REPORT NUMBER: 301-03-07

SAFETY COMPLIANCE TESTING FOR FMVSS 301
FUEL SYSTEM INTEGRITY

DAIMLERCHRYSLER
2003 CHRYSLER PT CRUISER
MPV

NHTSA NUMBER: C30303
VERIDIAN TEST NUMBER: 8655-P301-16

August 25, 2003

VERIDIAN ENGINEERING
P.O. BOX 400
BUFFALO, NEW YORK 14225

FINAL REPORT

PREPARED FOR:

U. S. Department of Transportation
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
490 Seventh Street, S. W.
Room No. 6115 (NV3-220)
Washington, DC 20590
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Approval Date:  
September 2, 2003

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By:  
Edward Cohen

Acceptance Date:  
9/11/03
**Final Report of FMVSS 301 Compliance Testing of a 2003 Chrysler PT Cruiser MPV**

NHTSA No. C30303

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Buffalo, New York 14225

**Sponsoring Agency Name and Address**
400 Seventh St., S.W., Rm. 6115, Washington, D.C. 20590

**Abstract**
Compliance tests were conducted on the subject 2003 Chrysler PT Cruiser MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-301-03 for the determination of FMVSS 301 compliance. For the purpose of acquiring information for applied research, two instrumented Anthropomorphic Test Devices (ATDs) were placed in the front occupant seating positions and various instrumentation was added to the test vehicle. Test failures identified were as follows:

The test vehicle appeared to comply with all requirements of FMVSS 301 "Fuel System Integrity."

**Key Words**
- Compliance Testing
- Safety Engineering
- FMVSS 301

**Distribution Statement**
Copies of this report are available from:
NHTSA Technical Reference Division
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SECTION 1

PURPOSE OF COMPLIANCE TEST

This 30 mph rear moving barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 301 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by Veridian Engineering under Contract No. DTNH22-01-C-01025. The purpose of this test was to determine if the subject vehicle, a 2003 Chrysler PT Cruiser MPV, meets the performance requirements of FMVSS No. 301, "Fuel System Integrity." This compliance test was conducted using the requirements found in the UVSC Laboratory Test Procedure No. TP-301-03, dated February 28, 2003.
SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

A 1604.0 kg 2003 Chrysler PT Cruiser MPV was impacted from the rear by an 1797 kg moving barrier at a velocity of 46.7 kph (29.0 mph). The test was performed by Veridian Engineering on August 25, 2003.

The test vehicle was equipped with a 56.78 liter fuel tank which was filled to 92.5 percent capacity with standard fluid prior to impact. For the purpose of acquiring information for applied research, one instrumented Part 572 E.50th percentile male Anthropomorphic Test Device (ATD) and one instrumented Part 572 0.5th percentile female ATD were placed in the driver and right front occupant seating positions respectively and various instruments were added to the test vehicle. Research data is presented in a separate report.

The crash event was recorded by ten high speed cameras and one real-time camera. Camera locations and other pertinent camera information are found on pages 3-9 and 3-10 of this report. Pre- and post test photographs of the vehicle can be found in Appendix A.

There was no fuel system fluid spillage following the impact or during any portion of the static rollover test. The average vehicle longitudinal crush was 259 millimeters. The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity."
# DATA SHEET 1

## TEST VEHICLE SPECIFICATIONS

### TEST VEHICLE INFORMATION:

<table>
<thead>
<tr>
<th>Year/Make/Model/Body Style:</th>
<th>2003 Chrysler PT Cruiser MPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHTSA No.:</td>
<td>C30303</td>
</tr>
<tr>
<td>Color:</td>
<td>White</td>
</tr>
<tr>
<td>Engine Data:</td>
<td>Cylinders: 4, CID: 2.4, Liters: 24</td>
</tr>
<tr>
<td>Placement:</td>
<td>Longitudinal or In-Line: X Transverse or Lateral</td>
</tr>
<tr>
<td>Final Drive:</td>
<td>Rear Wheel Drive: X, Front Wheel Drive: X, Four Wheel Drive: X</td>
</tr>
<tr>
<td>Date Received:</td>
<td>1/20/2003; Odometer Reading: 74 km</td>
</tr>
<tr>
<td>Selling Dealer:</td>
<td>Ricart Automotive</td>
</tr>
<tr>
<td>&amp; Address:</td>
<td>4255 South Hamilton Road, Columbus, Ohio 43227</td>
</tr>
</tbody>
</table>

### DATA FROM VEHICLE'S CERTIFICATION LABEL:

- Vehicle Manufactured by: DaimlerChrysler
- Date of Manufacture: 9/02
- VIN: 3C4FY4873T544020
- GVWR: 1917 kg, GAWR-FRONT: 1043 kg, GAWR-REAR: 942 kg

### DATA FROM VEHICLE'S TIRE LABEL:

- Location of Placard on Vehicle: Driver Door
- Recommended Tire Size: P195/65R15 89T
- Recommended Cold Tire Pressure: FRONT: 240 kPa; REAR: 240 kPa

### DATA FROM TIRE SIDEWALL:

- Size of Tires on Test Vehicle: P195/65R15 89T
- Manufacturer: Goodyear
- Tire Pressure with Maximum Capacity Vehicle Load: FRONT: 300 kPa; REAR: 300 kPa
- Type of Spare Tire: Temporary

### VEHICLE CAPACITY DATA:

- Type of Front Seats: Bench: X, Bucket: - Split Bench: -
- Number of Occupants: Front: 2, Rear: 3, Total: 5
- Vehicle Capacity Weight (VCW) = 392 kg
- No. of Occupants x 68.04 kg = 340.2 kg
- Rated Cargo/Luggage Weight (RCLW) = 51.8 kg

*Note: Tire pressure used for test.
DATA SHEET 2

PRE-TEST DATA

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

Right Front = 419.5  kg
Left Front = 407.5  kg
TOTAL FRONT = 827.0  kg
Right Rear = 293  kg
Left Rear = 288  kg
TOTAL REAR = 581.0  kg
TOTAL DELIVERED WEIGHT = 1408.0  kg

% of Total Front of Vehicle Weight = 58.7%  of Total Rear Weight = 41.3%

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1408.0  kg
Rated Cargo Luggage Weight (RCLW) = 51.8  kg
Weight of 2 p.572 Dummies, 74.4 kg = 148.8  kg
TARGET TEST WEIGHT = 1608.6  kg

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND .472 KG OF CARGO WEIGHT:

Right Front = 481.5  kg
Left Front = 479.5  kg
TOTAL FRONT = 961.0  kg
Right Rear = 324.0  kg
Left Rear = 319.0  kg
TOTAL REAR = 643.0  kg
TOTAL TEST WEIGHT = 1604.0  kg

% of Total Front of Vehicle Weight = 59.9%  of Total Rear Weight = 40.1%

* Weight of Ballast Secured in Vehicle Trunk Area = 0  kg

Type of Ballast: None
Method of Securing Ballast: Not Applicable

Vehicle Components Removed for Weight Reduction: Vehicle battery, rear windows and door trim, rear headrests, side view mirrors, airbox

VEHICLE ATTITUDE (all dimension in millimeters):

AS DELIVERED: RF 704  LF 704  RR 728  LR 730
AS TESTED: RF 683  LF 679  RR 720  LR 718

Vehicle'S Wheel Base: 2610  mm

Location of Vehicle'S C.G.: 1046  millimeters rearward of front wheel center.

FUJI SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 56.78  liters

Usable Capacity Figure Furnished by COTR = 56.78  liters

Test Volume Range (91 to 94% of Usable Capacity) = 51.67  to  53.37  liters

ACTUAL TEST VOLUME = 52.62  liters (with entire fuel system filled)

* Ballast weight includes the RCLW, the weight of drained vehicle fluids and the weight of any removed vehicle components less the weight of onboard instrumentation, cameras, and hardware.
DATA SHEET 2 (continued)

PRE-TEST DATA

FUEL SYSTEM DATA (continued):

Test Fluid Type: Stoddard Solution

Test Fluid Specific Gravity: 0.764

Test Fluid Kinematic Viscosity: 0.96 centistokes

Test Fluid Color: Orange ("red" is preferred)

Type of Vehicle Fuel Pump: Electric

Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF -
Fuel pump operated.

Details of Fuel System: The fuel tank is centered ahead of the rear axle; The fuel lines run along the inside of the right frame stiffener; The filler neck is located on the right side of the vehicle behind the rear axle.

Comments: None
DATA SHEET 3

MOVING BARRIER DATA

WEIGHT OF MOVING BARRIER:

Right Front = 504.9 kg
Left Front = 499.9 kg

Right Rear = 393.7 kg
Left Rear = 398.3 kg

TOTAL FRONT = 1004.8 kg
TOTAL REAR = 792.0 kg

TOTAL BARRIER WEIGHT = 1796.8 kg

MOVING BARRIER DIMENSIONS:

Barrier Face Height = 1524 mm
Barrier Face Width = 1981 mm
Barrier Face Ground Clearance = 127 mm
Tread Width = 1511 mm
Wheel Base = 3048 mm

Location of C.G.:
X: 1344 mm rearward of front wheel center
Y: 0 mm from longitudinal-vertical plane of symmetry.
Z: 414 mm above ground.

MOVING BARRIER TIRES:

Manufacturer: Classic
Model: Poly IV
Size: 215/75D15
Recommended Max Pressure: 240 kPa

MOVING BARRIER ABORT SYSTEM:

Type: Trailing cable
DATA SHEET 4

POST TEST DATA

TYPE OF TEST:

Type of Test: Rear Barrier Impact Angle: 0°

Test Date: August 25, 2003 Time: 13:20 Temperature: 27.8 °C

Vehicle NHTSA No.: C30303 VIN: 3C4FY48B73T544020

Required Impact Velocity Range: 46.51 to 48.12 kph

BARRIER IMPACT VELOCITY: (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 46.7 kph; Trap No. 2 = 46.7 kph

Average Impact Speed = 46.7 kph

VEHICLE STATIC CRUSH:

Vehicle Length:

<table>
<thead>
<tr>
<th>Pre-Test</th>
<th>Left</th>
<th>C/L</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4145</td>
<td>4335</td>
<td>4140</td>
</tr>
<tr>
<td>Post-Test</td>
<td>3884</td>
<td>4075</td>
<td>3883</td>
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<tr>
<td>Crush</td>
<td>Left</td>
<td>C/L</td>
<td>Right</td>
</tr>
<tr>
<td></td>
<td>261</td>
<td>260</td>
<td>257</td>
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<tr>
<td>AVERAGE</td>
<td></td>
<td>259</td>
<td></td>
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</tbody>
</table>

millimeters
DATA SHEET 4 (continued)

POST TEST DATA

TEST VEHICLE NHTSA NO.: C30303
TEST DATE: August 25, 2003

Vehicle Mfr./Make/Model: 2003 Chrysler PT Cruiser MPV

Test vehicle fuel tank filled to 91% to 94% of manufacturer's "usable" capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:
- Frontal (42.28 kph target velocity)
- Oblique (42.28 kph target velocity) with ___ barrier face first contacting _______ (driver/passenger) side
- X Rear Moving Barrier (42.28 kph target velocity)
- Lateral Moving Barrier (32.19 kph target velocity)

FUEL SPILLAGE MEASUREMENT:

1. From impact until vehicle motion ceases
2. For five minute period after vehicle motion ceases
3. For next 25 minutes

<table>
<thead>
<tr>
<th>ACTUAL</th>
<th>MAX ALLOWED</th>
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<tbody>
<tr>
<td>0</td>
<td>28 g</td>
</tr>
<tr>
<td>0</td>
<td>28 g</td>
</tr>
<tr>
<td>0</td>
<td>28 g/min.</td>
</tr>
</tbody>
</table>

SOLVENT SPILLAGE DETAILS:

None
DATA SHEET 5

STATIC ROLLOVER TEST DATA

Table 7 FMVSS NO. 301 - STATIC ROLLOVER DATA SHEET

Vehicle: 2003 Chrysler PT Cruiser MPV

NHTSA No.: C30303

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

<table>
<thead>
<tr>
<th>Rollover Stage</th>
<th>Rotation Time (spec. 1-3 min)</th>
<th>FMVSS 301 Hold Time</th>
<th>Total Time</th>
<th>Next Whole Minute Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0° - 90°</td>
<td>1 minute</td>
<td>0</td>
<td>5 minutes</td>
<td>6 minutes 10 seconds</td>
</tr>
<tr>
<td>90° - 180°</td>
<td>1 minute</td>
<td>04 seconds</td>
<td>5 minutes</td>
<td>6 minutes 4 seconds</td>
</tr>
<tr>
<td>180° - 270°</td>
<td>1 minute</td>
<td>03 seconds</td>
<td>5 minutes</td>
<td>6 minutes 3 seconds</td>
</tr>
<tr>
<td>270° - 360°</td>
<td>1 minute</td>
<td>08 seconds</td>
<td>5 minutes</td>
<td>6 minutes 8 seconds</td>
</tr>
</tbody>
</table>

II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

<table>
<thead>
<tr>
<th>First 5 minutes from onset of rotation</th>
<th>6th min.</th>
<th>7th min.</th>
<th>8th min. (if required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>142 g</td>
<td>28 g</td>
<td>28 g</td>
<td>28 g</td>
</tr>
</tbody>
</table>

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

<table>
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<tr>
<th>Rollover Stage</th>
<th>First 5 minutes from onset of rotation (g)</th>
<th>6th min. (g)</th>
<th>7th min. (g)</th>
<th>8th min. (if required) (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0° - 90°</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>90° - 180°</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>180° - 270°</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
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<tr>
<td>270° - 360°</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
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</tbody>
</table>

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S):

<table>
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<tr>
<th>Rollover Stage</th>
<th>Spillage Location</th>
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<tbody>
<tr>
<td>0° - 90°</td>
<td>None</td>
</tr>
<tr>
<td>90° - 180°</td>
<td>None</td>
</tr>
<tr>
<td>180° - 270°</td>
<td>None</td>
</tr>
<tr>
<td>270° - 360°</td>
<td>None</td>
</tr>
</tbody>
</table>
DATA SHEET 6
HIGH SPEED CAMERA LOCATIONS

REAL TIME CAMERA

NO STEEL GRATING ALLOWED OVER PHOTO PIT

TEST VEHICLE

CONCRETE PAD

TOW ROAD

TOP VIEW

MOVING BARRIER

PHOTO PIT

LEFT SIDE VIEW
DATA SHEET 6 (continued)

HIGH SPEED CAMERA LOCATIONS

NIITSA No.: C30303  Vehicle: 2003 Chrysler PT Cruiser MPV

<table>
<thead>
<tr>
<th>CAMERA NO.</th>
<th>VIEW</th>
<th>CAMERA POSITIONS (mm)*</th>
<th>ANGLE** (degrees)</th>
<th>LENS (mm)</th>
<th>SPEED (fps)</th>
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<tbody>
<tr>
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<td>Real-Time Camera</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Right Side View</td>
<td>14706 665 955</td>
<td>-1</td>
<td>35</td>
<td>1000</td>
</tr>
<tr>
<td>3</td>
<td>Left Side View</td>
<td>13589 596 1043</td>
<td>0</td>
<td>35</td>
<td>1000</td>
</tr>
<tr>
<td>4</td>
<td>Vehicle Front Underbody View</td>
<td>0 2413 -1956</td>
<td>90</td>
<td>13</td>
<td>1000</td>
</tr>
<tr>
<td>5</td>
<td>Vehicle Mid-Section Underbody View</td>
<td>0 2790   -1956</td>
<td>90</td>
<td>13</td>
<td>1010</td>
</tr>
<tr>
<td>6</td>
<td>Vehicle Rear Underbody View</td>
<td>0 680 -1956</td>
<td>90</td>
<td>13</td>
<td>1035</td>
</tr>
<tr>
<td>7</td>
<td>Moving Barrier View</td>
<td>0 0 2515</td>
<td>-105</td>
<td>7.5</td>
<td>10000</td>
</tr>
<tr>
<td>8</td>
<td>Overhead Overall View</td>
<td>-508 0 9804</td>
<td>-90</td>
<td>13</td>
<td>1000</td>
</tr>
<tr>
<td>9†</td>
<td>Onboard Driver View</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>10†</td>
<td>Onboard Passenger View</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
</tbody>
</table>

* X = film plane to monorail centerline (+ to left of rail)
  Y = film plane to impact location (+ ahead of impact location)
  Z = film plane to ground (+ above ground)

** = referenced to horizontal plane

† Research cameras.
# LIST OF PHOTOGRAPHS

<table>
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<th>Figure</th>
<th>Photograph Title</th>
<th>Page</th>
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<td>A-2</td>
<td>POST-TEST FRONT VIEW</td>
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<td>A-3</td>
<td>PRE-TEST LEFT SIDE VIEW</td>
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<td>A-5</td>
<td>PRE-TEST RIGHT SIDE VIEW</td>
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<td>POST-TEST RIGHT SIDE VIEW</td>
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<td>A-8</td>
<td>POST-TEST REAR VIEW</td>
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<td>A-9</td>
<td>PRE-TEST LEFT FRONT THREE-QUARTER VIEW</td>
<td>A-11</td>
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<tr>
<td>A-10</td>
<td>POST-TEST LEFT FRONT THREE-QUARTER VIEW</td>
<td>A-12</td>
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<td>PRE-TEST RIGHT REAR THREE-QUARTER VIEW</td>
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<tr>
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<td>POST-TEST RIGHT REAR THREE-QUARTER VIEW</td>
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<tr>
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<td>PRE TEST FRONT UNDERBODY VIEW</td>
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<td>POST-TEST FRONT UNDERBODY VIEW</td>
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<tr>
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<td>A-17</td>
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<td>A-16</td>
<td>POST-TEST REAR UNDERBODY VIEW</td>
<td>A-18</td>
</tr>
<tr>
<td>A-17</td>
<td>CERTIFICATION PLACARD</td>
<td>A-19</td>
</tr>
<tr>
<td>A-18</td>
<td>TIRE PLACARD</td>
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</tr>
<tr>
<td>A-19</td>
<td>ROLLOVER 90°</td>
<td>A-21</td>
</tr>
<tr>
<td>A-20</td>
<td>ROLLOVER 180°</td>
<td>A-22</td>
</tr>
<tr>
<td>A-21</td>
<td>ROLLOVER 270°</td>
<td>A-23</td>
</tr>
<tr>
<td>A-22</td>
<td>ROLLOVER 360°</td>
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