SAFETY COMPLIANCE TESTING FOR
FMVSS 124H
ACCELERATOR CONTROL SYSTEMS

DAIMLERCHRYSLER CORPORATION
2004 CHRYSLER PACIFICA, MPV
NHTSA NO. C40301

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

MAY 10, 2004
FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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OFFICE OF VEHICLE SAFETY COMPLIANCE
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ROOM 6115 (MV8-220)
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16. Abstract
Compliance tests were conducted on the subject 2004 Chrysler Pacifica MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-124-06 for the determination of FMVSS 124 compliance.

Test failures identified were as follows: NONE

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SECTION 1
PURPOSE OF COMPLIANCE TEST

FMVSS 124 specifies requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a severance or disconnection in the accelerator control system. The purpose of FMVSS 124 is to reduce deaths and injuries resulting from engine overspeed caused by malfunctions in the accelerator control system. This standard applies to passenger cars, multipurpose passenger vehicles (MPV's), trucks and buses.
SECTION 2
TEST PROCEDURES AND DISCUSSION OF RESULTS

Compliance testing was conducted on a 2004 CHRYSLER PACIFICA, MPV, NHTSA No. C40301 in accordance with the National Highway Traffic Safety Administration (NHTSA) Laboratory Procedure TP-124-06.

Output from the vehicle throttle position sensor on the air throttle plate shaft was used to measure throttle position and data was recorded at 1000 HZ with GTL's data acquisition system. Testing was conducted to simulate the normal removal of the driver's foot from the accelerator pedal. Testing was performed with the vehicle in park and the engine running. Return to idle times were determined for four throttle plate positions with the accelerator control system complete and with each of the two throttle return springs on the throttle plate shaft independently disconnected. The severed linkage test was also performed by disconnecting the throttle cable from the throttle body. As the air throttle plate was mechanically linked to the accelerator pedal, no electrical disconnections were required.

This testing was performed at high ambient temperature of 52°F (5 +0) in accordance with the NHTSA Test Procedure TP-124-06.
SECTION 3
COMPLIANCE TEST DATA

Test data for this test can be found on the following pages. Photographs are found in Section 5 and Test Plots are found in Section 6.
DATA SHEET 1
VEHICLE DESCRIPTION

VEHICLE MAKE/MODEL/BODY STYLE: 2004 CHRYSLER PACIFICA MPV
VEHICLE NHTSA NO.: C40301
VEHICLE VIN: 2C4GM68404R539386
DATE OF TEST: APRIL 21, 2004
TEST LAB: GENERAL TESTING LABORATORIES
VEHICLE ENGINE TYPE: V6
VEHICLE ENGINE SIZE: 3.5 L
GVWR: 2688 KG
MAX. BHP ENGINE SPEED: UNK.
MFR. IDLE RPM: COMPUTER CONTROLLED (730)
FUEL METERING DEVICE (Carburetor, fuel injection, etc): FUEL INJECTION

REMARKS:

RECORDED BY: [Signature]
DATE: 04/21/04
APPROVED BY: [Signature]
DATA SHEET 2
NORMAL OPERATION TEST
(fully operational system)

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 CHRYSLER PACIFICA, MPV
VEHICLE NHTSA NO.: C49301
DATE OF TEST: APRIL 21, 2004

Check one:

SYSTEM CONDITION: COMPLETE (no modifications) Normal Operation

<table>
<thead>
<tr>
<th>ACCELERATOR POSITION</th>
<th>THROTTLE POSITION SENSOR READING</th>
<th>RPM</th>
<th>TEMPERATURE (°F)</th>
<th>THROTTLE POSITION SENSOR READING @ IDLE BASELINE</th>
<th>RETURN TIME TO IDLE (Msec)</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>% WIDE OPEN THROTTLE (WOT)</td>
<td></td>
<td></td>
<td>ENGINE COOLANT</td>
<td>AMBIENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>25</td>
<td>4250</td>
<td>120.0</td>
<td>120.1</td>
<td>2%</td>
<td>27</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>4250</td>
<td>130</td>
<td>120.2</td>
<td>2%</td>
<td>32</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>4250</td>
<td>135</td>
<td>121</td>
<td>2%</td>
<td>37</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>4250</td>
<td>140.8</td>
<td>122.2</td>
<td>2%</td>
<td>37</td>
</tr>
</tbody>
</table>

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS XXXX  FAIL __________

REMARKS:

RECORDED BY: [Signature]  DATE: 04/21/04
APPROVED BY: [Signature]
DATA SHEET 3 (1 of 2)  
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE:  2004 CHRYSLER PACIFICA, MPV  
VEHICLE NHTSA NO.:  C40301  
DATE OF TEST:  APRIL 21, 2004  

Check one:

Mid Temp. Test:  
Low Temp. Test:  
High Temp. Test:  X  

SYSTEM CONDITION: #1 SPRING DISCONNECTED

<table>
<thead>
<tr>
<th>ACCELERATOR POSITION</th>
<th>THROTTLE POSITION SENSOR READING</th>
<th>RPM</th>
<th>TEMPERATURE (°F)</th>
<th>THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)</th>
<th>RETURN TIME TO IDLE (Msec)</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>% WIDE OPEN THROTTLE (WOT)</td>
<td></td>
<td></td>
<td>ENGINE COOLANT</td>
<td>AMBIENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>25</td>
<td>4250</td>
<td>133</td>
<td>122.0</td>
<td>2%</td>
<td>36</td>
</tr>
<tr>
<td>50%</td>
<td>60</td>
<td>4250</td>
<td>140.5</td>
<td>122.1</td>
<td>2%</td>
<td>40</td>
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<tr>
<td>75%</td>
<td>75</td>
<td>4250</td>
<td>150.0</td>
<td>122.8</td>
<td>2%</td>
<td>46</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>4250</td>
<td>154.6</td>
<td>123.0</td>
<td>2%</td>
<td>50</td>
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</table>

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.  
2 seconds (2000 ms) for vehicles more than 4536 kg.  
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS  X  FAIL  

REMARKS:  

RECORDED BY:  [Signature]  
DATE:  04/21/04  
APPROVED BY:  [Signature]
DATA SHEET 3 (2 of 2)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MAKE/MODEL/BODY STYLE: 2004 CHRYSLER PACIFICA, MPV
VEHICLE NHTSA NO.: C40301
DATE OF TEST: APRIL 21, 2004

Check one:

SYSTEM CONDITION: #2 SPRING DISCONNECTED

<table>
<thead>
<tr>
<th>ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)</th>
<th>THROTTLE POSITION SENSOR READING</th>
<th>RPM</th>
<th>TEMPERATURE (°F)</th>
<th>THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)</th>
<th>RETURN TIME TO IDLE (Msac)</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>25</td>
<td>4250</td>
<td>143.5</td>
<td>121.9</td>
<td>2%</td>
<td>35</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>4250</td>
<td>148.7</td>
<td>121.0</td>
<td>2%</td>
<td>42</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>4250</td>
<td>150.1</td>
<td>120.8</td>
<td>2%</td>
<td>47</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>4250</td>
<td>153.0</td>
<td>120.2</td>
<td>2%</td>
<td>43</td>
</tr>
</tbody>
</table>

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS ___ X ___  FAIL ____________

REMARKS:

RECORDED BY: ___________________________ DATE: 04/21/04
APPROVED BY: _________________________
DATA SHEET 4
FAIL-SAFE OPERATION SEVERED

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 CHRYSLER PACIFICA, MPV
VEHICLE NHTSA NO.: C40301
DATE OF TEST: APRIL 21, 2004

Check one:

SYSTEM CONDITION: SEVERANCE

<table>
<thead>
<tr>
<th>ACCELERATOR POSITION % WIDE OPEN Throttle (WOT)</th>
<th>THROTTLE POSITION SENSOR READING</th>
<th>RPM</th>
<th>TEMPERATURE (°F)</th>
<th>THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)</th>
<th>RETURN TIME TO IDLE (Maac)</th>
<th>PASS/FAIL</th>
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</thead>
<tbody>
<tr>
<td>25%</td>
<td>25</td>
<td>4250</td>
<td>146.2</td>
<td>121.7</td>
<td>2%</td>
<td>22</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>4250</td>
<td>155.6</td>
<td>122.0</td>
<td>2%</td>
<td>26</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>4250</td>
<td>168.0</td>
<td>121.2</td>
<td>2%</td>
<td>26</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>4250</td>
<td>180.0</td>
<td>120.2</td>
<td>2%</td>
<td>30</td>
</tr>
</tbody>
</table>

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -16° C or less

PASS ___ X ___  FAIL ________

REMARKS:

RECORDED BY: ___________________________ DATE: 04/21/04
APPROVED BY: ___________________________
### SECTION 4
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>DESCRIPTION</th>
<th>MODEL/ SERIAL NO.</th>
<th>CAL. DATE</th>
<th>NEXT CAL. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTINUOUS RECORDER</td>
<td>OMEGA</td>
<td>55562</td>
<td>03/04</td>
<td>03/05</td>
</tr>
<tr>
<td>ENGINE RECORDING</td>
<td>FLUKE</td>
<td>7471026</td>
<td>03/04</td>
<td>03/05</td>
</tr>
<tr>
<td>ENGINE RECORDING</td>
<td>MONARCH</td>
<td>1444664</td>
<td>01/04</td>
<td>07/05</td>
</tr>
<tr>
<td>SOFTWARE</td>
<td>GTL</td>
<td>N/A</td>
<td>BEFORE USE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td>CHAMBER</td>
<td>GTL</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>EXHAUST DUCT</td>
<td>GTL</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
SECTION 5
PHOTOGRAPHS
NHTSA C40301 CHRYSLER PACIFICA

Channel: Throttle Position

Y1: 28.862 %  
Y2: 2.029 %  

t1: -33477.689 ms  
t2: -33452.689 ms  
dt: 0.027 s  
f: 37.037 Hz
FMVSS 124 THROTTLE RETURN TEST
124 HOT/NORMAL/50% WOT 1:32:00 PM 4/21/04

NHTSA C40301 CHRYSLER PACIFICA

V % RPM


- TRIGGER [V] - Throttle Position [%] - Engine RPM [RPM]

Channel/Throttle Position

Y1: 40.636 %
X1: -33485.359 ms
dt: 0.032 s
f: 31.250 Hz

Y2: 1.000 %
X2: -33481.309 ms
FMVSS 124  THROTTLE RETURN TEST
124 HOT/NORMAL/75% WOT  1:35:05 PM  4/21/04

NHTSA C40301 CHRYSLER PACIFICA

V  %  RPM
5.00  3.75  2.50  1.25  0.00


TRIGGER  THROTTLE POSITION %

Channel: Throttle Position
Y1: 70.921 %  Y2: 1.680 %
t1: -13104.559 ms  t2: -13147.559 ms
dt: 0.037 s  f: 27.027 Hz
FMVSS 124  THROTTLE RETURN TEST
124 HOT/NORMAL/100% WOT  1:37:40 PM 4/21/04

NHTSA C40301 CHRYSLER PACIFICA

Channel:Throttle Position

Y1: 29.210 %  Y2: -0.036 %
T1: -9960.559 ms  T2: -9963.559 ms
dt: 0.037 s  f: 27.027 Hz
FMVSS 124  THROTTLE RETURN TEST
124 HOT/ SPRING 1/ 75% WOT  2:04:29 PM  4/21/04

NHTSA C40301 CHRYSLER PACIFICA

V  %  RPM

TRIGGER

THROTTLE POSITION %

0  25  50  75  100  0.00  0.25  0.50  0.75  1.00
0  2500  5000  7500  10000


TRIGGER [V]  Throttle Position [%]  Engine RPM [RPM]  h:min:s

Channel: Throttle Position

Y1:  85.715 %  Y2:  -0.083 %

t1:  -14150.669 ms  t2:  -14120.539 ms

dt:  0.046 s  f:  21.730 Hz
FMVSS 124 THROTTLE RETURN TEST
124 HOT/SPRING 1/ 100% WOT
2:06:20 PM 4/21/04

NHTSA C40301 CHRYSLER PACIFICA

V % RPM

Trigger [V] Throttle Position [%] Engine RPM [RPM]

Channel: Throttle Position
Y1: 100.518 % Y2: 1.782 %
t1: -6405.559 ms t2: -6405.559 ms
dt: 0.080 s t: 20000 Hz
FMVSS 124 THROTTLE RETURN TEST
124 HOT/SPRING 2.50% WOT

NHTBA C40301 CHRYSLER PACIFICA

V % RPM

5.00
3.75
2.50
1.25
0.00
100
75
50
25
0
5000
3750
2500
1250
0

Channel: Throttle Position

Y1: 58.379 %  Y2: 2.983 %
T1: -24057.110 ms  T2: -24053.110 ms
dt: 0.042 s  f: 23.810 Hz
NHTSA C40301 CHRYSLER PACIFICA

Channel: Throttle Position

Y1: 50.169 %  Y2: 2.736 %
T1: -13395.110 ms  T2: -13346.110 ms
dt: 0.047 s  f: 21.277 Hz
FMVSS 124 THROTTLE RETURN TEST
124 HOT/SEVERED/75% WOT

NHTSA C40391 CHRYSLER PACIFICA

Channel: Throttle Position
Y1: 56.396 %  Y2: 0.978 %
T1: -12991.352 ms  T2: -12972.352 ms
dt: 0.028 s  f: 36.462 Hz

Graph showing throttle position and RPM over time.
FMVSS 124 THROTTLE RETURN TEST
124 HOT/SEVERED/100% WOT
3:04:29 PM 4/21/04

NHTSA C40301 CHRYSLER PACIFICA

Channel: Throttle Position

Y1: 89.880 %
Y2: -2.000 %
t1: -4603.962 ms
t2: -4603.962 ms
dt: 0.030 s
t: 33.333 Hz
SECTION 7
MANUFACTURER'S DRAWINGS
VEHICLE INFORMATION/TEST SPECIFICATIONS
FMVSS 124 - Accelerator Control Systems

2004 MY – CHRYSLER PACIFICA

1.) A sketch of the driver operated accelerator control system (ACS) starting from the accelerator pedal up to and including the fuel metering device (carburetor, fuel injectors, fuel distributor, or fuel injection pump).

- See the Chrysler Pacifica Engineering Graphics Attachments I & II

2.) For Normal ACS operation, the method utilized to determine the engine idle state (air throttle plate position, fuel delivery rate, other).

- The engine idle state was determined by recording throttle position sensor (TPS) idle voltage prior to the start of test.

3.) For Fail-Safe operation of the ACS (disconnection or severance), the method utilized to determine return of engine power to the idle state (air throttle plate position, fuel delivery rate, air intake, engine rpm, other)

- With one of the two throttle body return springs disconnected, return of the engine power idle state was verified by measuring and recording TPS idle voltage.

4.) Is the vehicle ACS equipped with any of the following:
   - Accelerator Pedal Position Sensor (APS)
   - Throttle Plate Position Sensor (TPS)
   - Electronic Control Module (ECM)
   - Air throttle plate actuator motor

- The test vehicle was equipped with a throttle plate position sensor (TPS) and an electronic control module (ECM).

5.) If air throttle plate equipped, is there a procedure which can be utilized by the test laboratory to measure the position of the throttle plate by tapping into the TPS or ECM? If so, please describe.

- Throttle plate position was verified by tapping into the throttle position sensor (TPS) with a wire harness jumper.
6.) Point(s) chosen to demonstrate compliance with FMVSS 124 for single point disconnect and severance.

- The point chosen to show compliance with FMVSS 124 for single point disconnects was in the throttle body. One of the two throttle return springs was completely disconnected to demonstrate a worst case condition.

7.) Where applicable, were connections in the ACS beyond the ECM such as the fuel injectors tested for disconnection and severance. If yes, provide details.

- Not applicable – There were no other disconnects made in the accelerator control system.

8.) Where applicable, were idle return times tested for electrical severance accompanied by shorting to ground? If yes, please provide details.

- Not applicable – No idle return times were tested for electrical severance.

9.) All sources of return energy (springs) for the accelerator pedal and if applicable, the air throttle plate.

- The source of return energy for the throttle body, is the throttle return spring. One of the two springs was disconnected to demonstrate idle return times

10.) If fuel delivery rate is used to demonstrate return to idle state, provide:
A. The method used to measure this signal i.e. connection to standard SAE J1587 data bus.
B. Equipment required to measure signal.
C. Fuel rate signal output range at the idle state.

- Fuel delivery was not used to demonstrate return to idle times.

11.) Is the ACS equipped with a limp home mode? If yes, provide operation description.

- The Chrysler Pacifica has a mechanical throttle control system. The system is not equipped with a limp home mode.
12.) Method by which the test laboratory can record engine RPM by connection to ECM, OBD connector, etc.

- The engine RPM can be monitored by using the OBD plug located under the instrument panel. A DRB (diagnostic readout box – available in the field) can be used to monitor and capture RPM data.