SAFETY COMPLIANCE TESTING FOR FMVSS 201U
Occupant Protection In Interior Impact
Upper Interior Head Impact Protection

GENERAL MOTORS CORPORATION
2004 Chevrolet Colorado LS
NHTSA No. C40112

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

Test Dates: April 13-14, 2004
Report Date: April 16, 2004

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-220)
WASHINGTON, D.C. 20590
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Approval Date:  8/31/04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By:  

Acceptance Date:  10/13/2004
201U-MGA-04-07

2. Government Accession No. 

3. Recipient's Catalog No. 

4. Title and Subtitle 

5. Report Date 
April 16, 2004

6. Performing Organization Code 
MGA

7. Author(s) 
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201U-MGA-04-07

9. Performing Organization Name and Address 
MGA Research Corporation 
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Troy, Michigan 48083

10. Work Unit No. 

11. Contract or Grant No. 
DTNH22-99-C-11005

12. Sponsoring Agency Name and Address 
U.S. Department of Transportation 
National Highway Traffic Safety Administration 
Enforcement 
Office of Vehicle Safety Compliance (NVS-220) 
400 Seventh Street, SW 
Room 6111 
Washington, DC 20590

13. Type of Report and Period Covered 
Final Test Report

NVS-220

15. Supplementary Notes 

16. Abstract 
A compliance test was conducted on the subject 2004 Chevrolet Colorado LS, NHTSA No. C40112, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-201U-01 for the determination of FMVSS 201U compliance. The test was conducted at the MGA Research Corporation in Troy, Michigan on April 13-14, 2004. Test failures identified were as follows: 

NONE

The data recorded seems to indicate that the 2004 Chevrolet Colorado LS tested appears to comply with the requirements for FMVSS 201U which were set forth by the National Highway Traffic Safety Administration.

17. Key Words 
Compliance Testing 
Safety Engineering 
FMVSS 201U 
2004 Chevrolet Colorado LS

18. Distribution Statement 
Copies of this report are available from: NHTSA Technical Reference Division, Mail Code: NPO-230 
400 Seventh Street, SW 
Washington, D.C. 20590 
Telephone No. (202) 366-4946

19. Security Classif. (of this report) Unclassified
20. Security Classif. (of this page) Unclassified

21. No. of Pages 122
22. Price N/A

Form DOT F 1700.7 (8-69)
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1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2004 Chevrolet Colorado LS, meets the performance requirements of FMVSS 201U, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted during April 13-14, 2004 on a 2004 Chevrolet Colorado LS, manufactured by General Motors Corporation.

All tests were conducted in accordance with the U. S. Department of Transportation, National Highway Traffic Safety Administration's Laboratory Test Procedure TP-201U-01 dated April 3, 1998 and the corresponding MGA Research Corporation's FMVSS 201U procedure number MGATP201U_FRAME#2 dated March 20, 2003.

All tests were conducted at MGA Research Corporation in Troy, Michigan and were performed by MGA engineers and technicians. The FMVSS 201U impactor test machine was used to conduct the testing. Target locations were determined by using a Coordinate Measurement Machine in conjunction with the MGA EZ-Target™ program and MGA procedure MGATP201U_Test Series dated March 20, 2003.
2.0 COMPLIANCE TEST DATA SUMMARY

The 2004 Chevrolet Colorado LS was equipped with A, B, and Rear-pillars, grab handles above each door, an adjustable seat belt anchor on each B-pillar, a fixed seat belt anchor on each rear-pillar, and a light console on the center upper roof.

Upon completion of targeting the test vehicle, ten (10) targets were chosen to be impacted based upon engineering judgment and certification test data provided by General Motors Corporation. Targets were chosen which appeared most likely to give high HIC(d) values. The ten (10) targets chosen were:

<table>
<thead>
<tr>
<th>AP1</th>
<th>BP1</th>
<th>RH</th>
<th>UR5</th>
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</thead>
<tbody>
<tr>
<td>AP2</td>
<td>BP3</td>
<td>SR2B-Left</td>
<td></td>
</tr>
<tr>
<td>AP3</td>
<td>RP1</td>
<td>SR2-B Right</td>
<td></td>
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</tbody>
</table>

The 2004 Chevrolet Colorado LS tested appears to comply with the performance criteria for FMVSS 201U. The HIC(d) measured using the Part 572L (Free Motion Headform) was below 1000 for each tested component.
**TABLE 2-1**  
SUMMARY TABLE OF TEST RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: **2004 Chevrolet Colorado LS**  
VEH. NHTSA NO.: **C40112**  VIN: **1GCCS136848149843**  COLOR: **Maroon**  
VEH. BUILD DATE: **February, 2004**  TEST DATES: **April 13-14, 2004**  
TEST LABORATORY: **MGA Research Corporation**  
OBSERVERS: **David Gotwals, Nicholas Brzuch, George Baker**

<table>
<thead>
<tr>
<th>TARGET</th>
<th>VEHICLE SIDE</th>
<th>HORIZONTAL ANGLE (deg)</th>
<th>VERTICAL ANGLE (deg)</th>
<th>VELOCITY (kph)</th>
<th>HIC(d)</th>
<th>FMH HIC</th>
<th>IMPACT ON FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Above</td>
</tr>
<tr>
<td>AP1</td>
<td>Right</td>
<td>159</td>
<td>49</td>
<td>23.8</td>
<td>624</td>
<td>607</td>
<td>6</td>
</tr>
<tr>
<td>AP2</td>
<td>Left</td>
<td>202</td>
<td>42</td>
<td>23.6</td>
<td>461</td>
<td>390</td>
<td>13</td>
</tr>
<tr>
<td>AP3</td>
<td>Right</td>
<td>159</td>
<td>39</td>
<td>23.5</td>
<td>667</td>
<td>664</td>
<td>12</td>
</tr>
<tr>
<td>BP1</td>
<td>Left</td>
<td>270</td>
<td>28</td>
<td>23.8</td>
<td>620</td>
<td>601</td>
<td>12</td>
</tr>
<tr>
<td>BP3</td>
<td>Right</td>
<td>88</td>
<td>-3</td>
<td>23.8</td>
<td>635</td>
<td>621</td>
<td>12</td>
</tr>
<tr>
<td>RP1</td>
<td>Right</td>
<td>60</td>
<td>31</td>
<td>23.8</td>
<td>636</td>
<td>623</td>
<td>10</td>
</tr>
<tr>
<td>RH</td>
<td>Left</td>
<td>0</td>
<td>22</td>
<td>24.0</td>
<td>678</td>
<td>678</td>
<td>20</td>
</tr>
<tr>
<td>SR2-B</td>
<td>Left</td>
<td>270</td>
<td>50</td>
<td>23.4</td>
<td>946</td>
<td>1033</td>
<td>4</td>
</tr>
<tr>
<td>SR2-B</td>
<td>Right</td>
<td>90</td>
<td>50</td>
<td>23.4</td>
<td>978</td>
<td>1076</td>
<td>8</td>
</tr>
<tr>
<td>UR5</td>
<td>Right</td>
<td>90</td>
<td>38</td>
<td>23.6</td>
<td>698</td>
<td>705</td>
<td>56</td>
</tr>
</tbody>
</table>

Above and left/right refers to the position relative to reference pt. 0 where the target made contact with the Free Motion Headform. See the diagram below for details.
POST TEST COMMENTS:

The following description lists any post-test damage or other test observations for each target.

AP2 Left: The A-Pillar trim separated during impact.

AP3 Right: The A-Pillar trim was separated from the pillar.

RP1 Right: No visible damage to the FMH; slight headliner deformation.

SR2(B) Left: Slight headliner deformation.

SR2(B) Right: Slight headliner deformation.

No damage was observed for any other targets.

REMARKS:

The targets listed were impacted in the following order:

Right: RP1, AP3, AP1, SR2(B), BP3, UR5

Left: AP2, SR2(B), BP1, RH

The 150 mm rule was observed for targets horizontal to each other and the 200 mm rule was observed for vertical components.

RECORDED BY: David G. Gotwals  DATE: April 14, 2004

APPROVED BY: Helen A. Kaleto
**TABLE 2-2**

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2004 Chevrolet Colorado LS  
VEH. NHTSA NO.: C40112  VIN: 1GCCS136848149843  COLOR: Maroon  
VEH. BUILD DATE: February, 2004  TEST DATES: April 13-14, 2004  
TEST LABORATORY: MGA Research Corporation  
OBSERVERS: David Gotwals, Nicholas Brzuch, George Baker

INTERIOR TRIM INFORMATION:  A, B, and Rear-pillars, grab handles above each door, an adjustable seat belt anchor on each B-pillar, a fixed seat belt anchor on each rear-pillar, and a light console on the center upper roof.

SUNROOF INFORMATION:  
- **Installed:**  Yes  No  
- **Operation:**  Electric  Manual

ROLL-BAR INFORMATION:  
- **Installed:**  Yes  No  
- **Padded:**  Yes  No  
- **Braces:**  Yes  No

GENERAL INFORMATION:  
- **Date Received:** April 9, 2004;  
- **Odometer Reading:** 12 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:  
- **Vehicle Manufactured By:** General Motors Corporation  
- **Date of Manufacture:** February, 2004;  
- **VIN:** 1GCCS136848149843  
- **GVWR:** 2268 kg;  
- **GAWR FRONT:** 1149 kg;  
- **GAWR REAR:** 1314 kg
DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:
  FRONT: 230 kpa  REAR: 230 kpa
Recommended Tire Size: P225/75R15
Recommended Cold Tire Pressure:
  FRONT: 230 kpa  REAR: 230 kpa
Size of Tire on Test Vehicle: P225/75R15
Type of Spare Tire: T155/90R16  Saver: X;  Standard

VEHICLE CAPACITY DATA:
  Type of Front Seats: Bench ____;  Bucket X;  Split Bench ____
  Number of Occupants: Front 2;  Rear 3;  TOTAL 5

VEHICLE CAPACITY WEIGHT (VCW) = 550 kg
  No. of Occupants x 68 kg = 340 kg
Rated Cargo/Luggage Weight (RCLW) = 210 kg (difference)
Maximum Cargo/Luggage Weight (RCLW) = 136 kg

WEIGHT OF TEST VEHICLE AS DELIVERED AT LABORATORY: (with maximum fluids)
  Right Front = 460.0 kg  Right Rear = 368.0 kg
  Left Front = 482.5 kg  Left Rear = 388.5 kg
  TOTAL FRONT = 942.5 kg  TOTAL REAR = 756.5 kg
  % Total Weight = 55.5%  % Total Weight = 44.5%
  TOTAL DELIVERED WEIGHT = 1699.0 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:
  Total Delivered Weight = 1699.0 kg
  Rated Cargo/Luggage Weight = 136.0 kg
  Target Test Weight = 1835.0 kg
WEIGHT OF TEST VEHICLE:

Right Front = 454.5 kg  
Left Front = 479.0 kg  
TOTAL FRONT = 933.5 kg

Right Rear = 436.5 kg  
Left Rear = 461.0 kg  
TOTAL REAR = 897.5 kg

% Total Weight = 51.0 %  
% Total Weight = 49.0 %

TOTAL TEST WEIGHT = 1831.0 kg

Weight of ballast secured in vehicle’s cargo area = 136.0 kg

TEST VEHICLE ATTITUDE:

AS DELIVERED:  
Right Front 854.0 mm;  
Left Front 837.0 mm;  
Right Rear 871.0 mm;  
Left Rear 850.0 mm;  
Pitch Angle at Right Door Sill = 0.9 Rear higher  
Pitch Angle at Left Door Sill = 0.7 Rear higher  
Roll Angle at Front Bumper = 0.5 Right higher  
Roll Angle at Rear Bumper = 0.5 Right higher

FULLY LOADED:  
Right Front 856.0 mm;  
Left Front 836.0 mm;  
Right Rear 850.0 mm;  
Left Rear 830.0 mm;  
Pitch Angle at Right Door Sill = 0.5 Rear higher  
Pitch Angle at Left Door Sill = 0.3 Rear higher  
Roll Angle at Front Bumper = 0.7 Right higher  
Roll Angle at Rear Bumper = 0.5 Right higher

AS TARGETED:  
Right Front 1044.0 mm;  
Left Front 1034.0 mm;  
Right Rear 1056.0 mm;  
Left Rear 1039.0 mm;  
Pitch Angle at Right Door Sill = 0.9 Rear higher  
Pitch Angle at Left Door Sill = 0.6 Rear higher  
Roll Angle at Front Bumper = 0.5 Right higher  
Roll Angle at Rear Bumper = 0.5 Right higher

AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill = 0.9 Rear higher  
Pitch Angle at Left Door Sill = 0.6 Rear higher  
Roll Angle at Front Bumper = 0.5 Right higher  
Roll Angle at Rear Bumper = 0.5 Right higher
VEHICLE WHEELBASE = 3195.0 mm

REMARKS: The seat travel distance was measured to be 240 mm for the driver front seat and 240 mm for the passenger front seat.

RECORDED BY: David G. Gotwals      DATE: April 9, 2004

APPROVED BY: Helen A. Kaleto
**TABLE 2-3**

**HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS**

**VEH. MOD YR/MAKE/MODEL/BODY:** 2004 Chevrolet Colorado LS  
**VEH. NHTSA NO.: C40112**  
**VIN: 1GCCS136848149843**  
**COLOR: Maroon**  
**VEH. BUILD DATE:** February, 2004  
**TEST DATES:** April 13-14, 2004  
**TEST LABORATORY:** MGA Research Corporation  
**OBSERVERS:** David Gotwals, Nicholas Brzuch, George Baker

<table>
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<tr>
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<th>MINIMUM HORIZONTAL ANGLE</th>
<th>MAXIMUM HORIZONTAL ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-PILLAR</td>
<td>L 195°-255°</td>
<td>L 201.1°</td>
<td>L 247.3°</td>
</tr>
<tr>
<td></td>
<td>R 105°-165°</td>
<td>R 112.4°</td>
<td>R 159.2°</td>
</tr>
<tr>
<td>B-PILLAR</td>
<td>L 195°-345°</td>
<td>L 201.6°</td>
<td>L 287.9°</td>
</tr>
<tr>
<td></td>
<td>R 15°-165°</td>
<td>R 72.5°</td>
<td>R 159.4°</td>
</tr>
</tbody>
</table>

**AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1**

**REMARKS:**

**RECORDED BY:** David G. Gotwals  
**DATE:** April 9, 2004  
**APPROVED BY:** Helen A. Kaleto
TABLE 2-4
VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 2004 Chevrolet Colorado LS
VEH. NHTSA NO.: C40112  VIN: 1GCCS136848149843  COLOR: Maroon
VEH. BUILD DATE:  February, 2004  TEST DATES:  April 13-14, 2004
TEST LABORATORY:  MGA Research Corporation
OBSERVERS:  David Gotwals, Nicholas Brzuch, George Baker

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<td>FH1</td>
<td>L 0°-50°</td>
<td>L 0°</td>
<td>L 50°</td>
</tr>
<tr>
<td></td>
<td>R 0°-50°</td>
<td>R 0°</td>
<td>R 50°</td>
</tr>
<tr>
<td>FH2</td>
<td>L 0°-50°</td>
<td>L 0°</td>
<td>L 50°</td>
</tr>
<tr>
<td></td>
<td>R 0°-50°</td>
<td>R 0°</td>
<td>R 50°</td>
</tr>
<tr>
<td><strong>SIDE RAIL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR1</td>
<td>L 0°-50°</td>
<td>L 0°</td>
<td>L 50°</td>
</tr>
<tr>
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<td>R 0°-50°</td>
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<td>R 50°</td>
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<td>SR2A</td>
<td>L 0°-50°</td>
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<td>L 50°</td>
</tr>
<tr>
<td></td>
<td>R 0°-50°</td>
<td>R 0°</td>
<td>R 50°</td>
</tr>
<tr>
<td>SR2B</td>
<td>L 0°-50°</td>
<td>L 0°</td>
<td>L 50°</td>
</tr>
<tr>
<td></td>
<td>R 0°-50°</td>
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<td>R 50°</td>
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<td></td>
<td>R 0°-50°</td>
<td>R 0°</td>
<td>R 50°</td>
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<tr>
<td><strong>REAR HEADER</strong></td>
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<tr>
<td>RH</td>
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<td>L 0°</td>
<td>L 22°</td>
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<td></td>
<td>R 0°-50°</td>
<td>R 0°</td>
<td>R 22°</td>
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<td><strong>A-PILLAR</strong></td>
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<td>AP1</td>
<td>L -5°-50°</td>
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<td>L 48°</td>
</tr>
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<td>R 49°</td>
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<td>AP2</td>
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<td>L 42°</td>
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<td>----------------</td>
<td>--------------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
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<td><strong>AP3</strong></td>
<td>L -5°-50°</td>
<td>L -5°</td>
<td>L 39°</td>
</tr>
<tr>
<td></td>
<td>R -5°-50°</td>
<td>R -5°</td>
<td>R 39°</td>
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<tr>
<td><strong>B-PILLAR</strong></td>
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</tr>
<tr>
<td><strong>BP1</strong></td>
<td>L -10°-50°</td>
<td>L -10°</td>
<td>L 28°</td>
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<td></td>
<td>R -10°-50°</td>
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<td>L 0°-50°</td>
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<td>L 7°</td>
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<tr>
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<td>R 0°-50°</td>
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<tr>
<td><strong>BP3</strong></td>
<td>L -10°-50°</td>
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<td>L -3°</td>
</tr>
<tr>
<td></td>
<td>R -10°-50°</td>
<td>R -10°</td>
<td>R -3°</td>
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<tr>
<td><strong>BP4</strong></td>
<td>L -10°-50°</td>
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<td>L -10°</td>
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<tr>
<td></td>
<td>R -10°-50°</td>
<td>R -10°</td>
<td>R -10°</td>
</tr>
<tr>
<td><strong>Rear Pillar</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RP1</strong></td>
<td>L -10°-50°</td>
<td>L -10°</td>
<td>L 31°</td>
</tr>
<tr>
<td></td>
<td>R -10°-50°</td>
<td>R -10°</td>
<td>R 31°</td>
</tr>
<tr>
<td><strong>RP2</strong></td>
<td>L -10°-50°</td>
<td>L -10°</td>
<td>L 2°</td>
</tr>
<tr>
<td></td>
<td>R -10°-50°</td>
<td>R -10°</td>
<td>R 2°</td>
</tr>
<tr>
<td><strong>UPPER ROOF 1</strong></td>
<td>0°-50</td>
<td>0°</td>
<td>42°</td>
</tr>
<tr>
<td><strong>UPPER ROOF 2</strong></td>
<td>0°-50</td>
<td>0°</td>
<td>38°</td>
</tr>
<tr>
<td><strong>UPPER ROOF 3</strong></td>
<td>0°-50</td>
<td>0°</td>
<td>45°</td>
</tr>
<tr>
<td><strong>UPPER ROOF 4</strong></td>
<td>0°-50</td>
<td>0°</td>
<td>45°</td>
</tr>
<tr>
<td><strong>UPPER ROOF 5</strong></td>
<td>0°-50</td>
<td>0°</td>
<td>38°</td>
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<tr>
<td><strong>UPPER ROOF 6</strong></td>
<td>0°-50</td>
<td>0°</td>
<td>45°</td>
</tr>
</tbody>
</table>

As determined using the Procedures specified in S8.13.4.2. *Targets BP2 and RP2 are seat belt anchorage locations.

**RECORDED BY:** David G. Gotwals  **DATE:** April 8, 2004

**APPROVED BY:** Helen A. Kaleto
### TABLE 2-5

**TARGET MEASUREMENTS**

**VEH. MOD YR/MAKE/MODEL/BODY:** 2004 Chevrolet Colorado LS  
**VEH. NHTSA NO.:** C40112  **VIN:** 1GCCS136846149843  **COLOR:** Maroon  
**VEH. BUILD DATE:** February, 2004  **TEST DATES:** April 13-14, 2004  
**TEST LABORATORY:** MGA Research Corporation  
**OBSERVERS:** David Gotwals, Nicholas Brzuch, George Baker

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Description</th>
<th>Left Side</th>
<th>Right Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Seat Fore/Aft Travel (Front seats)</td>
<td>240.0 mm</td>
<td>240.0 mm</td>
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<tr>
<td>T°</td>
<td>Horizontal &lt; (CG-F1 (Left Seat) to (Right A-Pillar))</td>
<td>112.7°</td>
<td>--</td>
</tr>
<tr>
<td>A1°</td>
<td>360° - T°</td>
<td>247.3°</td>
<td>--</td>
</tr>
<tr>
<td>W°</td>
<td>Horizontal &lt; (CG-2 (Left Seat) to (Left A-Pillar))</td>
<td>201.1°</td>
<td>--</td>
</tr>
<tr>
<td>A2°</td>
<td>A2° = W°</td>
<td>201.1°</td>
<td>--</td>
</tr>
<tr>
<td>U°</td>
<td>Horizontal &lt; (CG-2 (Left Seat) to (Left B-Pillar))</td>
<td>287.9°</td>
<td>--</td>
</tr>
<tr>
<td>B1°</td>
<td>B1° = U°</td>
<td>287.9°</td>
<td>--</td>
</tr>
<tr>
<td>V°</td>
<td>Horizontal &lt; (CG-R (Left Seat) to (Left B-Pillar))</td>
<td>201.6°</td>
<td>--</td>
</tr>
<tr>
<td>B2°</td>
<td>B2° = V°</td>
<td>201.6°</td>
<td>--</td>
</tr>
<tr>
<td>W° (right)</td>
<td>Horizontal &lt; (CG-F2 (Right Seat) to (Right A-Pillar))</td>
<td>--</td>
<td>159.2°</td>
</tr>
<tr>
<td>A1° (right)</td>
<td>A1° (right) = W° (right)</td>
<td>--</td>
<td>159.2°</td>
</tr>
<tr>
<td>T° (right)</td>
<td>Horizontal &lt; (CG-F1 (Right Seat) to (Left A-Pillar))</td>
<td>--</td>
<td>247.6°</td>
</tr>
<tr>
<td>A2° (right)</td>
<td>360°-T° (right)</td>
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<td>112.4°</td>
</tr>
<tr>
<td>V° (right)</td>
<td>Horizontal &lt; (CG-R (Right Seat) to (Right B-Pillar))</td>
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<td>159.4°</td>
</tr>
<tr>
<td>B1° (right)</td>
<td>B1° (right) = V° (right)</td>
<td>--</td>
<td>159.4°</td>
</tr>
<tr>
<td>U° (right)</td>
<td>Horizontal &lt; (CG-F2 (Right Seat) to (Right B-Pillar))</td>
<td>--</td>
<td>72.5°</td>
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<tr>
<td>B2° (right)</td>
<td>B2° (right) = U° (right)</td>
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<td>72.5°</td>
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<tr>
<td>J</td>
<td>A-Pillar ((Plane 3) - (Plane 5))</td>
<td>308.1 mm</td>
<td>309.4 mm</td>
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<tr>
<td>J/2</td>
<td>J + 2</td>
<td>154.1 mm</td>
<td>154.7 mm</td>
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<tr>
<td>D1</td>
<td>Upper Roof ((Plane A) - (Plane B))</td>
<td>1603.4 mm</td>
<td></td>
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<tr>
<td>D1/2</td>
<td>D1 + 2</td>
<td>801.7 mm</td>
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<tr>
<td>D2</td>
<td>Upper Roof ((Plane C) - (Plane D))</td>
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<td>D2/2</td>
<td>D2 + 2</td>
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<tr>
<td>.35D1</td>
<td>.35 x D1</td>
<td>561.2 mm</td>
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<tr>
<td>.35D2</td>
<td>.35 x D2</td>
<td>424.0 mm</td>
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<td>Measurement</td>
<td>Description</td>
<td>Left Side</td>
<td>Right Side</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>N</td>
<td>B-Pillar ((BPR) - (lowest point on daylight opening forward of B-Pillar))</td>
<td>454.9 mm</td>
<td>455.2 mm</td>
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<tr>
<td>N/2</td>
<td>B-Pillar ((BP3) - (lowest point on daylight opening forward of B-Pillar))</td>
<td>227.5 mm</td>
<td>227.6 mm</td>
</tr>
<tr>
<td>N/4</td>
<td>B-Pillar ((BP4) - (lowest point on daylight opening forward of B-Pillar))</td>
<td>113.7 mm</td>
<td>113.8 mm</td>
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<tr>
<td>D</td>
<td>R-Pillar (Point 7 – Point M)</td>
<td>710.0 mm</td>
<td>710.0 mm</td>
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<tr>
<td>D/2</td>
<td>D / 2</td>
<td>355.0 mm</td>
<td>355.0 mm</td>
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<tr>
<td>3D/7</td>
<td>3D / 7</td>
<td>304.3 mm</td>
<td>304.3 mm</td>
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</table>

As determined using the Procedures specified in S10.1-10.13.

<table>
<thead>
<tr>
<th>SgRP Locations (vehicle coordinates)</th>
<th>Left (mm)</th>
<th>Right (mm)</th>
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<tbody>
<tr>
<td></td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>Front</td>
<td>1081.3</td>
<td>-360.0</td>
</tr>
<tr>
<td>Rear Row</td>
<td>1907.0</td>
<td>-360.0</td>
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</tbody>
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<table>
<thead>
<tr>
<th>SgRP Locations (world coordinates)</th>
<th>Left (mm)</th>
<th>Right (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>Front</td>
<td>1082.9</td>
<td>-359.7</td>
</tr>
<tr>
<td>Rear Row</td>
<td>1910.0</td>
<td>-359.4</td>
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<table>
<thead>
<tr>
<th>CG Locations (world coordinates)</th>
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<td>CGF1</td>
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<td>CGF2</td>
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<tr>
<td>CGR</td>
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<td>-359.4</td>
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</table>

REFERENCE FOR VEHICLE COORDINATE SYSTEM:
Driver door striker upper bolt hole (x, y, z) = (1310.1, 755.2, 394.9)

REMARKS:

RECORDED BY: David G. Gotwals     DATE: April 9, 2004

APPROVED BY: Helen A. Kaleto
TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2004 Chevrolet Colorado LS
VEH. NHTSA NO.: C40112 VIN: 1GCCS136848149843 COLOR: Maroon
VEH. BUILD DATE: February, 2004 TEST DATES: April 13-14, 2004
TEST LABORATORY: MGA Research Corporation
OBSERVERS: David Gotwals, Nicholas Brzuch, George Baker

<table>
<thead>
<tr>
<th>Target</th>
<th>Location (mm)</th>
<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
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<tbody>
<tr>
<td></td>
<td>x</td>
<td>y</td>
<td>z</td>
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<td></td>
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<tr>
<td>A-Pillar Left Side</td>
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<td></td>
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</tr>
<tr>
<td>AP1</td>
<td>807.1</td>
<td>-564.1</td>
<td>1046.6</td>
<td>202</td>
<td>48</td>
<td>No</td>
</tr>
<tr>
<td>AP2</td>
<td>646.7</td>
<td>-596.0</td>
<td>959.5</td>
<td>202</td>
<td>42</td>
<td>No</td>
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<tr>
<td>AP3</td>
<td>544.4</td>
<td>-615.5</td>
<td>893.3</td>
<td>202</td>
<td>39</td>
<td>No</td>
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<td>A-Pillar Right Side</td>
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<td></td>
<td></td>
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<tr>
<td>AP1</td>
<td>808.4</td>
<td>555.2</td>
<td>1047.7</td>
<td>159</td>
<td>49</td>
<td>No</td>
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<tr>
<td>AP2</td>
<td>646.5</td>
<td>591.7</td>
<td>960.5</td>
<td>159</td>
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<td>No</td>
</tr>
<tr>
<td>AP3</td>
<td>544.1</td>
<td>615.2</td>
<td>893.7</td>
<td>159</td>
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<tr>
<td>B-Pillar Left Side</td>
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<tr>
<td>BP1</td>
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<tr>
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<td>610.9</td>
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<td>630.9</td>
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<td>2181.7</td>
<td>-580.0</td>
<td>888.7</td>
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<td>501.1</td>
<td>1101.9</td>
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<td>Vertical Angle (deg)</td>
<td>Relocation (Yes/No)</td>
<td>Extension (# of 25 mm Spheres)</td>
<td>Impact (Yes/No)</td>
</tr>
<tr>
<td>--------</td>
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<td>------------------------</td>
<td>----------------------</td>
<td>---------------------</td>
<td>---------------------------------</td>
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<tr>
<td>RP2</td>
<td>2173.2   578.0 886.1</td>
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<td>No</td>
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**Front Header Left Side**

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<th>Target</th>
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<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
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<tbody>
<tr>
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<td>732.9   -472.0 1093.8</td>
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<td>REL</td>
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<tr>
<td>FH2</td>
<td>717.8   -324.5 1098.2</td>
<td>180</td>
<td>50</td>
<td>No</td>
<td>--</td>
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**Front Header Right Side**

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<th>Location (mm)</th>
<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
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<tbody>
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<td>50</td>
<td>--</td>
<td>1</td>
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**Side Rail Left Side**

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<th>Location (mm)</th>
<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
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<tbody>
<tr>
<td>SR1</td>
<td>957.6   -497.7 1094.9</td>
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<td>SR2A</td>
<td>1106.7  -503.2 1116.3</td>
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<td>--</td>
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<tr>
<td>REL</td>
<td>1139.4  -478.0 1110.7</td>
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<td>50</td>
<td>--</td>
<td>2</td>
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<td>SR2B</td>
<td>1102.6  -502.9 1116.3</td>
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<td>REL</td>
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<td>SR31</td>
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**Side Rail Right Side**

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<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
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<tr>
<td>SR1</td>
<td>959.4   495.9 1094.5</td>
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<td>50</td>
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<td>No</td>
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<td>1107.6  498.8 1115.8</td>
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<td>50</td>
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<td>2</td>
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<td>SR2B</td>
<td>1098.7  499.5 1114.9</td>
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<td>1631.9  473.8 1119.4</td>
<td>90</td>
<td>50</td>
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<td>--</td>
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<tr>
<td>SR32</td>
<td>1802.1  471.2 1118.7</td>
<td>90</td>
<td>50</td>
<td>No</td>
<td>--</td>
<td>No</td>
</tr>
</tbody>
</table>

**Rear Header Left Side**

<table>
<thead>
<tr>
<th>Target</th>
<th>Location (mm)</th>
<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH</td>
<td>2152.5  -373.0 1130.6</td>
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<td>22</td>
<td>No</td>
<td>--</td>
<td>Yes</td>
</tr>
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</table>

**Rear Header Right Side**

<table>
<thead>
<tr>
<th>Target</th>
<th>Location (mm)</th>
<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH</td>
<td>2150.0  374.0 1130.3</td>
<td>0</td>
<td>22</td>
<td>No</td>
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<td>No</td>
</tr>
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</table>

**Upper Roof Left Side**

<table>
<thead>
<tr>
<th>Target</th>
<th>Location (mm)</th>
<th>Horizontal Angle (deg)</th>
<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
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<tbody>
<tr>
<td>UR1</td>
<td>1238.0  -407.7 1173.4</td>
<td>270</td>
<td>42</td>
<td>No</td>
<td>--</td>
<td>No</td>
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<tr>
<td>UR2</td>
<td>1404.9  -409.0 1175.6</td>
<td>270</td>
<td>38</td>
<td>No</td>
<td>--</td>
<td>No</td>
</tr>
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</table>
### SUMMARY OF TARGETING RESULTS

<table>
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<th>Vertical Angle (deg)</th>
<th>Relocation (Yes/No)</th>
<th>Extension (# of 25 mm Spheres)</th>
<th>Impact (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>y</td>
<td>z</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UR3</td>
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<tr>
<td>Upper Roof Right Side</td>
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<tr>
<td>UR4</td>
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<tr>
<td>UR5</td>
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<td>UR6</td>
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As determined using the Procedures specified in S10.1-10.13.

**REMARKS:**

**RECORDED BY:** David G. Gotwals  
**DATE:** April 9, 2004  
**APPROVED BY:** Helen A. Kaleto
Impact Testing
2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST #3 RIGHT AP1
H/V IMPACT ANGLE= 159/49
FM4083 POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: C40112  VEHICLE YR/MAKE/MODEL: 2014 CHEVY COLORADO LS

GENERAL TEST PARAMETERS:

Target (Vehicle Side): left  AP1  Test Number: 3
MGA Test Reference No.: FMY Windsor 3
Approach Angles:
Vertical: 49°  FMH Serial No: 38
Horizontal: 159°  Temperature: 24°F
Humidity: 23%
Time of Test: 2:20 am/midnight

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
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</thead>
<tbody>
<tr>
<td>624</td>
<td>607</td>
<td>7.7</td>
<td>23.8</td>
<td>6</td>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

<table>
<thead>
<tr>
<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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</thead>
<tbody>
<tr>
<td>X</td>
<td>5</td>
<td>J86197</td>
<td>-107.5</td>
<td>1.20</td>
<td>1.20</td>
</tr>
<tr>
<td>Y</td>
<td>6</td>
<td>J86195</td>
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<td>1.25</td>
<td>1.25</td>
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<td>J88353</td>
<td>97.1</td>
<td>1.51</td>
<td>1.51</td>
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</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By:  
Approved By: Helen A. Kalito  Date: 4/13/04

*Only necessary for NHTSA (Government) Compliance testing.
FMH
G0417-001.6

Customer: CHEVY
Test # 3
FM4083
Additional Desc: N/A

Vehicle Program: COLORADO LS
Model Year: 2004
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 159/49

HIC(d) = 624, HIC = 607, Delta T = 7.7 msec

Max Resultant = 104.3 g's @ 18.2 mm

Resultant (g's) vs. Displacement (mm)

Max Resultant = 104.3 g @ 2.9 msec

Resultant Accel (g's) vs. Time (msec)
FMH
G0417-001.6

Customer: CHEVY
Test # 3
FM4083
Additional Desc: N/A

Vehicle Program: COLORADO LS
Model Year: 2004
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 159/49

HIC(d) = 624, HIC = 607, Delta T = 7.7 msec

Max Acceleration = -0.2 g's @ 0 msec, Min Acceleration = -104 g's @ 2.9 msec

Accel X (g's) vs. Time (msec)

Max Acceleration = 15.7 g's @ 6.6 msec, Min Acceleration = -6.4 g's @ 2.5 msec

Accel Y (g's) vs. Time (msec)
Max Acceleration = 5.5 g's @ 14.2 msec, Min Acceleration = -30.6 g's @ 6.7 msec

Max Velocity = 24 kph @ 108.3 msec, Impact Velocity = 23.8 kph
FMH
G0417-001.6

Customer: CHEVY
Test # 3
FM4083
Additional Desc: N/A

Vehicle Program: COLORADO LS
Model Year: 2004
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 159/49

HIC(d) = 624, HIC = 607, Delta T = 7.7 msec

Max Displacement = 33.2 mm @ 8.9 msec

Displacement (mm) vs. Time (msec)
Impact Testing
4/14/04
2004 CHEVY COLORADO LS C40112
FMVSS 201 U - UPPER INTERIOR
TEST #7 LEFT AP2
H/V IMPACT ANGLE = 202 / 42
FM4087 POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: C40112  VEHICLE YR/MAKE/MODEL: 2004 CHEVY SUBURBAN

GENERAL TEST PARAMETERS:
Target (Vehicle Side): Left Front  A82  Test Number: 4
MGA Test Reference No.: 040027  Temperature: 23 °F/C
Approach Angles:  Horizontal 202°  Humidity: 20%
Vertical 42°  Time of Test: 9:45 am
FMH Serial No: 3B

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>461</td>
<td>390</td>
<td>10.4</td>
<td>23.6</td>
<td>Above Pt. O 13 Left/Right Pt. O 4</td>
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</tbody>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

<table>
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<tr>
<th>Axis</th>
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<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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</thead>
<tbody>
<tr>
<td>X</td>
<td>5</td>
<td>J36197</td>
<td>-107.3</td>
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<td>1.20</td>
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</tbody>
</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

A-pillar trim separated from panel impact.

Recorded By: [Signature]  Approved By: [Signature]  Date: 4/14/04

*Only necessary for NHTSA (Government) Compliance testing.
Max Acceleration = 0 g's @ 0 msec, Min Acceleration = -109.2 g's @ 2.2 msec

Max Acceleration = 8 g's @ 13.6 msec, Min Acceleration = -34.1 g's @ 2.9 msec
HIC(d) = 461, HIC = 390, Delta T = 10.4 msec

Max Acceleration = 8.4 g's @ 13.8 msec, Min Acceleration = -18.3 g's @ 5.2 msec

Max Velocity = 23.8 kph @ 107.7 msec, Impact Velocity = 23.6 kph
HIC(d) = 461, HIC = 390, Delta T = 10.4 msec

Max Displacement = 31.4 mm @ 10.5 msec

Displacement (mm) vs. Time (msec)
2004 CHEVY COLORADO C40112
FMVSS 2010 - UPPER INTERIOR
TEST#2 RIGHT AP3
H/V IMPACT ANGLE = 159 / 39
FMVSS 1022  POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: C40112  VEHICLE YR/MAKE/MODEL: 2004 CHEVY COLORADO LT

GENERAL TEST PARAMETERS:

Target (Vehicle Side): left/right: ○ A
MGA Test Reference No.:
Approach Angles: Horizontal 159°  Vertical 35°

Test Number: 2
Temperature: 24 °F
Humidity: 33%
Time of Test: 1:57 am/pm
FMH Serial No: 37

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
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</thead>
<tbody>
<tr>
<td>667</td>
<td>664</td>
<td>4.0</td>
<td>23.5</td>
<td>Above Pt. 0, Left/Right 12 3</td>
</tr>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

<table>
<thead>
<tr>
<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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<tbody>
<tr>
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<td>1.20</td>
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<td>1.23</td>
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<td>Z</td>
<td>7</td>
<td>J35791</td>
<td>89.3</td>
<td>1.51</td>
<td>1.51</td>
</tr>
</tbody>
</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

A. Pileup was separation from the pileup

Recorded By: [Signature]  Approved By*: Helen K. Date: 4/3/04

*Only necessary for NHTSA (Government) Compliance testing.
HIC(d) = 667, HIC = 664, Delta T = 4.8 msec

Max Resultant = 141.8 g's @ 14.3 mm

Max Resultant = 141.8 g @ 2.5 msec
HIC(d) = 667, HIC = 664, Delta T = 4.8 msec

Max Acceleration = .8 g's @ 0 msec, Min Acceleration = -140.1 g's @ 2.5 msec

Max Acceleration = 21 g's @ 3.9 msec, Min Acceleration = -8.3 g's @ 7.9 msec
Max Acceleration = -1 g's @ 13 msec, Min Acceleration = -19.4 g's @ 5.5 msec

Max Velocity = 23.7 kph @ 107.4 msec, Impact Velocity = 23.5 kph
FMH
G0417-001.6

Customer: CHEVY
Test #: 2
FM4082
Additional Desc: N/A

Vehicle Program: COLORADO
Model Year: 2004
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 159/39

HIC(d) = 667, HIC = 664, Delta T = 4.8 msec

Max Displacement = 23.1 mm @ 8 msec

Displacement (mm) vs. Time (msec)
Impact Testing

4/14/04

2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR

TEST #9 LEFT BP1
HV IMPACT ANGLE = 270 / 28

FM4089 PRE-TEST
Impact Testing

4/14/04

2004 CHEVY COLORADO LS G40142
FMVSS 201U - UPPER INTERIOR

TEST #9 LEFT B-P1
H/V IMPACT ANGLE= 270 / 28

FM4089 POST TEST
Impact Testing

2006 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST #9  LEFT BP1
HV IMPACT ANGLE = 270 / 28
FM4089  POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: CY0112  VEHICLE YR/MAKE/MODEL: 1994 FORD CROWN VICTORIA

GENERAL TEST PARAMETERS:
Target (Vehicle Side): Left/Right: Left
MGA Test Reference No.: Toledo
Approach Angles: Horizontal: 270° Vertical: 26°

Test Number: 9
Temperature: 24°F
Humidity: 70%
Time of Test: 1:26 am

TEST RESULTS:

<table>
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<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Above Pt. O</td>
</tr>
<tr>
<td>620</td>
<td>601</td>
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<td>23.8</td>
<td>12</td>
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</table>

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7284-2000)

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<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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<tbody>
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<td>J31051</td>
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<td>1.51</td>
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</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):


Recorded By: [Signature]  Approved By*: [Signature] Date: 4/4/04

*Only necessary for NHTSA (Government) Compliance testing.
HIC(d) = 620, HIC = 601, Delta T = 8.6 msec

Max Resultant = 122.4 g/s @ 31.7 mm

Max Resultant = 122.4 g @ 6.1 msec
Max Acceleration = -.6 g's @ 0 msec, Min Acceleration = -112.7 g's @ 6.1 msec

Max Acceleration = 3.8 g's @ 4.4 msec, Min Acceleration = -3.1 g's @ 7.6 msec
Max Acceleration = 17.4 g's @ 14.3 msec, Min Acceleration = -47.7 g's @ 6 msec

Max Velocity = 23.9 kph @ 109.1 msec, Impact Velocity = 23.8 kph
Max Displacement = 35.2 mm @ 9.3 msec

Displacement (mm) vs. Time (msec)
Impact Testing

3/19/04

G0407-001-6

2004 CHEVY COLORADO LS C40112

FMVSS 201U - UPPER INTERIOR

TEST #5 RIGHT BP3

HIV IMPACT ANGLE = 88° ± 3°

FM4085 POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: CY0112    VEHICLE YR/MAKE/MODEL: 2004 CHEVY AVALANCHE LS

GENERAL TEST PARAMETERS:

Target (Vehicle Side): Left 893   Temperature: 24°F
MGA Test Reference No.: 893   Humidity: 26%
Approach Angles: Horizontal 88°   Time of Test: 4:00 am/pm
Vertical -3°    FMH Serial No: 36

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

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<tr>
<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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<tbody>
<tr>
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REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By:  
Approved By*:

*Only necessary for NHTSA (Government) Compliance testing.
Customer: CHEVY
Test #: 5
FM4085
Additional Desc: N/A

Vehicle Program: COLORADO LS

Model Year: 2004
Target: BP3
Vehicle Side: Right
Horz/Vert Angle: 88/-3

HIC(d) = 635, IIIC = 621, Delta T = 7.7 msec

Max Resultant = 118.2 g's @ 22 mm

Max Resultant = 118.2 g @ 4 msec
HIC(d) = 635, HIC = 621, Delta T = 7.7 msec

Max Acceleration = 1 g's @ 0 msec, Min Acceleration = -115.6 g's @ 3.7 msec

Max Acceleration = 15.2 g's @ 5.5 msec, Min Acceleration = -2.3 g's @ 14.8 msec
Max Acceleration = 2.5 g's @ 16.4 msec, Min Acceleration = -33.5 g's @ 5.4 msec

Max Velocity = 23.9 kph @ 107.4 msec, Impact Velocity = 23.8 kph
HIC(d) = 635, HIC = 621, Delta T = 7.7 msec

Max Displacement = 28.5 mm @ 8.3 msec

Displacement (mm) vs. Time (msec)
**SUMMARY OF FMVSS 201U TEST**

**JOB/NHTSA NO:** CY0112  
**VEHICLE YR/MAKE/MODEL:** 2004 CHEVY COELENEDELS

**GENERAL TEST PARAMETERS:**  
Target (Vehicle Side): Left/Right  
MGA Test Reference No.: FM4081  
Approach Angles: Horizontal 60°  
Vertical 31°  
Test Number: 1  
Temperature: 24 °F/°C  
Humidity: 23 %  
Time of Test: 12:00 am/pm  
FMH Serial No: 36

**TEST RESULTS:**

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>636</td>
<td>625</td>
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**INSTRUMENTAION INFORMATION:** (all accelerometers are Endevco 7264-2000)

<table>
<thead>
<tr>
<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
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<th>ΔV Post-Test</th>
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<td>99.1</td>
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<td>1.51</td>
</tr>
</tbody>
</table>

**REMARKS** (Summary of test, damage, non-compliance, invalid test, etc.):

- NO VISIBLE DAMAGE TO FMH
- SLIGHT HORIZONTAL DEFORMATION

Recorded By: [Signature]  
Approved By*: [Signature]  
Date: 4/15/04

*Only necessary for NHTSA (Government) Compliance testing.
Customer: CHEVY
Test # 1
PM4081
Additional Desc: N/A

Vehicle Program: COLORADO
Model Year: 2004
Target: RP1
Vehicle Side: Right
Horz/Vert Angle: 60/31

HIC(d) = 636, HIC = 623, Delta T = 8.6 msec

Max Acceleration = 0.5 g's @ 0 msec, Min Acceleration = -109.2 g's @ 5.7 msec

Max Acceleration = 9.8 g's @ 3.3 msec, Min Acceleration = -2.9 g's @ 13 msec
Customer: CHEVY
Test #: 1
FM4081
Additional Desc: N/A

Vehicle Program: COLORADO
Test Date: 4/13/04

Model Year: 2004
Target: RP1
Vehicle Side: Right
Horz/Vert Angle: 60/31

HIC(d) = 636, HIC = 623, Delta T = 8.6 msec

Max Acceleration = 10.4 g's @ 3.1 msec, Min Acceleration = -26.4 g's @ 6.1 msec

Max Velocity = 23.9 kph @ 110.8 msec, Impact Velocity = 23.8 kph
HIC(d) = 636, HIC = 623, Delta T = 8.6 msec

Max Displacement = 37.8 mm @ 9.3 msec

Displacement (mm) vs. Time (msec)
Impact Testing
G0417-001.0
2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST #10 LEFT RH
HV IMPACT ANGLE = 0 / 22
FM4090   PRE-TEST
mga  Impact Testing
G0407-001.6
2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST #10 LEFT RH
F/V IMPACT ANGLE = 0/22
FM4090  POST TEST
1997 CHEVY COLORADO LS 640112
405-653-2011 U - UPPER INTERIOR
TEST #10 LEFT RH
HV IMPACT ANGLE = 0/22
PM/000 POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: 490112  VEHICLE YR/MAKE/MODEL: 2004 CHEVY MALIBU LS

GENERAL TEST PARAMETERS:
Target (Vehicle Side): Left 2L4
MGA Test Reference No.: 644090
Approach Angles: Horizontal 0° Vertical 27°

Test Number: 10
Temperature: 24°F
Humidity: 20%
Time of Test: 2:00 AM
FMH Serial No: 37

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Above Pt. O</td>
</tr>
<tr>
<td>678</td>
<td>678</td>
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<td>24.0</td>
<td>20</td>
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INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

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<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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<tbody>
<tr>
<td>X</td>
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<td>J35800</td>
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<td>J35821</td>
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<td>J35791</td>
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<td>1.81</td>
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</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

NO VISIBLE DAMAGE

Recorded By: [Signature]  Approved By*: [Signature]  Date: 9/4/04

*Only necessary for NHTSA (Government) Compliance testing.
Customer: CHEVY
Vehicle Program: COLORADO LS
Model Year: 2004
Target: RH
Vehicle Side: Left
Horz/Vert Angle: 0/22

HIC(d) = 678, HIC = 678, Delta T = 9.6 msec

Max Resultant = 133.2 g's @ 42.4 mm

Max Resultant = 133.2 g @ 8.3 msec

Resultant (g's) vs. Displacement (mm)

Resultant Accel (g's) vs. Time (msec)
Max Acceleration = -4 g's @ 0 msec, Min Acceleration = -128.9 g's @ 8.6 msec

Max Acceleration = 13.8 g's @ 5.1 msec, Min Acceleration = -7 g's @ 15.1 msec
Vehicle Program: COLORADO LS

HIC(d) = 678, HIC = 677, Delta T = 9.6 msec

Max Acceleration = 31.6 g's @ 12 msec, Min Acceleration = -36.2 g's @ 8.3 msec

Max Velocity = 24.1 kph @ 107.7 msec, Impact Velocity = 24.0 kph
FMH
G0417-001.6

Customer: CHEVY
Test #: 10
FM4090
Additional Desc: N/A

Vehicle Program: COLORADO LS

Model Year: 2004
Target: RH
Vehicle Side: Left
Horz/Vert Angle: 0/22

HIC(d) = 678, HIC = 678, Delta T = 9.6 msec

Max Displacement = 44.2 mm @ 10.1 msec

Displacement (mm) vs. Time (msec)
2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST #8  LEFT SR2(B)
H/V IMPACT ANGLE = 270 / 50
PRE-TEST
Impact Testing

C0417-0016

2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR

TEST #8 LEFT SR2(B)
HV IMPACT ANGLE = 270/60

FM4088 POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: C40112  VEHICLE YR/MAKE/MODEL: 2004 CHEVY CAVALIER S

GENERAL TEST PARAMETERS:

Target (Vehicle Side) Left Right S R Z B
MGA Test Reference No.: FM408E
Approach Angles: Horizontal 270° Vertical 80°
Humidity: 20%
Temperature: 24°F

Time of Test: 11:55 a.m.
FMH Serial No: 36

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Above Pt. O</td>
</tr>
<tr>
<td>946</td>
<td>1033</td>
<td>5.3</td>
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<td>4</td>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

<table>
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<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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<tr>
<td>x</td>
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<td>J35518</td>
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<td>1.51</td>
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</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.): SLIGHT HEADLINER DEFORMATION

Recorded By: [Signature] Approved By*: [Signature] Kaloto Date: 9/1/04

*Only necessary for NHTSA (Government) Compliance testing.
FMH
G0417-001.6

Customer: CHEVY
Test # 8
FM4088
Additional Desc: N/A

Vehicle Program: COLORADO LS
Model Year: 2004
Target: SR2(b)
Vehicle Side: Left
Horz/Vert Angle: 270/50

HIC(d) = 946, HIC = 1033, Delta T = 5.3 msec

Max Resultant = 163.4 g's @ 38.7 mm

Max Resultant = 163.4 g @ 6.8 msec

Resultant (g's) vs. Displacement (mm)

Resultant Accel (g's) vs. Time (msec)
HIC(d) = 946, HIC = 1033, Delta T = 5.3 msec

Max Acceleration = -2 g/s @ 0 msec, Min Acceleration = -161.6 g/s @ 7.1 msec

Max Acceleration = 5.3 g/s @ 6.6 msec, Min Acceleration = -2.1 g/s @ 2.5 msec
Max Acceleration = 2.8 g's @ 11.3 msec, Min Acceleration = -26.5 g's @ 7.6 msec

Max Velocity = 23.6 kph @ 106.8 msec, Impact Velocity = 23.4 kph
Max Displacement = 41.7 mm @ 8.9 msec

HIC(d) = 946, HIC = 1033, Delta T = 5.3 msec
Impact Testing

CVS-0

604/000/1.6

2004 CHEVY COLORADO LS C40112

VSS 291U - UPPER INTERIOR

TEST#4 RIGHT SR2(B)

H/V IMPACT ANGLE = 90 / 30

FV4084 POST TEST
Impact Testing
4/13/04  G0417-001.6
2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST#4 RIGHT SR2(B)
HV IMPACT ANGLE= 90 / 50
FM4084    POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: C40112  VEHICLE YR/MAKE/MODEL: 2004 CHEVY COLORADO

GENERAL TEST PARAMETERS:
Target (Vehicle Side): left (522)  MGA Test Reference No: 140408
Temperature: 27 °F  Humidity: 26 %
Test Number: 4  Time of Test: 3:15 am/pm
Approach Angles: Horizontal 90 °  FMH Serial No: 35
  Vertical 80 °

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>Δt (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Above Pt. O</td>
</tr>
<tr>
<td>978</td>
<td>1076</td>
<td>5.2</td>
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</tr>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

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<th>Axis</th>
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<th>Serial No.</th>
<th>DLR Value</th>
<th>ΔV Pre-Test</th>
<th>ΔV Post-Test</th>
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<tbody>
<tr>
<td>A</td>
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<td>1.51</td>
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</tbody>
</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Slight Headliner Deformation

Recorded By: [Signature]  Approved By: [Signature] Date: 9/15/04

*Only necessary for NHTSA (Government) Compliance testing.
HIC(d) = 978, HIC = 1076, Delta T = 5.2 msec

Max Resultant = 162 g's @ 33.7 mm

Max Resultant = 162 g @ 6.2 msec
HIC(d) = 978, HIC = 1076, Delta T = 5.2 msec

Max Acceleration = -1 g's @ 0 msec, Min Acceleration = -159.3 g's @ 5.9 msec

Max Acceleration = 2.8 g's @ 2.8 msec, Min Acceleration = -4.7 g's @ 8.7 msec
Max Acceleration = 5.1 g's @ 3.6 msec, Min Acceleration = -39.8 g's @ 7 msec

Max Velocity = 23.7 kph @ 107.2 msec, Impact Velocity = 23.4 kph
HIC(d) = 978, HIC = 1076, Delta T = 5.2 msec

Max Displacement = 35.4 mm @ 7.8 msec

Displacement (mm) vs. Time (msec)
2004 CHEVY COLORADO LS 04/04
FMVSS 201 U - UPPER INTERIOR
TEST#6 RIGHT UP6
H/V IMPACT ANGLE= 90 deg
FM4086  PRE-TEST
mga

Impact Testing

4/13/04

004 F0016

2004 CHEVY COLORADO LS 040142

FMVSS 201U - UPPER INTERIOR

TEST #6 RIGHT UR6

H/V IMPACT ANGLE = 90 / 38

FM4086 POST TEST
mca  Impact Testing
4/13/04  G0417-00116
2004 CHEVY COLORADO LS C40112
FMVSS 201U - UPPER INTERIOR
TEST#6 RIGHT UR5
H/V IMPACT ANGLE= 90 / 38
FM4086  POST TEST
SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: CY0112  VEHICLE YR/MAKE/MODEL: 2004 CHEVY COLORADO 4S

GENERAL TEST PARAMETERS:

Target (Vehicle Side): left ( ) right (x) URS  Test Number: 6

MGA Test Reference No.: EMYOE6  Temperature: 24 °F

Approach Angles: horizontal 90°  Humidity: 25%

vertical 38°  Time of Test: 9:57 am/6m

FMH Serial No: 37

TEST RESULTS:

<table>
<thead>
<tr>
<th>HIC(d)</th>
<th>HIC</th>
<th>∆t (msec)</th>
<th>Velocity (kph)</th>
<th>Impact location on FMH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>605</td>
<td>6.0</td>
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<td>S6</td>
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INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

<table>
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<tr>
<th>Axis</th>
<th>Channel</th>
<th>Serial No.</th>
<th>DLR Value</th>
<th>∆V Pre-Test</th>
<th>∆V Post-Test</th>
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<tbody>
<tr>
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</tbody>
</table>

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: [Signature] Approved By: [Signature] Date: 4/3/01

*Only necessary for NHTSA (Government) Compliance testing.
Customer: CHEVY
Test # 6
FM4086
Additional Desc: N/A

Vehicle Program: COLORADO LS
Model Year: 2004
Target: UR5
Vehicle Side: Right
Horz/Vert Angle: 90/38

HIC(d) = 698, HIC = 705, Delta T = 6 msec

Max Resultant = 136.3 g's @ 24.8 mm

Resultant (g's) vs. Displacement (mm)

Max Resultant = 136.3 g @ 4.3 msec

Resultant Accel (g's) vs. Time (msec)
Customer: CHEVY
Test # 6
FM4086
Additional Desc: N/A

Vehicle Program: COLORADO LS
Model Year: 2004
Target: UR5
Vehicle Side: Right
Horz/Vert Angle: 90/38

HIC (d) = 698, HIC = 705, Delta T = 6 msec

Max Acceleration = -1 g's @ 0 msec, Min Acceleration = -134.8 g's @ 4.1 msec

Max Acceleration = 2.5 g's @ 14.7 msec, Min Acceleration = -8.1 g's @ 5.7 msec
Max Acceleration = 5.8 g's @ 18.4 msec, Min Acceleration = -42.6 g's @ 6 msec

Max Velocity = 23.7 kph @ 110.6 msec, Impact Velocity = 23.6 kph
FMH G0417-001.6

Customer: CHEVY  Vehicle Program: COLORADO LS  Model Year: 2004
Test # 6  Target: UR5
FM4086  Vehicle Side: Right
Additional Desc: N/A  Horz/Vert Angle: 90/38

HIC(d) = 698, HIC = 705, Delta T = 6 msec

Max Displacement = 31.5 mm @ 8.5 msec

Displacement (mm) vs. Time (msec)
4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

The following section lists the test equipment for the compliance test series. Items marked with an asterisk are calibrated by an external lab. An additional summary table is given for the pre and post-test calibration data for the Free Motion Headforms. The temperature trace to confirm testing was conducted between 66°F and 78°F (19°C - 26°C) is included in Appendix A.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MANUFACTURER NAME</th>
<th>MODEL #</th>
<th>FUNCTION OF ITEM</th>
<th>ACCURACY</th>
<th>CAL. INTERNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Drop Tower (includes test frame and DAS)</td>
<td>MGA Research Corp.</td>
<td>MGA-100-DC</td>
<td>FMH Calibration</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Accelerometers</td>
<td>Endevco</td>
<td>7264-2000</td>
<td>Acceleration Data</td>
<td>±0.5%</td>
<td>6 months</td>
</tr>
<tr>
<td>*Digital Inclinometer</td>
<td>Mitutoyo</td>
<td>PRO 360</td>
<td>Set Angle of FMH/Targeting</td>
<td>0.1°</td>
<td>Annual</td>
</tr>
<tr>
<td>FMVSS 201U Test Frame (includes the propulsion control system, actuator, test frame, and DAS)</td>
<td>MGA Research Corp.</td>
<td>MGA-100-FMH</td>
<td>Test System</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Free Motion Headforms</td>
<td>UTAMA</td>
<td>035</td>
<td>Test Device</td>
<td>N/A</td>
<td>Pre and Post-Test Series</td>
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<td></td>
<td>UTAMA</td>
<td>036</td>
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<td>High Speed Video</td>
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<td>RO1000</td>
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<td>*FARO™</td>
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<td>SO8059801273</td>
<td>Targeting</td>
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<td>Measuring Devices: - Tape Measure</td>
<td>Stanley</td>
<td>33-215</td>
<td>Measurement Targeting</td>
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<td>- Plumb Bobs</td>
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<td>FMH setup</td>
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<td>- Protractor</td>
<td>Craftsman</td>
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<td>Horizontal Measurement</td>
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<td>*Vehicle Scale</td>
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<td>9804-022</td>
<td>Weighing Vehicle</td>
<td>± .5 kg</td>
<td>Annual</td>
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<tr>
<td>* Scale</td>
<td>Detecto</td>
<td>AP-20</td>
<td>Weigh FMH Head</td>
<td>± 0.01 lb</td>
<td>Annual</td>
</tr>
<tr>
<td>*Temperature Recorder</td>
<td>Dickson</td>
<td>TR-320</td>
<td>Record Temperature and Humidity</td>
<td>± 1°C ± 1% RH</td>
<td>Annual</td>
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<tr>
<td>FMH Serial #</td>
<td>Weight (lbs)</td>
<td>Temp (°C)</td>
<td>% Humidity</td>
<td>Peak Resultant Acceleration (G's)</td>
<td>Peak Lateral Acceleration (G's)</td>
</tr>
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Calibration certificates and headform calibration information can be found in the P572L Performance Calibration report which accompanies this report.

RECORDED BY: David G. Gotwals  DATE: April 14, 2004

APPROVED BY: Helen A. Kaleto
TIRE AND LOADING INFORMATION

SEATING CAPACITY: TOTAL 5 | FRONT 2 | CENTER 1 | REAR 2

The combined weight of occupants and cargo should never exceed 550 kg or 1212 lbs.

<table>
<thead>
<tr>
<th>ORIGINAL TIRE SIZE</th>
<th>COLD TIRE INFLATION PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>P225/75R15</td>
<td>FRONT 230 kPa, 33 PSI</td>
</tr>
<tr>
<td>P225/75R15</td>
<td>REAR 230 kPa, 33 PSI</td>
</tr>
<tr>
<td>T155/90R16</td>
<td>SPARE 420 kPa, 60 PSI</td>
</tr>
</tbody>
</table>

SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION