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Prepared By: [Signature] 
Approved By: [Signature] 
Approval Date: 4/30/04

FINAL REPORT ACCEPTANCE BY OVS:

Accepted By: [Signature] 
Acceptance Date: 5/15/04
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<th>8. Performing Organ. Rep#</th>
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<tr>
<td>Grant Farrand, Project Engineer</td>
<td>GTL-DOT-04-124-001</td>
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<tr>
<td>Debbie Messick, Project Manager</td>
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</tr>
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<th>10. Work Unit No. (TRAIS)</th>
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<td>General Testing Laboratories, Inc.</td>
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</tr>
<tr>
<td>1823 Leedstown Road</td>
<td></td>
</tr>
<tr>
<td>Colonial Beach, Va 22443</td>
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<th>13. Type of Report and Period Covered</th>
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<td>U.S. Department of Transportation</td>
<td>Final Test Report</td>
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<td>National Highway Traffic Safety Admin.</td>
<td>April 15, 2004</td>
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<td>Office of Vehicle Safety Compliance (NVS-220)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 7th Street, S.W., Room 6115</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Washington, DC 20590</td>
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15. Supplementary Notes

16. Abstract
Compliance tests were conducted on the subject 2004 Honda Element 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

17. Key Words
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Safety Engineering
FMVSS 124

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE</th>
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<tbody>
<tr>
<td>1 Purpose of Compliance Test</td>
<td>1</td>
</tr>
<tr>
<td>2 Test Procedure and Discussion of Results</td>
<td>2</td>
</tr>
<tr>
<td>3 Compliance Test Data</td>
<td>3</td>
</tr>
<tr>
<td>4 Test Equipment List and Calibration Information</td>
<td>10</td>
</tr>
<tr>
<td>5 Photographs</td>
<td>11</td>
</tr>
<tr>
<td>5.1 Front of Vehicle</td>
<td></td>
</tr>
<tr>
<td>5.2 Left Side View of Vehicle</td>
<td></td>
</tr>
<tr>
<td>5.3 Right Side View of Vehicle</td>
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<td>5.4 Vehicle's Certification Label</td>
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<td>5.5 Vehicle's Tire Information Label</td>
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<tr>
<td>5.6 Throttle Body on Engine</td>
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<tr>
<td>5.7 Accelerator Cable Linkage to Throttle Body</td>
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<tr>
<td>5.8 Accelerator Pedal</td>
<td></td>
</tr>
<tr>
<td>5.9 Accelerator Pedal Return Spring (Spring #3)</td>
<td></td>
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<tr>
<td>5.10 Throttle Body Removed from Engine</td>
<td></td>
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<td>5.11 Throttle Body Sensor</td>
<td></td>
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<tr>
<td>5.12 Throttle Control Springs #1 and #2</td>
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<tr>
<td>5.13 Top View of Throttle Body</td>
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</tr>
<tr>
<td>5.14 Vehicle in Test Chamber</td>
<td></td>
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<tr>
<td>5.15 124 Test Instrumentation Set-up</td>
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</tr>
<tr>
<td>6 Plots</td>
<td>27</td>
</tr>
<tr>
<td>7 Manufacturer's Drawings</td>
<td>48</td>
</tr>
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</table>
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 Honda Element, MPV, NHTSA No. C45300 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 three throttle return springs (2) on the throttle plate shaft and (1) on the accelerator pedal 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°C (-5 to 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 MY/MAKE/MODEL/BODY STYLE: 2004 HONDA ELEMENT MPV
VEHICLE NHTSA NO.: C45300
VEHICLE VIN: 5J6YH28254
DATE OF TEST: APRIL 15, 2004
TEST LAB: GENERAL TESTING LABORATORIES

VEHICLE ENGINE TYPE: 4 CYL
GVWR: 2020 KG
VEHICLE ENGINE SIZE: 2.4 L D.O.H.C 16 VALVE

VEHICLE ACCEL. CONTROL SYSTEM (ACS) (Air or Fuel Throttled): AIR
MAX. BHP ENGINE SPEED: 160 HP.

MFR. IDLE RPM: COMPUTER CONTROLLED (750)
FUEL METERING DEVICE (Carburetor, fuel injection, etc): FUEL INJECTION

REMARKS:

RECORDED BY: [Signature] DATE: 04/15/04
APPROVED BY: [Signature]
DATA SHEET 2  
NORMAL OPERATION TEST  
(fully operational system)

VEHICLE MY/MAKE/MODEL/BODY STYLE:  2004 HONDA ELEMENT, MPV  
VEHICLE NHTSA NO.:  C45300  
DATE OF TEST:  APRIL 15, 2004

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

SYSTEM CONDITION: COMPLETE (no modifications) Normal Operation

<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 (Msec)</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>25</td>
<td>5000</td>
<td>152</td>
<td>120.4</td>
<td>12%</td>
<td>20</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>5000</td>
<td>152</td>
<td>120.4</td>
<td>12%</td>
<td>20</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>5000</td>
<td>152</td>
<td>120.4</td>
<td>12%</td>
<td>20</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>5000</td>
<td>152</td>
<td>120.4</td>
<td>12%</td>
<td>40</td>
</tr>
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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:  04/15/04  
APPROVED BY:
DATA SHEET 3 (1 of 3)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 HONDA ELEMENT, MPV
VEHICLE NHTSA NO.: C45300
DATE OF TEST: APRIL 15, 2004

Check one:


SYSTEM CONDITION: #1 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 (Msec)</th>
<th>PASS/FAIL</th>
</tr>
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<tbody>
<tr>
<td>25%</td>
<td>25</td>
<td>5000</td>
<td>133</td>
<td>120.7</td>
<td>12%</td>
<td>20 P</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>5000</td>
<td>130</td>
<td>120.5</td>
<td>12%</td>
<td>30 P</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>5000</td>
<td>127</td>
<td>120.4</td>
<td>12%</td>
<td>40 P</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>5000</td>
<td>126</td>
<td>120.4</td>
<td>12%</td>
<td>50 P</td>
</tr>
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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: 04/15/04
APPROVED BY: [Signature]
DATA SHEET 3 (2 of 3)  
FAIL-SAFE OPERATION DISCONNECTION  

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 HONDA ELEMENT, MPV  
VEHICLE NHTSA NO.: C45300  
DATE OF TEST: APRIL 15, 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>ENGINE COOLANT TEMPERATURE (°F)</th>
<th>AMBIENT TEMPERATURE (°F)</th>
<th>THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)</th>
<th>RETURN TIME TO IDLE (Msec)</th>
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<tbody>
<tr>
<td>25%</td>
<td>25</td>
<td>5000</td>
<td>130</td>
<td>120.9</td>
<td>12%</td>
<td>20</td>
<td>P</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>5000</td>
<td>130</td>
<td>120.8</td>
<td>12%</td>
<td>30</td>
<td>P</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>5000</td>
<td>128</td>
<td>120.8</td>
<td>12%</td>
<td>40</td>
<td>P</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>5000</td>
<td>128</td>
<td>120.4</td>
<td>12%</td>
<td>40</td>
<td>P</td>
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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: 04/15/04  
APPROVED BY: [Signature]
### SYSTEM CONDITION: #3 SPRING DISCONNECTED (ACCELERATOR RETURN)

<table>
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<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>
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<td>25</td>
<td>5000</td>
<td>136</td>
<td>120.9</td>
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<td>20</td>
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<tr>
<td>50%</td>
<td>50</td>
<td>5000</td>
<td>136</td>
<td>120.9</td>
<td>12%</td>
<td>30</td>
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<tr>
<td>75%</td>
<td>75</td>
<td>5000</td>
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<td>100</td>
<td>5000</td>
<td>136</td>
<td>120.9</td>
<td>12%</td>
<td>40</td>
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</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: [Signature]  DATE: 04/15/04  
APPROVED BY: [Signature]
DATA SHEET 4
FAIL-SAFE OPERATION SEVERED

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 HONDA ELEMENT, MPV
VEHICLE NHTSA NO.: C45300
DATE OF TEST: APRIL 15, 2004

Check one:

SYSTEM CONDITION: SEVERANCE

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<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>
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</thead>
<tbody>
<tr>
<td>25%</td>
<td>25</td>
<td>5000</td>
<td>130</td>
<td>120.9</td>
<td>20</td>
<td>P</td>
</tr>
<tr>
<td>50%</td>
<td>50</td>
<td>5000</td>
<td>130</td>
<td>120.9</td>
<td>20</td>
<td>P</td>
</tr>
<tr>
<td>75%</td>
<td>75</td>
<td>5000</td>
<td>128</td>
<td>120.6</td>
<td>20</td>
<td>P</td>
</tr>
<tr>
<td>100%</td>
<td>100</td>
<td>5000</td>
<td>128</td>
<td>120.6</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: __________ DATE: 04/15/04
APPROVED BY: __________
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<th>NEXT CAL. DATE</th>
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<td>7471026</td>
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<tr>
<td>CHAMBER</td>
<td>GTL</td>
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<td>N/A</td>
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<tr>
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<td>GTL</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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</tbody>
</table>
SECTION 5
PHOTOGRAPHS
2004 HONDA ELEMENT
NHTSA NO. C45300
FMVSS NO. 124H

FIGURE 5.1
FRONT VIEW OF VEHICLE
2004 HONDA ELEMENT
NHTSA NO. C45300
FMVSS NO. 124H

FIGURE 5.2
LEFT SIDE VIEW OF VEHICLE
2004 HONDA ELEMENT
NHTSA NO. C45300
FMVSS NO. 124H

FIGURE 5.3
RIGHT SIDE VIEW OF VEHICLE
<table>
<thead>
<tr>
<th><strong>SEATING CAPACITY</strong></th>
<th>1 TOTAL 4 [FRONT 2] [REAR 2]</th>
</tr>
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<tbody>
<tr>
<td><strong>ORIGINAL TIRE SIZE</strong></td>
<td><strong>COLD TIRE INFLATION PRESSURE</strong></td>
</tr>
<tr>
<td>P215/70R16 99S</td>
<td>FRONT 220KPA 32PSI</td>
</tr>
<tr>
<td>COMPACT SPARE TIRE</td>
<td>REAR 235KPA 34PSI</td>
</tr>
<tr>
<td>115/60R16 106H</td>
<td>COLD TIRE INFLATION PRESSURE</td>
</tr>
<tr>
<td></td>
<td>220KPA 32PSI</td>
</tr>
</tbody>
</table>

**FIGURE 5.5**
CLOSE-UP VIEW OF VEHICLE'S TIRE INFORMATION LABEL

2004 HONDA ELEMENT
NHTSA NO. C45300
FMVSS NO. 124H
FIGURE 5.9
ACCELERATOR PEDAL RETURN SPRING
(SPRING #3)
RETURN SPRING #1 ON TOP.
SPRING #2 ON BOTTOM.
SECTION 6

PLOTS
FMVSS 124
THROTTLE CONTROL TEST

124 HOT/SPRING 1 REMOVED/25% WOT 3:04:02 PM 4/15/04

NHTSA C48300 HONDA ELEMENT

V % RPM

14:45:37.10 14:45:37.15 14:45:37.20

TRIGGER Throttle Position Engine RPM

Channel: Throttle Position

Y1: 27.28 % Y2: 12.65 %
T1: 14:45:37.14 T2: 14:45:37.18
dt: 0.02 sec f: 40.45 Hz
FMVSS 124
THROTTLE CONTROL TEST

124 HOT/SPRING 1 REMOVED/75% WOT  2:53:02 PM  4/15/04

NHTSA C45300  HONDA ELEMENT

V  %  RPM

--- TRIGGER --- Throttle Position --- Engine RPM

Channel: Throttle Position

Y1: 66.81 %
H: 14:45:18.57
dt: 0.04 s

Y2: 12.96 %
T2: 14:45:18.61
t: 25.64 Hz
FMVSS 124
THROTTLE CONTROL TEST
124 HOT/SPRING 1 REMOVED/100% WOT   2:50:40 PM 4/15/04

NHTSA C45300 HONDA ELEMENT

V  %  RPM

Channel: Throttle Position
Y1: 99.71 %  Y2: 12.14 %
t1: 14:45:05.47  t2: 14:45:05.62
t: 0.05 s  f: 18.521 Hz
FMVSS 124
THROTTLE CONTROL TEST

124 HOT/SPRING 2 REMOVED/25% WOT

3:49:46 PM 4/15/04

NHTSA C45300 HONDA ELEMENT

V  %  RPM

Channel: Throttle Position
Y1:  20.67 %  Y2:  12.04 %
T1:  15:40:48.48  T2:  15:40:48.50
dt:  0.02 s  f:  52.83 Hz
FMVSS 124
THROTTLE CONTROL TEST

124 HOT/SPRING 2 REMOVED 50% WOT

3:56:19 PM 4/15/04

NHTSA C45300 HONDA ELEMENT

V % RPM


TRIGGER Throttle Position Engine RPM

Channel: Throttle Position

Y1: 47.08 % Y2: 13.42 %
t1: 15:40:37.96 t2: 15:40:38.01
dt: 0.03 s f: 35.71 Hz
FMVSS 124
THROTTLE CONTROL TEST

124 HOT/SPRING 2 REMOVED/75% WOT

NHTSA C46300 HONDA ELEMENT

V % RPM

Channel: Throttle Position
Y1: 65.70 %
Y2: 12.74 %
t1: 15:40:29.77
t2: 15:40:29.80
dt: 0.04 s
t: 27.79 Hz
FMVSS 124
THROTTLE CONTROL TEST
124 HOT/SPRING 3 REMOVED / 75% WOT

4:42:01 PM 4/15/04

NHTSA C46800 HONDA ELEMENT

Channel: Throttle Position
Y1: 67.46 %
Y2: 12.88 %
T1: 16:28:28.90
T2: 16:28:28.97
dt: 0.07 s
t: 14.49 Hz
FMVSS 124
THROTTLE CONTROL TEST
124 HOT/SPRING 3 REMOVED /100% WOT 4:34:00 PM 4/15/04

NHTSA C45300 HONDA ELEMENT

V % RPM

16:28:15.80 16:29:15.85

Channel: Throttle Position
Y1 = 100.39 % Y2 = 13.39 %
t1 = 16:28:15.81 t2 = 16:29:15.85
dt = 0.04 s f = 25.84 Hz
FMVSS 124
THROTTLE CONTROL TEST
124 HOT/SEVERANCE/25% WOT

NHTSA C45300 HONDA ELEMENT

V % RPM

3:01.450 17:00:01.480 17:06:01.470 17:09:01.480 17:09:01.490

-- TRIGGER -- Throttle Position -- Engine RPM

Channel: Throttle Position

Y1: 35.06 %  Y2: 13.00 %
T1: 17:08:01.46  T2: 17:08:01.48
dt: 0.02 sec  f: 56.68 Hz
FMVSS 124
THROTTLE CONTROL TEST

124 HOT/SEVERANCE/50% WOT

5:22:44 PM 4/15/04

NHTSA C46300 HONDA ELEMENT

V % RPM

:08:51.95 17:08:52.00 17:08:52.05 17:08:52.10

- TRIGGER - Throttle Position - Engine RPM

Channel: Throttle Position

Y1: 48.66 %  Y2: 12.82 %
T1: 17:08:52.03  T2: 17:08:52.05
dt: 0.02 s  t: 52.63 Hz
FMVSS 124
THROTTLE CONTROL TEST
124 HOT/SEVERANCE/100 % WOT

NHTSA C46300  HONDA ELEMENT

V % RPM

17:08:32.20  17:08:32.25  17:08:32.30  17:08:32.35  17:08:32.40  17:08:32.45
h:min:s

Channel: Throttle Position
Y1: 88.47 %
T1: 17:08:32.30
dt: 0.04 s

Y2: 12.11 %
T2: 17:08:32.34
f: 23.81 Hz
Requested Information:

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).

Answer: Refer to Fig. 1.

Fig. 1 Accelerator Control System of 04M ELEMENT
2.) For Normal ACS operation, the method utilized to determine the engine idle state (air throttle plate position, fuel delivery rate, other).

Answer: Air Throttle Plate Position is used.

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).

Answer: Air Throttle Plate Position is used.

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

Answer: B. and C.

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.

Answer: Connect Recorder to TPS wire as shown in Fig.2. The WOT of the throttle is measured by first measuring the voltage at the idle position, which is set to 0%, and by setting voltage of the fully open throttle to 100%. Also, the throttle return time is measured by the voltage difference time of the throttle position sensor.

Connecting Method for Recorder (Fig.2)
Throttle Plate Position Sensor (Photo)

Yellow / Blue (+) - Light green / Black
Red / Black (-)

Example of the Throttle Return Time

6.) Point(s) chosen to demonstrate compliance with FMVSS 124 for single point disconnect and severance.

Answer: The Accelerator Pedal Spring is removed.
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.

Answer: No

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

Answer: No

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

Answer: Primary Return Spring and Secondary Return Spring of Air Throttle Valve

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.

Answer: N.A.

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

Answer: N.A.