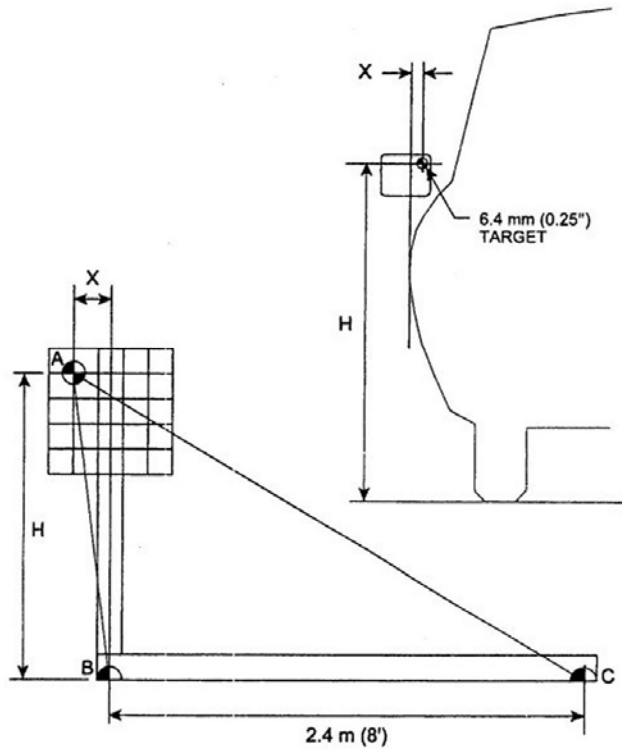


DRIVER SIDE OUTSIDE MIRROR FIELD OF VIEW TEST SETUP

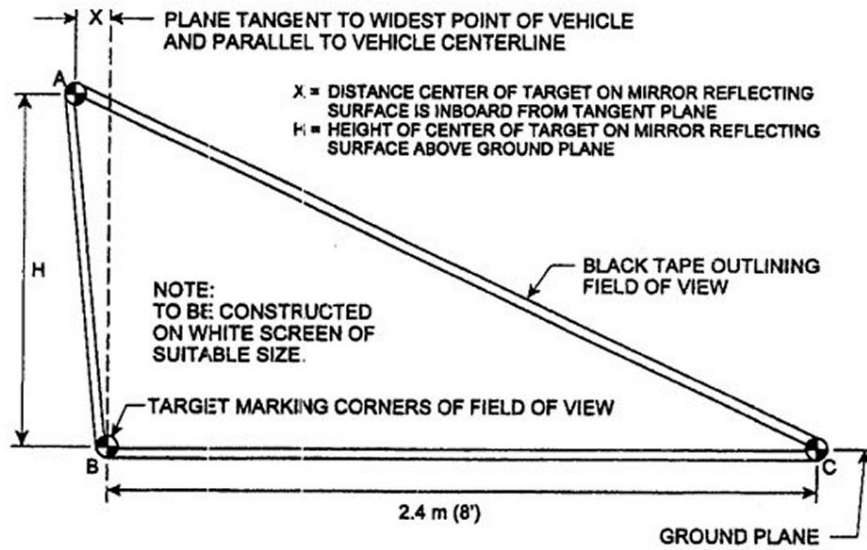


**DATA SHEET NO. 3... (Continued)**

**DRIVER SIDE OUTSIDE MIRROR TARGET DISC LOCATION WITH X AND H DIMENSIONS**



**DRIVER SIDE OUTSIDE MIRROR REQUIRED FIELD OF VIEW TRIANGLE**



**DATA SHEET NO. 4  
REFLECTANCE TEST**

Vehicle Information			
Year	2010	Make	Nissan
Model	Cube 1.8S	Body Style	5-Door MPV
NHTSA No.	CA5203	VIN	JN8AZ2KR6AT151088
Test Date	7-12-10	Temperature	75

DESCRIPTION OF TEST APPARATUS: THE APPARATUS CONSISTS OF AN INCANDESCENT TUNGSTEN FILAMENT LAMP OPERATING AT A NOMINAL COLOR TEMPERATURE OF 2,856 K, COLLIMATING OPTICS, A SAMPLE HOLDER POSITIONED AT 25°, A SILICON PHOTOCCELL, AND A FLUKE 45 DUAL DISPLAY MULTIMETER (CALIBRATION DUE DATE 3-26-08). REFLECTANCE TESTS ARE CONDUCTED IN A 4'X6' WOODEN CABINET PAINTED FLAT BLACK. FOR CONVEX MIRROR A 6" INTEGRATING SPHERE WAS INCORPORATED INTO THE RECEIVER.

MIRROR DESCRIPTION: **INTERIOR DAY/NIGHT REARVIEW MIRROR**

VOLTAGE READING FROM CALIBRATION (Average Value): 264mV

VOLTAGE READING FROM LIGHT REFLECTED BY DAY MIRROR (Average Value): 257mV

REFLECTOMETER VOLTAGE READINGS		
	DAY MIRROR	NIGHT MIRROR
TEST NO. 1	257	178
TEST NO. 2	257	178
TEST NO. 3	257	178
TEST NO. 4	257	177
TEST NO. 5	257	178

REFLECTANCE (Day) = Voltage (Refl)/Voltage (Cal) = .9735 x 100 = 97.4 percent  
(Min. Required = 35%)

VOLTAGE READING FROM CALIBRATION (Average Value) = 264

VOLTAGE READING FROM LIGHT REFLECTED BY NIGHT MIRROR (Average Value): 177.8

REFLECTANCE (Night) = Voltage (Refl)/Voltage (Cal) = .6735 x 100 = 67.4 percent  
(Min. Required = 4%)

NOTE: If meter reading directly in percent is used, record only percent

**DATA SHEET NO. 4... (Continued)**

MIRROR DESCRIPTION: **DRIVER SIDE OUTSIDE MIRROR.**

VOLTAGE READING FROM CALIBRATION (Average Value): 264

VOLTAGE READING FROM LIGHT REFLECTED BY DAY MIRROR (Average Value): 252

REFLECTOMETER VOLTAGE READINGS	
TEST NO. 1	<b>252</b>
TEST NO. 2	<b>252</b>
TEST NO. 3	<b>252</b>
TEST NO. 4	<b>252</b>
TEST NO. 5	<b>252</b>

REFLECTANCE (Day) = Voltage (Refl)/Voltage (Cal) = 0.9545 x 100 = 95.5 percent  
(Min. Required = 35%)

NOTE: If meter reading directly in percent is used, record only percent

**DATA SHEET NO. 4... (Continued)**

MIRROR DESCRIPTION: **PASSENGER SIDE OUTSIDE MIRROR.**

VOLTAGE READING FROM CALIBRATION (Average Value): 333

VOLTAGE READING FROM LIGHT REFLECTED BY DAY MIRROR (Average Value): 337.4

REFLECTOMETER VOLTAGE READINGS	
TEST NO. 1	<b>338</b>
TEST NO. 2	<b>338</b>
TEST NO. 3	<b>337</b>
TEST NO. 4	<b>337</b>
TEST NO. 5	<b>337</b>

REFLECTANCE (Day) = Voltage (Refl)/Voltage (Cal) = 1.0132 x 100 = 101.3 percent

REFERANCE MIRROR VALUE 93.4 X 101.3 (reflectance value) = 94.6 %  
(Min. Required = 35%)

NOTE: If meter reading directly in percent is used, record only percent

TEST STATUS	PASSED —	<b>X</b>	FAILED —	
-------------	----------	----------	----------	--

RECORDED BY: Mr. Jonathan F. Williams DATE: 7-12-10

APPROVED BY: Mr. Michael L. Dunlap DATE: 8-04-10

**DATA SHEET NO. 5**  
**BREAKAWAY TEST - INSIDE REARVIEW MIRROR**

Vehicle Information			
<b>Year</b>	2010	<b>Make</b>	Nissan
<b>Model</b>	Cube 1.8S	<b>Body Style</b>	5-Door MPV
<b>NHTSA No.</b>	CA5203	<b>VIN</b>	JN8AZ2KR6AT151088
<b>Test Date</b>	6-16-10	<b>Temperature</b>	70

**MOUNTING OF MIRROR (INSIDE) DESCRIPTION: TAB GLUED TO WINDSHIELD. MIRROR BASE SLIPS OVER BASE AND HELD IN PLACE WITH SPRING CLIP.**

(Requirement: the mirror shall deflect, collapse or break away when it is subjected to a force of 400 N or less)

TEST NO.	LOAD DIRECTION VERTICAL/HORIZONTAL	MAXIMUM FORCE (N)	DISPLACEMENT (MM)	PASS	FAIL
1	0-90 DEGREES	N/A	N/A	N/A	N/A
2	+45/90 DEGREES	N/A	N/A	N/A	N/A
3	-45/90 DEGREES	N/A	N/A	N/A	N/A
4	-45/+45 DEGREES	77.5	24.5	X	
5	+45/+45 DEGREES	N/A	N/A	N/A	N/A
6	+45/-45 DEGREES	N/A	N/A	N/A	N/A
7	-45/-45 DEGREES	N/A	N/A	N/A	N/A

REMARKS: The mounting base broke during test 4 (-45/+45) which was the first test performed. Failure of that component, which appears to be the system weak-link, precluded additional tests to be conducted. See figure 23. Based on visual inspection it appears that the mirror will meet all other Breakaway requirements for all other test angles.

**DATA SHEET NO. 5... (Continued)**

**BREAKAWAY TEST - INSIDE REARVIEW MIRROR FAILURE TYPE – DESCRIPTION:**

FAILURE TYPE – DESCRIPTION:

**NONE**

TEST STATUS	PASSED —	<b>X</b>	FAILED —	
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REMARKS: See previous page.

RECORDED BY: **Mr. Jonathan F. Williams**

DATE: **7-14-10**

APPROVED BY: **Mr. Michael L. Dunlap**

DATE: **8-04-10**



**DATA SHEET NO. 6**  
**UNIT MAGNIFICATION AND CONVEX MIRROR TESTS**

Vehicle Information			
<b>Year</b>	2010	<b>Make</b>	Nissan
<b>Model</b>	Cube 1.8S	<b>Body Style</b>	5-Door MPV
<b>NHTSA No.</b>	CA5203	<b>VIN</b>	JN8AZ2KR6AT151088
<b>Test Date</b>	7-13-10	<b>Temperature</b>	72

**DRIVER'S SIDE & INSIDE REARVIEW MIRRORS:**

DRIVER SIDE MIRROR	
TEST POSITION	DIAL READINGS
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0

INSIDE MIRROR	
TEST POSITION	DIAL READINGS
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	5*

All dial indicator readings for unit magnification mirrors must be zero.

\* Variation appears to be due to accepted normal manufacturing tolerances. See figure 24.

**DATA SHEET NO. 6... (Continued)**  
**UNIT MAGNIFICATION AND CONVEX MIRROR TESTS**

PASSENGER SIDE REARVIEW MIRROR:

CONVERSION TABLE FROM SPHEROMETER DIAL  
 READING TO RADIUS OF CURVATURE

TEST POSITION	DIAL READINGS (inches) Passenger	RADIUS OF CURVATURE (mm)	DEVIATION BETWEEN THE AVERAGE RADIUS OF CURVATURE AND THE TEST POSITION RADIUS OF CURVATURE (mm)	PERCENT DEVIATION FROM THE AVERAGE RADIUS OF CURVATURE
1	.0053	1347.9	5.4	0.4
2	.0056	1272.4	70.1	5.2
3	.0053	1347.9	5.4	0.4
4	.0054	1320.0	22.5	1.7
5	.0054	1320.0	22.5	1.7
6	.0053	1347.9	5.4	0.4
7	.0052	1374.2	31.7	2.4
8	.0052	1374.2	31.7	2.4
9	.0051	1400.1	57.6	4.3
10	.0054	1320.0	22.5	1.7
Average Radius of Curvature		1342.5	Greatest Percent Deviation	5.2

REMARKS:

**DATA SHEET NO. 6... (Continued)**  
**UNIT MAGNIFICATION AND CONVEX MIRROR TESTS**

PASSENGER'S SIDE REARVIEW MIRROR

IF CONVEX, ARE THERE ANY DISCONTINUITIES IN THE SLOPE OF THE MIRROR SURFACE YES \_\_\_ NO **X**

IF CONVEX, ARE THE WORDS, "**OBJECTS IN THE MIRROR ARE CLOSER THAN THEY APPEAR**" PRESENT YES **X** NO \_\_\_

IF CONVEX, MEASURE LETTER HEIGHT OF WORDS     **5**     mm

IF CONVEX, LETTERS ARE NOT < 4.8 mm OR > 6.4 mm HIGH YES **X** NO \_\_\_

IF CONVEX, RADIUS OF CURVATURE NOT < 889 mm OR > 1651 mm YES **X** NO \_\_\_

IF CONVEX, THE GREATEST PERCENT DEVIATION FROM AVERAGE RADIUS OF CURVATURE IS  $\pm 12.5\%$  YES **X** NO \_\_\_

IF UNIT MAGNIFICATION, ALL DIAL READINGS ARE ZERO  $\pm 0$ . YES **N/A** NO \_\_\_

NOTE: PASSENGER MIRROR REQUIRED PER S5.3

TEST STATUS	PASSED —	<b>X</b>	FAILED —
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RECORDED BY:     **Mr. Jonathan F. Williams**     DATE:     **7-13-10**    

APPROVED BY:     **Mr. Michael L. Dunlap**     DATE:     **8-04-10**



**DATA SHEET NO. 8**  
**TEST SUMMARY-FMVSS 111-REARVIEW MIRRORS**

Vehicle Information			
<b>Year</b>	2010	<b>Make</b>	Nissan
<b>Model</b>	Cube 1.8S	<b>Body Style</b>	5-Door MPV
<b>NHTSA No.</b>	CA5203	<b>VIN</b>	JN8AZ2KR6AT151088
<b>Test Date</b>	7-14-10	<b>Temperature</b>	N/A

PASSENGER VEHICLE TESTING:

OUTSIDE DRIVER SIDE MIRROR	PASS	FAIL	COMMENTS
STABLE SUPPORT	X		
DOES NOT PROTRUDE BEYOND VEHICLE BODY	X		
NOT OBSCURED BY UNWIPED PORTION OF WINDSHIELD	X		
ADJUSTABLE BY TILTING	X		
ADJUSTABLE FROM DRIVER SEAT	X		
FREE OF SHARP EDGES	X		
FIELD-OF-VIEW	X		
REFLECTANCE	X		
UNIT MAGNIFICATION	X		

INSIDE REARVIEW MIRROR	PASS	FAIL	COMMENTS
STABLE SUPPORT	X		
ADJUSTABLE BY TILTING	X		
FIELD-OF-VIEW	X		
REFLECTANCE	X		
BREAK AWAY	X		
UNIT MAGNIFICATION*	X		

OUTSIDE PASSENGER MIRROR	PASS	FAIL	COMMENTS
STABLE SUPPORT	X		
ADJUSTABLE BY TILTING	X		
FREE OF SHARP EDGES	X		
UNIT OR CONVEX			Convex
LABELING	X		
REFLECTANCE	X		

\*Variation appears to be due to accepted normal manufacturing tolerances

APPENDIX A  
PHOTOGRAPHS



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 1: LEFT FRONT ¾ VIEW



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 2: LEFT SIDE VIEW





2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 3: RIGHT REAR ¾ VIEW



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 4: RIGHT SIDE VIEW

MFD BY. NISSAN MOTOR CO., LTD.

DATE 10/09

GVWR 3858 LBS.

GAWR FR. 1984 LBS.

WITH P195/60R15 TIRES.

15X6 RIMS. AT 33 PSI

COLD SINGLE.

GAWR RR. 1896 LBS.

WITH P195/60R15 TIRES.

15X6 RIMS. AT 33 PSI

COLD SINGLE.

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: JN8AZ2KR6AT151088

TYPE: MPV

COLOR	TRIM	TRANS
K21	G	REOF08B

AXLE	ENGINE
GH54	MR18 (DE) 1798CC

JN8AZ2KR6AT151088

2010 NISSAN CUBE 1.8S  
 NHTSA NO. CA5203  
 FMVSS NO. 111

FIGURE 5: MANUFACTURER'S LABEL

TIRE AND LOADING INFORMATION RENSEIGNEMENTS SUR LES PNEUS ET LE CHARGEMENT				
SEATING CAPACITY NOMBRE DE PLACES	TOTAL TOTAL	5	FRONT AVANT	2
			REAR ARRIÈRE	3

The combined weight of occupants and cargo should never exceed **390 kg** or **860 lbs.**  
 Le poids total des occupants et du chargement ne doit jamais dépasser **390 kg** ou **860 lb.**

TIRE PNEU	SIZE DIMENSIONS	COLD TIRE PRESSURE PRESSION DES PNEUS À FROID
FRONT AVANT	P195/60R15 87H	230kPa , <b>33PSI</b>
REAR ARRIÈRE	P195/60R15 87H	230kPa , <b>33PSI</b>
<b>SPARE DE SECOURS</b>	T125/70D15	420kPa , <b>60PSI</b>

**SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION.  
 VOIR LE MANUEL DE L'USAGER POUR PLUS DE RENSEIGNEMENTS**

ZA 1FC0B

2010 NISSAN CUBE 1.8S  
 NHTSA NO. CA5203  
 FMVSS NO. 111

FIGURE 6:TIRE PLACARD



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 7: DRIVER SIDE REARVIEW MIRROR AND MOUNTING



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 8: PASSENGER SIDE REARVIEW MIRROR AND MOUNTING



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 9: INSIDE REARVIEW MIRROR AND MOUNTING



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 10:TEST SET-UP





2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 11:CAMERA SET-UP FOR PHOTOGRAPHING REFERENCE BOARD



2010 NISSAN CUBE 1.8S NHTSA NO. CA5203 FMVSS NO. 111  
FIGURE 12: OVERALL SET-UP AND INSTRUMENTATION FOR MIRROR BREAK- AWAY TEST



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 13:CLOSE-UP OF MIRROR BREAK- AWAY TEST



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 14: REFLECTION TEST SET-UP



2010  
NISSAN CUBE 1.8S  
CA5203  
FMVSS 111

2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 15: MIRROR SET-UP FOR AREA MEASUREMENT



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 16:LEFT EYE FIELD OF VIEW TEST (INSIDE MIRROR)



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 17:REFERENCE BOARD FOR INSIDE MIRROR, LEFT EYE



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

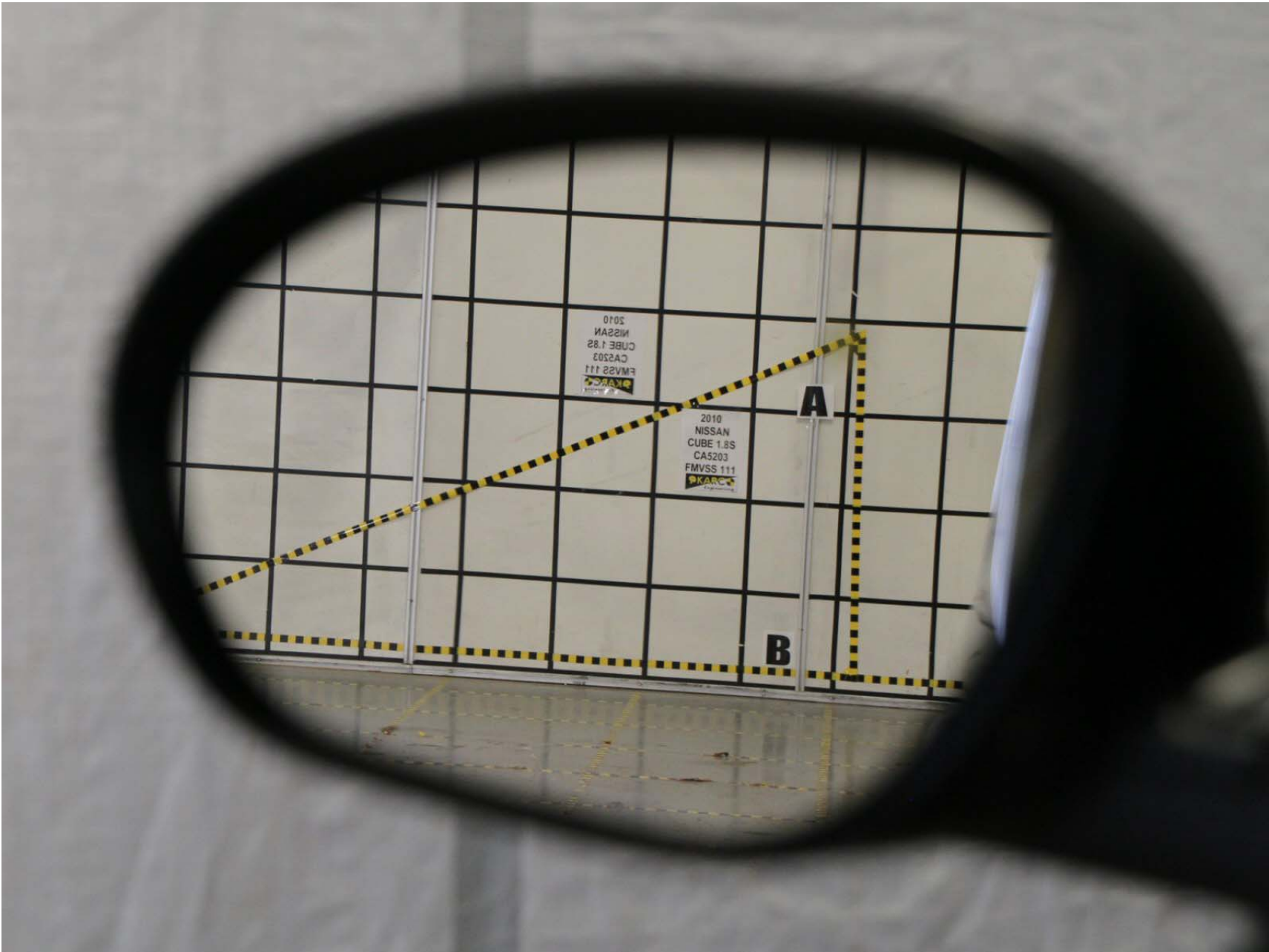
FIGURE 18:RIGHT EYE FIELD OF VIEW TEST (INSIDE MIRROR)





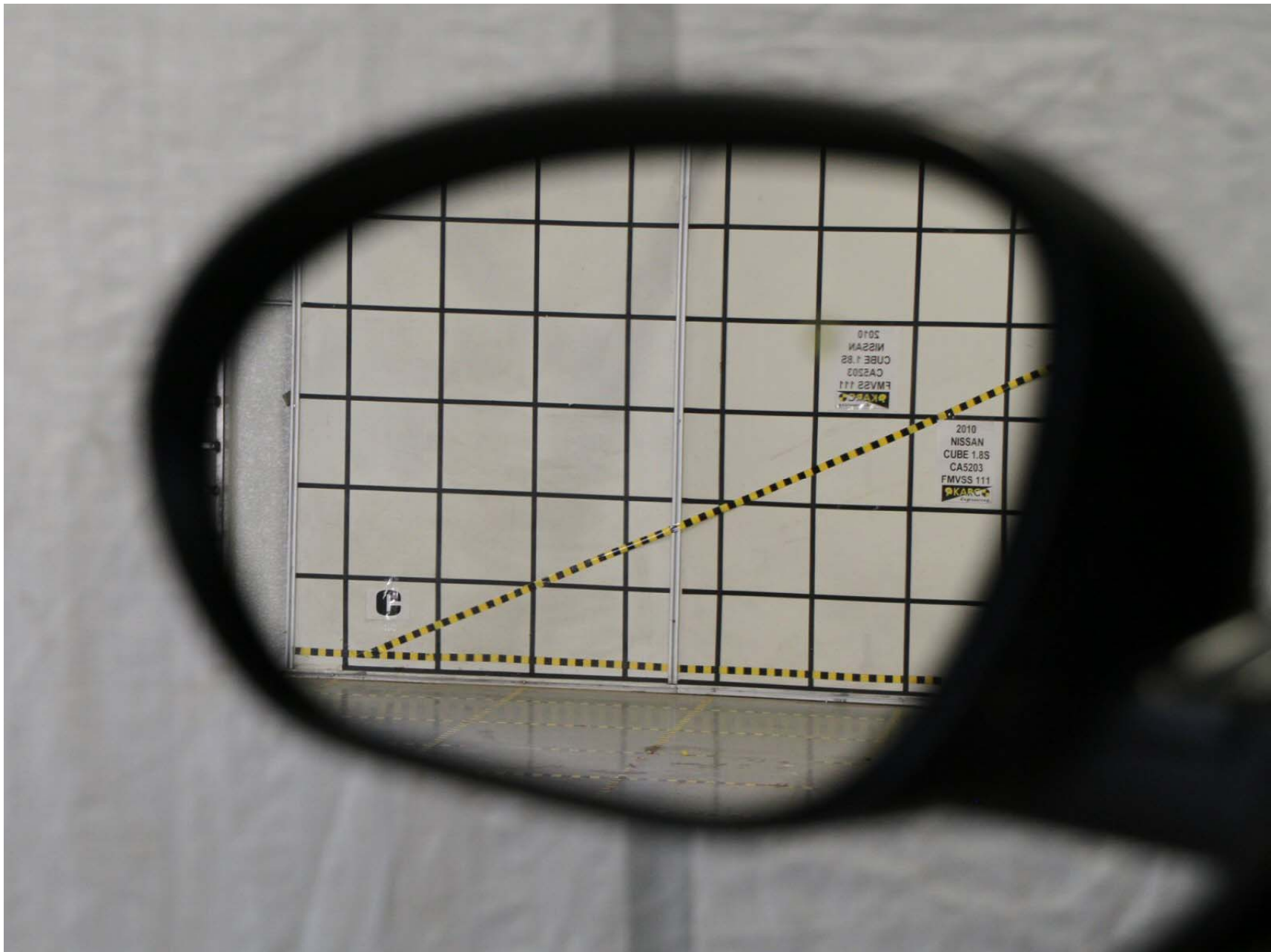
2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 19:REFERENCE BOARD FOR INSIDE MIRROR, RIGHT EYE



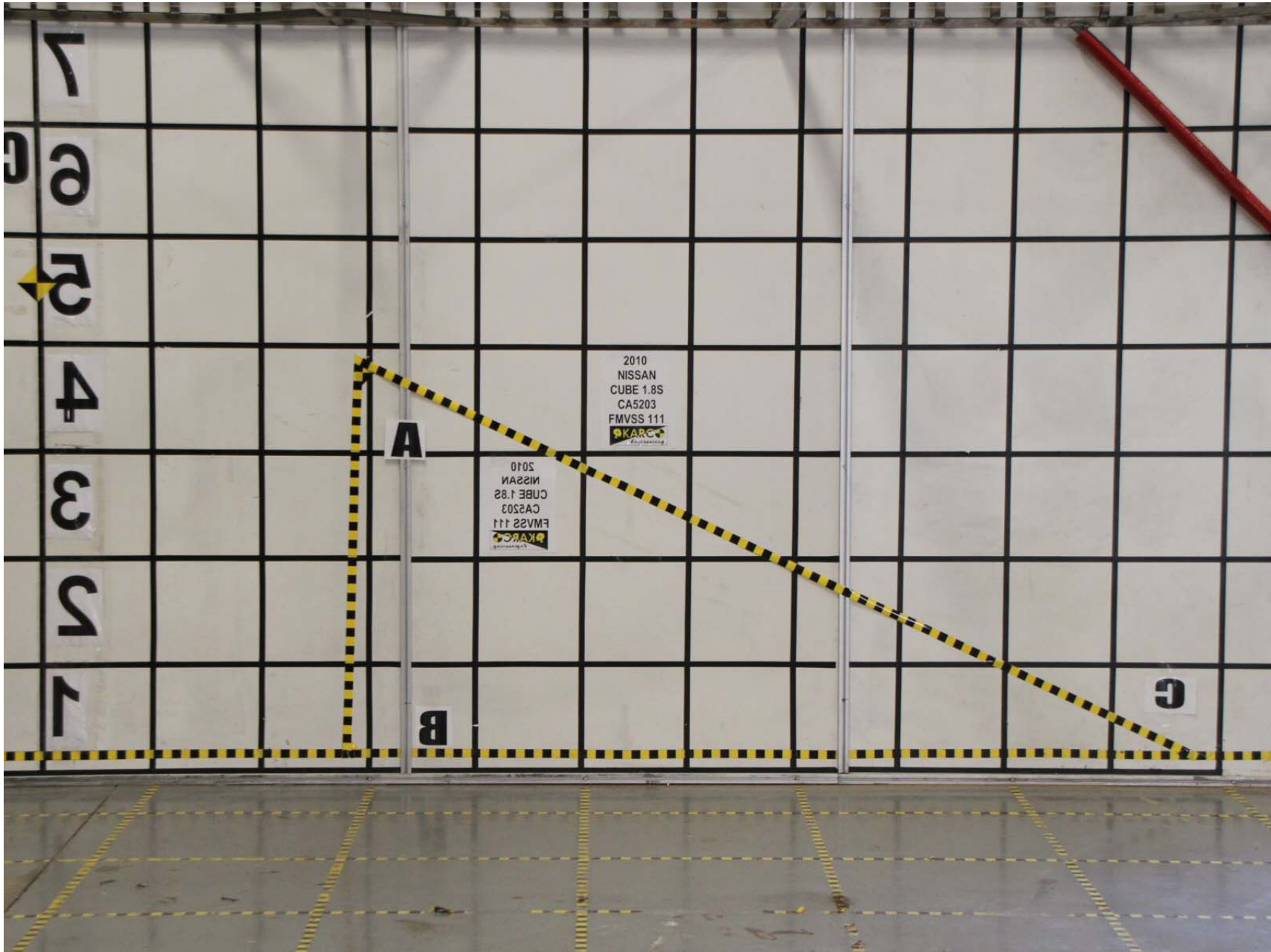
2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 20:LEFT EYE FIELD OF VIEW TEST (DRIVER SIDE MIRROR)



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 21:RIGHT EYE FIELD OF VIEW TEST (DRIVER SIDE MIRROR)



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 23:MIRROR AFTER BRAKEAWAY TEST



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

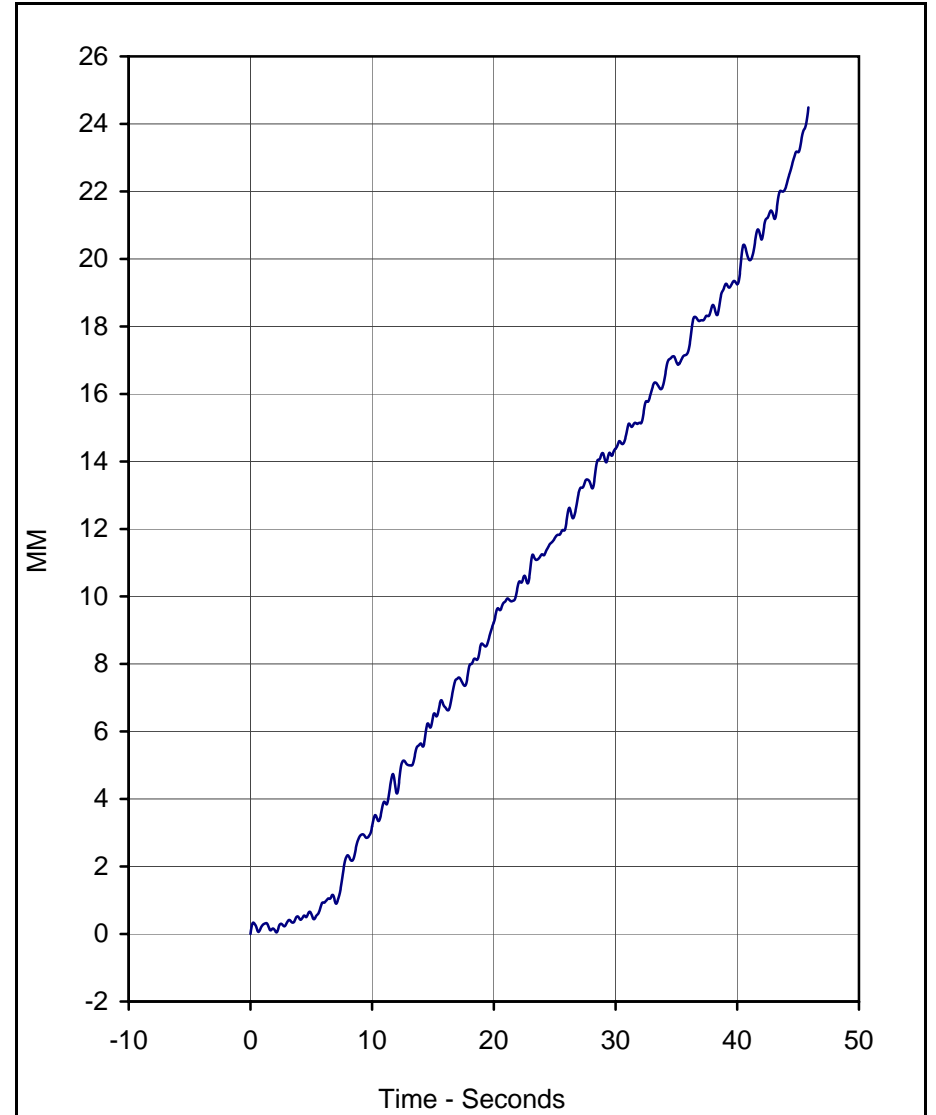
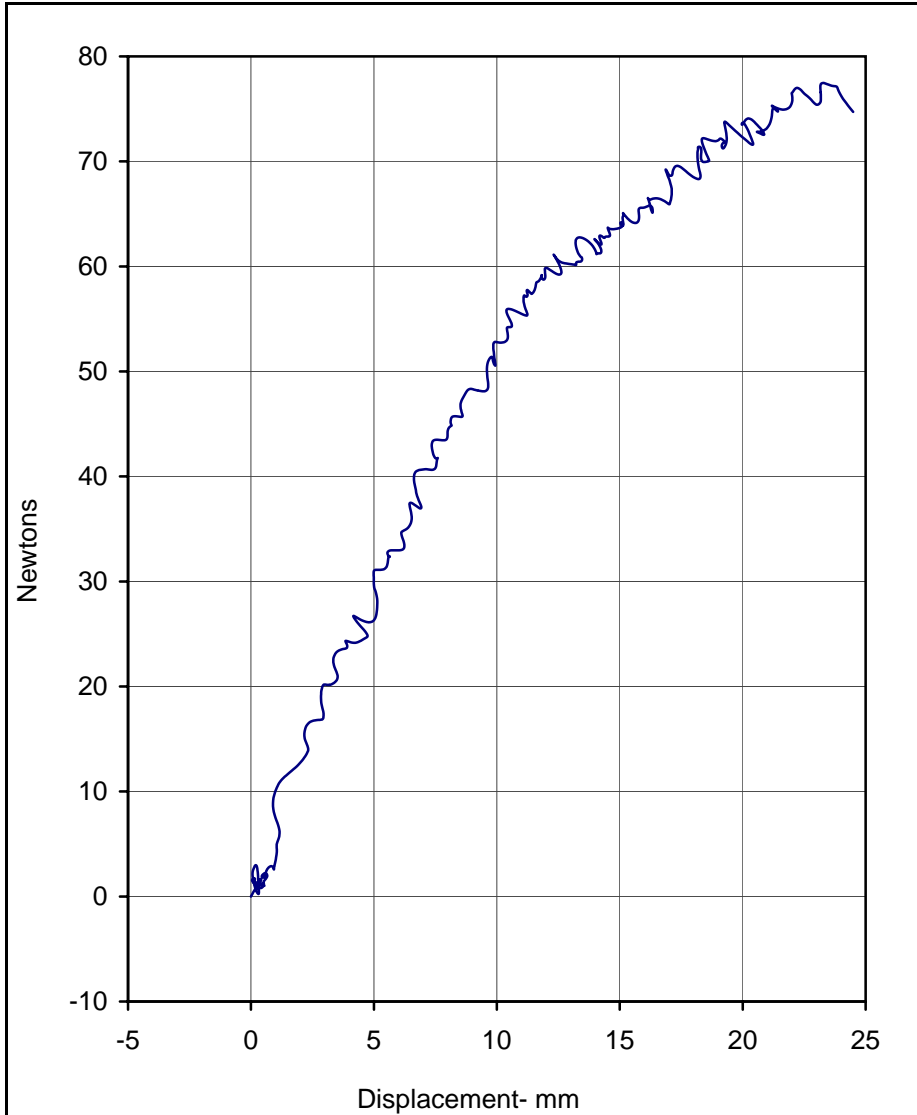
FIGURE 23:MIRROR AFTER BRAKEAWAY TEST



2010 NISSAN CUBE 1.8S  
NHTSA NO. CA5203  
FMVSS NO. 111

FIGURE 24: DIAL INDICATOR USED FOR UNIT MAGNIFICATION  
AND CONVEX MIRROR TESTS

APPENDIX B  
DATA PLOTS



Curve Description	CURNO	Type
Force vs. Displacement	001	FIL

Curve Description	CURNO	Type
Displacement vs. Time	002	FIL

Units	Peak Force	Displacement	Filter (Hz)
Newtons	77.5	23.3	1

Units	Max	Time	Displ. Rate (mm/min.)	Filter (Hz)
MM	24.5	45.9	31.5	1

Test Program: 2010 FMVSS 111 Rearview Mirrors Test No.: 4  
 Test Vehicle: 2010 Nissan Cube 1.8S 5-Dr MPV No.: CA5203

Load Direction: -45 / +45  
 Test Date: 7/14/10





APPENDIX C

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

**2010 FMVSS 111 Rearview Mirrors  
 Test Equipment List  
 7/14/10  
 2010 Nissan Cube 1.8S 5-Dr MPV**

Description	Manufacturer	Model No.	Serial No.	Limit	Accuracy	Cal. Date	Due Cal.
Hydraulic Pump	Lincoln	T-3825-C	2460952	8 gpm @ 2700 psi	N/A	N/A	N/A
Computer	Panasonic	CF-71	8IMAA01852	N/A	N/A	N/A	N/A
TDAS	DTS	TDAS	DM0100	N/A	SAE J211	11/25/09	11/25/10
Load Cell	Interface	1500ASK-300	230965A	1334 N	± 1.0%	5/12/10	5/12/11
Displacement Xdcr.	Celesco	PTX101-0030	J0654652	76 CM	± 1.0%	5/10/10	5/10/11



APPENDIX D  
EYELIPSE LOCATIONS SUPPLIED BY MANUFACTURER

# ATTACHMENT 1

FMVSS 111; MY10 Nissan Cube

# VEHICLE INFORMATION / TEST SPECIFICATIONS

FMVSS No. 111

Vehicle Make/Model/Year: 2010 Model Year Nissan Cube

Driver's Eye Reference Points:

Coordinate System:

- X = Longitudinal Dimension
- Y = Lateral Dimension
- Z = Vertical Dimension

Positive Values are as follows:

- X = Forward of Reference Point
- Y = Outboard of Reference Point (to driver's side)
- Z = Above Reference Point

Provide Reference/Body Fiducial Point that dimensions below are measured from. **Point must be easily accessible and usable by test laboratory personnel, i.e. seat track mounting bolt, seat belt anchorage bolt, door latch at B pillar striker.** (Provide sketch of reference point if necessary.)

The reference point is the door switch (detecting whether the door is in the fully closed position) located on the B-pillar and near the door latch.

**Reference Point Coordinates: (X = -1371.3, Y = 690.1, Z = 464.5)**

COORDINATES	LEFT SIDE MIRROR		INSIDE MIRROR		RIGHT SIDE MIRROR	
	LE1 (left eye)	RE1 (right eye)	LE2	RE2	LE3	RE3
<b>X</b>	-1260.8	-1260.8	-1260.8	-1260.8	-1260.8	-1260.8
<b>Y</b>	297.5	362.5	297.5	362.5	297.5	362.5
<b>Z</b>	1085.0	1085.0	1085.0	1085.0	1085.0	1085.0
Mirror Mfr., Model Part No.	Magna Donnelly 96302 1FC0A 96302 1FC0C		Magna Donnelly 96321 1FC0C		Magna Donnelly 96301 1FC0A 96301 1FC0C	