SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 301L
FUEL SYSTEM INTEGRITY

GENERAL MOTORS CORPORATION
2004 CHEVROLET COLORADO, TRUCK
NHTSA NO. C40112

GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443

OCTOBER 4, 2004

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 5115 (NVS-220)
WASHINGTON, D.C. 20590
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Prepared By: [Signature]

Approved By: [Signature]

Approval Date: [Date]

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: [Signature]

Acceptance Date: [Date]
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<td>Debbie Messick, Project Manager</td>
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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Chevrolet Colorado Truck was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 301 testing to determine if the vehicle was in compliance with the requirements of the standard. The purpose of this standard is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes, and resulting from ingestion of fuels during siphoning.

1.1 The test vehicle was a 2004 Chevrolet Colorado Truck. Nomenclature applicable to the test vehicle are:

   A. Vehicle Identification Number: 1GCCS136848149843

   B. NHTSA No.: C40112

   C. Manufacturer: GENERAL MOTORS CORPORATION

   D. Manufacture Date: 02/04

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 301 testing on September 21, 2004.
SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

2.0 TEST RESULTS

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-301-02 dated 8 November 1994 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-301-02, "Fuel System Integrity".

Based on the test performed, the 2004 Chevrolet Colorado Truck appears to meet the lateral impact requirements of FMVSS 301 testing.
SECTION 3

COMPLIANCE TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of testing on the 2004 Chevrolet Colorado.
SUMMARY OF RESULTS

Vehicle's NHTSA No.: C40112  Test Model: COLORADO

Test Date.: 09/21/04  Time: 16:20  Temperature 74°F

Vehicle Model Year, Make, Model and Body Style:
2004 CHEVROLET COLORADO TRUCK

Vehicle Test Weight: 4370 lbs.; Impact Velocity: 19.7 mph

Type of Front Occupant Restraint System Installed in Test Vehicle:

Driver's DSP: TYPE 2 BELT WITH FRONTAL AIR BAG IN STEERING WHEEL

Right Passenger's DSP: TYPE 2 BELT WITH FRONTAL AIR BAG IN DASH

Stoddard solvent spillage from Vehicle's Fuel System: None

REMARKS:

RECORDED BY: [Signature]  DATE: 09/21/04

APPROVED BY: [Signature]
DATA SHEET 1
TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

NHTSA No.: C40112
Year/Make/Model/Body Style: 2004 CHEVROLET COLORADO
Engine Data: 3.5 LITER 5 CYLINDERS
Transmission Data: 4 SPEED AUTOMATIC
Final Drive Data: REAR WHEEL DRIVE WITH 373 RATIO
Major Options: 3.5L VORTEC 5 CYLINDER ENGINE
Date Received: 07/14/04; Odometer Reading: 153 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: GENERAL MOTORS CORPORATION
Date of Manufacture: 02/04
VIN: 1GCCS136848149843
GVWR: 2268 kg (5000 lbs.); GAWR Front: 1149 kg (2533 lbs.) GAWR Rear: 1314 kg (2896 lbs.)

DATA FROM VEHICLE'S TIRE PLACARD:

Location of Placard on Vehicle: DRIVER'S "B" PILLAR
Tire Pressure With Maximum Capacity Vehicle Load —
   Front: 33 psi; Rear: 33 psi
Recommended Tire Size: P225/75R15
Recommended Cold Tire Pressure: Front = 230 kPa (33 psi) Rear = 230 kPa (33 psi)
Size of Tires on Test Vehicle: P225/75R15
Type of Spare Tire: SPACE SAVER T155/90R16

Vehicle Capacity Data —

Type of Front Seat(s): BUCKET
Number of Occupants: Front = 2; Mid = 0; Rear = 3; Total = 5

A. VEHICLE CAPACITY WEIGHT (VCW) = 1212 lbs.
B. Number of Occupants x 150 lbs. = 750 lbs.
RATED CARGO AND LUGGAGE WEIGHT (RCLW) = A - B = 462 lbs.

RECORDED BY: DATE: 09/21/04
APPROVED BY:
DATA SHEET 2
PRE-TEST DATA

WEIGHT OF TEST VEHICLE:

A. As Received At Laboratory (Maximum Fluids) —

Right Front = 463 kg (1021 lbs.)  Right Rear = 364 kg (802 lbs.)

Left Front = 488 kg (1076 lbs.)  Left Rear = 388 kg (855 lbs.)

TOTAL FRONT = 951 kg (2097 lbs.)  TOTAL REAR = 752 kg (1657 lbs.)

% of TOTAL = 56 %  % of TOTAL = 44 %

TOTAL DELIVERED WEIGHT = 1703 kg (3754 lbs.)

B. Calculation of Target Test Weight —

1. Total Delivered Weight = 1703 kg (3754 lbs.)

2. Rated Cargo & Lugg. Weight (RCLW) = 136 kg (300 lbs.)

3. Weight of 2 Dummies (164 lbs. each) = 149 kg (328 lbs.)

TARGET TEST WEIGHT = 1 + 2 + 3 = 1988 kg (4382 lbs.)

C. Vehicle, Dummies and 136 kg (300 lbs.) of Cargo Weight —

Right Front = 513 kg (1132 lbs)  Right Rear = 456 kg (1005 lbs)

Left Front = 537 kg (1183 lbs)  Left Rear = 476 kg (1050 lbs)

TOTAL FRONT = 1050 kg (2315 lbs)  TOTAL REAR = 932 kg (2055 lbs)

% of TOTAL = 53 %  % of TOTAL = 47 %

TOTAL TEST WEIGHT = 1982 kg (4370 lbs)

Weight of Ballast secured in cargo area = 154 kg (339 lbs)
Type of Ballast: SALT BAGS

Method of Securing Ballast: VEHICLE SEAT BELTS

Vehicle Components Removed for Weight Reduction: NONE
DATA SHEET 2
PRE-TEST DATA CONTINUED

TEST VEHICLE ATTITUDE:

As Delivered —
- Right Front: 846 mm (33.3 inches)
- Left Front: 831 mm (32.7 inches)
- Right Rear: 859 mm (33.8 inches)
- Left Rear: 843 mm (33.2 inches)

As Tested —
- Right Front: 841 mm (33.1 inches)
- Left Front: 826 mm (32.5 inches)
- Right Rear: 838 mm (33.0 inches)
- Left Rear: 820 mm (32.3 inches)

Vehicle's Wheelbase = 3200 mm (126 inches)

FUEL SYSTEM DATA:

Fuel System Capacity Listed in Owner's Manual = 76 liters (19.5 gallons)
Usable Capacity Figure Furnished By COTR = 76 liters (19.5 gallons)

Test Volume Range (91 to 94% of Usable Capacity) —

67 liters (17.7 gallons) TO 69 liters (18.3 gallons)

ACTUAL TEST VOLUME = 68 liters (18.0 gallons) (with entire fuel system filled)

Test Fluid Type: Stoddard solvent
Test Fluid Specific Gravity: .7583
Test Fluid Kinematic Viscosity: 1.7 centistokes at 77° F
Test Fluid Color: BLUE ("red" is preferred)
Type of Vehicle Fuel Pump: ELECTRIC
Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF —
YES, FUEL PUMP WILL RUN FOR TWO TO THREE SECONDS

Details of Fuel System: HIGH PRESSURE ELECTRIC FUEL PUMP
SUPPLY TO FUEL INJECTORS WITH LOW PRESSURE RETURN LINE TO FUEL TANK.

REMARKS:

RECORDED BY:  DATE: 09/21/04
APPROVED BY:   
DATA SHEET 3
POST IMPACT DATA

TYPE OF TEST: 301L
TEST DATE: 09/21/04; TIME: 16:20; TEMP.: 74 °F
VEH. NHTSA NO.: C40112; VIN: 1GCCS136848149843

REQUIRED IMPACT VELOCITY RANGE: 18.9 to 19.9 mph

ACTUAL IMPACT VELOCITY: (speed traps located within 5 feet of impact plane)

Trap No. 1 = 19.7 mph
Trap No. 2 = 19.7 mph
Average Impact Speed = 19.7 mph

REMARKS:

RECORDED BY: [Signature] DATE: 09/21/04
APPROVED BY: [Signature]
DATA SHEET 4
SUMMARY OF FMVSS 301 DATA

TEST VEHICLE NHTSA NO.: C40112; TEST DATE: 09/21/04

VEHICLE YEAR/MAKE/MODEL/BODY STYLE:
2004 CHEVROLET COLORADO

TYPE OF IMPACT: 301L

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. From impact until vehicle motion ceases —
   Actual = 0 oz.  Maximum Allowable = 1 ounce

B. For 5 minute period after vehicle motion ceases —
   Actual = 0 oz.  Maximum Allowable = 5 ounces

C. For next 25 minutes —
   Actual = 0 oz.  Maximum Allowable = 1 oz./minute

D. Provide Spillage Details: NONE

REMARKS:

RECORDED BY: DATE: 09/21/04

APPROVED BY:
DATA SHEET 5
STATIC ROLLOVER TEST DATA:

A. Test Phase = 0° to 90°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1 minutes, 36 seconds

(Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 36 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 minutes from onset of rotation = 0 oz.
   (5 oz. allowed)

2. 6th minute = 0 oz.
   (1 oz. allowed)

3. 7th minute = 0 oz.
   (1 oz. allowed)

4. 8th minute (if required) = N/A oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations — NONE
DATA SHEET 5 CONTINUED

B. Test Phase = 90° to 180°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90° Rotation Time = _1_ minutes, _35_ seconds

(Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold Time = 5 minutes, 0 seconds

3. TOTAL = _6_ minutes, _35_ seconds

4. NEXT WHOLE MINUTE INTERVAL = _7_ minutes

Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 minutes from onset of rotation = _0_ oz. (5 oz. allowed)

2. 6th minute = _0_ oz. (1 oz. allowed)

3. 7th minute = _0_ oz. (1 oz. allowed)

4. 8th minute (if required) = N/A oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations — _NONE_
C. **Test Phase = 180° to 270°**

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90°
   Rotation Time = _1_ minutes, _24_ seconds

   (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold
   Time = 5 minutes, 0 seconds

3. **TOTAL = _6_ minutes, _24_ seconds**

4. **NEXT WHOLE MINUTE INTERVAL = _7_ minutes**

   Actual Test Vehicle Stoddard Solvent Spillage:

1. First 5 minutes from onset of rotation = _0_ oz.
   (5 oz. allowed)

2. 6th minute = _0_ oz.
   (1 oz. allowed)

3. 7th minute = _0_ oz.
   (1 oz. allowed)

4. 8th minute (if required) = _N/A_ oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations — **NONE**
D. Test Phase = 270° to 360°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90°
   Rotation Time = 1 minute, 45 seconds

   (Specified Range is 1 to 3 minutes)

2. FMVSS 301 Position Hold
   Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 45 seconds

4. NEXT WHOLE MINUTE INTERVAL = 7 minutes

   Actual Test Vehicle Stoddard Solvent Spillage:

   1. First 5 minutes from onset of rotation = 0 oz.
      (5 oz. allowed)

   2. 6th minute = 0 oz.
      (1 oz. allowed)

   3. 7th minute = 0 oz.
      (1 oz. allowed)

   4. 8th minute (if required) = N/A oz. (1 oz. allowed)

   Provide Details of Stoddard Solvent Spillage Locations — NONE
DATA SHEET 6
CAMERA LOCATION

VEHICLE NHTSA NO.: C40112 TEST DATE: 09/21/04

CAMERA 1 – REAR SIDE VIEW OF VEHICLE DURING CRASH
CAMERA 2 – FRONT SIDE VIEW OF VEHICLE DURING CRASH
CAMERA 3 – OVERHEAD VIEW OF ENTIRE IMPACT
CAMERA 4 – UNDERBODY VIEW OF FUEL TANK LOCATED IN PIT

PHOTO PIT

TEST VEHICLE

NO STEEL GRATING ALLOWED OVER PHOTO PIT

CONCRETE PAD

TOP VIEW

TOW ROAD

MONORAIL
## SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

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2004 CHEVROLET COLORADO
NHTSA NO. C40112
NHTSA NO. 301L

FIGURE 5.5
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE PRE-TEST
SECTION 6

BARRIER INFORMATION
NOTES:
1. Face Plate 0.50 in. (19mm) thick cold rolled steel
2. All Inner Reinforcements 4.0 x 2.0 x 0.19 in. (102 x 51 x 5mm) Steel Tubing
3. Impact Surface above shown without .75 x 48 x 96 in. Plywood Face attached
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TEST SET-UP OF COMMON CARRIAGE WITH 60" x 78" FLAT FACE IMPACT SURFACE INSTALLED:

LEFT FRONT WEIGHT  1075
RIGHT FRONT WEIGHT  1075
LEFT REAR WEIGHT    887
RIGHT REAR WEIGHT   887

TOTAL WEIGHT  3924

* EXCLUDING 3/4" PLYWOOD FACE

DIMENSIONS FOR GTL 60" x 78" FLAT FACE IMPACT SURFACE