REPORT NUMBER 301L-GTL-03-009

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

FORD MOTOR CO. IN U.S.A.
2003 FORD EXPEDITION MPV
NHTSA NO. C30200

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

SEPTEMBER 04, 2003
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 8111 (NVS-220)
WASHINGTON, D.C. 20590
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Prepared By: [Signature]
Approved By: [Signature]
Approval Date: 09/04/02

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: [Signature]
Acceptance Date: 9/9/03
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<td>Grant Farrand, Project Engineer</td>
</tr>
<tr>
<td>Debbie Messick, Project Manager</td>
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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2003 Ford Expedition 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 2003 Ford Expedition MPV. Nomenclature applicable to the test vehicle are:

A. **Vehicle Identification Number**: 1FMU15W73LA80166

B. **NHTSA No.**: C30200

C. **Manufacturer**: FORD MOTOR CO. IN U.S.A.

D. **Manufacture Date**: 09/02

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 301 testing on August 25, 2003.
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 2003 Ford Expedition MPV 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 2003 Ford Expedition MPV.
SUMMARY OF RESULTS

Vehicle's NHTSA No.: __C30200___ ........ Test Model: __EXPEDITION_____

Test Date: ___08/25/03__ ............. Time: 12:45 ____ Temperature 90°F

Vehicle Model Year, Make, Model and Body Style:
2003 FORD EXPEDITION MPV

Vehicle Test Weight: __5937___ lbs.; Impact Velocity: __19.35___ 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: ___08/25/03___
APPROVED BY: [Signature]
DATA SHEET 1
TEST VEHICLE SPECIFICATIONS

TEST VEHICLE INFORMATION:

NHTSA No.: C30200
Year/Make/Model/Body Style: 2003 FORD EXPEDITION MPV
Engine Data: 4.6 LITER V8
Transmission Data: 4 SPEED AUTOMATIC
Final Drive Data: REAR WHEEL DRIVE
Major Options: PREMIUM STEREO, CLOTH CAPTAINS CHAIRS, CONSOLE
Date Received: 07/10/03
Odometer Reading: 1435.7 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: FORD MOTOR CO. IN U.S.A.
Date of Manufacture: 09/02
VIN: 1FMRL15W73LA80166

GVWR: 3129 kg (6900 lbs.); GAWR Front: 1338 kg (2950 lbs.) GAWR Rear: 1814 kg (4000 lbs.)

DATA FROM VEHICLE'S TIRE PLACARD:

Location of Placard on Vehicle: DRIVER'S "B" PILLAR
Tire Pressure With Maximum Capacity Vehicle Load —
Front: _35_ psi; Rear: _35_ psi
Recommended Tire Size: P265/70R17
Recommended Cold Tire Pressure: Front = 241 kPa (35 psi) Rear = 241 kPa (35 psi)
Size of Tires on Test Vehicle: _P265/70R17_
Type of Spare Tire: FULL SIZE

*NOTE: Data from supplement sheet in glove box

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) = __1578__ lbs.
B. Number of Occupants x 150 lbs. = __1200__ lbs.
RATED CARGO AND LUGGAGE WEIGHT (RCLW) = A - B = __378__ lbs.

RECORDED BY: [Signature] DATE: 08/25/03
APPROVED BY: [Signature]
WEIGHT OF TEST VEHICLE:

A. As Received At Laboratory (Maximum Fluids) —

Right Front = 586 ___ kg (1292 lbs.)  Right Rear = 625 ___ kg (1377 lbs.)
Left Front = 570 ___ kg (1256 lbs.)  Left Rear = 634 ___ kg (1397 lbs.)

TOTAL FRONT = 1156 ___ kg (2548 lbs.)  TOTAL REAR = 1258 ___ kg (2774 lbs.)

% of TOTAL = _48___%  % of TOTAL = _52___%

TOTAL DELIVERED WEIGHT = ___2414___ ___kg (5322 lbs.)

B. Calculation of Target Test Weight —

1. Total Delivered Weight = ___2414___ kg (5322 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 = ___2699___ kg (5950 lbs.)

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

Right Front = 629 ___ kg (1387 lbs)  Right Rear = 723 ___ kg (1593 lbs)
Left Front = 604 ___ kg (1331 lbs)  Left Rear = 738 ___ kg (1626 lbs)

TOTAL FRONT = 1233 ___ kg (2718 lbs)  TOTAL REAR = 1460 ___ kg (3219 lbs)

% of TOTAL = __.46___%  % of TOTAL = __.54___%

TOTAL TEST WEIGHT = ___2693___ ___kg (5937 lbs)

Weight of Ballast secured in cargo area = 172 ___ kg (380 lbs)
Type of Ballast: SALT BAGS  
Method of Securing Ballast: PASSENGER SEAT BELTS  
Vehicle Components Removed for Weight Reduction:  
NONE
TEST VEHICLE ATTITUDE:

As Delivered — Right Front: 909 mm (35.8 inches)
Left Front: 915 mm (36.0 inches)
Right Rear: 920 mm (36.2 inches)
Left Rear: 911 mm (35.8 inches)

As Tested — Right Front: 900 mm (35.4 inches)
Left Front: 906 mm (35.8 inches)
Right Rear: 900 mm (35.4 inches)
Left Rear: 894 mm (35.2 inches)

Vehicle's Wheelbase = 3022 mm (119 inches)

FUEL SYSTEM DATA:

Fuel System Capacity Listed in Owner's Manual = 106 liters (28 gallons)
Usable Capacity Figure Furnished By COTR = 106 liters (28 gallons)

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

96.5 liters (25.48 gallons) TO 99.6 liters (26.32 gallons)

ACTUAL TEST VOLUME = 109 liters (25.9 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: IN TANK ELECTRIC
Electric Fuel Pump Operation with ignition Switch ON and Engine OFF —
YES, FOR 2 SECONDS

Details of Fuel System: SEQUENTIAL FUEL INJECTION

REMARKS:

RECORDED BY: DATE: 08/25/03
APPROVED BY:
DATA SHEET 3
POST IMPACT DATA

TYPE OF TEST: 301L
TEST DATE: 08/25/03; TIME: 12:45; TEMP.: 90 °F
VEH. NHTSA NO.: C30200; VIN: 1FMUR15W73LA50166

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 = 19.3 mph
Trap No. 2 = 19.3 mph
Average Impact Speed = 19.3 mph

REMARKS:

RECORDED BY: [Signature]
DATE: 08/25/03

APPROVED BY: [Signature]
DATA SHEET 4
SUMMARY OF FMVSS 301 DATA

TEST VEHICLE NHTSA NO.: C30200 ; TEST DATE: 08/25/03

VEHICLE YEAR/MAKE/MODEL/BODY STYLE:
2003 FORD EXPEDITION

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: ____ 08/25/03

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 minute, ___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___
B. Test Phase = 90° to 180°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90°
   Rotation Time = 1 minute, 34 seconds
   (Specified Range is 1 to 3 minutes)

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

3. TOTAL = _6_ minutes, _34_ 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

C. Test Phase = 180° to 270°

Determination of Stoddard Solvent Collection Time Period:

1. Rollover Fixture 90°
   Rotation Time = 1 minutes, 25 seconds

   (Specified Range is 1 to 3 minutes)

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

3. TOTAL = 6 minutes, 25 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 = ___ minutes, ___ seconds
   (Specified Range is 1 to 3 minutes)

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

3. TOTAL = ___ minutes, ___ seconds

4. NEXT WHOLE MINUTE INTERVAL = ___ minutes

Actual Test Vehicle Stoddard Solvent Spillage:

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

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

3. 7th minute = ___ 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.: C30200 TEST DATE: 08/25/03

PHOTO PIT

TEST VEHICLE

CONCRETE PAD

TOW ROAD

MONORAIL

NO STEEL GRATING ALLOWED OVER PHOTO PIT

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
### SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

**TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST**

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2003 FORD EXPEDITION
NHTSA NO. C30200
FMVSS NO. 301L

FIGURE 5.8
RIGHT VIEW OF VEHICLE/BARRIER PRE-TEST
2003 FORD EXPEDITION
NHTSA NO. C30200
FMVSS NO. 301L

FIGURE 5.20
VEHICLE FUEL CAP 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

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 1081
RIGHT FRONT WEIGHT 1079
LEFT REAR WEIGHT 882
RIGHT REAR WEIGHT 873

TOTAL WEIGHT 3915

* EXCLUDING 3/4" PLYWOOD FACE

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