REPORT NO. 207-KAR-10-005

# COMPLIANCE TESTING FOR FMVSS 207

# SEATING SYSTEMS

2010 NISSAN CUBE
5-DOOR MPV

NHTSA NO.CA5203

PREPARED BY:
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September 23, 2010

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NVS-221
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WASHINGTON, D.C. 20590

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## Technical Report Documentation Page

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| 16. *Abstract*<br>Compliance tests were conducted on the subject 2010 Nissan Cube 5-door MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-207-09 for the determination of FMVSS 207 Compliance. Test failures identified were as follows:<br>None. | | | |
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## 1. PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2010 Nissan Cube 5-door MPV, manufactured by Nissan Motor Corporation to determine FMVSS 207, “Seating Systems” Compliance data. The purpose of this standard is to reduce the number of deaths and injuries that may be caused by the failure of seats, their attachment hardware, and their installation when said failure results from the forces on the seat in a vehicle impact.

All tests were conducted based on the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-207-09, dated June 18, 1992, and corresponding KARCO Engineering, LLC test procedure KTP-207, dated August 2, 2002. 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 2 | - | Compliance Test Procedure and Data Summary |
| Section 3 | - | Compliance Test Data |
| Section 4 | - | No Compliance Data (if applicable) |
| Appendix A | - | Photographs |
| Appendix B | - | Data Plots |
| Appendix C | - | Test Equipment List and Calibration Information |

## 2. COMPLIANCE TEST PROCEDURE AND DATA SUMMARY

A 2010 Nissan Cube 5-door MPV was subjected to FMVSS 207 Compliance testing on September 16 thru September 23, 2010. All tests were conducted at KARCO Engineering, LLC in Adelanto, California. Summary data is shown on Data Sheet No. 2. The following tests were performed:

- Receiving inspection
- Aft moment tests on front seat backs
- Aft load tests on front seat frames and adjusters
- Forward load tests on front seat frames and adjusters
- Forward load tests on front seat frames and adjusters, including FMVSS 210 Loads
- Aft moment tests on rear seat back
- Forward load tests on rear seat backs
- Aft load tests on rear seat frames and adjusters
- Forward load tests on rear seat frames and adjusters
- Forward load tests on rear seat frames and adjusters, including FMVSS 210

The tests were conducted per the FMVSS 207 test procedure. The significant aspects of the test procedure are described in the following paragraphs.

2.1 Test Vehicle Inspection. The test vehicle was inspected to verify that all seat, restraint systems and seat belt assembly anchorage systems are complete and the seat adjusting mechanisms are working properly.

2.2 Test Vehicle Preparation and Pre-test Measurements. The test vehicle was securely mounted to the test fixture and connected to the appropriate number of hydraulic actuators. Lateral spacing of the individual seat anchorages were measured and all other angular and dimensional measurements were verified to be in Compliance with the requirements of the subject safety standards. The components were weighed and their centers of gravity determined.

2.3 Static Load Tests-General Performance Requirements.

When tested in accordance with S5, each occupant seat, other than a side-facing seat or a passenger seat on a bus, shall withstand the following forces:

(a) In any position to which it can be adjusted — 20 times the weight of the seat applied in a forward longitudinal direction;

**2. (Continued)**

(b) In any position to which it can be adjusted — 20 times the weight of the seat applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat — the force specified in subparagraph (a), if it is a forward facing seat, or subparagraph (b), if it is a rearward facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with section S4.2 of Federal Motor Vehicle Safety Standard No. 210; and

(d) In its rearmost position — a force that produces a 3,300 inch-pound moment about the seating reference point (SRP) for each designated seating position (DSP) that the seat provides, applied to the upper cross-member of the seat back or the upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

(e) To meet FMVSS 210 requirements, the anchorages, attachment hardware, and attachment bolts for all Type 2 and automatic seat belt assemblies that are installed to comply with Standard No. 208 (49 CFR 571.208) shall withstand 3,000 pound forces when tested in accordance with S5.2.

## 3. COMPLIANCE TEST DATA

The results of FMVSS 207 Compliance tests that were conducted on the 2010 Nissan Cube 5-door MPV on September 16 thru September 23, 2010, to determine Compliance with FMVSS 207, “Seating Systems” are presented in this section. No performance failures were identified with the vehicle tested.

**DATA SHEET NO. 1**

**TEST VEHICLE RECEIVING INSPECTION**

| TEST VEHICLE INFORMATION | | | |
|---|---|---|---|
| YEAR | **2010** | MAKE | **Nissan** |
| MODEL | **Cube** | BODY STYLE | **5-Door MPV** |
| NHTSA NO. | **CA5203** | VIN | **JN8AZ2KR6AT151088** |
| BUILD DATE | **10/09** | TEST DATE | **9/16/10 – 9/23/10** |
| TEST LABORATORY | | **KARCO Engineering, LLC.** | |

1. First Compliance test by laboratory for this vehicle is S207 test.

   _____ Yes **X** No (Go to item 2)

   | | | |
   |---|---|---|
   | * | 1.1 | Label test vehicle with NHTSA Number |
   | * | 1.2 | Verify all options on the "window sticker" are present on the vehicle |
   | * | 1.3 | Verify tires and wheel rims are new and the same as listed |
   | * | 1.4 | Verify there are no dents or other interior or exterior flaws |
   | * | 1.5 | Verify the glove box contains an owner's manual, warranty document, consumer information, and extra keys |
   | * | 1.6 | Verify the vehicle is equipped with the proper fuel filler cap |
   | * | 1.7 | If the vehicle has been delivered from the dealer, verify the vehicle has been properly prepared and is in running condition |

2. Verify seat adjusters are working

   **X** Yes _____ No

3. Verify there is a seat belt at each seating position

   **X** Yes _____ No

4. Without disturbing the integrity of each seat belt and anchorage, verify that each seat belt is attached to the anchorage. For seat belts that are attached to the seat, also verify the seats are attached to the seat anchors and the seat anchors are attached to the vehicle.

   **X** Yes _____ No

RESULTS OR RECEIVING INSPECTION:

PASS - - **X**

FAIL - - _____

CONDITIONAL - - _____

REMARKS:

* Vehicle had previously been tested to FMVSS 111.

RECORDED BY: **Mark Kratzke** DATE: **9/23/10**

APPROVED BY: **Michael L. Dunlap** DATE: **9/23/10**

**DATA SHEET NO. 2**

**SEATING SYSTEM TEST RESULTS**

| TEST VEHICLE INFORMATION | | | |
|---|---|---|---|
| YEAR | **2010** | MAKE | **Nissan** |
| MODEL | **Cube** | BODY STYLE | **5-Door MPV** |
| NHTSA NO. | **CA5203** | VIN | **JN8AZ2KR6AT151088** |
| BUILD DATE | **10/09** | TEST DATE | **9/16/10 – 9/23/10** |
| TEST LABORATORY | | **KARCO Engineering, LLC.** | |

LEGEND: Wa - Weight of Seat Assembly

Wb - Weight of Seat Back

Wc - Weight of Seat Cushion

Z - Distance from Seat SRP to Uppermost Crossmember = 16.0 "

FOR FRONT BUCKET SEATS - - LEFT SIDE

| COMPONENT | LOAD DIRECTION | COMPONENT WEIGHT (lbs) | REQUIRED LOAD (lbs) | ACTUAL LOAD (lbs) | PEAK MOMENT (in-lbs) | ATTACHMENT (PASS/FAIL) |
|---|---|---|---|---|---|---|
| Seat Back | Forward | Wb = n/a | 20 x Wb = n/a | **N/A** | **N/A** | **N/A** |
| Seat Assy. | Forward | Wa = 56 | 20 x Wa = 1120 | **1137.9** | **N/A** | **PASS** |
| | Rearward | Wa = 56 | 20 x Wa = 1120 | **1138.6** | **N/A** | **PASS** |
| Seat Back Moment | Rearward | **N/A** | 3275 in-lb/Z | **213.2** | **3411.2** | **PASS** |

FOR FRONT BUCKET SEATS - - RIGHT SIDE

| COMPONENT | LOAD DIRECTION | COMPONENT WEIGHT (lbs) | REQUIRED LOAD (lbs) | ACTUAL LOAD (lbs) | PEAK MOMENT (in-lbs) | ATTACHMENT (PASS/FAIL) |
|---|---|---|---|---|---|---|
| Seat Back | Forward | Wb = n/a | 20 x Wb = n/a | **N/A** | **N/A** | **N/A** |
| Seat Assy. | Forward | Wa = 47 | 20 x Wa = 940 | **956.0** | **N/A** | **PASS** |
| | Rearward | Wa = 47 | 20 x Wa = 940 | **944.9** | **N/A** | **PASS** |
| Seat Back Moment | Rearward | **N/A** | 3275 in-lb/Z | **211.2** | **3379.2** | **PASS** |

## DATA SHEET NO. 2 (Continued)

FOR FRONT BUCKET SEATS - - COMBINED

| COMPONENT | LOAD DIRECTION | COMPONENT WEIGHT (lbs) | REQUIRED LOAD (lbs) | ACTUAL LOAD (lbs) | ATTACHMENT (PASS/FAIL) |
|---|---|---|---|---|---|
| Driver Lap Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3064.5** | **PASS** |
| Driver Shoulder Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3041.3** | **PASS** |
| Passenger Lap Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3030.8** | **PASS** |
| Passenger Shoulder Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3025.8** | **PASS** |
| Driver Seat Assembly | Forward | Wa = 56 | 20 x Wa = 1120 | **1137.0** | **PASS** |
| Passenger Seat Assembly | Forward | Wa = 47 | 20 x Wa = 940 | **961.8** | **PASS** |

LEGEND: Wa - Weight of Seat Assembly

Wb - Weight of Seat Back

Wc - Weight of Seat Cushion

Z - Distance from Seat SRP to Uppermost Crossmember = 16.0 "

FOR REAR BENCH SEAT:-

| COMPONENT | LOAD DIRECTION | COMPONENT WEIGHT (lbs) | REQUIRED LOAD (lbs) | ACTUAL LOAD (lbs) | PEAK MOMENT (in-lbs) | ATTACHMENT (PASS/FAIL) |
|---|---|---|---|---|---|---|
| Seat Back Left | Forward | Wb = 16 | 20 x Wb = 320 | **334.8** | **N/A** | **PASS** |
| Seat Back Right | Forward | Wb = 11 | 20 x Wb = 220 | **225.9** | **N/A** | **PASS** |
| Seat Assembly | Forward | Wa = 95 | 20 x Wa = 1900 | **1926.6** | **N/A** | **PASS** |
| Seat Assembly | Rearward | Wa = 95 | 20 x Wa = 1900 | **1953.7** | **N/A** | **PASS** |
| Seat Back Moment | Rearward | **N/A** | 3275 in-lb/Z | **212.4** | **3398.4** | **PASS** |
| Seat Back Moment | Rearward | **N/A** | 3275 in-lb/Z | **212.1** | **3393.6** | **PASS** |

RECORDED BY: **Mark Kratzke** DATE: **9/23/10**

APPROVED BY: **Michael L. Dunlap** DATE: **9/23/10**

**DATA SHEET NO. 2 (Continued)**

FOR REAR BENCH SEATS - - COMBINED

| COMPONENT | LOAD DIRECTION | COMPONENT WEIGHT (lbs) | REQUIRED LOAD (lbs) | ACTUAL LOAD (lbs) | ATTACHMENT (PASS/FAIL) |
|---|---|---|---|---|---|
| Driver Lap Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3030.9** | **PASS** |
| Driver Shoulder Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3038.4** | **PASS** |
| Center Lap Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3035.5** | **PASS** |
| Center Shoulder Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3036.4** | **PASS** |
| Passenger Lap Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3025.3** | **PASS** |
| Passenger Shoulder Belt | Forward | **N/A** | 3,000 lbs, +0, -50 | **3025.7** | **PASS** |
| Seat Assembly | Forward | Wa = 95 | 20 x Wa = 1900 | **1967.7** | **PASS** |

LEGEND: Wa - Weight of Seat Assembly
Wb - Weight of Seat Back
Wc - Weight of Seat Cushion

RECORDED BY: **Mark Kratzke** DATE: **9/23/10**

APPROVED BY: **Michael L. Dunlap** DATE: **9/23/10**

**DATA SHEET NO. 3**

**SEAT BACK ANGLES**

| TEST VEHICLE INFORMATION | | | |
|---|---|---|---|
| YEAR | **2010** | MAKE | **Nissan** |
| MODEL | **Cube** | BODY STYLE | **4-Door** |
| NHTSA NO. | **CA5203** | VIN | **JN8AZ2KR6AT151088** |
| BUILD DATE | **10/09** | TEST DATE | **9/16/10 – 9/23/10** |
| TEST LABORATORY | | **KARCO Engineering, LLC.** | |

LAP BELT ANCHORAGES:

| SEAT | SEATING POSITION | SPECIFIED ANGLE RANGE ABOVE HORIZONTAL | MEASURED ANGLE | | DOES BELT SECURELY FIT ON PELVIS? |
|---|---|---|---|---|---|
| | | | **I/B** | **O/B** | |
| FRONT | Left | 30 to 75 degrees | **46** | **48** | **YES** |
| | Center | 30 to 75 degrees | **N/A** | **N/A** | **N/A** |
| | Right | 30 to 75 degrees | **47** | **50** | **YES** |
| REAR | Left | 30 to 75 degrees | **62** | **64** | **YES** |
| | Center | 30 to 75 degrees | **60** | **63** | **YES** |
| | Right | 30 to 75 degrees | **63** | **62** | **YES** |

SHOULDER BELT ANCHORAGES:

| SEAT | SEATING POSITION | SPECIFIED ANGLE RANGE ABOVE OR BELOW HORIZONTAL | MEASURED ANGLE |
|---|---|---|---|
| FRONT | Left | 0 – 80 degrees above | **36º** |
| | | 0 – 40 degrees below | |
| | Right | 0 – 80 degrees above | **40º** |
| | | 0 – 40 degrees below | |
| REAR | Left | 0 – 80 degrees above | **66º** |
| | | 0 – 40 degrees below | **N/A** |
| | Center | 0 – 80 degrees above | **68º** |
| | | 0 – 40 degrees below | **N/A** |
| | Right | 0 – 80 degrees above | **64º** |
| | | 0 – 40 degrees below | **N/A** |

RECORDED BY: **Mark Kratzke** DATE: **9/23/10**

APPROVED BY: **Michael L. Dunlap** DATE: **9/23/10**

**DATA SHEET NO. 4**

**REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING**

The following vehicle has been subjected to Compliance testing for FMVSS No. **207**

| TEST VEHICLE INFORMATION | | | |
|---|---|---|---|
| NHTSA NO. | **CA5203** | TEST DATE | **9/16/10-9/23/10** |
| CONTRACT NO. | **DTNH22-01-C-31025** | VIN | **JN8AZ2KR6AT151088** |
| VEHICLE OR SEAT MANUFACTURER | | **Nissan Motor Corporation** | |
| TEST LABORATORY | | **KARCO Engineering, LLC.** | |

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

| TEST VEHICLE INFORMATION | | | |
|---|---|---|---|
| Manufacturer | **Nissan Motor Corporation** | VIN | **JN8AZ2KR6AT151088** |
| Manufacturing Date | **10/09** | Delivery Date | **6/25/10** |
| Dealer | **Town North Nissan** | NHTSA No. | **CA5203** |
| Odometer Reading (mi.) | **259.0** | Fuel Type | **GAS** |
| Engine Displacement | **1.8 LITER** | Cylinders | **L-4** |
| Transmission | **CVT** | Final Drive | **Rear** |
| Engine Placement | **Transverse** | Color | **White** |
| Tire Press./Max. Cap. Front | **51 PSI** | Cold Tire Press. Front | **33 PSI** |
| Tire Press./Max. Cap. Rear | **51 PSI** | Cold Tire Press. Rear | **33 PSI** |
| Recommend Tire Size | **P195/60R15** | Type of Spare | **T125/70D15** |
| Tire Size on Vehicle | **P195/60R15** | Manufacturer | **Toyo** |
| GVWR | **1750 Kg.** | Cargo Capacity | **390** |
| GAWR Front | **900 Kg.** | GAWR Rear | **860 Kg.** |
| Air Conditioning | **YES** | Power Steering | **YES** |
| Power Brakes | **YES** | AM/FM/Cassette | **YES** |
| Disc Brakes (Front) | **YES** | Disc Brakes (Rear) | **NO** |
| Power Windows | **YES** | Tilt Steering | **YES** |
| Anti-lock Brakes (ABS) | **YES** | Power Seats | **YES** |
| Driver Airbag | **YES** | Passenger Airbag | **YES** |

Test Vehicle Condition at the end of testing: **FRONT OF VEHICLE WAS REMOVED, SEATS WERE TESTED.**

RECORDED BY: **Mark Kratzke** DATE: **9/23/10**

APPROVED BY: **Michael L. Dunlap** DATE: **9/23/10**

APPENDIX A

PHOTOGRAPHS

FIGURE 1. Left Front ¾ View, As Received

FIGURE 2. Left Side, As Received


FIGURE 3. Right Rear ¾ View, As Received

FIGURE 4. Right  Side, As Received


FIGURE 5. Manufacturer's Label

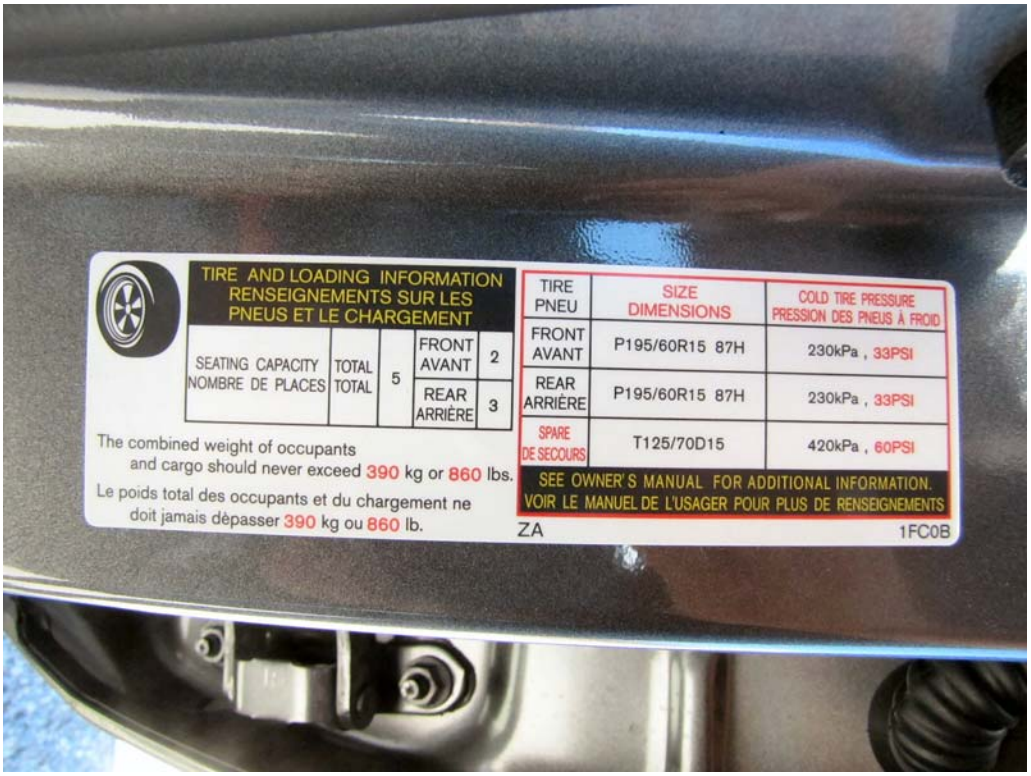



FIGURE 6. Vehicle Tire Placard

FIGURE 7. Vehicle Mounted in Test Fixture

FIGURE 8. Vehicle Mounted in Test Fixture

FIGURE 9. Vehicle Mounted in Test Fixture

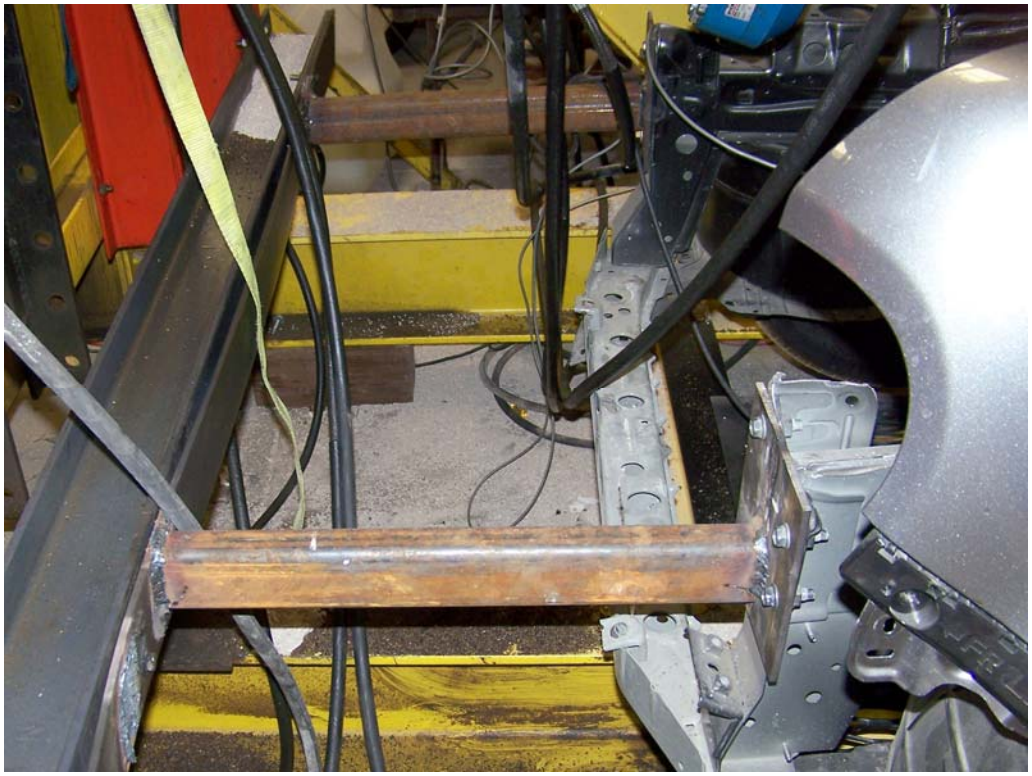


FIGURE 10. Vehicle Mounted in Test Fixture


FIGURE 11. Aft Moment on Seat Back, P1, Pre-Test


FIGURE 12. Aft Moment on Seat Back, P1, Post-Test


FIGURE 13. Aft Moment on Seat Back, P2, Pre-Test


FIGURE 14. Aft Moment on Seat Back, P2, Post-Test


FIGURE 15. Forward Load on Seat Frame and Adjusters, P1, Pre-Test


FIGURE 16. Forward Load on Seat Frame and Adjusters, P1, Post-Test


FIGURE 17. Forward Load on Seat Frame and Adjusters, P2, Pre-Test


FIGURE 18. Forward Load on Seat Frame and Adjusters, P2, Post-Test


FIGURE 19. Aft Load on Seat Frame and Adjusters, P1, Pre-Test


FIGURE 20. Aft Load on Seat Frame and Adjusters, P1, Post-Test


FIGURE 21 Aft Load on Seat Frame and Adjusters, P2, Pre-Test


FIGURE 22. Aft Load on Seat Frame and Adjusters, P2, Post-Test


FIGURE 23. 207/210 Forward Load on Seat Frame and Adjusters, P1, Pre-Test


FIGURE 24. 207/210 Forward Load on Seat Frame and Adjusters, P1, Post-Test


FIGURE 25. 207/210 Forward Load on Seat Frame and Adjusters, P2, Pre-Test


FIGURE 26. 207/210 Forward Load on Seat Frame and Adjusters, P2, Post-Test


FIGURE 27. Aft Moment on Seat Back, P1, Pre-Test


FIGURE 28. Aft Moment on Seat Back, P1, Post-Test


FIGURE 29. Aft Moment on Seat Back, P2, Pre-Test


FIGURE 30. Aft Moment on Seat Back, P2, Post-Test


FIGURE 31. Forward Load on Seat Back, P4, Pre-Test


FIGURE 32. Forward Load on Seat Back, P4, Post-Test


FIGURE 33. Forward Load on Seat Back, P3, Pre-Test


FIGURE 34. Forward Load on Seat Back, P3, Post-Test


FIGURE 35. Forward Load on Seat Frame and Adjusters, P4, Pre-Test


FIGURE 36. Forward Load on Seat Frame and Adjusters, P4, Post-Test


FIGURE 37. Forward Load on Seat Frame and Adjusters, P3, Pre-Test


FIGURE 38. Forward Load on Seat Frame and Adjusters, P3, Post-Test


FIGURE 39. Aft Load on Seat Frame and Adjusters, P4, Pre-Test


FIGURE 40. Aft Load on Seat Frame and Adjusters, P4, Post-Test


FIGURE 41. Aft Load on Seat Frame and Adjusters, P3, Pre-Test


FIGURE 42. Aft Load on Seat Frame and Adjusters, P3, Post-Test


FIGURE 43. 207/210 Forward Load on Seat Frame and Adjusters, P4, Pre-Test


FIGURE 44. 207/210 Forward Load on Seat Frame and Adjusters, P4, Post-Test


FIGURE 45. 207/210 Forward Load on Seat Frame and Adjusters, P3, Pre-Test


FIGURE 46. 207/210 Forward Load on Seat Frame and Adjusters, P3, Post-Test

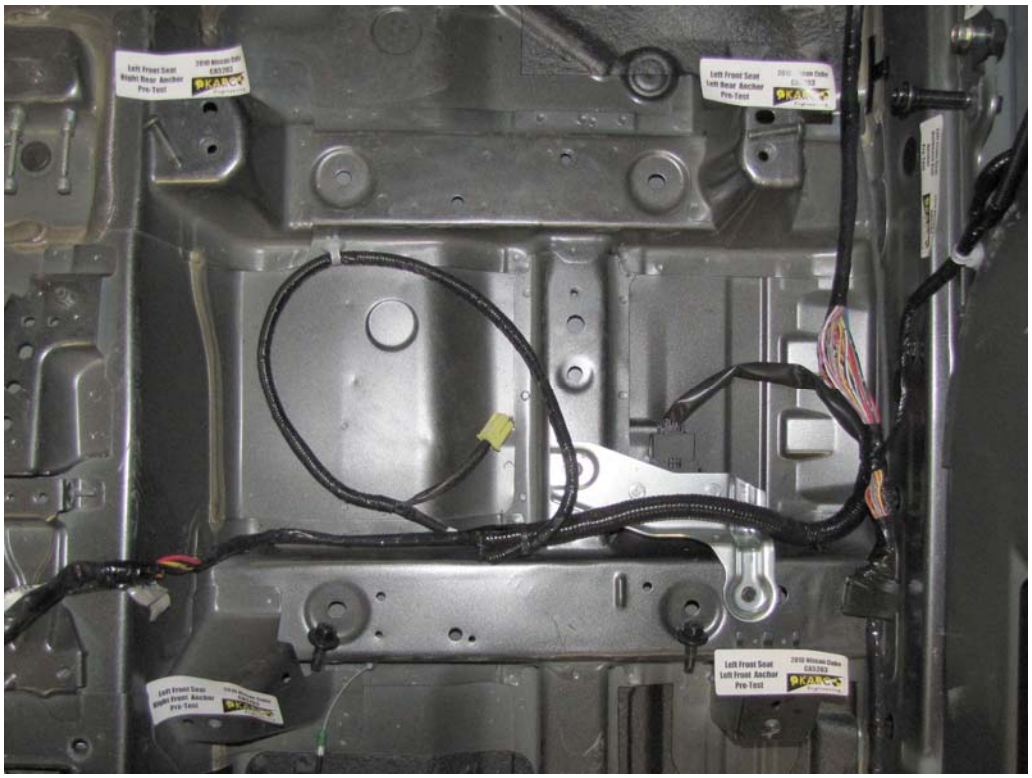


FIGURE 47. Floor Pan Anchors, P1 Overall, Pre-Test

FIGURE 48. Floor Pan Anchors, P1 Overall, Post-Test

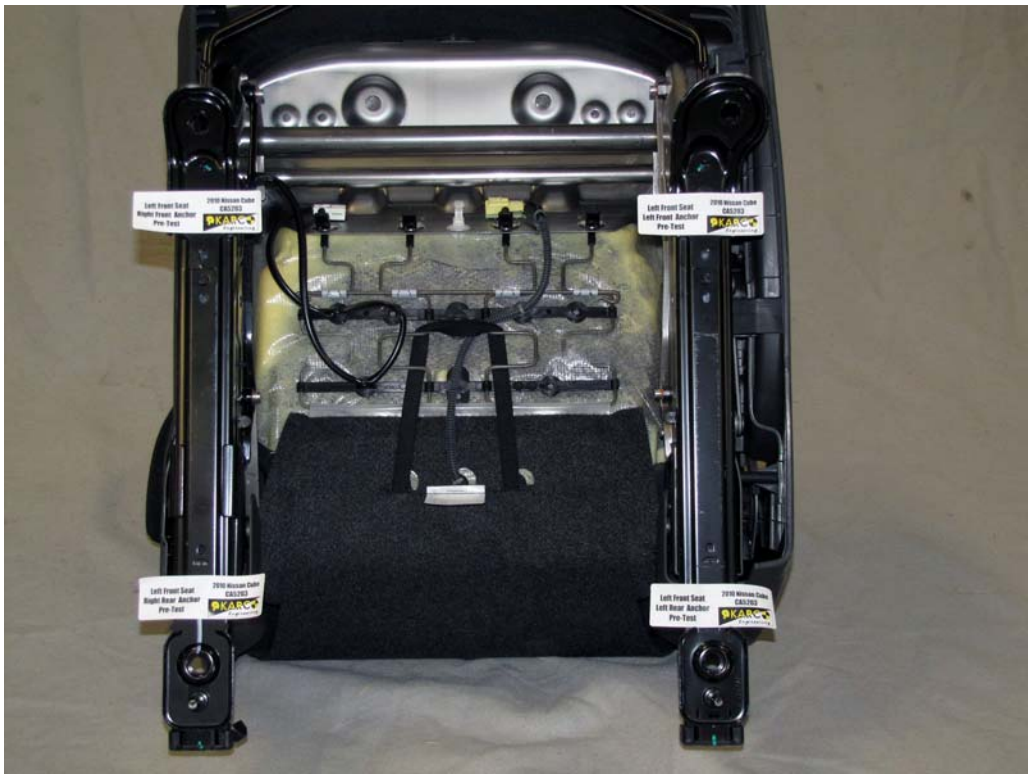


FIGURE 49. Seat Anchors, P1 Overall, Pre-Test

FIGURE 50. Seat Anchors, P1 Overall, Post-Test


FIGURE 51. Floor Pan Anchor, P1, Pre-Test


FIGURE 52. Floor Pan Anchor, P1, Post-Test


FIGURE 53. Seat Anchor, P1, Pre-Test


FIGURE 54. Seat Anchor, P1, Post-Test


FIGURE 55. Floor Pan Anchor, P1, Pre-Test


FIGURE 56. Floor Pan Anchor, P1, Post-Test


FIGURE 57. Seat Anchor, P1, Pre-Test


FIGURE 58. Seat Anchor, P1, Post-Test


FIGURE 59. Floor Pan Anchor, P1, Pre-Test


FIGURE 60. Floor Pan Anchor, P1, Post-Test


FIGURE 61. Seat Anchor, P1, Pre-Test


FIGURE 62. Seat Anchor, P1, Post-Test


FIGURE 63. Floor Pan Anchor, P1, Pre-Test


FIGURE 64. Floor Pan Anchor, P1, Post-Test


FIGURE 65. Seat Anchor, P1, Pre-Test


FIGURE 66. Seat Anchor, P1, Post-Test


FIGURE 67. Shoulder Belt Anchor, P1, Pre-Test


FIGURE 68.Shoulder  Belt Anchor, P1, Post-Test


FIGURE 69. Shoulder Belt Anchor, P1, Pre-Test


FIGURE 70. Shoulder Belt Anchor, P1, Post-Test


FIGURE 71. Belt Anchor, P1, Pre-Test


FIGURE 72. Belt Anchor, P1, Post-Test


FIGURE 73. Belt Anchor, P1, Pre-Test


FIGURE 74. Belt Anchor, P1, Post-Test

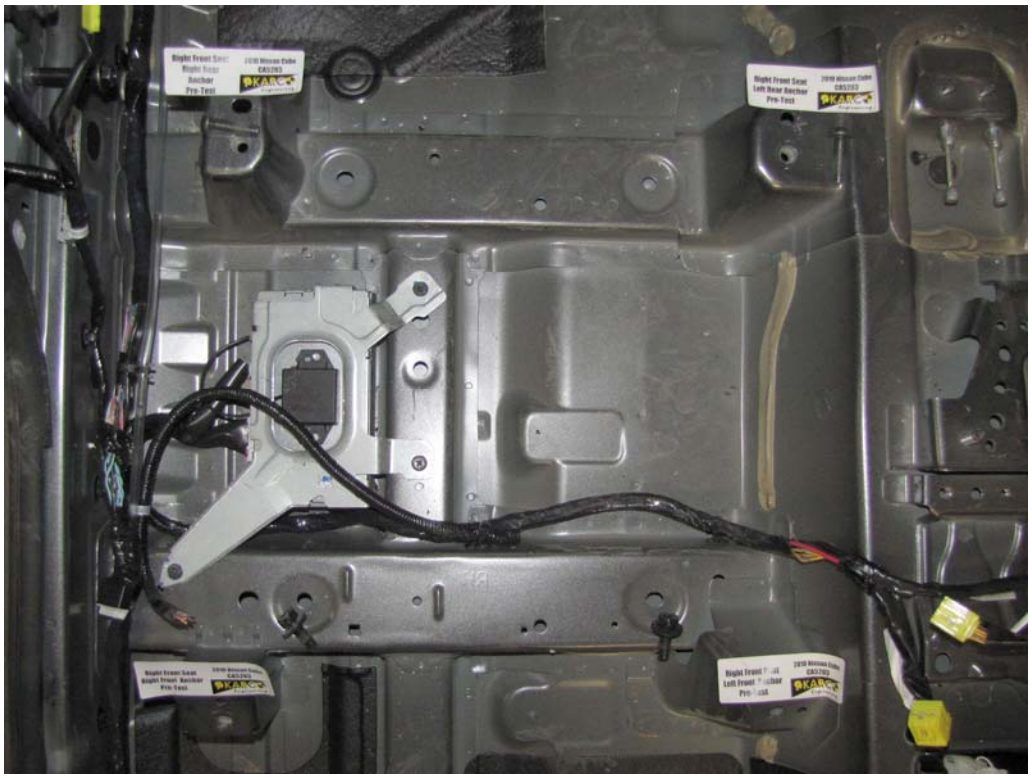


FIGURE 75. Floor Pan Anchors, P2 Overall, Pre-Test

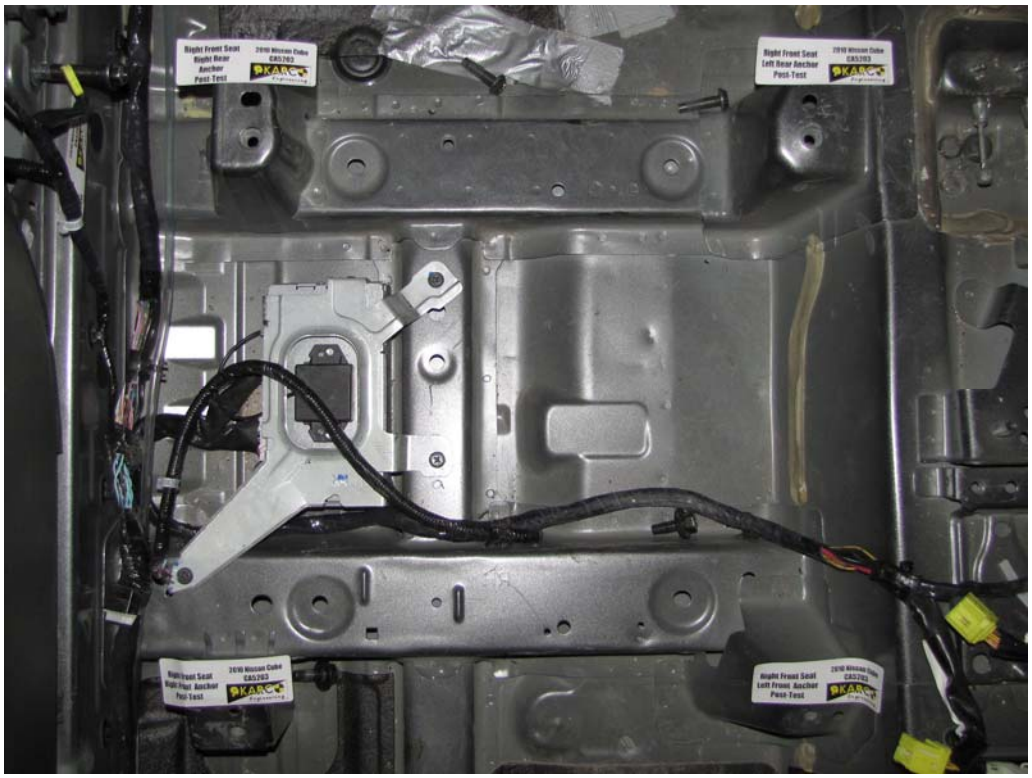


FIGURE 76. Floor Pan Anchors, P2 Overall, Post-Test

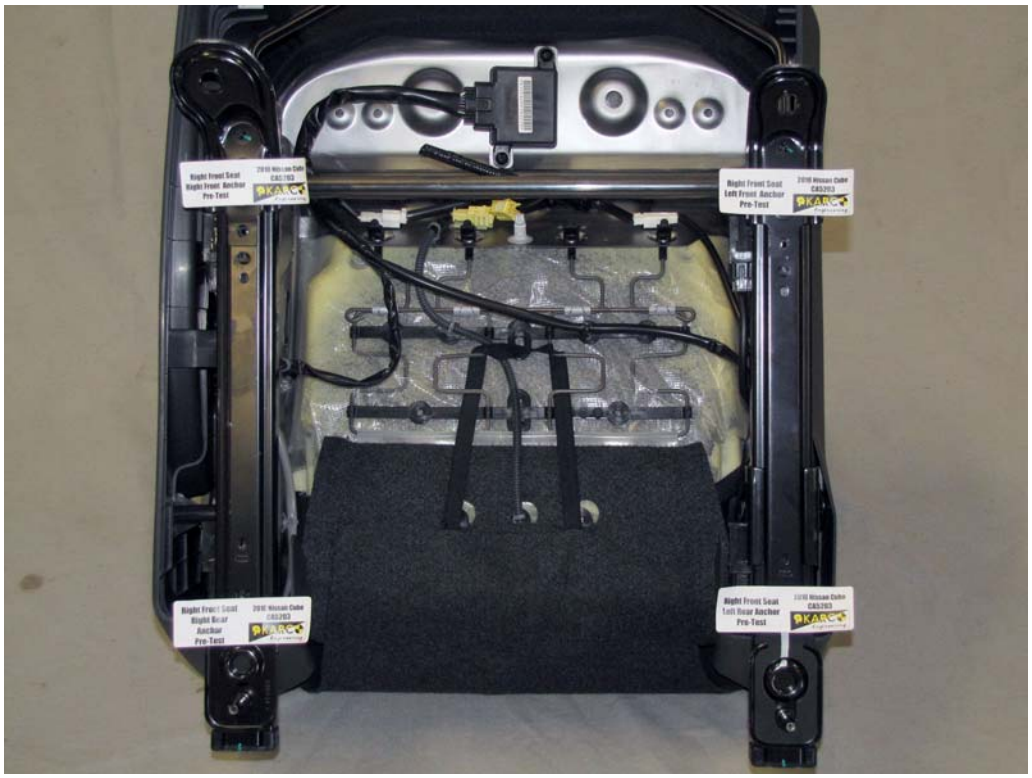


FIGURE 77. Seat Anchors, P2 Overall, Pre-Test

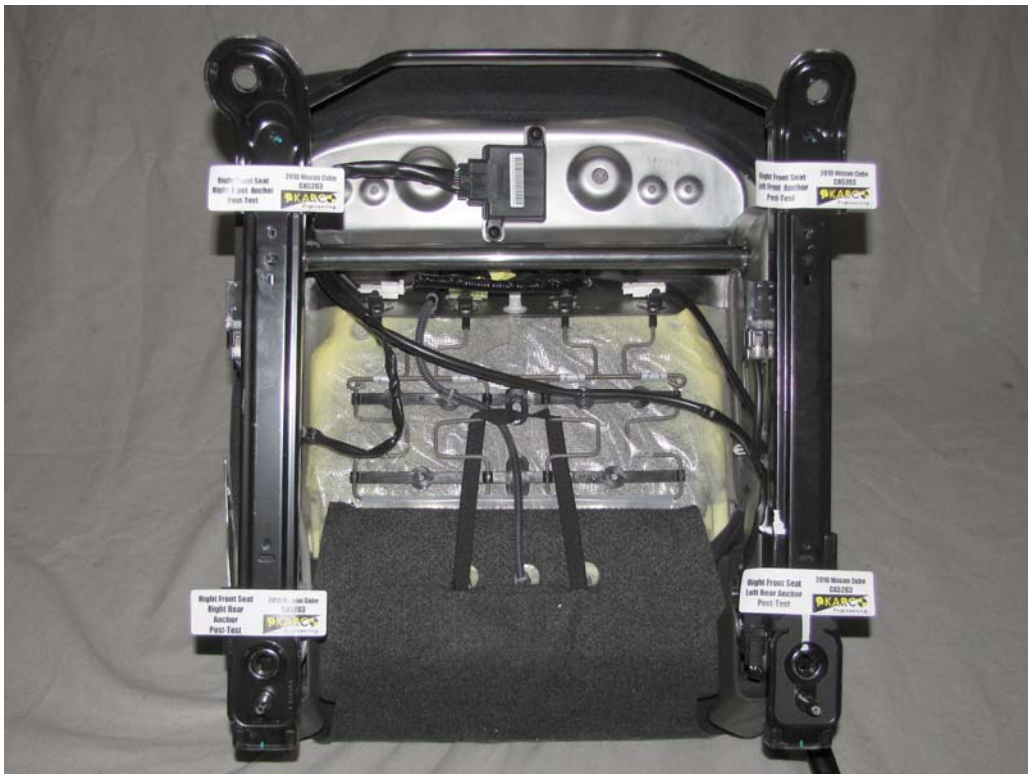


FIGURE 78. Seat Anchors, P2 Overall, Post-Test


FIGURE 79. Floor Pan Anchor, P2, Pre-Test


FIGURE 80. Floor Pan Anchor, P2, Post-Test


FIGURE 81. Seat Anchor, P2, Pre-Test


FIGURE 82. Seat Anchor, P2, Post-Test


FIGURE 83. Floor Pan Anchor, P2, Pre-Test


FIGURE 84. Floor Pan Anchor, P2, Post-Test


FIGURE 85. Seat Anchor, P2, Pre-Test


FIGURE 86. Seat Anchor, P2, Post-Test


FIGURE 87. Floor Pan Anchor, P2, Pre-Test


FIGURE 88. Floor Pan Anchor, P2, Post-Test


FIGURE 89. Seat Anchor, P2, Pre-Test


FIGURE 90. Seat Anchor, P2, Post-Test


FIGURE 91. Floor Pan Anchor, P2, Pre-Test


FIGURE 92. Floor Pan Anchor, P2, Post-Test


FIGURE 93. Seat Anchor, P2, Pre-Test


FIGURE 94. Seat Anchor, P2, Post-Test


FIGURE 95. Shoulder Belt Anchor, P2, Pre-Test


FIGURE 96. Shoulder Belt Anchor, P2, Post-Test


FIGURE 97. Shoulder Belt Anchor, P2, Pre-Test


FIGURE 98. Shoulder Belt Anchor, P2, Post-Test


FIGURE 99. Belt Anchor, P2, Pre-Test


FIGURE 100. Belt Anchor, P2, Post-Test


FIGURE 101. Belt Anchor, P2, Pre-Test


FIGURE 102. Belt Anchor, P2, Post-Test

FIGURE 103. Floor Pan Anchors, P3-P4-P6 Overall, Pre-Test

FIGURE 104. Floor Pan Anchors, P3-P4-P6 Overall, Post-Test

FIGURE 105. Seat Anchors, P3-P4-P6 Overall, Pre-Test

FIGURE 106. Seat Anchors, P3-P4-P6 Overall, Post-Test


FIGURE 107. Floor Pan Anchor, P3, Pre-Test


FIGURE 108. Floor Pan Anchor, P3, Post-Test


FIGURE 109. Seat Anchor, P3, Pre-Test


FIGURE 110. Seat Anchor, P3, Post-Test


FIGURE 111. Floor Pan Anchor, P3, Pre-Test


FIGURE 112. Floor Pan Anchor, P3, Post-Test


FIGURE 113. Seat Anchor, P3, Pre-Test


FIGURE 114. Seat Anchor, P3, Post-Test


FIGURE 115. Belt Anchor, P3, Pre-Test


FIGURE 116. Belt Anchor, P3, Post-Test


FIGURE 117. Belt Anchor, P3, Pre-Test


FIGURE 118. Belt Anchor, P3, Post-Test


FIGURE 119. Belt Anchor, P3, Pre-Test


FIGURE 120. Belt Anchor, P3, Post-Test


FIGURE 121. Belt Anchor, P3, Pre-Test


FIGURE 122. Belt Anchor, P3, Post-Test


FIGURE 123. Floor Pan Anchor, P4, Pre-Test


FIGURE 124. Floor Pan Anchor, P4, Post-Test


FIGURE 125. Seat Anchor, P4, Pre-Test


FIGURE 126. Seat Anchor, P4, Post-Test


FIGURE 127. Floor Pan Anchor, P4, Pre-Test


FIGURE 128. Floor Pan Anchor, P4, Post-Test


FIGURE 129. Seat Anchor, P4, Pre-Test


FIGURE 130. Seat Anchor, P4, Post-Test


FIGURE 131. Shoulder Belt Anchor, P4, Pre-Test


FIGURE 132. Shoulder Belt Anchor, P4, Pre-Test


FIGURE 133. Shoulder Belt Anchor, P4, Pre-Test


FIGURE 134. Shoulder Belt Anchor, P4, Post-Test


FIGURE 135. Belt Anchor, P4, Pre-Test


FIGURE 136. Belt Anchor, P4, Post-Test


FIGURE 137. Belt Anchor, P4, Pre-Test


FIGURE 138. Belt Anchor, P4, Post-Test


FIGURE 139. Shoulder Belt Anchor, P6, Pre-Test


FIGURE 140. Shoulder Belt Anchor, P6, Post-Test


FIGURE 141. Shoulder Belt Anchor, P6, Pre-Test


FIGURE 142. Shoulder Belt Anchor, P6, Post-Test


FIGURE 143. Belt Anchor, P6, Pre-Test

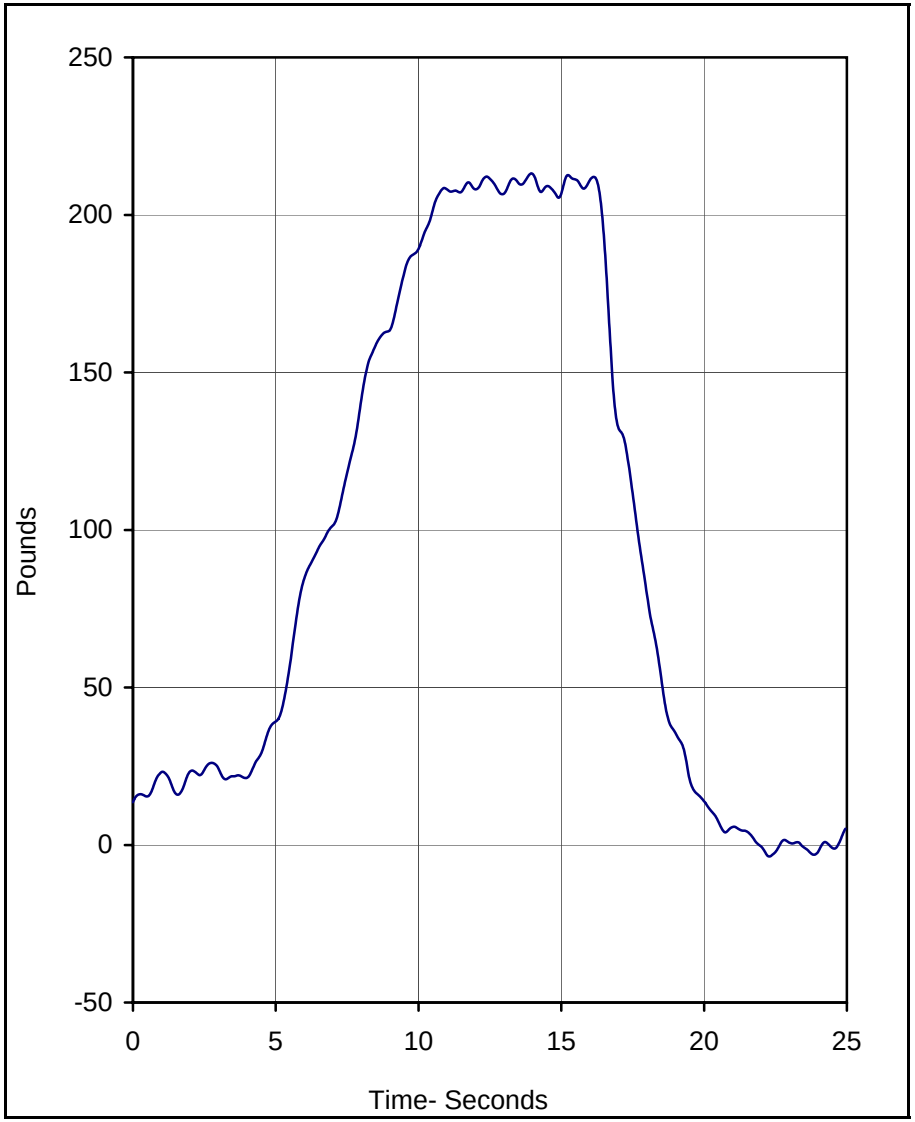

FIGURE 144. Belt Anchor, P6, Post-Test

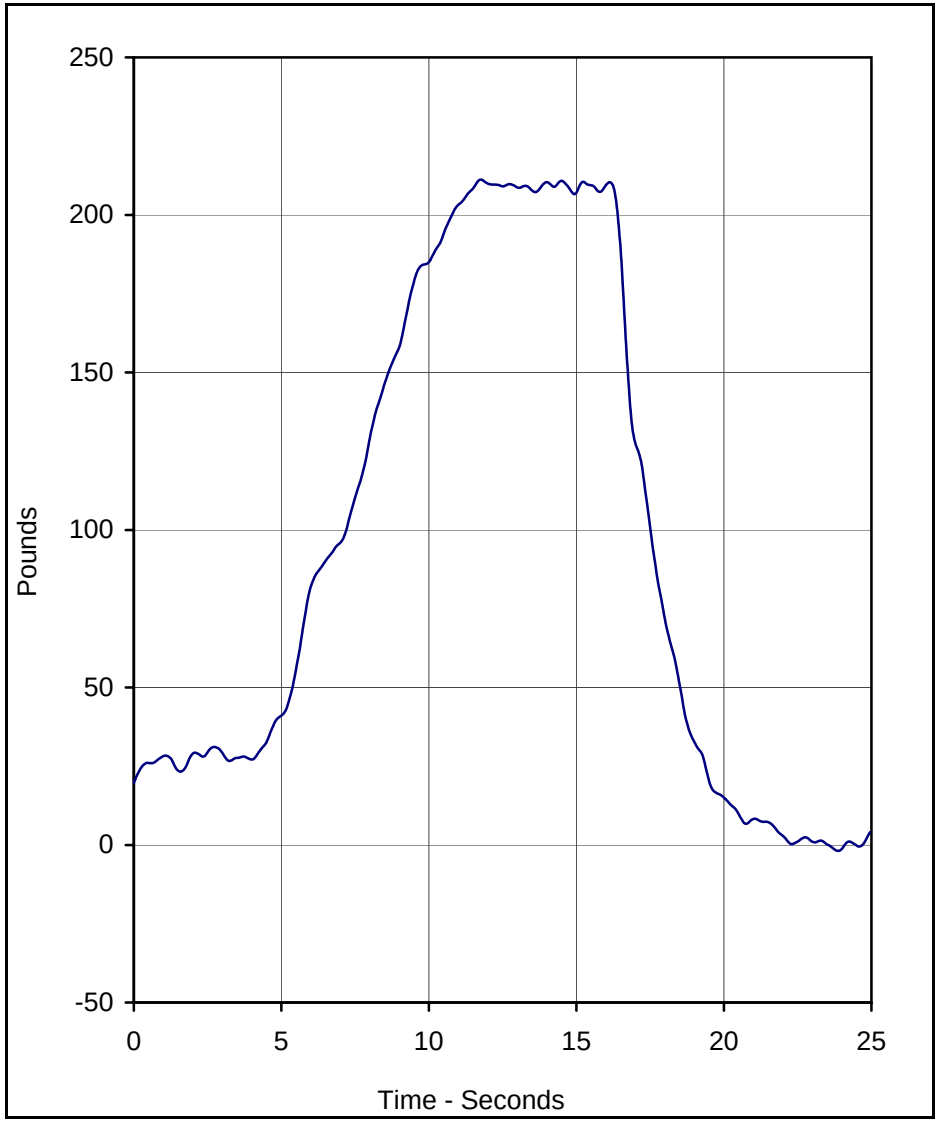

FIGURE 145. Shoulder Belt Anchor, P6, Pre-Test


FIGURE 146. Shoulder Belt Anchor, P6, Post-Test

APPENDIX B

DATA PLOTS




| Curve Description | CURNO | Type |
|---|---|---|
| Driver Seat | 001 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 213.2 | 14.0 | -3.6 | 22.3 | 1 |

| Curve Description | CURNO | Type |
|---|---|---|
| Passenger Seat | 002 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 211.2 | 11.8 | -1.8 | 23.9 | 1 |

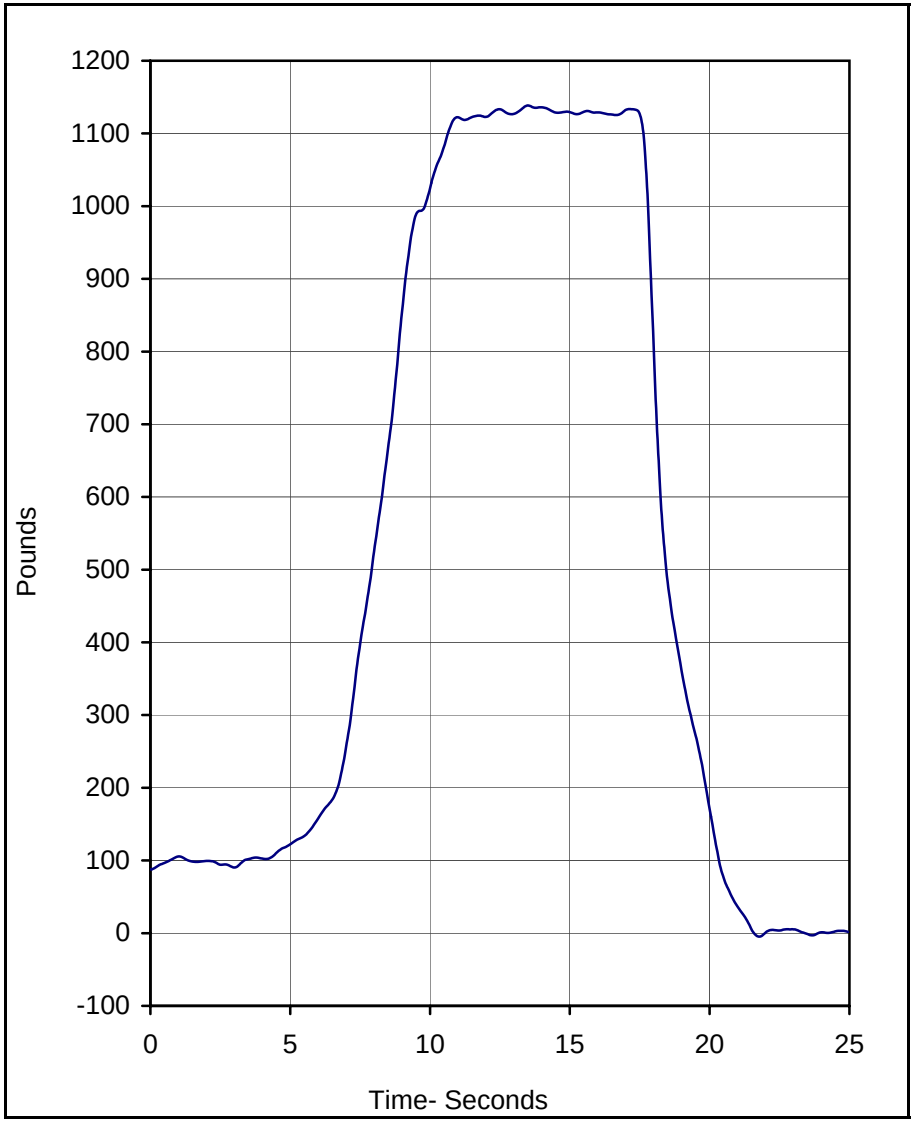
Test Program: FMVSS 207 Aft Moment (Front Seats)

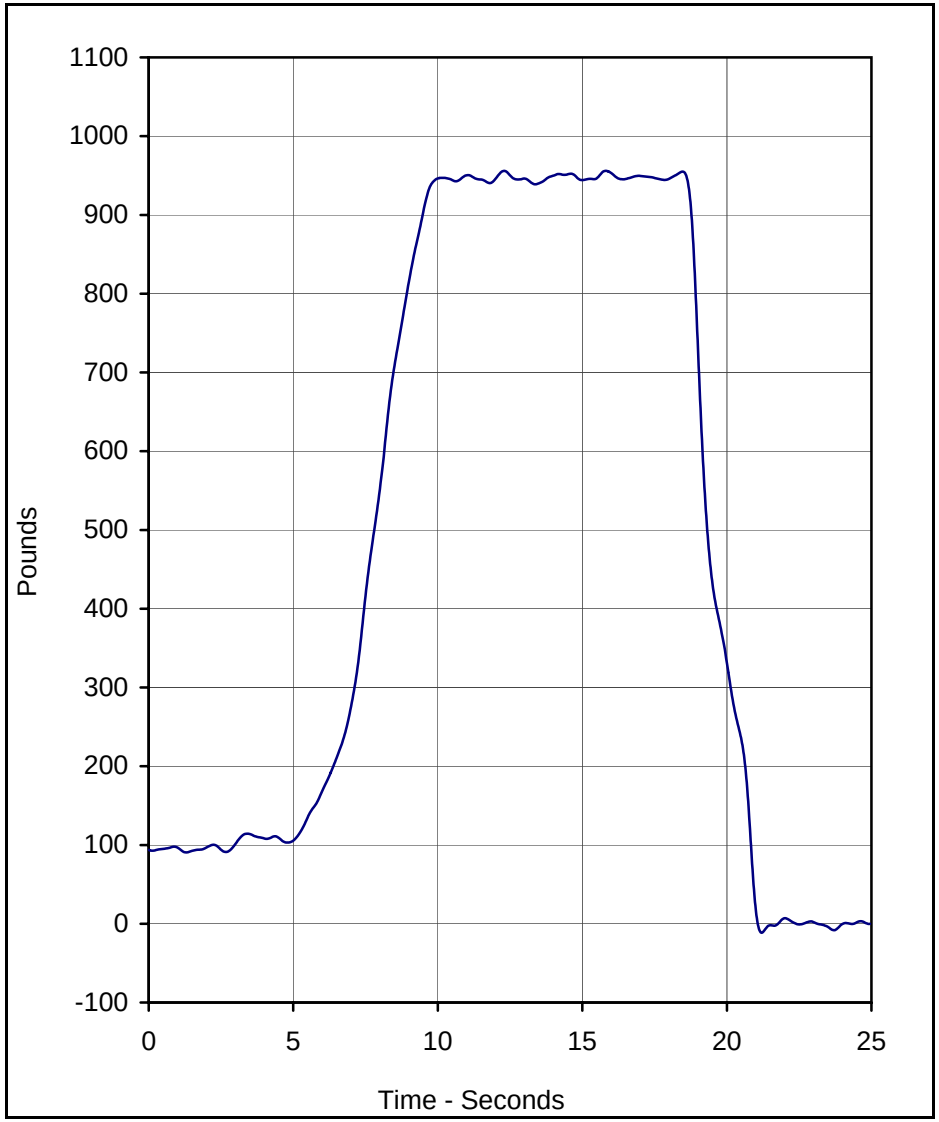
Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/16/10

Project No.: CA5203

KARCO Engineering LLC




| Curve Description | CURNO | Type |
|---|---|---|
| Driver Seat | 001 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 1138.6 | 13.5 | -4.7 | 21.8 | 1 |

| Curve Description | CURNO | Type |
|---|---|---|
| Passenger Seat | 002 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 956.0 | 15.8 | -11.4 | 21.2 | 1 |

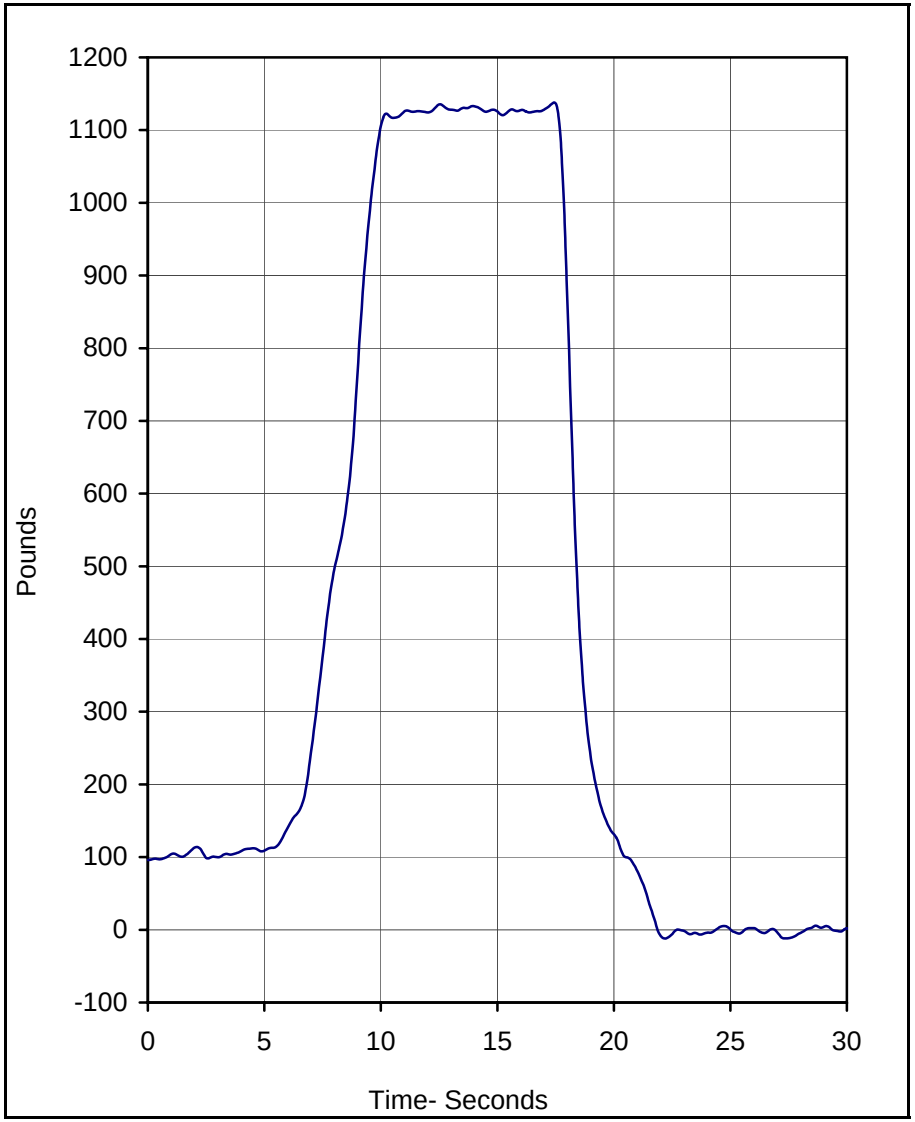
Test Program: FMVSS Aft Seat Frame and Adj. (Front Seats)

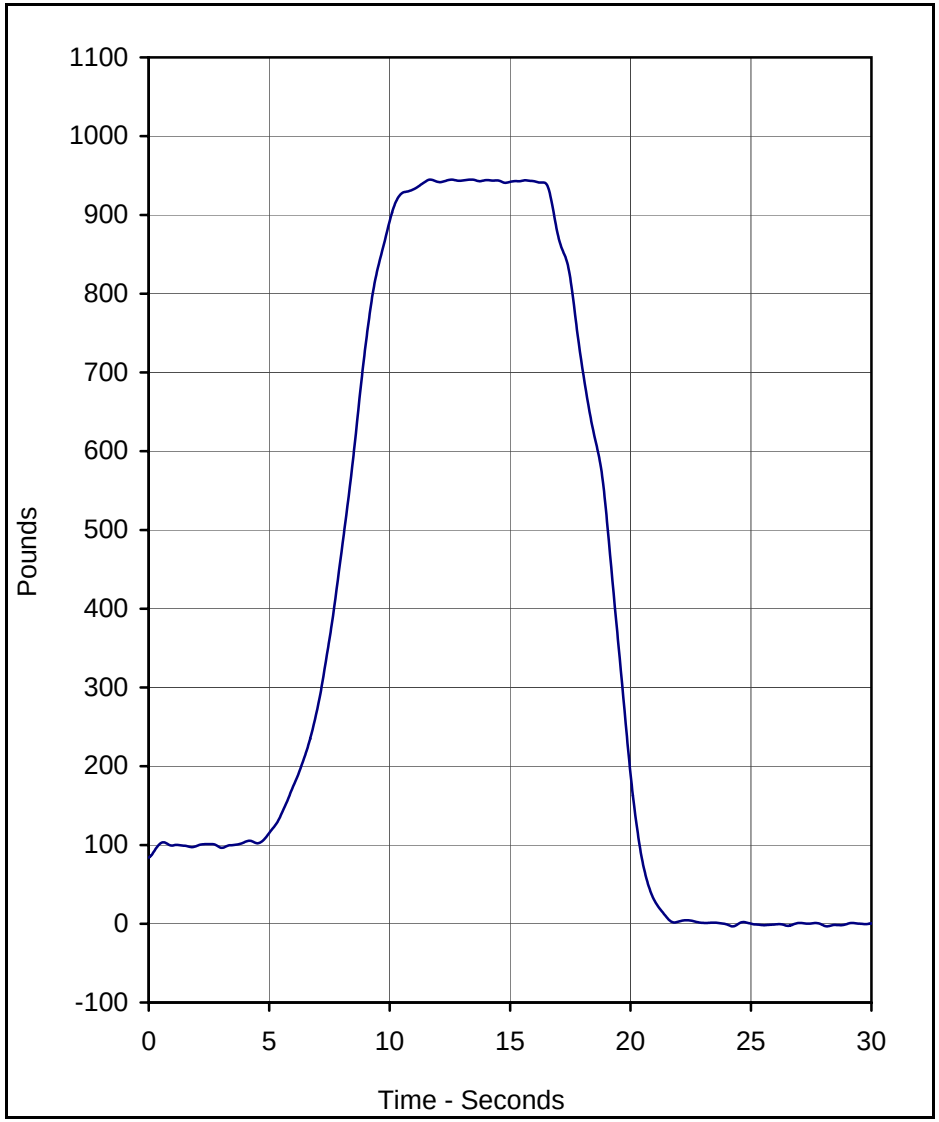
Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/16/10

Project No.: CA5203

KARCO Engineering LLC



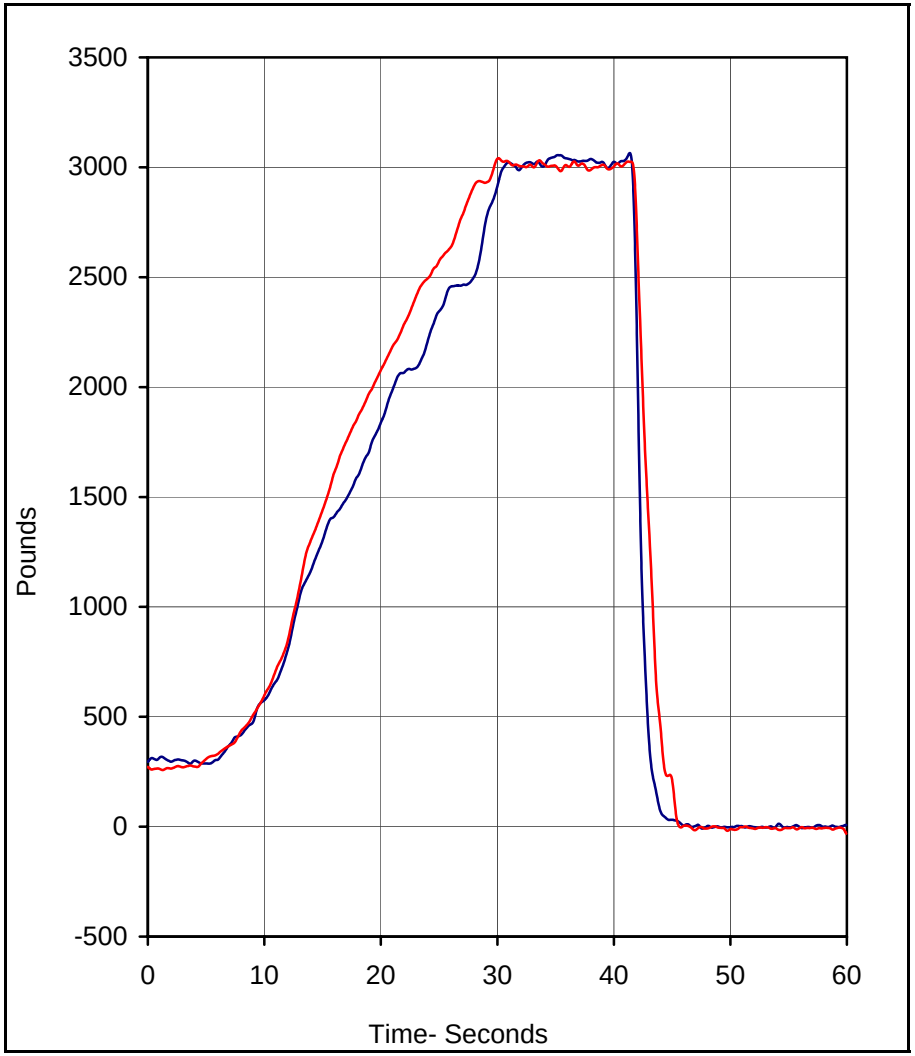

| Curve Description | CURNO | Type |
|---|---|---|
| Driver Seat | 001 | FIL |

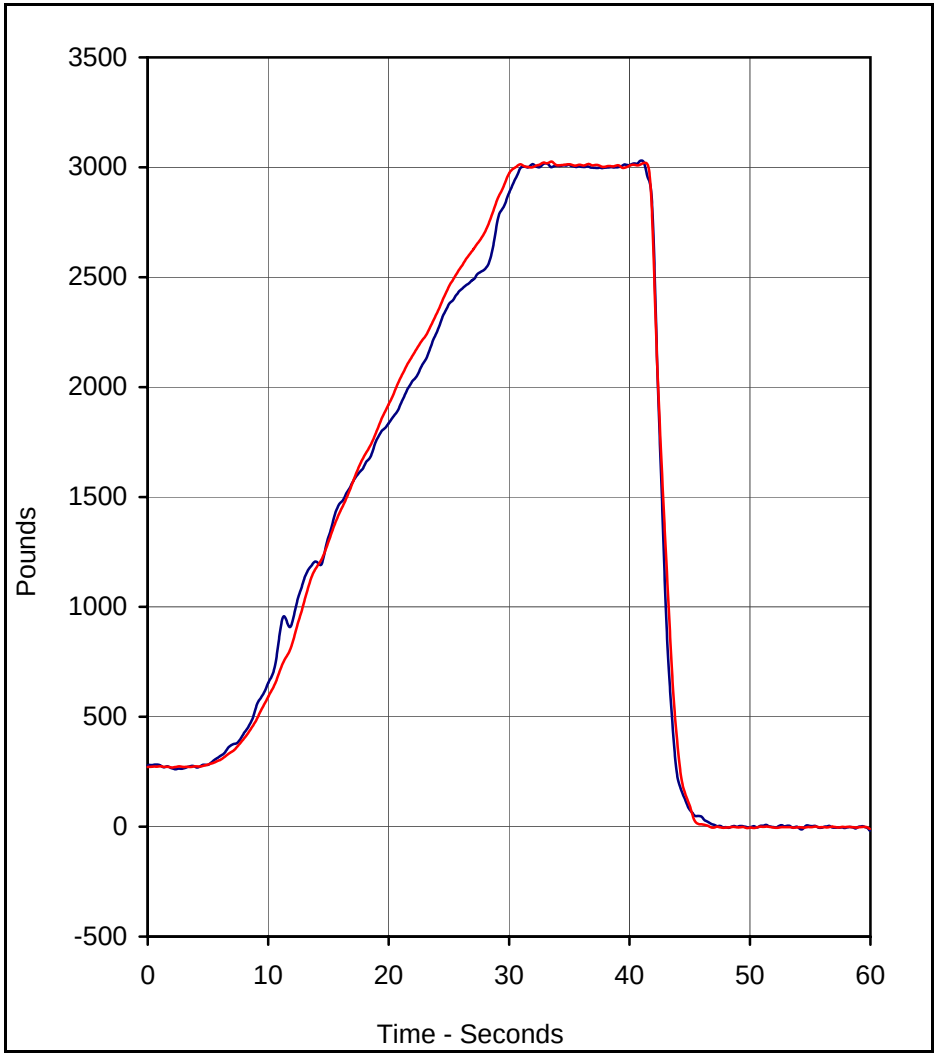
| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 1137.9 | 17.5 | -12.0 | 22.2 | 1 |

| Curve Description | CURNO | Type |
|---|---|---|
| Passenger Seat | 002 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 944.9 | 11.7 | -3.4 | 24.3 | 1 |

Test Program: FMVSS 207 Fwd Seat Frame and Adj. (Front Seats)
Test Vehicle: 2010 Nissan Cube 5-Door MPV
Test Date: 09/17/10
Project No.: CA5203




| Curve Description | CURNO | Type |
|---|---|---|
| Driver Lap Force | 001 | FIL |
| Driver Shoulder Force | 002 | FIL |

| Curve Description | CURNO | Type |
|---|---|---|
| Passenger Lap Force | 004 | FIL |
| Passenger Shoulder Force | 005 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 3064.5 | 41.4 | -8.6 | 47.6 | 1 |
| Pounds | 3041.3 | 30.1 | -18.9 | 49.8 | 1 |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 3030.8 | 41.0 | -12.3 | 54.3 | 1 |
| Pounds | 3025.8 | 33.5 | -6.4 | 49.8 | 1 |

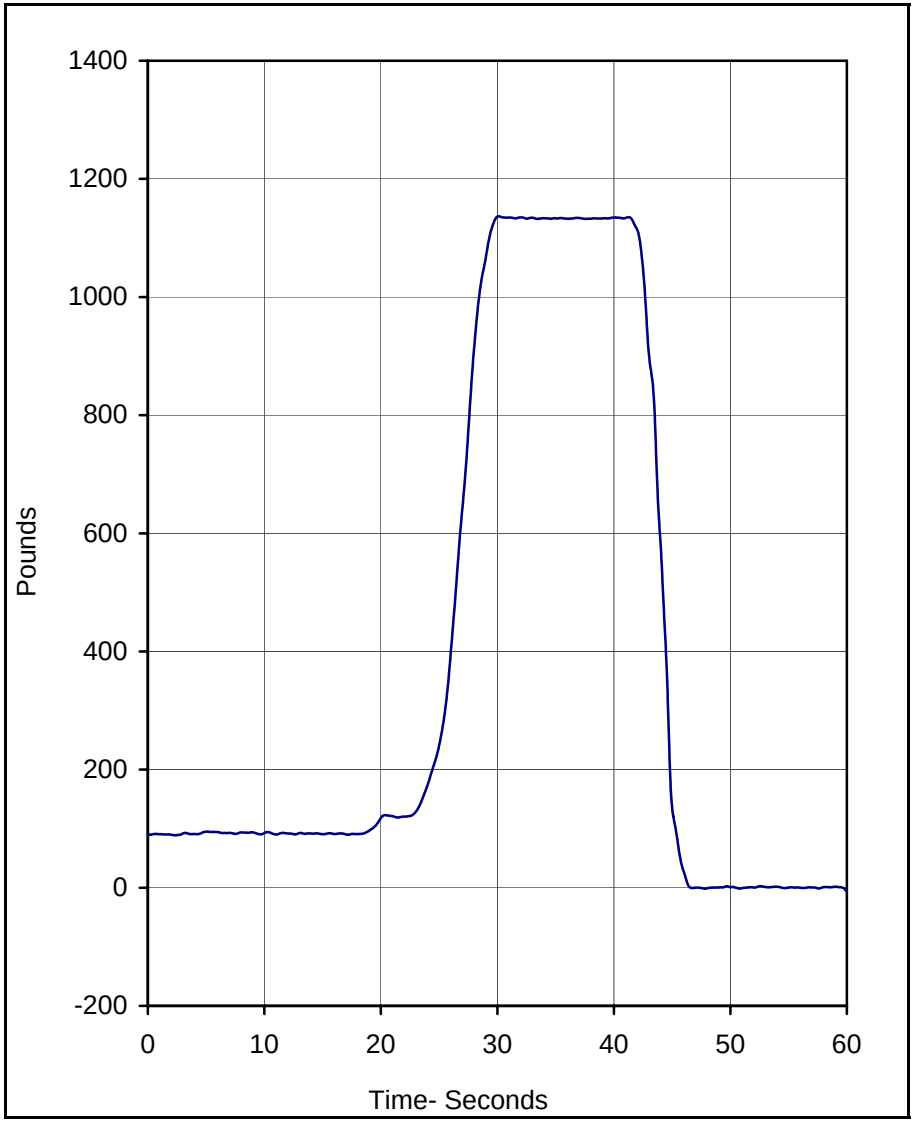
Test Program: FMVSS 207/210 (Front Seats)

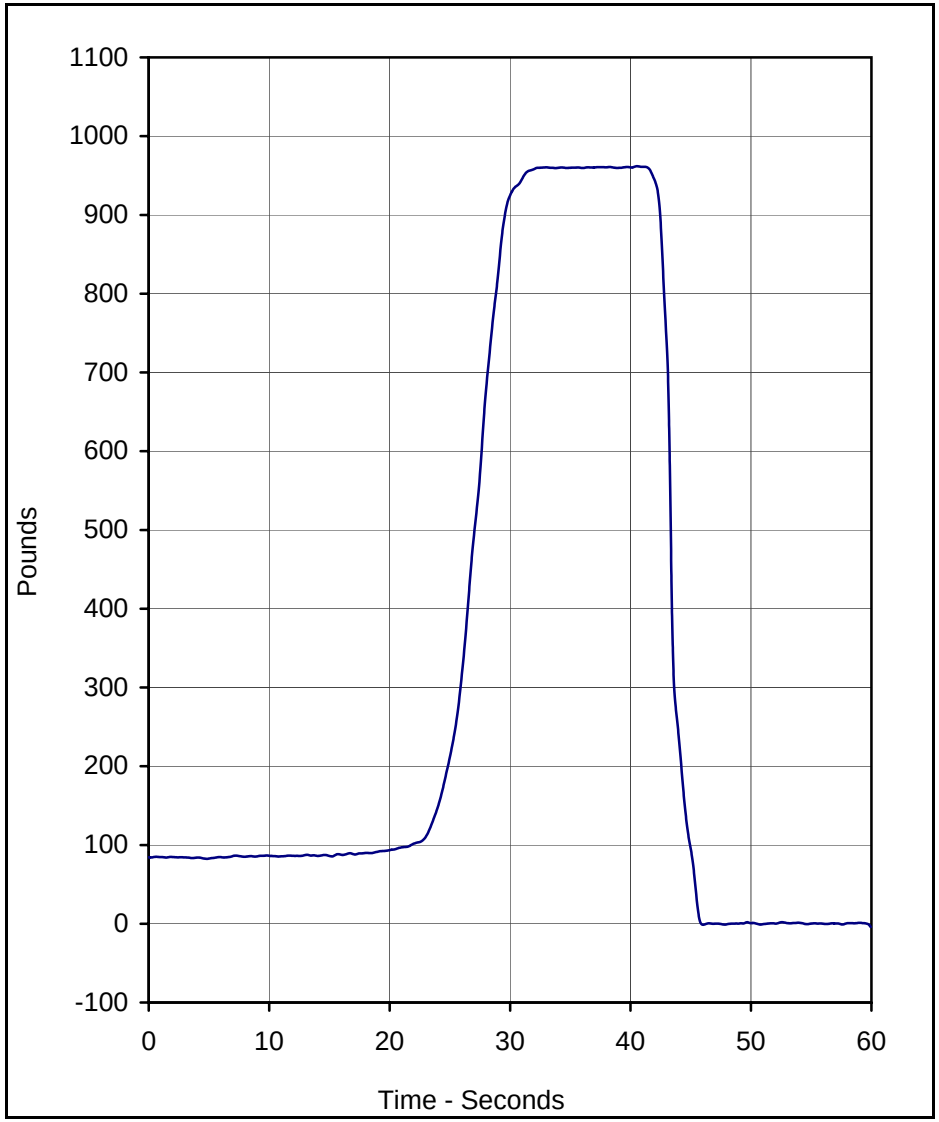
Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/17/10

Project No.: CA5203

KARCO Engineering LLC




| Curve Description | CURNO | Type |
|---|---|---|
| Driver Seat Force | 006 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 1137.0 | 30.1 | -1.6 | 47.8 | 1 |

| Curve Description | CURNO | Type |
|---|---|---|
| Passenger Seat Force | 007 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 961.8 | 40.6 | -1.3 | 46.0 | 1 |

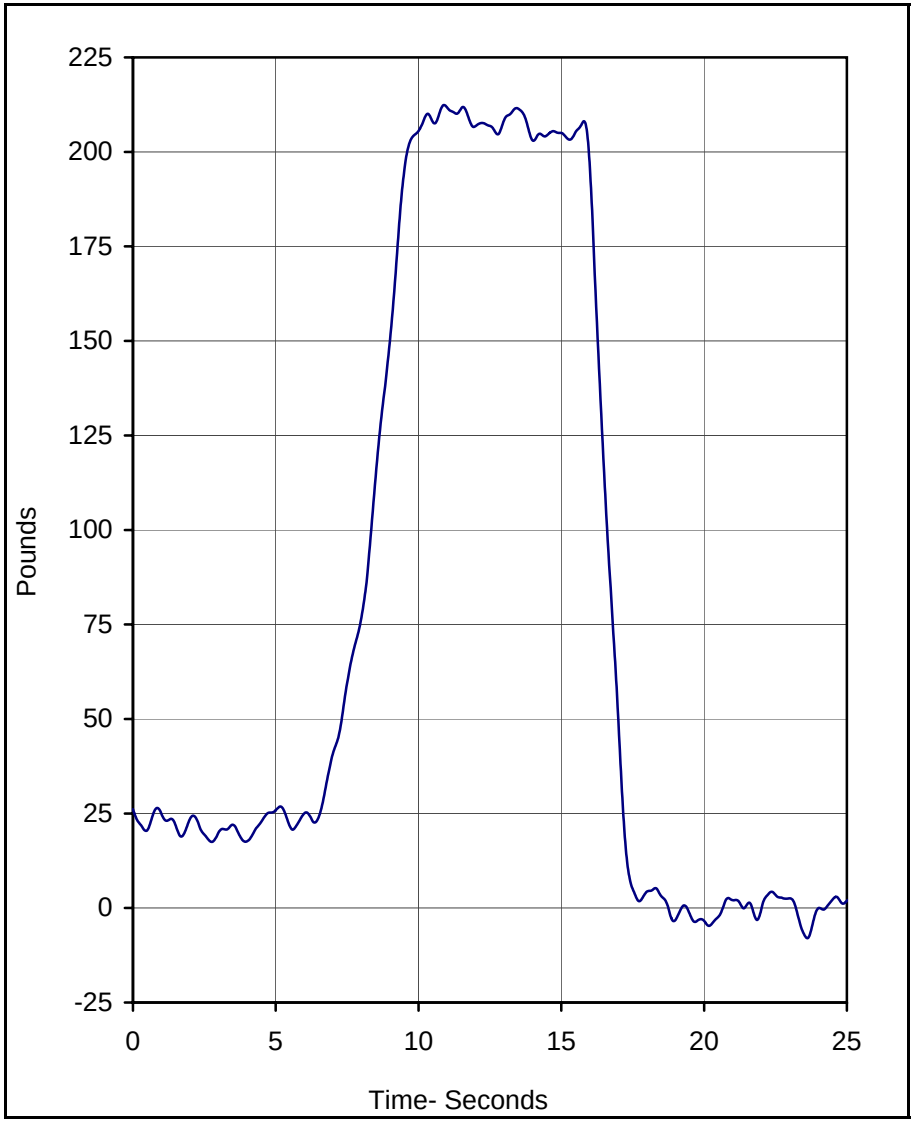
Test Program: FMVSS 207/210 (Front Seats)

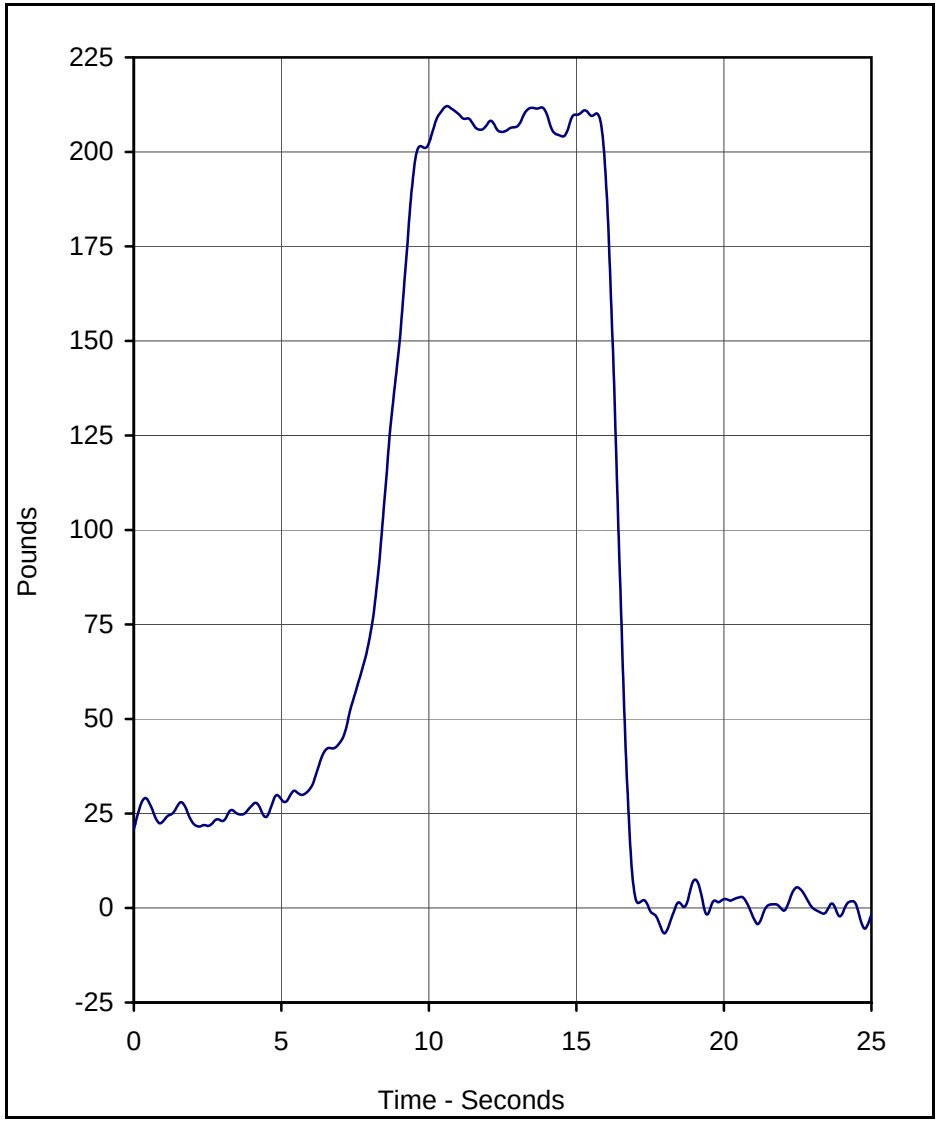
Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/17/10

Project No.: CA5203

KARCO Engineering LLC




| Curve Description | CURNO | Type |
|---|---|---|
| Left Rear Seat | 001 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 212.4 | 10.9 | -8.0 | 23.6 | 1 |

| Curve Description | CURNO | Type |
|---|---|---|
| Right Rear Seat | 002 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 212.1 | 10.6 | -6.7 | 18.0 | 1 |

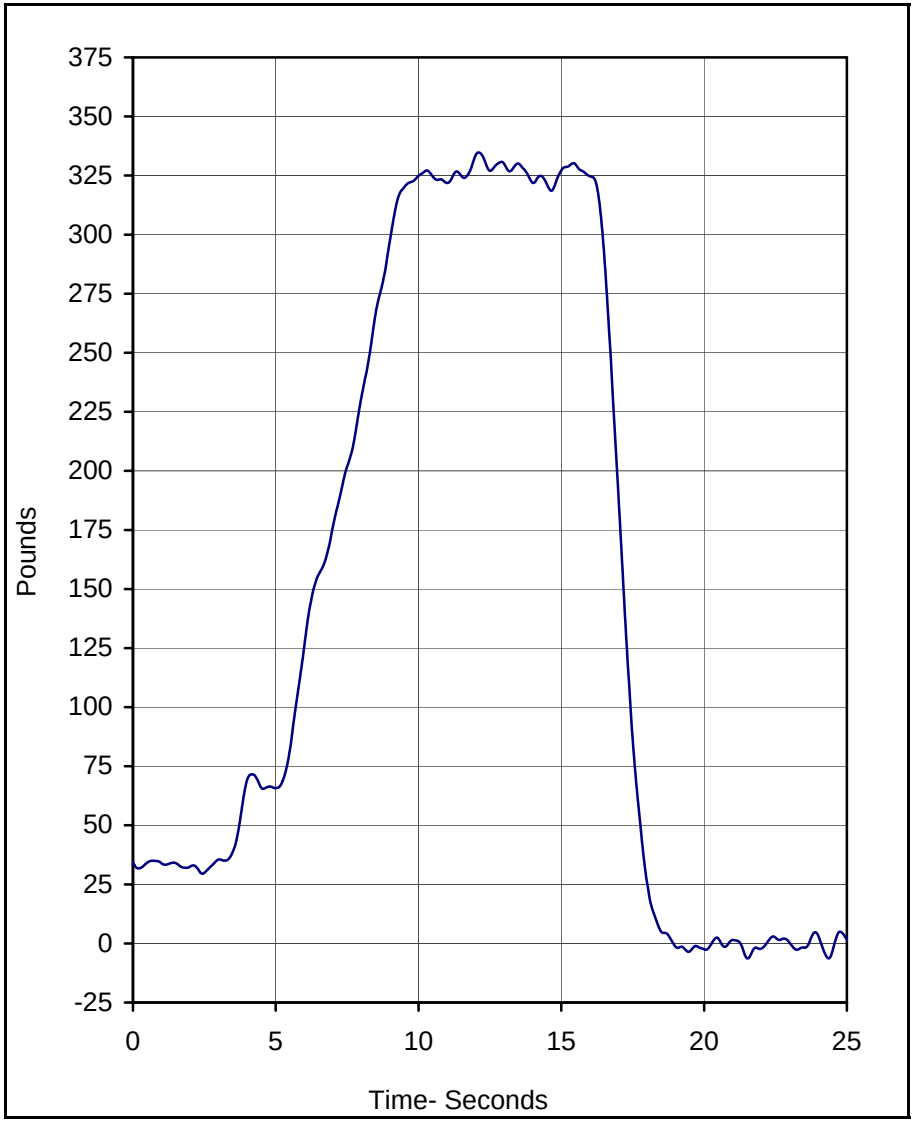
Test Program: FMVSS 207 Aft Moment (Rear Seats)

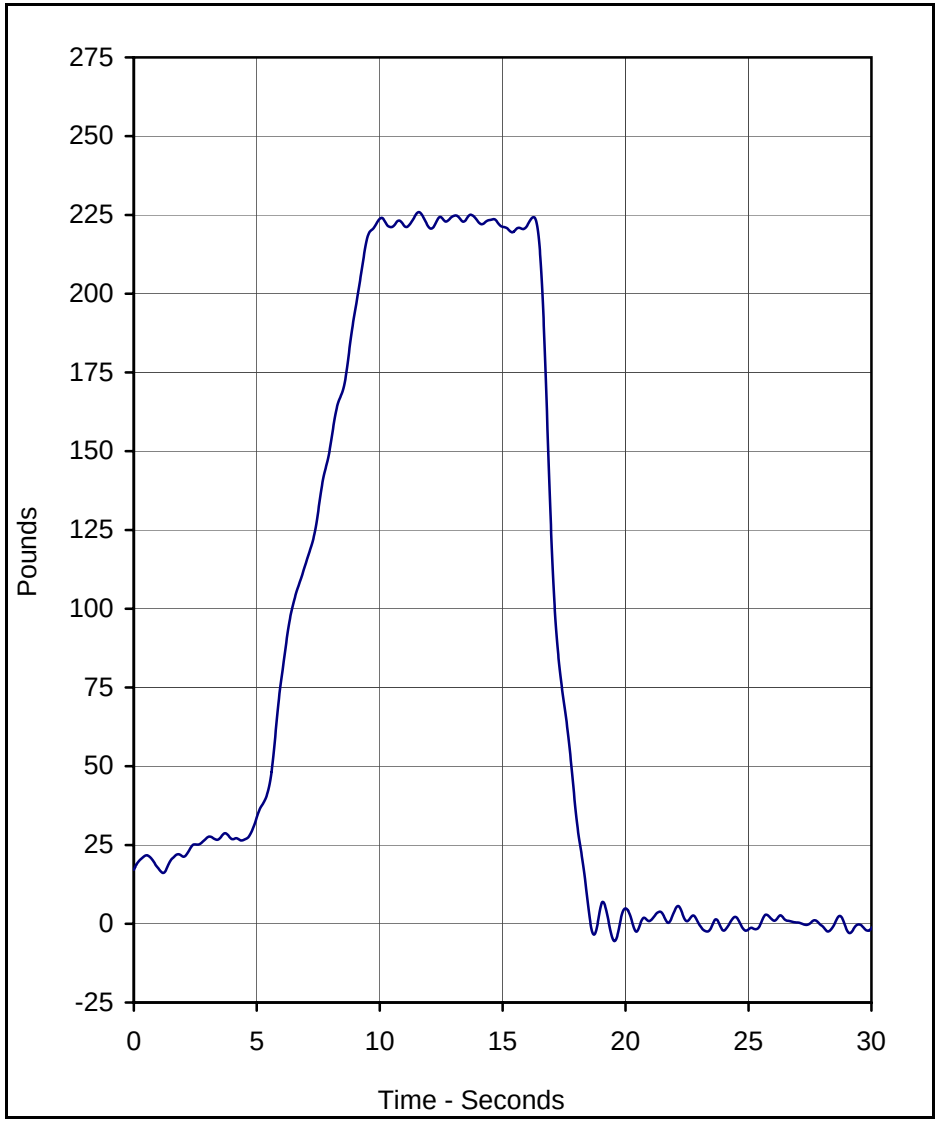
Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/21/10

Project No.: CA5203

KARCO Engineering LLC




| Curve Description | CURNO | Type |
|---|---|---|
| Left Rear Seat | 001 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 334.8 | 12.1 | -6.3 | 24.4 | 1 |

| Curve Description | CURNO | Type |
|---|---|---|
| Right Rear Seat | 002 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 225.9 | 11.6 | -5.5 | 19.6 | 1 |

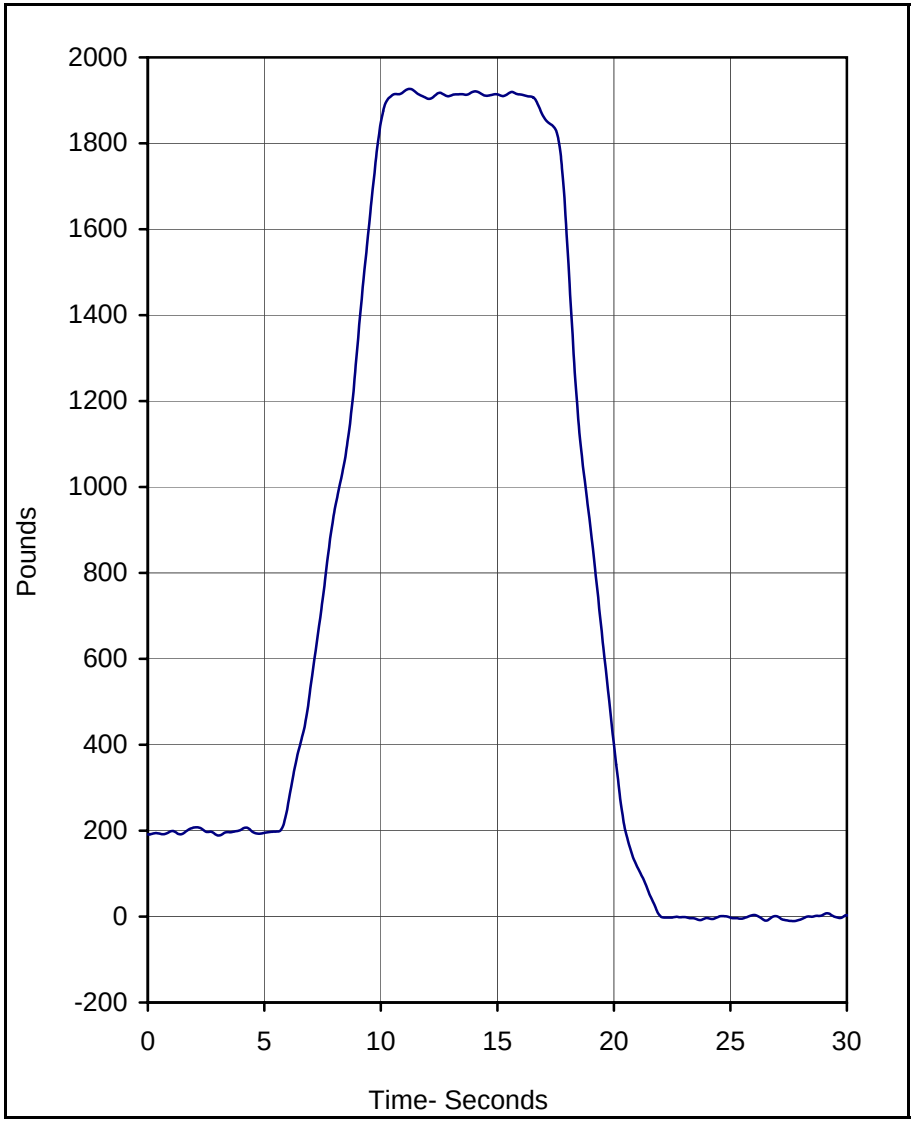
Test Program: FMVSS 207 Fwd Load Seat Back (Rear Seats)

Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/21/10

Project No.: CA5203

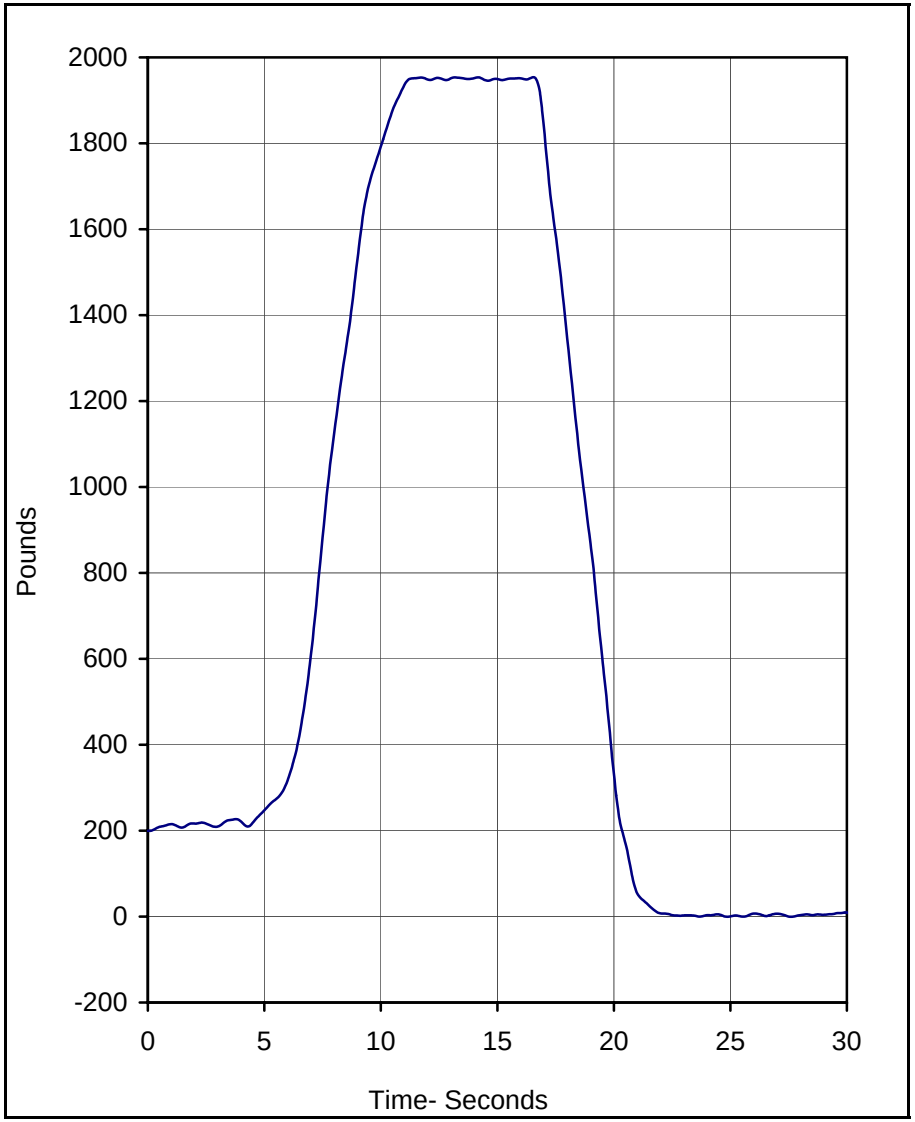
KARCO Engineering LLC




| Curve Description | CURNO | Type |
|---|---|---|
| Rear Seat | 001 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 1926.6 | 11.3 | -8.2 | 23.7 | 1 |

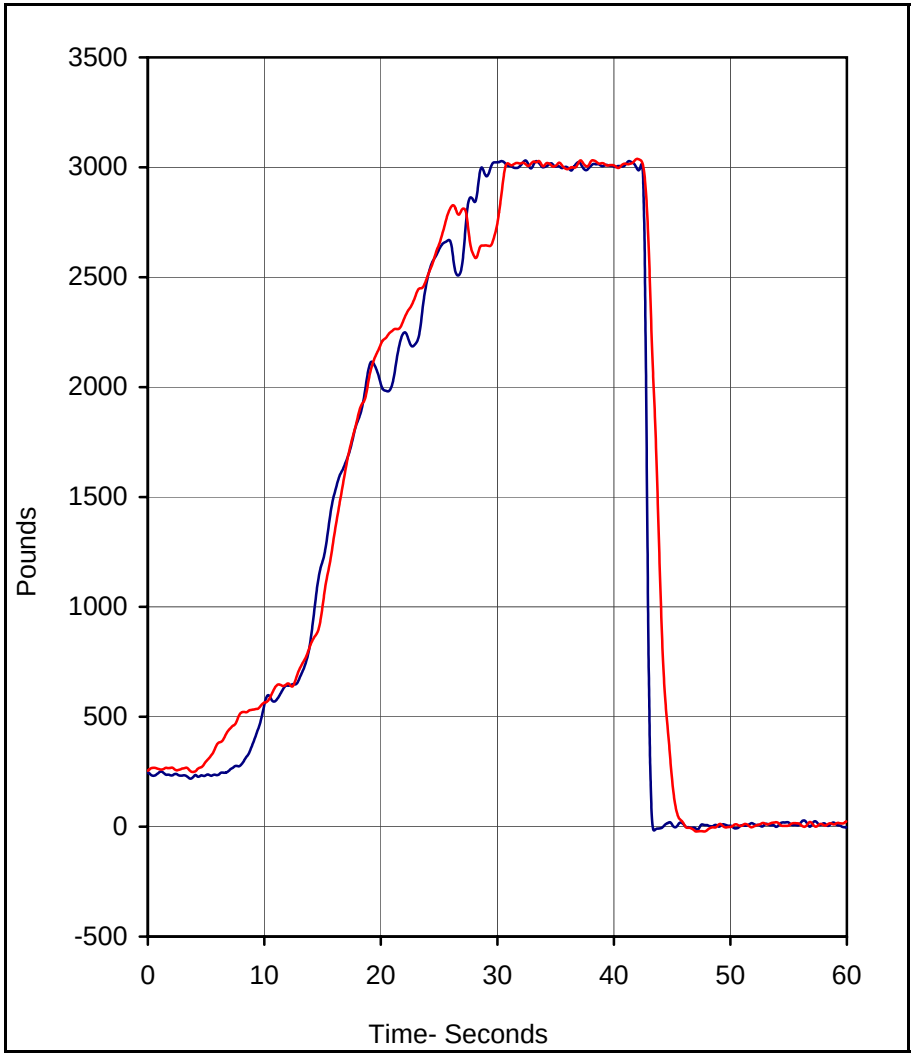
Test Program: FMVSS 207 Aft Load Seat Assembly (Rear Seat)
Test Vehicle: 2010 Nissan Cube 5-Door MPV
Test Date: 09/21/10
Project No.: CA5203

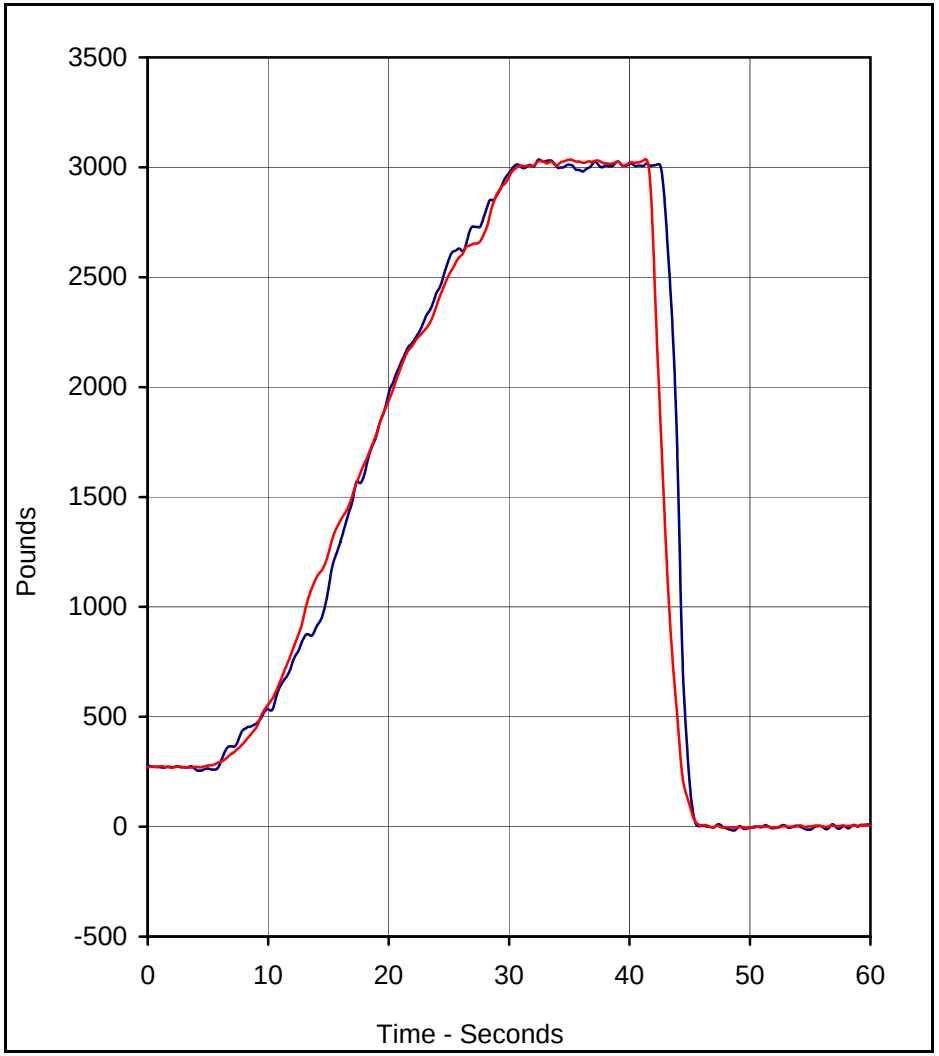



| Curve Description | CURNO | Type |
|---|---|---|
| Rear Seat | 001 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 1953.7 | 16.6 | -0.3 | 24.9 | 1 |

| | | | |
|---|---|---|---|
| Test Program: | FMVSS 207 Fwd Load Seat Assembly (Rear Seat) | Test Date: | 09/21/10 |
| Test Vehicle: | 2010 Nissan Cube 5-Door MPV | Project No.: | CA5203 |




| Curve Description | CURNO | Type |
|---|---|---|
| Left Rear Lap Force | 001 | FIL |
| Left Rear Shoulder Force | 002 | FIL |

| Curve Description | CURNO | Type |
|---|---|---|
| Center Rear Lap Force | 003 | FIL |
| Center Rear Shoulder Force | 004 | FIL |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 3030.9 | 32.4 | -17.3 | 43.5 | 1 |
| Pounds | 3038.4 | 42.0 | -21.8 | 47.1 | 1 |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 3035.5 | 32.5 | -17.5 | 48.7 | 1 |
| Pounds | 3036.4 | 41.4 | -6.4 | 49.8 | 1 |

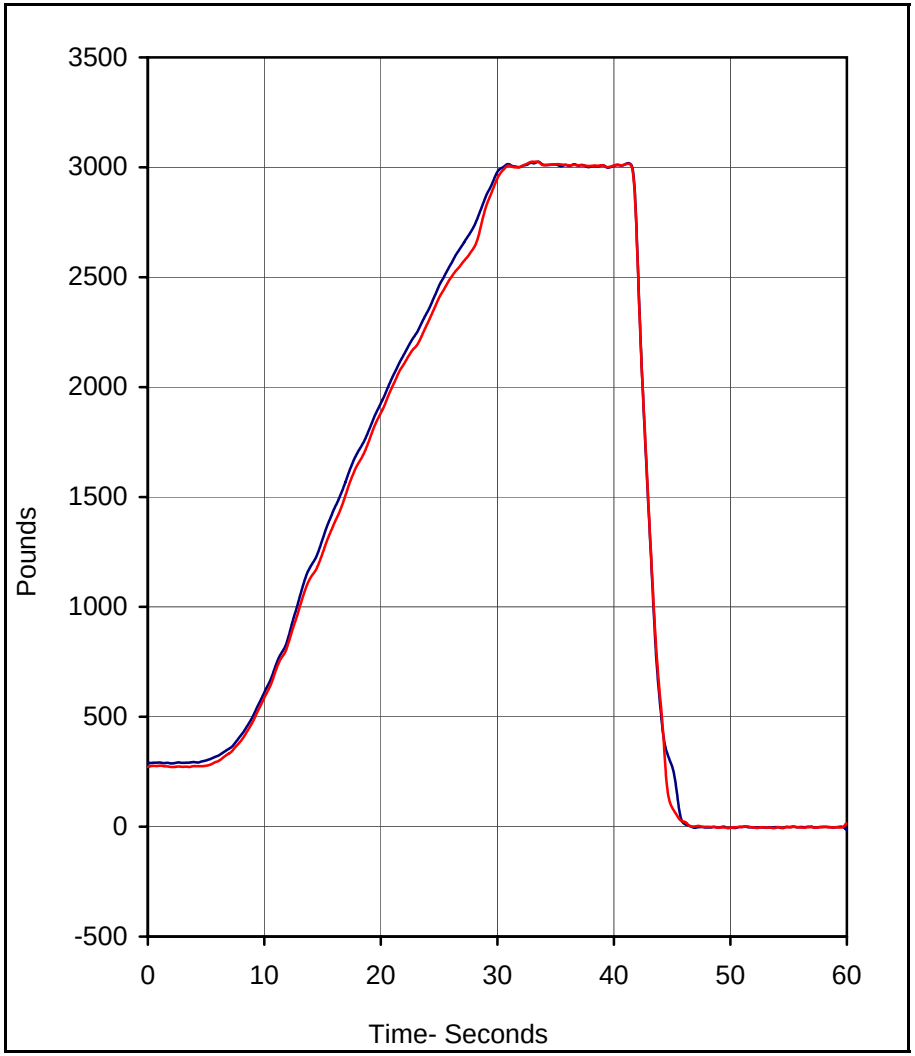
Test Program: FMVSS 207/210 (Rear Seats)

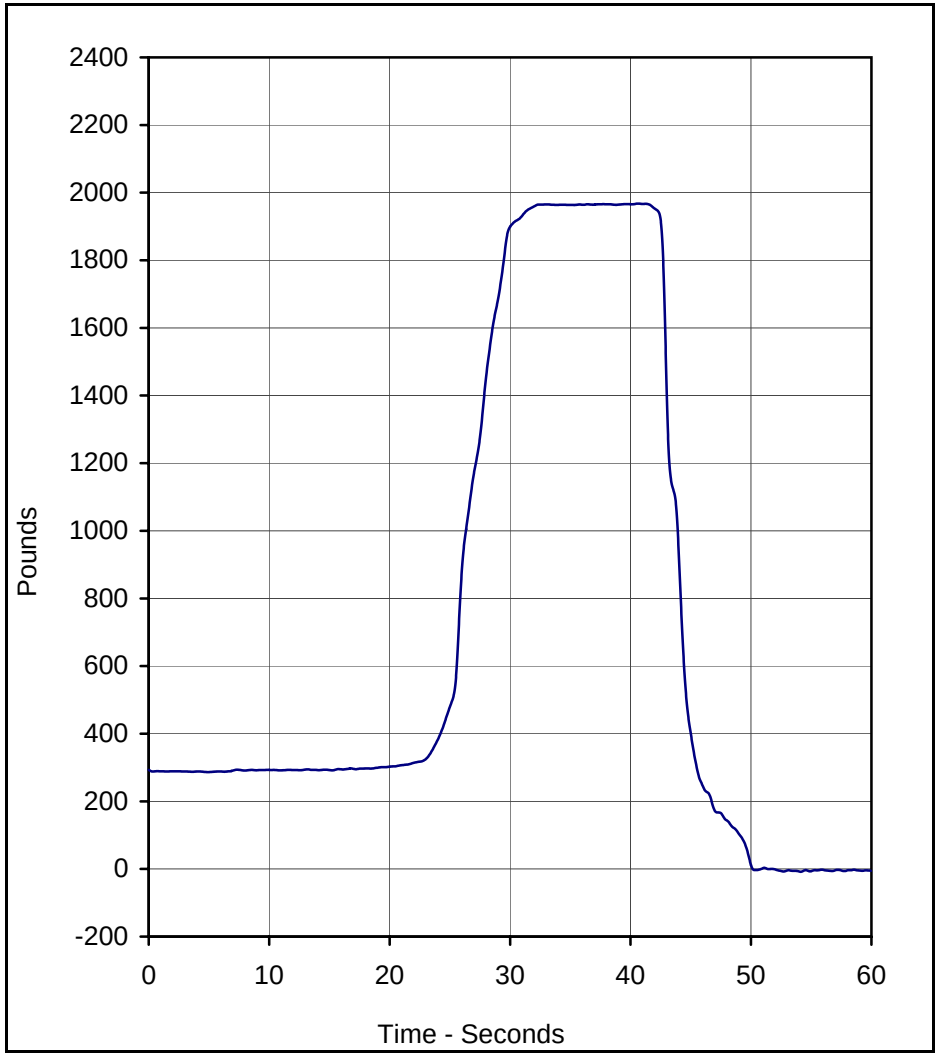
Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/23/10

Project No.: CA5203

KARCO Engineering LLC




| Curve Description | CURNO | Type |
|---|---|---|
| Right Rear Lap Force | 005 | FIL |
| Right Rear Shoulder Force | 006 | FIL |

| Curve Description | CURNO | Type |
|---|---|---|
| Seat Force | 007 | FIL |
| | | |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 3025.3 | 33.5 | -6.1 | 54.4 | 1 |
| Pounds | 3025.7 | 33.4 | -6.5 | 53.8 | 1 |

| Units | Max | Time | Min | Time | Filter (Hz) |
|---|---|---|---|---|---|
| Pounds | 1967.7 | 40.6 | -8.3 | 54.2 | 1 |
| | | | | | |

Test Program: FMVSS 207/210 (Rear Seats)

Test Vehicle: 2010 Nissan Cube 5-Door MPV

Test Date: 09/23/10

Project No.: CA5203

KARCO Engineering LLC

# APPENDIX C

# TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

**FMVSS 207**

**Test Equipment List**

**9/16/2010 - 9/23/10**

**2010 Nissan Cube 5-Door MPV**

| Description | Manufacturer | Model No. | Serial No. | Limit | Accuracy | Cal. Date | Due Cal. |
|---|---|---|---|---|---|---|---|
| Hydraulic Pump | Lincoln | T-3825-C | 2460952 | 8 gpm @ 2700 psi | | | |
| Computer | Panasonic | CF-71 | 8IMAA01852 | N/A | N/A | N/A | N/A |
| TDAS | DTS | TDAS | DM0103 | N/A | SAE J211 | 11/10/09 | 11/10/10 |
| Load Cell | Interface | 1220FS | 132305A | 50K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | Interface | 1220FS | 19344 | 50K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | BLH | U3G1 | 49296 | 3K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | BLH | U-1C | N873 | 6K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | BLH | U-1C | 11139 | 12K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | Alinco | 342-E | 22438-B | 10K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | Alinco | 342-E | 22440-A | 10K | ± 1.0% | 04/05/10 | 10/04/10 |
| Load Cell | BLH | U3G1 | 81711A | 10K | ± 1.0% | 04/05/10 | 10/04/10 |