SAFETY COMPLIANCE TESTING FOR FMVSS 202a
“Head Restraints”

FORD MOTOR COMPANY
2010 Lincoln MKT MPV
NHTSA No. CA0213

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: September 22, 2010 & September 29-30, 2010
Report Date: January 10, 2011

FINAL REPORT

Prepared For:

U.S DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (Rm W45-304)
1200 New Jersey Avenue, SE
Washington, DC 20590
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Prepared By:
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Approved By:
P. Michael Miller II, Vice President

February 11, 2011

FINAL REPORT ACCEPTANCE BY OVSC:
Edward E. Chan

Accepted By:

Acceptance Date:

MGA File #: G10Q7-001.2
**Abstract**

A compliance test was conducted on the subject 2010 Lincoln MKT MPV, NHTSA No. CA0213, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-202aS-00S-00 for the determination of FMVSS 202a compliance. The test was conducted at MGA Research Corporation in Troy, Michigan on September 22, 2010 and September 29-30, 2010. Test failures identified were as follows:

**NONE**

The data recorded indicates that the 2010 Lincoln MKT MPV tested appears to meet the requirements of FMVSS 202a.
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<td>6.8.4 Passenger Test Photo #4</td>
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<td>6.8.6 Passenger Test Photo #6</td>
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APPENDIX B MANUFACTURER’S DATA (OVSC Form-SRP)

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<td>8</td>
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1.0 PURPOSE AND PROCEDURE

**Purpose:** The purpose of this testing was to determine whether head restraints equipped in vehicles supplied by the National Highway Traffic Safety Administration meet the requirements of Federal Motor Vehicle Safety Standard Number 202a, entitled “Head Restraints”.

**Test Procedures:** The “MGA Research Corporation Testing Procedures for FMVSS 202a,” submitted to and approved by the National Highway Traffic Safety Administration, contains the specific procedures used to conduct the testing.

This procedure shall not be interpreted to conflict with any portion of NHTSA TP-202aS-00, FMVSS 202a nor any amendment thereof within the applicable contract.

2.0 DATA SUMMARY

Summary data is provided below. Data for the configuration and the location of each seating position tested is provided in Section 5.0. Photographs can be found in Section 6.0 and test plots can be found in Section 7.0. The data recorded indicates that the 2010 Lincoln MKT MPV tested appears to meet the requirements of FMVSS 202a.

**Table 1. Summary Data**

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Test Type</th>
<th>Seat Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10855</td>
<td>Dimensional Measurements</td>
<td>Front LH 12-Way Power (Leather)</td>
</tr>
<tr>
<td>E10856</td>
<td>Dimensional Measurements</td>
<td>Front RH 12-Way Power (Leather)</td>
</tr>
<tr>
<td>E10882</td>
<td>Height Retention</td>
<td>Front RH 12-Way Power (Leather)</td>
</tr>
<tr>
<td>E10881</td>
<td>Backset Retention, Displacement and Strength</td>
<td>Front LH 12-Way Power (Leather)</td>
</tr>
<tr>
<td>D10291</td>
<td>Energy Absorption</td>
<td>Front RH 12-Way Power (Leather)</td>
</tr>
</tbody>
</table>
3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

<table>
<thead>
<tr>
<th>VEH. MOD YR/MAKE/MODEL/BODY</th>
<th>2010 Lincoln MKT MPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEH. NHTSA NO.</td>
<td>CA0213</td>
</tr>
<tr>
<td>VIN</td>
<td>2LMHJ5FR9ABJ10077</td>
</tr>
<tr>
<td>COLOR</td>
<td>Silver</td>
</tr>
<tr>
<td>VEH. BUILD DATE</td>
<td>2010</td>
</tr>
<tr>
<td>TEST DATES</td>
<td>September 22, 2010 and September 29-30, 2010</td>
</tr>
<tr>
<td>TEST LABORATORY</td>
<td>MGA Research Corporation</td>
</tr>
<tr>
<td>OBSERVERS</td>
<td>Alisshia Woods, Helen Kaleto, Dave Maier</td>
</tr>
</tbody>
</table>

GENERAL INFORMATION:

DATA FROM VEHICLE’S CERTIFICATION LABEL:

Vehicle Manufactured By: Ford Motor Company
Date of Manufacture: September 9, 2009    VIN: 2LMHJ5FR9ABJ10077
GVWR: 2735kg    GAWR FRONT: 1320kg    GAWR REAR: 1429kg

DATA FROM TIRE placARD:

Tire Pressure with Maximum Capacity Vehicle Load:
FRONT: 240 kpa    REAR: 240 kpa
Recommended Tire Size: P235/55R19
Recommended Cold Tire Pressure:
FRONT: 240 kpa    REAR: 230 kpa
Size of Tire on Test Vehicle: P235/55R19
Size of Spare Tire: T155/70D17

VEHICLE CAPACITY DATA:

Type of Front Seats:    Bench X; Bucket; Split Bench
Number of Occupants:    Front 2; Rear 5 TOTAL 7.
## 4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

<table>
<thead>
<tr>
<th>Test Equipment Used for Testing</th>
<th>Calibration Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGA Hydraulic Test Frame (202a)</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydraulic Pump</td>
<td>N/A</td>
</tr>
<tr>
<td>MGA Data Acquisition System (202a)</td>
<td>1/25/2011</td>
</tr>
<tr>
<td>Inclinometer (Digital) - MGA0000823</td>
<td>1/27/2011</td>
</tr>
<tr>
<td>Accelerometer – P57862, P58043</td>
<td>11/17/2010</td>
</tr>
<tr>
<td>LVDT’s - H1, H3, T1</td>
<td>12/15/2010</td>
</tr>
</tbody>
</table>
5.0 DATA

All data summarized below appears to meet the requirements of FMVSS 202a.

### Table 3. S5.2.1-5.2.4 Dimensional Measurement

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Average H-Point (Reference Point: Seat Back Pivot)</th>
<th>S4.2.1 – Average Height (mm) (Req’t&gt;800 at 1 adj. / No adjustments below 750)</th>
<th>S4.2.3-Average Backset (mm) Req’t&lt;55</th>
<th>S4.2.2-Width (mm) Req’t&gt;170</th>
<th>S4.2.4-Gaps Did Cylinder Pass Through? (Yes/No) Req’t = No</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10855 (LH Power)</td>
<td>X (mm)</td>
<td>Z (mm)</td>
<td>H1</td>
<td>H2</td>
<td>H3</td>
</tr>
<tr>
<td>E10856 (RH Power)</td>
<td>-188</td>
<td>73</td>
<td>829</td>
<td>809</td>
<td>775</td>
</tr>
<tr>
<td></td>
<td>-186</td>
<td>72</td>
<td>831</td>
<td>810</td>
<td>777</td>
</tr>
</tbody>
</table>

### Table 4. S5.2.5 Energy Absorption

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Impact Angle ($\theta$)</th>
<th>Impact Velocity (kph)</th>
<th>Accel 1 (g’s)</th>
<th>Accel 2 (g’s)</th>
<th>Post-Test Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Peak</td>
<td>3msec Clip Req’t&lt;80</td>
<td>Peak</td>
</tr>
<tr>
<td>D10291 (RH Power)</td>
<td>0.0</td>
<td>24.0</td>
<td>23.8</td>
<td>21.0</td>
<td>25.2</td>
</tr>
</tbody>
</table>

### Table 5. S5.2.6 Height Retention

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Initial Displacement at 50 N (mm) Req’t &lt; 25</th>
<th>Max. Load (N) Req’t=500 N (+0, -10) (Hold 5 Sec.)</th>
<th>Height Retention (mm) Req’t &lt; 13</th>
<th>Post-Test Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10882 (RH Power)</td>
<td>8.1</td>
<td>499</td>
<td>5.8</td>
<td>• The H/R successfully completed the load profile.</td>
</tr>
</tbody>
</table>

### Table 6. S5.2.7 Backset Retention, Displacement and Strength

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>H/R Type</th>
<th>H/R Test Position</th>
<th>Displaced Torso Angle (deg)</th>
<th>Initial Headform Disp. at 37 Nm (mm) Req’t&lt;25</th>
<th>Headform Disp. at 373 Nm (mm) Req’t&lt;102</th>
<th>Backset Retention (mm) Req’t&lt;13</th>
<th>Max Load Applied through Headform (N) Req’t&gt;890</th>
<th>Headform Loading Axis Distance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E10881 (LH Power)</td>
<td>2-Way</td>
<td>H2 (809)</td>
<td>27.3</td>
<td>14.5</td>
<td>-37.0</td>
<td>6.0</td>
<td>895</td>
<td>738</td>
</tr>
</tbody>
</table>

**Note:** H2 designates one notch below full up.
DATA SHEET 1

SUMMARY OF RESULTS

VEH. MOD YR/MAKE/MODEL/BODY STYLE: 2010 Lincoln MKT MVP

VEH. NHTSA NO.: CA0213 ; VIN: ZLMH55FR9A#10077

VEH. BUILD DATE: 9/69 ; TEST DATE: 9/22/09, 9/23/09, 9/24/09

TEST LABORATORY: N/A

OBSERVERS: Melissa Woods, Helen Kugel, David Meier

---

A. VISUAL INSPECTION OF TEST VEHICLE

Upon receipt for completeness, function, and discrepancies or damage which might influence the testing.

RESULTS: NONE

B. DIMENSIONAL REQUIREMENTS

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

C. OWNER'S MANUAL

PASS | FAIL

D. REMOVABILITY

PASS | FAIL | N/A

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger's Side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

E. NON-USE POSITION

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear Designated Seating Positions</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

F. ENERGY ABSORPTION TEST

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

MGA File #: G10Q7-001.2
### G. HEIGHT RETENTION TEST

<table>
<thead>
<tr>
<th>Position</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td>NA</td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>X</td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>NA</td>
</tr>
</tbody>
</table>

### H. BACKSET RETENTION TEST

<table>
<thead>
<tr>
<th>Position</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td>X</td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>NA</td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>NA</td>
</tr>
</tbody>
</table>

**RECORDED BY:** [Signature]

**DATE:** 09/22/10

**APPROVED BY:** [Signature]
DATA SHEET 2a

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: CA0213  TEST DATE: 9/22/10

Seat Location: Driver 12-in. power (center)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 22.

Striker to H-Point (mm): \( H \)  Striker to H-Point angle: \( H \)

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 624  \( \checkmark \) PASS  FAIL

Hh \( \geq \) or \( = \) 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hi (mm): 775  \( \checkmark \) PASS  FAIL

Hi \( \geq \) or \( = \) 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 66 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 764

Width, W (mm): 260  \( \checkmark \) PASS  FAIL

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.
Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: \( \theta \)

Striker to H-Point (mm): \( h \)  
Striker to H-Point angle: \( \alpha \)

Position the head restraint at a height greater than or equal to 750 \( \text{mm} \) and less than or equal to 800 \( \text{mm} \) for front head restraints. Exception: head restraint with lowest position higher than 800 \( \text{mm} \), adjust to lowest position.

**Backset, B (mm):** 0  
\[ \checkmark \text{PASS} \quad \text{FAIL} \]

Backset must be less than or equal to 55 \( \text{mm} \).

**Gap Measurement**

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): 0

Size of each gap (as measured with the spherical head form): 0

**Gap Size** 25 \( \text{mm} \) Diameter did not pass through the \( \checkmark \text{PASS} \quad \text{FAIL} \)

Gaps must be less than or equal to 60 \( \text{mm} \).

**REMARKS:**

**RECORDED BY:**  
**DATE:** 9/22/10

**APPROVED BY:**  

MGA File #: G10Q7-001.2
DATA SHEET 2a

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: CH0213     TEST DATE: 9/22/04

Seat Location: Passenger 3rd row 2nd seat

Height Measurement

SAE J826 three-dimensional manikin torso angle: 27°

Striker to H-Point (mm): \(\text{NA}\)  
Striker to H-Point angle:  \(\text{NA}\)

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 931  
\(\checkmark\) PASS \(\times\) FAIL

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 777  
\(\checkmark\) PASS \(\times\) FAIL

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 66 mm below the measured Height, Hh.

Height, Hw (= Hh − 65): 766

Width, W (mm): 197  
\(\checkmark\) PASS \(\times\) FAIL

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.
Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: \(22\degree\)

Striker to H-Point (mm): \(\text{NA}\)  
Striker to H-Point angle: \(\text{NA}\)

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

**Backset, B (mm):** \(3\)  

\(<\) PASS  
FAIL

Backset must be less than or equal to 55 mm.

**Gap Measurement**

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: \(3\)

Least dimension of each gap (measured with a steel tape): \(\text{NA}\)

Size of each gap (as measured with the spherical head form): \(\text{NA}\)

**Gap Size**  
25 mm cylinder shall not pass through each gap  
\(<\) PASS  
FAIL

Gaps must be less than or equal to 60 mm.

**REMARKS:**

**RECORDED BY:** [Signature]  
**DATE:** 9/22/10

**APPROVED BY:** [Signature]
DATA SHEET 3

OWNER'S MANUAL

VEH. NHTSA NO.: C-22-A3 TEST DATE: 1/22/10

Emphasize that all occupants should place their head restraint in a proper position prior to operating the vehicle in order to prevent the risk of serious injury.

PASS_ FAIL

Description of the head restraint system and identification of which seats are equipped.

PASS_ FAIL

If the head restraint is removable, instructions on how to properly remove and reinstall using a deliberate action distinct from any act necessary for adjustment.

PASS_ FAIL N/A

Warning that all head restraints must be reinstalled properly to protect occupants.

PASS_ FAIL

Describe the adjustment of the head restraints and/or seat back to achieve proper head restraint position relative to the head. The description must include the following:

1) a presentation and explanation of the main components of the vehicle's head restraints

2) the basic requirements for proper head restraint operation, including an explanation of the actions that may affect the proper functioning of the head restraints.

3) the basic requirements for proper positioning of a head restraint in relation to an occupant's head position, including information regarding the proper positioning of the center of gravity of an occupant's head in relation to the head restraint.

PASS_ FAIL

Include copies of relevant pages from the owner's manual in the final report.

REMARKS:

RECORDED BY: ______________________ DATE: 1/22/10

APPROVED BY: ______________________

MGA File #: G10Q7-001.2
DATA SHEET 4
REMOVABILITY

VEH. NHTSA NO.: CH0213  TEST DATE: 9/22/10

Are the head restraints removable?  √ YES  NO

If removable, does removal REQUIRE an action distinct from actions to adjust the head restraint?  × YES (PASS)  NO (FAIL)

Description of action(s) for head restraint adjustment:
1. Raise the head restraint by pulling up on the head restraint.
2. Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.

Description of distinct action for removal:
1. Pull up the head restraint until it reaches its highest adjustment position.
2. Simultaneously press and hold both the adjust/release button and the unlock/remove button, then pull up on the head restraint.

REMARKS:

RECORDED BY:  Alexander Wool DATE: 9/22/10
APPROVED BY:  Debby Kebbi
DATA SHEET 6

ENERGY ABSORPTION TEST

VEH. NHTSA NO.: CA0213  TEST DATE: 9/30/10

Seat Location: Passenger 12-in. Rear
Type of head restraint: Adjustable

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 2.2

Striker to H-Point (mm): N/A  Striker to H-Point angle: N/A

Description of equipment or method used to rigidly fix the seat back:

Accelerometer identification: P57862  Accelerometer type/brand: Enduro
Last calibration date: 5/17/10

Head form vertical angle (-2° - +2°):
Distance between head form and target location (> or = 25 mm): 310
Impact velocity (23.6 kph ± 0.5 kph): 24.04
Impact location: 635 mm above the impact and within 29 mm of vertical centerline

Maximum deceleration (< or = 785 m/s² (80 g)): 210  ≤ PASS  ≥ FAIL

REMARKS: HG test position was 211 mm from the vehicle centerline

RECORDED BY:  DATE: 9/30/10

APPROVED BY:  H. E. Kaldor

MGA File #: G10Q7-001.2
DATA SHEET 7
HEIGHT RETENTION TEST
(ADJUSTABLE HEAD RESTRAINTS ONLY)

VEH. NHTSA NO.: C401213 TEST DATE: 9/27/10

Seat Location: Passenger 12 in. Rear (10 in.)

Pre-test measurements
SAE J826 Manikin torso angle: 22°
Top of Head Restraint Height (mm): 831
Striker to H-Point (mm): N/A
Striker to H-Point angle: N/A
Description of height retention lock: Spring loaded button catch

Test measurements
Initial load (50 N ± 1 N): 50
Initial Displacement, D1 (mm): 8.1
Initial Displacement (D1) < 25 mm \(\times\) PASS \(\checkmark\) FAIL
Maximum load (495 N ± 5 N): 499
Maximum Displacement, D2 (mm):
Return load (50 N ± 1 N): 50
Return Displacement, D3 (mm): 13.9
Total displacement (D3-D1) < 13 mm: 5.0 \(\times\) PASS \(\checkmark\) FAIL

REMARKS:

RECORDED BY: Ada Hicks DATE: 9/27/10
APPROVED BY: Dee Kaht
DATA SHEET 8

BACKSET RETENTION TEST

VEH. NHTSA NO.: CA0213  TEST DATE: 9/29/10

Seat Location:  Driver  Rear

Type of head restraint: Adjustable

Pre-test measurements

SAE J826 Manikin torso angle: 22°  Top of Head Restraint Height (mm): 800
Striker to H-Point (mm):  NA  Striker to H-Point angle:  NA

Displacement torso reference line

Test device back pan angle: 27.3°

Distance from the H-point to the initial location of the load (0.290 ± 0.013 m): 0.285
Initial load (N): 1309  Initial moment (373 ± 7.5 Nm): 373

Backset retention and strength

Distance from the H-point to the head form tangency point (m): 0.736
Initial load (N): 508.8  Initial moment (37 ± 0.7 Nm): 37
Initial head form displacement, D1 (< or = 25 mm): 14.5  x PASS  FAIL
Load range to generate a 373 ± 7.5 Nm rearward moment (N): 560
Actual load applied (N): 560  Resultant moment (Nm): 373

Maximum Head form displacement, D2 (< or = 102 mm): -37.0  x PASS  FAIL
Final head form displacement, D3 (mm): 20.5° measured at (37 ± 0.7 Nm)

Total displacement (D3-D1) < 13 mm: 6.0  x PASS  FAIL
Maximum applied load (> or equal to 885 N): 885°  x PASS  FAIL

REMARKS:

RECORDED BY:  DATE: 9/29/10
APPROVED BY:  F. O. D. 10
PHOTOGRAPHS

6.1 Front right view
6.2 Front left view
6.3 Rear right view
6.4 Rear left view
6.5 Test vehicle’s certification label
6.5.1 Certification label photo #1
6.5.2 Tire information label photo #1
6.6 S5.2.1-5.2.4 Dimensional Measurements
6.6.1 Driver Test Photo #1
6.6.2 Driver Test Photo #2
6.6.3 Driver Test Photo #3
6.6.4 Driver Test Photo #4
6.6.5 Driver Test Photo #5
6.6.6 Driver Test Photo #6
6.6.7 Driver Test Photo #7
6.6.8 Driver Test Photo #8
6.6.9 Driver Test Photo #9
6.6.10  Driver Test Photo #10
6.6.11 Passenger Test Photo #11
6.6.12 Passenger Test Photo #12
6.6.14    Passenger Test Photo #14
6.6.15 Passenger Test Photo #15
6.6.16   Passenger Test Photo #16
6.6.17  Passenger Test Photo #17
6.7 S5.2.5 Energy Absorption
6.7.1 Passenger Pre-Test Photo #1
6.7.2 Passenger Pre-Test Photo #2
6.7.3 Passenger Post-Test Photo #1
6.7.4 Passenger Post-Test Photo #2
6.8 S5.2.6 Height Retention
   6.8.1 Passenger Test Photo #1
6.8.2 Passenger Test Photo #2
6.8.3 Passenger Test Photo #3
6.8.4 Passenger Test Photo #4
6.8.6 Passenger Test Photo #6
6.8.7 Passenger Test Photo #7
6.8.8 Passenger Test Photo #8
6.9.3 Driver Test Photo #3
6.9.4 Driver Test Photo #4
6.9.5 Driver Test Photo #5
6.9.6 Driver Test Photo #6
6.9.8 Driver Test Photo #8
7.0 PLOTS

7.1.1 S5.2.5 Energy Absorption
7.2.1 S5.2.6 Height Retention

E10882-B: RH Head Force (N) vs. RH Head Disp. (mm)
7.2.2 S5.2.6 Height Retention
7.2.3 S5.2.6 Height Retention
7.3.1 S5.2.7 Backset Retention, Displacement and Strength

![Graph showing data related to backset retention, displacement, and strength.](image-url)
7.3.2 S5.2.7 Backset Retention, Displacement and Strength
7.3.3 S5.2.7 Backset Retention, Displacement and Strength
7.3.4 S5.2.7 Backset Retention, Displacement and Strength
7.3.5 S5.2.7 Backset Retention, Displacement and Strength
7.3.6 §5.2.7 Backset Retention, Displacement and Strength

[Graph showing force vs. time with axis labels and values]
7.3.7 S5.2.7 Backset Retention, Displacement and Strength

![Graph showing backset retention, displacement, and strength](image-url)
8.0 REPORT OF VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING
CONTRACT No.: DTNH22-06-C-00030/0008 DATE: September 22, 2010 and September 29-30, 2010

From: MGA Research Corporation, 446 Executive Drive, Troy, MI 48083

To: NHTSA, OVSC, NVS-220

The following vehicle has been subjected to compliance testing for FMVSS No. 201U & 202a

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD0-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

VEH. MOD YR/MAKE/MODEL/BODY: 2010 Lincoln MKT MPV
VEH. NHTSA NO.: CA0213 VIN: 2LMHJ5FR9ABJ10077
COLOR: Silver

ODOMETER READINGS: ARRIVAL 188 miles Date: February 22, 2010
COMPLETION 188 miles Date: September 30, 2010

ENGINE DATA: 6 Cylinders 3.7 Liters ___Cubic Inches
TRANSMISSION DATA: X Automatic ___Manual ___No. of Speeds
FINAL DRIVE DATA: ___Rear Drive X Front Drive ____4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:
TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Alisshia Woods and Dave Maier

<table>
<thead>
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<td>Air Conditioning</td>
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<td>Traction Control</td>
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<td>X</td>
<td>Clock</td>
<td></td>
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<tr>
<td>Yes</td>
<td>Tinted Glass</td>
<td>N/A</td>
<td>All Wheel Drive</td>
<td>N/A</td>
<td>N/A</td>
<td>Roof Rack</td>
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<td>X</td>
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<td>X</td>
<td>Speed Control</td>
<td>X</td>
<td>X</td>
<td>Console</td>
<td></td>
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<tr>
<td>X</td>
<td>Power Windows</td>
<td>X</td>
<td>Rear Window Defroster</td>
<td>X</td>
<td>Driver Air Bag</td>
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<td>X</td>
<td>Power Door Locks</td>
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<td>Sun Roof or T-Top</td>
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<td>Passenger Air Bag</td>
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<td>Power Seat(s)</td>
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<td>Tachometer</td>
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<td>Power Brakes</td>
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<td>Tilt Steering Wheel</td>
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<td>Rear Disc Brakes</td>
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<td>X</td>
<td>Antilock Brake System</td>
<td>X</td>
<td>AM/FM/Compact Disc</td>
<td>Other</td>
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</tbody>
</table>
REMARKS:
Salvage only.

Equipment that is no longer on the test vehicle as noted on previous pages:
All equipment inventoried and placed in vehicle.

Explanation for equipment removal:
Roof removed and vehicle cut to accommodate test equipment.

Test Vehicle Condition:
Salvage only. Vehicle cut in half to complete testing.

RECORDED BY: 
DATE:

APPROVED BY:
APPENDIX A
OWNERS MANUAL HEAD RESTRAINTS
Seating and Safety Restraints

Seating

1. **WARNING:** Reclining the seatback can cause an occupant to slide under the seat's safety belt, resulting in severe personal injuries in the event of a collision.

2. **WARNING:** Do not pile cargo higher than the seatbacks to reduce the risk of injury in a collision or sudden stop.

3. **WARNING:** Before returning the seatback to its original position, make sure that cargo or any objects are not trapped behind the seatback. After returning the seatback to its original position, pull on the seatback to ensure that it has fully latched. An unlatched seat may become dangerous in the event of a sudden stop or collision.

4. **WARNING:** Never adjust the driver's seat or seatback when the vehicle is moving.

5. **WARNING:** Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

6. **WARNING:** To minimize the risk of neck injury in the event of a crash, the driver and passenger occupants should not sit in and/or operate the vehicle, until the head restraint is placed in its proper position. The driver should never adjust the head restraint while the vehicle is in motion.

7. **WARNING:** The adjustable head restraint is a safety device. Whenever possible, it should be installed and properly adjusted when the seat is occupied.

8. **WARNING:** To minimize the risk of neck injury in the event of a crash, head restraints must be installed properly.

**First-row adjustable head restraints**

Your vehicle is equipped with front row outboard head restraints that are vertically adjustable.

Seating and Safety Restraints

The adjustable head restraints consist of:

- a trimmed energy absorbing foam and structure (1),
- two steel stems (2),
- a guide sleeve adjust/release button (3),
- and a guide sleeve unlock/remove button (4).

To adjust the head restraint, do the following:

1. Adjust the seatback to an upright driving/riding position. Refer to Adjusting the front manual seat later in this chapter.
2. Raise the head restraint by pulling up on the head restraint.

3. Lower the head restraint by pressing and holding the guide sleeve adjust/release button and pushing down on the head restraint.

Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your head. For occupants of extremely tall stature, adjust the head restraint to its full up position.
Seating and Safety Restraints

Ten-way power seats

1. Move the control up or down to tilt the seat cushion.
2. Move the rear of the control up or down to raise or lower the seat.
3. Move the control in the directions shown to move the seat forward or backward.
4. Press the control to recline the seatback forward or backward.

To reposition the adjustable head restraint, do the following:
1. Insert the two arms into the guide sleeve collar.
2. Pull the head restraint down until it locks.

Properly adjust the head restraint so that the top of the head restraint is even with the top of your head and positioned as close as possible to the back of your neck. If your car has an extremely tall stature, adjust the head restraint to its full up position.
TEST VEHICLE SEAT INFORMATION
FMVSS No. 201, 202, 203, 207 & 210
(All dimensions in inches)

Model Year: 2010  Make: Lincoln  Model: MkT  Body Style: All

Note: A: CG of Seat Back
      B: CG of total seating system

<table>
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<tr>
<th></th>
<th>Weight of Hinged or Folding portion of seat</th>
<th>Driver 12-way</th>
<th>Passenger 12-way</th>
<th>50/50 Manual</th>
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</thead>
<tbody>
<tr>
<td>A1a</td>
<td>8.05</td>
<td>29.9 lbs</td>
<td>29.9 lbs</td>
<td>29.9 lbs</td>
</tr>
<tr>
<td>B1a</td>
<td>15.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1b</td>
<td>8.21</td>
<td>73.2 lbs</td>
<td>73.6 lbs</td>
<td>73.6 lbs</td>
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<tr>
<td>B1b</td>
<td>15.85</td>
<td>Angle of Seat Back 22°</td>
<td>22°</td>
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<tr>
<td>A3</td>
<td>6.53</td>
<td>REMARKS: The weights include FMVSS 5%.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>15.49</td>
<td>A1a &amp; B1a is the 1st row driver 12-way, A1b &amp; B1b is the 1st row passenger 12-way, and A3 &amp; B3 is the 3rd row 50/50 Manual</td>
<td></td>
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# Seating Reference Point (SRP) and Torso Angle Data

FMVSS No. 201, 202, 203, 207 & 210
(All dimensions in inches)

**Model Year:** 2010  **Make:** Lincoln  **Model:** MKT  **Body Style:** All


## Left Side View of Test Vehicle

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>FRONT, A1</th>
<th>MIDDLE, A2</th>
<th>REAR, A3</th>
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<tbody>
<tr>
<td>A</td>
<td>11.12</td>
<td>13.60 (OB)</td>
<td>15.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.31 (Ctr)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>15.27</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>53.02 (OB) / 52.12 (Ctr)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>85.04</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>7.57</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>22 Degrees</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>21 Degrees (OB and Ctr)</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>18 Degrees</td>
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SEATING REFERENCE POINT (SRP) AND TORSO ANGLE DATA
FMVSS No. 201, 202, 203, 207 & 210
(All dimensions in inches)

Model Year: 2010  Make: Lincoln  Model: MKT  Body Style: All
Seat Style: 1st Row: Driver 12-way, Passenger 12-way; 2nd Row 60/40 and 40/40; 3rd Row: 50/50 Manual

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<th>B</th>
<th>C</th>
<th>D</th>
<th>H*</th>
<th>I*</th>
<th>J*</th>
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<td></td>
<td>15.27</td>
<td>53.02 (OB) / 52.12 (Ctr)</td>
<td>85.04</td>
<td>8.03 (1R) / 7.21 (2R OB) / 13.00 (3R)</td>
<td>22.92 (2R Ctr)</td>
<td>37.81 (1R) / 38.63 (2R OB) / 32.84 (3R)</td>
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</tbody>
</table>

* Provide all dimensions needed to locate SRP.

FORM – SRP

MGA File #: G10Q7-001.2