FMVSS NO. 207
INDICANT TEST

GENERAL MOTORS OF CANADA LTD.
2005 BUICK LACROSSE, PASSENGER CAR
NHTSA NO. C50103

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

JUNE 24, 2005
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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   NHTSA No. C50103

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    June 15, 2005

    NVS-220

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16. Abstract
   Indicant tests were conducted on the subject 2005 Buick Lacrosse passenger car in accordance
   with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-207-00
   for the determination of FMVSS 207 compliance.
   Test failures identified were as follows:
   NONE

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5.1 % Frontal Left Side View of Vehicle  
5.2 % Rear Right Side View of Vehicle  
5.3 Vehicle Certification Label  
5.4 Vehicle Tires Information Label  
5.5 % Left Rear View of Vehicle in Test Rig  
5.6 % Left Front View of Vehicle in Test Rig  
5.7 % Right Front View of Vehicle in Test Rig  
5.8 % Right Rear View of Vehicle in Test Rig  
5.9 Pre-Test Row 1, Left Side View  
5.10 Pre-Test Row 1, % Left Front View  
5.11 Pre-Test Row 1, % Right Front View  
5.12 Pre-Test Row 1, Right Side View  
5.13 End of Test, Row 1, Left Side View  
5.14 End of Test, Row 1, % Left Front View  
5.15 End of Test, Row 1, % Right Front View  
5.16 End of Test, Row 1, Right Side View  
5.17 Pre-Test Row 1, Left Side View  
5.18 Pre-Test Row 1, % Left Front View  
5.19 Pre-Test Row 1, % Right Front View  
5.20 Pre-Test Row 1, Right Side View  
5.21 Full Load Row 1, Left Side View  
5.22 Full Load Row 1, % Left Front View  
5.23 Full Load Row 1, % Right Front View  
5.24 Full Load Row 1, Right Side View  
5.25 Post Test Row 1, Left Side View  
5.26 Post Test Row 1, % Left Front View  
5.27 Post Test Row 1, % Right Front View  
5.28 Post Test Row 1, Right Side View  
5.29 Pre-Test Row 2, Left Side View  
5.30 Pre-Test Row 2, % Left Front View  
5.31 Pre-Test Row 2, % Right Front View  
5.32 Pre-Test Row 2, Right Side View  
5.33 Pre-Test Row 2, Left Side View
5.34 Full Load Row 2, ¾ Left Front View
5.35 Full Load Row 2, ¾ Right Front View
5.36 Full Load Row 2, Right Side View
5.37 Post Test Row 2, ¾ Left Front View
5.38 Post Test Row 2, ¾ Left Front View
5.39 Post Test Row 2, ¾ Right Front View
5.40 Post Test Row 2, Right Side View

Test Plots
SECTION 1

INTRODUCTION

1.0 PURPOSE OF INDICANT TEST

A 2005 Buick Lacrosse 4-door passenger car was subjected to the following tests to determine the effects of the newly developed FMVSS 207/210 force application devices (FAD) (a.k.a. Tommy (FAD 1) and Tommy Jr (FAD 2)) as compared to the current FMVSS 207/210 seat belt body blocks.

1.1 TEST VEHICLE

The test vehicle was a 2005 Buick Lacrosse 4-door passenger car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 2G4WC532051308892

B. NHTSA No.: C50103

C. Manufacturer: GENERAL MOTORS OF CANADA LTD.

D. Manufacture Date: 04/05

1.2 TEST DATE

The test vehicle was subjected to testing on June 15, 2005.
SECTION 2
TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 GENERAL

The 2005 Buick Lacrosse 4-door passenger car, NHTSA No. C50103, was subjected to testing on June 15, 2005.

2.1 TEST PROCEDURE

FAD Positioning Procedure:

1. Place seat in full rearward and full downward position.
2. Set seatback angle per manufacturer's recommendation.
3. Identify and mark the centerline of the seat and seat back for each seating position.
4. Place the FAD so the midsagittal plane of the FAD contains the centerline for both the seat and back support of the seat. (Centerline of Body aligns with the centerline of the seat)
5. Rotate torso forward.
6. Push on pelvis parallel to surface of seating surface so the back of the pelvis is solidly against the seat back.
7. Rotate the torso up against the seatback while holding the pelvis in place.
8. Push on torso at center of gravity, perpendicular to the seat back with a force of 40 pounds.
9. Attach seatbelt and position the seatbelt so lap belt is over the FAD's hips and the shoulder strap over the torso (chest).
10. If seatbelts need to be replaced with wire rope, install ratchet-type-belt tensioner on B-pillar between D-Ring and retractor and remove excess belt from the retractor. If a second retractor is installed on the lap belt, install a second ratchet type-belt tensioner between the FAD and the lap belt retractor.
11. Attach one actuator to the torso pull yoke and one to the pelvis eyelet.

Pull Test Procedure:

1. Connect load cells and actuators to the FAD's so they pull in a plane that is inclined 10° ± 4° above the horizontal. The applied load shall be parallel to the vehicle's centerline ± 3°. Also connect the standard test blocks in accordance with FMVSS 207/210 compliance testing.
2. Take pre-test photographs.
3. Ramp to holding load within 30 seconds.
4. Take photographs.
5. Hold the maximum force for a period of not less than ten seconds.
6. Take post test photographs.
SECTION 2 Continued

Test Configuration for Buick Lacrosse 5 Passenger Sedan:

1. LF FAD1
2. RF Standard Blocks
3. LR Standard Blocks
4. CR FAD2
5. RR FAD1

2.2 SUMMARY OF RESULTS

The test results are provided in Section 3, Test Data.
3.0 DATA

The following items were noted during the conduct of these tests.

1. The new FMVSS 207/210 FAD (Tommy Blocks) are much easier to position and set for lap and shoulder belts than the current FMVSS 207/210 body blocks.

2. The current FMVSS 207/210 shoulder belt body block wants to slide down and rest on top of the lower body block. This is no longer a problem with the new FMVSS 207/210 FAD (Tommy Blocks).

3. The new FMVSS 207/210 FAD (Tommy Blocks) appear to be more “seat belt friendly” than the current FMVSS 207/210 body blocks. ie: A remote chance of breakage of the lap belt buckle due to bending around the corner of the current FMVSS 207/210 lap belt body block and less pay-out of shoulder belt during the test due to the torso being connected to the lap on the new FMVSS 207/210 FAD (Tommy Blocks).

4. Using existing body block, pay-out of seat belt webbing due to load limiters causes hydraulic test load application cylinders to bottom-out and test cannot be completed without resetting and starting the test over again. The resetting of the hydraulic test load application cylinders was not necessary using the new proposed FMVSS 207/210 FAD (Tommy Blocks).

5. This vehicle appears to meet the requirements of FMVSS 210 when tested with current FMVSS 207/210 body blocks and the proposed FMVSS 207/210 FAD force application device (a.k.a.) Tommy (FAD 1) and Tommy Jr. (FAD 2).
DATA SHEET 1
LAP AND SHOULDER BELT ASSEMBLY ANCHORAGE LOADING

VEHICLE MAKE/MODEL/BODY STYLE: 2005 BUICK LACROSSE PASSENGER CAR
VEHICLE NHTSA NO.: C50103  VIN: 2G4WC532051308692
LABORATORY: GENERAL TESTING LABORATORIES
TEST DATE: 06/15/05
OBSERVERS: G. Farrand, J. Letane

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<td>Left Shoulder</td>
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<td>Right Lap</td>
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REMARKS: *Passenger side shoulder belt hydraulic ram bottomed out due to spool-out of the shoulder belt retractor on test #5310. Hydraulic rams were re-hooked and test was continued. See Test #5311.

RECORDED BY: [Signature]  DATE: 06/15/05
APPROVED BY: [Signature]
# DATA SHEET 2
## SEAT BELT ASSEMBLY LOAD ANGLE MEASUREMENT

**VEHICLE MAKE/MODEL/BODY STYLE:** 2005 BUICK LACROSSE PASSENGER CAR  
**VEHICLE NHTSA NO.:** C50103  
**VIN:** 2G4WC532051308892  
**LABORATORY:** GENERAL TESTING LABORATORIES  
**TEST DATE:** 06/15/05  
**OBSERVERS:** G. Farrand, J. Latane

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**REMARKS:**

**RECORDED BY:**  
**DATE:** 06/15/05  
**APPROVED BY:**
## SECTION 4
### INSTRUMENTATION AND EQUIPMENT LIST

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SECTION 5
PHOTOGRAPHS
FIGURE 5.2
X-REAR RIGHT SIDE VIEW OF VEHICLE

2005 BUICK LACROSSE
NHTSA NO. C56103
FMVSS NO. 210
SECTION 6
TEST PLOTS
GTL 5310, NHTSA C50103.

210. Lap Belt, Row 1 Left DSP.

Load in Pounds

Time in Seconds
GTL 5310, NHTSA C50103.

210, Shoulder Belt, Row 1 Left DSP.
GTL 5310, NHTSA C50103.

210, Lap Belt, Row 1 Right DSP.
GTL 5310, NHTSA C50103.

210. Shoulder Belt, Row 1 Right DSP.
GTL 5311, NHTSA C50103.

210, Shoulder Belt, Row 1 Left DSP.

Graph showing load in pounds (thousands) over time in seconds.
GTL 5311, NHTSA C50103.

210, Shoulder Belt, Row 1 Right DSP.

Load in Pounds (Thousands)

Time in Seconds
GTL 5312, NHTSA C50103.

210. Lap Belt, Row 2 Left DSP.
GTL 5312, NHTSA C50103.

210, Shoulder Belt, Row 2 Left DSP.

Load in Pounds (Thousands)

Time in Seconds
GTL 5312, NHTSA C50103.

210. Shoulder Belt, Row 2 Right DSP.

Load in Pounds (Thousands)

Time in Seconds
GTL 5312, NHTSA C50103.

210. Lap Belt, Row 2 Center DSP.

Load in Pounds (Thousands)

Time in Seconds
GTL 5312, NHTSA C50103.

210, Shoulder Belt, Row 2 Center DSP.