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

GENERAL MOTORS CORP.
2004 CHEVROLET EXPRESS, MPV
NHTSA NO. C40111

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 6115 (NVS-220)
WASHINGTON, D.C. 20590
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Prepared By:  Debbie Messick

Approved By:  [Signature]

Approval Date:  10/04/04

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NHTSA No. C40111

5. Report Date October 4, 2004
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7. Author(s)
Grant Farrand, Project Engineer
Debbie Messick, Project Manager


9. Performing Organization Name and Address
General Testing Laboratories, Inc.
1623 Leedstown Road
Colonial Beach, Va 22443

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Final Test Report
September 17, 2004


15. Supplementary Notes

16. Abstract
Compliance tests were conducted on the subject, 2004 Chevrolet Express MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-02 for the determination of FMVSS 301 compliance.
Test failures identified were as follows:
NONE

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Safety Engineering
FMVSS 301

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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Chevrolet Express MPV 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 Express MPV. Nomenclature applicable to the test vehicle are:

A. **Vehicle Identification Number:** 1GNFG15XX41117979

B. **NHTSA No.:** C40111

C. **Manufacturer:** GENERAL MOTORS CORP.

D. **Manufacture Date:** 08/03

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 301 testing on September 17, 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 Express MPV appears to meet the lateral impact requirements of FMVSS 301 testing.
3.0 TEST RESULTS

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

Vehicle's NHTSA No.: C40111  Test Model: EXPRESS

Test Date.: 09/17/04  Time: 13:10  Temperature 77 °F

Vehicle Model Year, Make, Model and Body Style:
2004 CHEVROLET EXPRESS MPV

Vehicle Test Weight: 5925 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: 09/17/04

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

TEST VEHICLE INFORMATION:

NHTSA No.: C40111
Year/Make/Model/Body Style: 2004 CHEVROLET EXPRESS
Engine Data: 4.3 LITER V6
Transmission Data: 4 SPEED AUTOMATIC
Final Drive Data: N/A
Major Options: EIGHT SEAT OPTION
Date Received: 06/04/04; Odometer Reading: 1141 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: GENERAL MOTORS CORP.
Date of Manufacture: 08/03
VIN: 1GNFG15XX41117979

GVWR: 3266 kg (7200 lbs.); GAWR Front: 1633 kg (3600 lbs.); GAWR Rear: 1814 kg (4000 lbs.)

DATA FROM VEHICLE'S TIRE PLACARD:

Location of Placard on Vehicle: DRIVER'S SIDE DOOR
Tire Pressure With Maximum Capacity Vehicle Load —
  Front: 35 psi; Rear: 38 psi
Recommended Tire Size: P235/75R16XL
Recommended Cold Tire Pressure: Front = 240 kPa (35 psi) Rear = 260 kPa (38 psi)
Size of Tires on Test Vehicle: P235/75R16
Type of Spare Tire: FULL SIZE

Vehicle Capacity Data —

Type of Front Seat(s): BUCKET
Number of Occupants: Front = 2; Mid = 3; Rear = 3; Total = 8

A. VEHICLE CAPACITY WEIGHT (VCW) = 1895 lbs.
B. Number of Occupants x 150 lbs. = 1200 lbs.
RATED CARGO AND LUGGAGE WEIGHT (RCLW) = A - B = 695 lbs.

RECORDED BY: ____________________  DATE: 09/16/04
APPROVED BY: ____________________
WEIGHT OF TEST VEHICLE:

A. As Received At Laboratory (Maximum Fluids) —

Right Front = ___651___ kg (1436 lbs.)
Left Front = ___620___ kg (1367 lbs.)
Right Rear = ___567___ kg (1250 lbs.)
Left Rear = ___568___ kg (1252 lbs.)

TOTAL FRONT = ___1271___ kg (2803 lbs.)
TOTAL REAR = ___1135___ kg (2502 lbs.)

% of TOTAL = ___52.8___ %
% of TOTAL = ___47.2___ %

TOTAL DELIVERED WEIGHT = ___2406___ kg (5305 lbs.)

B. Calculation of Target Test Weight —

1. Total Delivered Weight = ___2406___ kg (5305 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 = ___2691___ kg (5933 lbs.)

C. Vehicle, Dummies and ___136___ kg (300 lbs.) of Cargo Weight —

Right Front = ___697___ kg (1537 lbs.)
Left Front = ___706___ kg (1557 lbs.)
Right Rear = ___633___ kg (1396 lbs.)
Left Rear = ___651___ kg (1435 lbs.)

TOTAL FRONT = ___1403___ kg (3094 lbs.)
TOTAL REAR = ___1284___ kg (2831 lbs.)

% of TOTAL = ___52___ %
% of TOTAL = ___48___ %

TOTAL TEST WEIGHT = ___2688___ kg (5925 lbs.)

Weight of Ballast secured in cargo area = ___150___ kg (330 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: 851 mm (33.5 inches)
- Left Front: 857 mm (33.75 inches)
- Right Rear: 892 mm (35.125 inches)
- Left Rear: 895 mm (35.25 inches)

As Tested —
- Right Front: 838 mm (33.0 inches)
- Left Front: 838 mm (33.0 inches)
- Right Rear: 879 mm (34.6 inches)
- Left Rear: 876 mm (34.5 inches)

Vehicle’s Wheelbase = 3429 mm (135 inches)

FUEL SYSTEM DATA:

Fuel System Capacity Listed in Owner’s Manual = 117 liters (31 gallons)
Usable Capacity Figure Furnished By COTR = 117 liters (31.01 gallons)

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

107 liters (28.22 gallons) TO 110 liters (29.15 gallons)

ACTUAL TEST VOLUME = 109 liters (28.7 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

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

REMARKS:

RECORDED BY: [Signature] DATE: 09/16/04

APPROVED BY: [Signature]
DATA SHEET 3
POST IMPACT DATA

TYPE OF TEST: 301L
TEST DATE: 09/17/04; TIME: 13:10; TEMP.: 77 °F
VEH. NHTSA NO.: C40111; VIN: 1GNFG15XX41117979

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 = 19.6 mph
Average Impact Speed = 19.7 mph

REMARKS:

RECORDED BY: [Signature]  DATE: 09/17/04
APPROVED BY: [Signature]
DATA SHEET 4
SUMMARY OF FMVSS 301 DATA

TEST VEHICLE NHTSA NO.: C40111; TEST DATE: 09/17/04

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

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: [Signature] DATE: 09/17/04

APPROVED BY: [Signature]
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 minute, 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
B. Test Phase = 90° to 180°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90°
Rotation Time = _1_ minutes, _28_ seconds

(Specified Range is 1 to 3 minutes)

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

3. TOTAL = _6_ minutes, _28_ 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, __27__ seconds
   (Specified Range is 1 to 3 minutes)

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

3. TOTAL = __6__ minutes, __27__ 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, 47 seconds

   (Specified Range is 1 to 3 minutes)

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

3. TOTAL = 6 minutes, 47 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.: C40111 TEST DATE: 09/17/04

PHOTO PIT

TEST VEHICLE

NO STEEL GRATING ALLOWED OVER PHOTO PIT

CONCRETE PAD

TOW ROAD

MONORAIL

TOP VIEW

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
### TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

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SECTION 5
PHOTOGRAPHS
2004 CHEVROLET EXPRESS
NHTSA NO. C40111
FMVSS NO. 301L

FIGURE 5.6
3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE
PRE-TEST
2004 CHEVROLET EXPRESS
NHTSA NO. C40111
FMVSS NO. 301L

FIGURE 5.15
UNDERBODY VIEW OF FUEL FILTER AND LINES PRE-TEST
FIGURE 5.16
UNDERBODY VIEW OF FUEL LINES TO TANK
PRE-TEST
2004 CHEVROLET EXPRESS
NHTSA NO. C40111
FMVSS NO. 301L

FIGURE 5.34
UNDERBODY VIEW OF FUEL FILL HOSE AT TANK POST TEST
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

DIMENSIONS SHOWN IN TABLE ON NEXT PAGE
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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