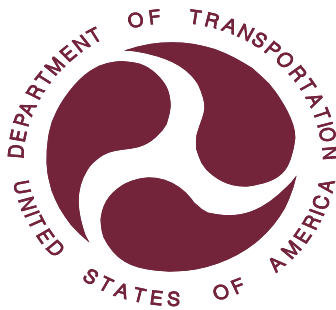


REPORT NUMBER 138-STF-10-006

# SAFETY COMPLIANCE TESTING FOR FMVSS NO. 138 TIRE PRESSURE MONITORING SYSTEMS

HONDA MOTOR COMPANY  
2010 HONDA ODYSSEY  
FOUR-DOOR MPV  
NHTSA NO. CA5305

U.S. DOT SAN ANGELO TEST FACILITY  
131 COMANCHE TRAIL, BUILDING 3527  
GOODFELLOW AFB, TEXAS 76908



JUNE 30, 2010

FINAL REPORT

PREPARED FOR

U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
ENFORCEMENT  
NVS-220  
OFFICE OF VEHICLE SAFETY COMPLIANCE  
1200 NEW JERSEY AVENUE, SE  
WASHINGTON, D.C. 20590

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| 16. Abstract<br>Compliance tests were conducted on the subject 2010 Honda Odyssey four-door MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure Number TP-138-03 for the determination of FMVSS 138 compliance. Test failures identified were as follows: None |                             |   |
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SECTION 1  
INTRODUCTION

1.1 PURPOSE OF COMPLIANCE TEST

A 2010 Honda Odyssey four-door MPV was tested to determine if the vehicle was in compliance with the requirements of FMVSS 138. All tests were conducted in accordance with NHTSA/Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure TP-138-03 dated July 12, 2007.

1.2 TEST VEHICLE

The test vehicle was a 2010 Honda Odyssey four-door MPV. Nomenclatures applicable to the test vehicle are:

A. Vehicle Identification Number: 5FNRL3H21AB039382

B. NHTSA Number: CA5305

C. Manufacturer: Honda Motor Company

D. Manufacture Date: 12/2009

1.3 TEST DATE

The test vehicle was tested during the time period May 7 through May 13, 2010.

## SECTION 2

### TEST PROCEDURE AND SUMMARY OF RESULTS

#### 2.1 TEST PROCEDURE

Prior to test, the test vehicle was inspected for completeness, systems operability, and appropriate fuel and liquid levels, i.e. oil and coolant. The vehicle was then photographically documented as required by the NHTSA/OVSC Test Procedure. Tire sidewall and vehicle labeling information were recorded. The owner's manual was reviewed, and pertinent tire and TPMS information were noted. Telltale's symbol, color, location, and lamp function were checked.

Subsequent events included weighing the vehicle to establish the Unloaded Vehicle Weight (UVW) and the distribution of weight on the front and rear axles and each wheel position. The vehicle was loaded to its Lightly Loaded Vehicle Weight (LLVW) for three tire deflation scenarios. This LLVW included the weights of driver, one passenger, ballast, and test equipment. The vehicle was loaded to its Unloaded Vehicle Weight plus Vehicle Capacity Weight (VCW) for three additional tire deflation scenarios. The VCW included the weights of driver, one passenger, test equipment, ballast in the rear seat, and ballast in the rear cargo area. The vehicle is required to be loaded to its maximum capacity without exceeding either the Vehicle Capacity Weight or Gross Vehicle Weight Rating (GVWR). For determination of the telltale warning activation pressure, the recommended cold inflation pressure was identified from the vehicle placard.

The vehicle was instrumented with a Racelogic VBOX III 100 Hz GPS Data Logger and brake pedal trigger. The VBOX uses GPS to measure vehicle speed, time, and distance. Test data were recorded to a compact flash card. During the test, a stopwatch was used to determine the approximate "cumulative driving time" during each test phase. Cumulative driving time does not include time during the brake application or when the vehicle speed was below 50 km/h or above 100 km/h. Upon completion of a tire deflation scenario, graphs were generated by VBOX software showing vehicle speed versus time during the test procedures. The graphs furnish a second by second analysis of each calibration and low inflation pressure detection phase (as appropriate). The cumulative driving time was calculated by post-processing the VBOX graph data, and is reported in Section 3 (Test Data) as 'Total Driving Time'.

The tire deflation test scenario consisted of four phases:

1. Calibration phase: Tires were set at vehicle placard cold inflation pressure and the vehicle was driven for at least twenty minutes of cumulative driving time between 50 and 100 km/h.

2. Detection phase: Immediately after calibration phase, the selected tire(s) were deflated to seven kPa (one psi) below the Telltale Warning Activation Pressure. After one minute, the inflation pressure(s) of only deflated tire(s) were rechecked and adjusted if necessary. The vehicle was started and driven to ensure that the low inflation pressure telltale illuminated.
3. Cool down phase: Vehicle was parked in the San Angelo Test Facility (SATF) open bay shielded from direct sunlight. Tires were allowed to cool down for a minimum of one hour. After cool down, the vehicle was started and the low tire pressure telltale was checked for re-illumination.
4. Extinguishment phase: Tires were adjusted to vehicle placard cold inflation pressure. The vehicle was started and driven to ensure that the low inflation pressure telltale extinguished.

Two malfunction scenarios were performed on the Honda Odyssey. The first scenario was performed with the vehicle loaded to its LLVW. The malfunction was simulated by placing the compact spare tire, with no TPMS sensor, on the right front wheel position. The second scenario was performed by removing a TPMS fuse.

## 2.2 SUMMARY OF RESULTS

Three tire deflation scenarios were performed on the test vehicle at LLVW:

- A. Left rear
- B. Left rear and right rear
- C. Left front, left rear, right rear, and right front

Three tire deflation scenarios were performed on the test vehicle at UVW + VCW:

- D. Left front
- E. Left front and right rear
- F. Left front, left rear, and right rear

The data indicate compliance of the test vehicle's tire pressure monitoring system for the six tire deflation scenarios tested.

One malfunction detection scenario was performed on the test vehicle at LLVW:

- G. Spare tire without TPMS sensor was applied to right front wheel position.

One malfunction detection scenario was performed on the test vehicle at UVW + VCW:

- H. TPMS fuse was removed.

In both scenarios, the vehicle's dedicated malfunction telltale properly operated per the standard's requirements.

SECTION 3  
TEST DATA



## FMVSS No. 138 – TEST DATA SUMMARY

TEST DATES: May 7 – May 13, 2010      LAB: U.S. DOT San Angelo Test Facility

VIN: 5FNRL3H21AB039382      VEHICLE NHTSA NUMBER: CA5305

CERTIFICATION LABEL BUILD DATE: 12/2009

| REQUIREMENTS  | PASS/FAIL   |
|---|-------------|
| LOW TIRE PRESSURE WARNING TELLTALE<br>S138: S4.3.1 (a), (b); S4.3.3 (a), (b)          |             |
| Mounting  | <b>PASS</b> |
| Symbol and color  | <b>PASS</b> |
| Check of lamp function  | <b>PASS</b> |
| MALFUNCTION TELLTALE<br>S138: S4.4 (b) or (c)   |             |
| Mounting  | <b>PASS</b> |
| Symbol and color  | <b>PASS</b> |
| Check of lamp function  | <b>PASS</b> |
| LOW TIRE PRESSURE WARNING - OPERATIONAL PERFORMANCE<br>S138: S4.2, S4.3.1 (c), S4.3.2 |             |
| Telltale illumination   | <b>PASS</b> |
| MALFUNCTION INDICATOR – OPERATIONAL PERFORMANCE<br>S138: S4.4 (a)                     |             |
| Telltale illumination   | <b>PASS</b> |
| TPMS WRITTEN INSTRUCTIONS<br>S138: S4.5   |             |
| Image of telltales  | <b>PASS</b> |
| Verbatim statements   | <b>PASS</b> |

REMARKS: None

**DATA SHEET 1 (Sheet 1 of 3)**  
**TEST PREPARATION INFORMATION**

TEST DATE: May 7, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305 VIN: 5FNRL3H21AB039382

CERTIFICATION LABEL BUILD DATE: 12/2009 ENGINE: 3.5 liter, V6

MY/MAKE/MODEL/BODY STYLE: 2010 Honda Odyssey four-door MPV

**TIRE CONDITIONING:**

( X ) Tires used more than 100 km. Actual odometer reading : 132 km (82 mi)

**VEHICLE ALIGNMENT AND WHEEL BALANCING:**

Alignment checked: ( ) Front ( ) Rear ( X ) COTR waived

Wheels balanced: ( ) Front ( ) Rear ( X ) COTR waived

**TPMS IDENTIFICATION:**

TPMS MAKE/MODEL: Sensor: TRW; receiver: TRW

Source: Manufacturer supplied information

TPMS TYPE: ( X ) Direct ( ) Indirect ( ) Other

Does TPMS require execution of a learning/calibration driving phase? ( ) YES ( X ) NO

Source: Manufacturer supplied information

Does TPMS have a manual reset control? ( ) YES ( X ) NO

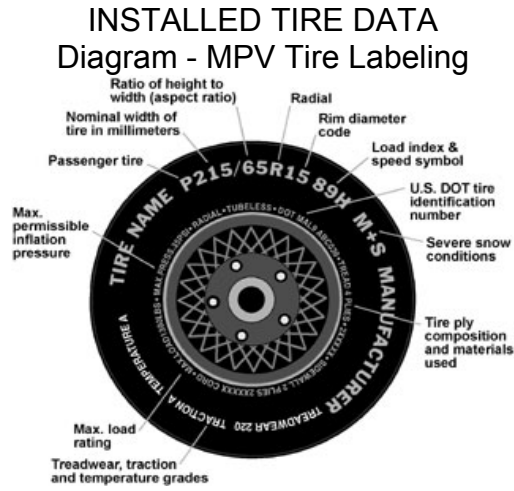
**TPMS MALFUNCTION INDICATOR TYPE:**

( ) None ( X ) Dedicated Telltale ( ) Combination low tire pressure/malfunction telltale

**DATA SHEET 1 (Sheet 2 of 3)  
TEST PREPARATION INFORMATION**

**DESIGNATED TIRE SIZE(S) FROM VEHICLE LABELING AND OWNER'S MANUAL:**

| Axle  | Tire Size | Recommended Cold Inflation Pressure | Source          |
|-------|-----------|-------------------------------------|-----------------|
| Front | 235/65R16 | 230 kPa (33 psi)                    | Vehicle placard |
| Rear  | 235/65R16 | 240 kPa (35 psi)                    | Vehicle placard |



**Front and Rear Axles**

Tire Size and Load Index / Speed Rating: 235/65R16 103T

Manufacturer/Tire Name: Michelin Energy LX4

Sidewall Max Load Rating: 875 kg (1,929 lbs)

Max Inflation Pressure: 300 kPa (44 psi)

Sidewall Construction (number of plies and ply material): 2 polyester

Tread Construction (number of plies and ply material): 2 polyester, 1 polyamide, 2 steel

**Do all installed tires have the same sidewall information?**     YES     NO

**Are all installed tires the same as designated by the vehicle manufacturer on the vehicle placard?**     YES     NO

**DATA SHEET 1 (Sheet 3 of 3)  
TEST PREPARATION**

| <b>Worksheet for Determining FMVSS No. 138 Telltale Warning Activation Pressure for Tires Installed on Vehicle</b>                              |  |  |
|---|--|--|
| <b>Part</b>   | <b>Front Axle</b>  | <b>Rear Axle</b>   |
| <b>(A)</b> Recommended Inflation Pressure x .75   | <u>230 kPa</u> x .75 = <u>172.5</u> kPa  | <u>240 kPa</u> x .75 = <u>180.0</u> kPa  |
| <b>(B)</b> Information from FMVSS 138 Table 1 below, Tire types are:<br><br>Inflation pressure<br><br>Minimum activation pressures from Table 1 | ( <input checked="" type="checkbox"/> ) P-metric-Standard load<br>( <input type="checkbox"/> ) P-metric-Extra Load<br>Load Range ( <input type="checkbox"/> ) C, ( <input type="checkbox"/> ) D,<br>or ( <input type="checkbox"/> ) E<br><br>( <input checked="" type="checkbox"/> ) Maximum or ( <input type="checkbox"/> ) Rated<br><u>300</u> kPa (44 psi)<br><br><u>140</u> kPa (20 psi) | ( <input checked="" type="checkbox"/> ) P-metric-Standard load<br>( <input type="checkbox"/> ) P-metric-Extra Load<br>Load Range ( <input type="checkbox"/> ) C, ( <input type="checkbox"/> ) D,<br>or ( <input type="checkbox"/> ) E<br><br>( <input checked="" type="checkbox"/> ) Maximum or ( <input type="checkbox"/> ) Rated<br><u>300</u> kPa (44 psi)<br><br><u>140</u> kPa (20 psi) |
| <b>(C)</b> Telltale Warning Activation Pressure is the higher of Part (A) or (B)  | <u>172.5</u> kPa (25 psi)  | <u>180</u> kPa (26 psi)  |
| <b>(D)</b> Pressure at which to deflate tire(s) = (C) – 7 kPa   | <u>165.5</u> kPa (24 psi)  | <u>173</u> kPa (25 psi)  |

**FMVSS 138 Table 1 - Low Tire Pressure Warning Telltale - Minimum Activation Pressure**

| <b>Tire Type</b>          | <b>Maximum or Rated Inflation Pressure</b> |                     | <b>Minimum Activation Pressure</b> |                |
|---------------------------|--|---------------------|------------------------------------|----------------|
|                           | <b>(kPa)</b>                               | <b>(psi)</b>        | <b>(kPa)</b>                       | <b>(psi)</b>   |
| P-metric -- Standard Load | 240,<br>300, or<br>350                     | 35,<br>44, or<br>51 | 140<br>140<br>140                  | 20<br>20<br>20 |
| P-metric - Extra Load     | 280 or<br>340                              | 41 or<br>49         | 160<br>160                         | 23<br>23       |
| Load Range C              | 350  | 51                  | 200                                | 29             |
| Load Range D              | 450  | 65                  | 240                                | 35             |
| Load Range E              | 550  | 80                  | 240                                | 35             |

REMARKS: None

RECORDED BY: Todd P. Groghan

DATE: May 7, 2010

APPROVED BY: Kenneth H. Yates

**DATA SHEET 2 (Sheet 1 of 2)**  
**LOW TIRE PRESSURE WARNING AND MALFUNCTION TELLTALE**

TEST DATE: May 7, 2010 LAB: U.S. DOT San Angelo Test Facility


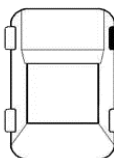
VEHICLE NHTSA NUMBER: CA5305

**TPMS Low Tire Pressure Warning Telltale**

Telltale is mounted inside the occupant compartment in front of and in clear view of the driver?  
( X )YES ( )NO (fail)

TPMS Low Tire Pressure Warning Telltale Location: Between speedometer and fuel gauge  
in instrument cluster

Identify Telltale Symbol Used (check box above figure).

|  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>                |
|  |  | <u>OTHER (fail)</u><br>(describe below) |

Note any words or additional symbols used: None

Telltale is part of a reconfigurable display? ( )YES ( X )NO

**TPMS Malfunction Telltale**

( ) None ( X ) Dedicated stand-alone ( ) Combined with low tire pressure telltale

TPMS Dedicated Malfunction Telltale Location: Between speedometer and fuel gauge in  
instrument cluster

Telltale is mounted inside the occupant compartment in front of and in clear view of the driver?  
( X )YES ( )NO (fail)

Malfunction telltale is part of a reconfigurable display? ( )YES ( X )NO

Identify Dedicated Telltale Symbol Used: ( X ) "TPMS" ( ) OTHER (fail)

Note any words or additional symbols used: None

**DATA SHEET 2 (Sheet 2 of 2)**  
**LOW TIRE PRESSURE WARNING AND MALFUNCTION TELLTALE**

**Check Telltale Lamp Functions:**

LOW TIRE PRESSURE WARNING TELLTALE

Ignition locking system position when telltale illuminates:

- |                                     |          |                          |                             |
|-------------------------------------|----------|--------------------------|-----------------------------|
| <input type="checkbox"/>            | OFF/LOCK | <input type="checkbox"/> | Between OFF/LOCK and ON/RUN |
| <input checked="" type="checkbox"/> | ON/RUN   | <input type="checkbox"/> | Between ON/RUN and START    |

Is the telltale yellow in color?      ( X )YES    ( )NO (fail)

Time telltale remains illuminated   3   seconds.

DEDICATED MALFUNCTION TELLTALE

Ignition locking system position when telltale illuminates:

- |                                     |          |                          |                             |
|-------------------------------------|----------|--------------------------|-----------------------------|
| <input type="checkbox"/>            | OFF/LOCK | <input type="checkbox"/> | Between OFF/LOCK and ON/RUN |
| <input checked="" type="checkbox"/> | ON/RUN   | <input type="checkbox"/> | Between ON/RUN and START    |

Is the telltale yellow in color?      ( X )YES    ( )NO (fail)

Time telltale remains illuminated   3   seconds.

**Starter Interlocks:**

Does vehicle have any starter, transmission or other interlocks that affect operation of the telltale lamp check function?      ( )YES      ( X )NO

**Low Tire Pressure Warning and Malfunction Telltales (PASS/FAIL)        PASS**

REMARKS:   None  

RECORDED BY:   Todd P. Groghan  

DATE:   May 7, 2010  

APPROVED BY:   Kenneth H. Yates

**DATA SHEET 3 (Sheet 1 of 22)  
TPMS OPERATIONAL PERFORMANCE**

TEST DATE: May 7, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Time: Start: 7:15 am End: 8:55 am

Ambient Temperature: Start: 22.6°C (72.7°F) End: 22.8°C (73.0°F)

Trip Odometer Reading: Start: 133.6 km (83 mi)

Fuel Level: Start: Full

Weather Conditions: Sunny, light breeze

Time vehicle remained with engine off and tires shielded from direct sunlight  
(1 hour minimum): 1 hour

**PRE-TEST TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES:**

| <b>Execution Procedure</b>   | <b>LF Tire</b>          | <b>LR Tire</b>          | <b>RR Tire</b>          | <b>RF Tire</b>          |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Pre-test cold measurements after ambient soak:<br>Inflation Pressure | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp   | 23.2°C<br>(73.8°F)      | 22.8°C<br>(73.0°F)      | 22.6°C<br>(72.7°F)      | 23.2°C<br>(73.8°F)      |

**DATA SHEET 3 (Sheet 2 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**

**VEHICLE WEIGHT:**

**Vehicle Ratings from Certification Label:**

GVWR: 2,695 kg (5,941 lbs)

GAWR (front): 1,320 kg (2,910 lbs)

GAWR (rear): 1,450 kg (3,197 lbs)

**Vehicle Capacity Weight:**

Vehicle Capacity Weight: 612 kg (1,349 lbs)

**Measured Unloaded Vehicle Weight:**

|   |                             |      |                           |
|---|-----------------------------|------|---------------------------|
| LF  | <u>562 kg (1,240 lbs)</u>   | LR   | <u>444 kg (980 lbs)</u>   |
| RF  | <u>547 kg (1,205 lbs)</u>   | RR   | <u>426 kg (939 lbs)</u>   |
| Front                                     |                             | Rear |                           |
| Axle                                      | <u>1,109 kg (2,445 lbs)</u> | Axle | <u>870 kg (1,919 lbs)</u> |
| Total Vehicle <u>1,979 kg (4,364 lbs)</u> |                             |      |                           |

**Measured Test Weight: ( X )LLVW(+50, -0 kg) ( )UVW + VCW ( )GVWR(+0, -50 kg)**

|   |                                       |      |                                     |
|---|---------------------------------------|------|-------------------------------------|
| LF  | <u>617 kg (1,361 lbs)</u>             | LR   | <u>483 kg (1,064 lbs)</u>           |
| RF  | <u>596 kg (1,314 lbs)</u>             | RR   | <u>463 kg (1,021 lbs)</u>           |
| Front   |                                       | Rear |                                     |
| Axle  | <u>1,213 kg (2,675 lbs) ( ≤ GAWR)</u> | Axle | <u>946 kg (2,085 lbs) ( ≤ GAWR)</u> |
| Total Vehicle <u>2,159 kg (4,760 lbs) (not greater than GVWR)</u> |                                       |      |                                     |

Note: For scenarios A through C, this Total Vehicle Weight measures the vehicle loaded to Lightly Loaded Vehicle Weight (LLVW), 180 kg (396 lbs) of driver, passenger, ballast, and test equipment.

RECORDED BY: Todd P. Groghan

DATE: May 7, 2010

APPROVED BY: Kenneth H. Yates



**DATA SHEET 3 (Sheet 3 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO A – Left Rear Tire Deflation at LLVW**

TEST DATE: May 7, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Note: See Data Sheet 3 (Sheet 2 of 22) for Test Weight.

**TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES  
BEFORE CALIBRATION PHASE:**

| <b>Execution Procedure</b>   | <b>LF Tire</b>          | <b>LR Tire</b>          | <b>RR Tire</b>          | <b>RF Tire</b>          |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After loading vehicle to LLVW, positioning vehicle at selected test start point, and vehicle cool down period:<br>Ambient Temperature: <u>23.4°C (74.1°F)</u> Vehicle cool down period: <u>overnight</u> |                         |                         |                         |                         |
| Inflation Pressure   | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp   | 23.6°C<br>(74.5°F)      | 23.6°C<br>(74.5°F)      | 23.8°C<br>(74.8°F)      | 23.6°C<br>(74.5°F)      |
| San Angelo Test Facility Shop Floor Temp   | 23.6°C<br>(74.5°F)      | 23.6°C<br>(74.5°F)      | 23.8°C<br>(74.8°F)      | 23.6°C<br>(74.5°F)      |

**SYSTEM CALIBRATION/LEARNING PHASE:**

Time of Data Acquisition: Start: 14:15:02 UTC End: 14:40:42 UTC

Trip Odometer Reading: Start: 134.2 km (83.4 mi) End: 166.1 km (103.2 mi)

Ambient Temperature: Start: 23.5°C (74.3°F) End: 25.5°C (77.9°F)

Roadway Temperature: Start: 27.6°C (81.7°F) End: 30.8°C (87.4°F)

Driving in first direction:

Goodfellow Air Force  
Starting point: Base (GAFB) north gate Direction: see chart, page 63  
10:13 minutes (stopwatch time) 15.8 km (9.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 63  
10:22 minutes (stopwatch time) 16.1 km (10.0 mi) distance

**Max speed:** 98.9 km/h (61.5 mph)

**Total Driving Time:** 20:37 minutes (VBox time)

**DATA SHEET 3 (Sheet 4 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO A – Left Rear Tire Deflation at LLVW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER CALIBRATION PHASE:**

| <b>Execution Procedure</b>   | <b>LF Tire</b>          | <b>LR Tire</b>          | <b>RR Tire</b>          | <b>RF Tire</b>          |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Immediately, after vehicle is stopped, engine off:<br>Inflation Pressure | 254.2 kPa<br>(36.9 psi) | 260.2 kPa<br>(37.7 psi) | 260.7 kPa<br>(37.8 psi) | 254.5 kPa<br>(36.9 psi) |
| Tire Sidewall Temp   | 42.8°C<br>(109.0°F)     | 37.8°C<br>(100.0°F)     | 35.6°C<br>(96.1°F)      | 39.4°C<br>(102.9°F)     |
| San Angelo Test Facility Shop Floor Temp                                 | 24.2°C<br>(75.6°F)      | 24.6°C<br>(76.3°F)      | 24.4°C<br>(75.9°F)      | 23.8°C<br>(74.8°F)      |

**SYSTEM DETECTION PHASE:**

**LOCATION AND PRESSURE(S) OF DEFLATED TIRE(S):**

| <b>Execution Procedure</b>  | <b>LF Tire</b> | <b>LR Tire</b>          | <b>RR Tire</b> | <b>RF Tire</b> |
|---|----------------|-------------------------|----------------|----------------|
| Indicate Location of Tire(s) Deflated:<br>( )LF ( X )LR ( )RR ( )RF<br>Inflation Pressure |                | 173.0 kPa<br>(25.1 psi) |                |                |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop

Illumination at 1:32 minutes (stopwatch time – non-cumulative)

0.2 km (0.1 mi) distance

Driving above 50 km/h was not necessary.

**TEST RESULTS**

|  |
|--|
| <b>TELLTALE ILLUMINATES WITHIN 20 MINUTES: ( X )YES ( )NO (fail)</b> |
|--|

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
( X )YES ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
( X )YES ( )NO (fail)

**DATA SHEET 3 (Sheet 5 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO A – Left Rear Tire Deflation at LLVW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER TELLTALE ILLUMINATION:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After vehicle cool down period:<br>Ambient Temperature: <u>26.5°C (79.7°F)</u> Vehicle cool down period: <u>61</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 240.5 kPa<br>(34.9 psi) | 165.1 kPa<br>(23.9 psi) | 247.3 kPa<br>(35.9 psi) | 241.1 kPa<br>(35.0 psi) |
| Tire Sidewall Temp   | 33.2°C<br>(91.8°F)      | 28.8°C<br>(83.8°F)      | 28.6°C<br>(83.5°F)      | 32.8°C<br>(91.0°F)      |
| San Angelo Test Facility Shop Floor Temp   | 24.8°C<br>(76.6°F)      | 24.6°C<br>(76.3°F)      | 24.8°C<br>(76.6°F)      | 24.6°C<br>(76.3°F)      |

After the cool down period of a minimum of one hour, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?

YES     NO (fail)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After illumination verification:<br>Re-adjusted Inflation Pressure: |                         |                         |                         |                         |
|   | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |

Is it necessary to drive the vehicle to extinguish the telltale?     YES     NO

Starting point:    San Angelo Test Facility shop

1:41 minutes (stopwatch time – non-cumulative)      0.3 km (0.2 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)**

PASS

Left rear tire was deflated at LLVW.

REMARKS: None

RECORDED BY:    Todd P. Groghan

DATE:    May 7, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 3 (Sheet 6 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO B – Left Rear, Right Rear Tire Deflation at LLVW**

TEST DATE: May 10, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Note: See Data Sheet 3 (Sheet 2 of 22) for Test Weight.

**TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES  
BEFORE CALIBRATION PHASE:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After loading vehicle to LLVW, positioning vehicle at selected test start point, and vehicle cool down period:<br>Ambient Temperature: <u>22.4°C (72.3°F)</u> Vehicle cool down period: <u>overnight</u> |                         |                         |                         |                         |
| Inflation Pressure   | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp   | 22.8°C<br>(73.0°F)      | 23.2°C<br>(73.8°F)      | 23.0°C<br>(73.4°F)      | 22.8°C<br>(73.0°F)      |
| San Angelo Test Facility Shop Floor Temp   | 22.8°C<br>(73.0°F)      | 22.8°C<br>(73.0°F)      | 22.6°C<br>(72.7°F)      | 22.6°C<br>(72.7°F)      |

**SYSTEM CALIBRATION/LEARNING PHASE:**

Time of Data Acquisition: Start: 12:57:23 UTC End: 13:22:47 UTC  
 Trip Odometer Reading: Start: 169.3 km (105.2 mi) End: 201.2 km (125.0 mi)  
 Ambient Temperature: Start: 22.4°C (72.3°F) End: 23.3°C (73.9°F)  
 Roadway Temperature: Start: 23.6°C (74.5°F) End: 25.2°C (77.4°F)

Driving in first direction:

Starting point: GAFB north gate Direction: see chart, page 64  
10:20 minutes (stopwatch time) 15.8 km (9.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 64  
10:15 minutes (stopwatch time) 16.1 km (10.0 mi) distance

**Max speed:** 98.6 km/h (61.3 mph)

**Total Driving Time:** 20:36 minutes (VBox time)

**DATA SHEET 3 (Sheet 7 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO B – Left Rear, Right Rear Tire Deflation at LLVW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER CALIBRATION PHASE:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Immediately, after vehicle is stopped, engine off:<br>Inflation Pressure | 251.8 kPa<br>(36.5 psi) | 256.7 kPa<br>(37.2 psi) | 260.4 kPa<br>(37.8 psi) | 252.0 kPa<br>(36.5 psi) |
| Tire Sidewall Temp   | 38.8°C<br>(101.8°F)     | 33.8°C<br>(92.8°F)      | 34.4°C<br>(93.9°F)      | 36.4°C<br>(97.5°F)      |
| San Angelo Test Facility Shop Floor Temp                                 | 22.6°C<br>(72.7°F)      | 23.0°C<br>(73.4°F)      | 22.8°C<br>(73.0°F)      | 22.6°C<br>(72.7°F)      |

**SYSTEM DETECTION PHASE:**

**LOCATION AND PRESSURE(S) OF DEFLATED TIRE(S):**

| Execution Procedure   | LF Tire | LR Tire                 | RR Tire                 | RF Tire |
|---|---------|-------------------------|-------------------------|---------|
| Indicate Location of Tire(s) Deflated:<br>( )LF (X)LR (X)RR ( )RF<br>Inflation Pressure |         | 173.0 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) |         |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop

Illumination at 2:17 minutes (stopwatch time – non-cumulative)

0.3 km (0.2 mi) distance

Driving above 50 km/h was not necessary.

**TEST RESULTS**

|  |                              |
|--|------------------------------|
| <b>TELLTALE ILLUMINATES WITHIN 20 MINUTES:</b> | <b>( X )YES ( )NO (fail)</b> |
|--|------------------------------|

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position? ( X )YES ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position? ( X )YES ( )NO (fail)

**DATA SHEET 3 (Sheet 8 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO B – Left Rear, Right Rear Tire Deflation at LLVW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER TELLTALE ILLUMINATION:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After vehicle cool down period:<br>Ambient Temperature: <u>24.7°C (76.5°F)</u> Vehicle cool down period: <u>62</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 237.7 kPa<br>(34.5 psi) | 165.2 kPa<br>(24.0 psi) | 164.7 kPa<br>(23.9 psi) | 238.4 kPa<br>(34.6 psi) |
| Tire Sidewall Temp   | 28.6°C<br>(83.5°F)      | 25.4°C<br>(77.7°F)      | 26.8°C<br>(80.2°F)      | 29.6°C<br>(85.3°F)      |
| San Angelo Test Facility Shop Floor Temp   | 28.6°C<br>(83.5°F)      | 23.2°C<br>(73.8°F)      | 23.6°C<br>(74.5°F)      | 23.2°C<br>(73.8°F)      |

After the cool down period of a minimum of one hour, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?

YES     NO (fail)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After illumination verification:<br>Re-adjusted Inflation Pressure: | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |

Is it necessary to drive the vehicle to extinguish the telltale?       YES     NO

Starting point:    San Angelo Test Facility shop

0:55 minutes (stopwatch time – non-cumulative)      0.2 km (0.1 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)**

**PASS**

Left rear and right rear tires were deflated at LLVW.

**REMARKS:** None

RECORDED BY:    Todd P. Groghan

DATE:    May 10, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 3 (Sheet 9 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**  
**SCENARIO C – Left Front, Left Rear, Right Rear,**  
**and Right Front Tire Deflation at LLVW**

TEST DATE: May 11, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Note: See Data Sheet 3 (Sheet 2 of 22) for Test Weight.

**TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES  
BEFORE CALIBRATION PHASE:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After loading vehicle to LLVW, positioning vehicle at selected test start point, and vehicle cool down period:<br>Ambient Temperature: <u>23.7°C (74.7°F)</u> Vehicle cool down period: <u>overnight</u> |                         |                         |                         |                         |
| Inflation Pressure   | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp   | 24.4°C<br>(75.9°F)      | 24.4°C<br>(75.9°F)      | 24.4°C<br>(75.9°F)      | 24.4°C<br>(75.9°F)      |
| San Angelo Test Facility Shop Floor Temp   | 24.4°C<br>(75.9°F)      | 24.4°C<br>(75.9°F)      | 24.6°C<br>(76.3°F)      | 24.2°C<br>(75.6°F)      |

**SYSTEM CALIBRATION/LEARNING PHASE:**

Time of Data Acquisition: Start: 14:41:34 UTC End: 15:06:58 UTC  
Trip Odometer Reading: Start: 284.4 km (176.7 mi) End: 316.2 km (196.5 mi)  
Ambient Temperature: Start: 23.7°C (74.7°F) End: 23.7°C (74.7°F)  
Roadway Temperature: Start: 27.4°C (81.3°F) End: 29.4°C (84.9°F)

Driving in first direction:

Starting point: GAFB north gate Direction: see chart, page 65  
10:13 minutes (stopwatch time) 15.8 km (9.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 65  
10:27 minutes (stopwatch time) 16.1 km (10.0 mi) distance

**Max speed: 97.8 km/h (60.8 mph)**

**Total Driving Time: 20:41 minutes (VBox time)**

**DATA SHEET 3 (Sheet 10 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**  
**SCENARIO C – Left Front, Left Rear, Right Rear,**  
**and Right Front Tire Deflation at LLVW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER CALIBRATION PHASE:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Immediately, after vehicle is stopped, engine off:<br>Inflation Pressure | 250.3 kPa<br>(36.3 psi) | 255.7 kPa<br>(37.1 psi) | 258.5 kPa<br>(37.5 psi) | 249.7 kPa<br>(36.2 psi) |
| Tire Sidewall Temp   | 38.4°C<br>(101.1°F)     | 33.8°C<br>(92.8°F)      | 35.4°C<br>(95.7°F)      | 37.4°C<br>(99.3°F)      |
| San Angelo Test Facility Shop Floor Temp                                 | 24.6°C<br>(76.3°F)      | 24.6°C<br>(76.3°F)      | 24.4°C<br>(75.9°F)      | 24.2°C<br>(75.6°F)      |

**SYSTEM DETECTION PHASE:**

**LOCATION AND PRESSURE(S) OF DEFLATED TIRE(S):**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| Indicate Location of Tire(s) Deflated:<br>( X )LF ( X )LR ( X )RR ( X )RF<br>Inflation Pressure | 165.5 kPa<br>(24.0 psi) | 173.0 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) | 165.5 kPa<br>(24.0 psi) |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop

Illumination at 1:13 minutes (stopwatch time – non-cumulative)

0.2 km (0.1 mi) distance

Driving above 50 km/h was not necessary.

**TEST RESULTS**

**TELLTALE ILLUMINATES WITHIN 20 MINUTES:                    ( X )YES   ( )NO (fail)**

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?                    ( X )YES   ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?                    ( X )YES   ( )NO (fail)



**DATA SHEET 3 (Sheet 11 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**  
**SCENARIO C – Left Front, Left Rear, Right Rear,**  
**and Right Front Tire Deflation at LLVW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER TELLTALE ILLUMINATION:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After vehicle cool down period:<br>Ambient Temperature: <u>24.8°C (76.6°F)</u> Vehicle cool down period: <u>60</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 158.6 kPa<br>(23.0 psi) | 166.6 kPa<br>(24.2 psi) | 165.6 kPa<br>(24.0 psi) | 158.9 kPa<br>(23.0 psi) |
| Tire Sidewall Temp   | 29.6°C<br>(85.3°F)      | 27.2°C<br>(81.0°F)      | 28.6°C<br>(83.5°F)      | 30.4°C<br>(86.7°F)      |
| San Angelo Test Facility Shop Floor Temp   | 24.6°C<br>(76.3°F)      | 24.8°C<br>(76.6°F)      | 25.2°C<br>(77.4°F)      | 24.6°C<br>(76.3°F)      |

After the cool down period of a minimum of one hour, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
 YES     NO (fail)

**TELLTALE EXTINGUISHMENT:**  
**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After illumination verification:<br>Re-adjusted Inflation Pressure: | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |

Is it necessary to drive the vehicle to extinguish the telltale?     YES     NO

Starting point:    San Angelo Test Facility shop

1:40 minutes (stopwatch time – non-cumulative)      0.3 km (0.2 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)**

**PASS**

Left front, left rear, right rear, and right front tires were deflated at LLVW.

**REMARKS:**    None

RECORDED BY:    Todd P. Groghan

DATE:    May 11, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 3 (Sheet 12 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**

TEST DATE: May 11, 2010      LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Time:                                      Start: 11:45 am                                      End: 2:08 pm

Ambient Temperature:                Start: 27.7°C (81.9°F)                                      End: 28.7°C (83.7°F)

Trip Odometer Reading:              Start: 318 km (197.7 mi)

Fuel Level:                                Start: Full

Weather Conditions:                    Cloudy, light breeze

Time vehicle remained with engine off and tires shielded from direct sunlight  
(1 hour minimum): 1.5 hours

**PRE-TEST TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Pre-test cold measurements after ambient soak:<br>Inflation Pressure | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp   | 29.6°C<br>(85.3°F)      | 29.0°C<br>(84.2°F)      | 30.4°C<br>(86.7°F)      | 30.0°C<br>(86.0°F)      |

**DATA SHEET 3 (Sheet 13 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**

**VEHICLE WEIGHT:**

**Vehicle Ratings from Certification Label:**

GVWR: 2,695 kg (5,941 lbs)

GAWR (front): 1,320 kg (2,910 lbs)

GAWR (rear): 1,450 kg (3,197 lbs)

**Vehicle Capacity Weight:**

Vehicle Capacity Weight: 612 kg (1,349 lbs)

**Measured Unloaded Vehicle Weight:**

|   |                             |      |                           |
|---|-----------------------------|------|---------------------------|
| LF  | <u>561 kg (1,237 lbs)</u>   | LR   | <u>446 kg (983 lbs)</u>   |
| RF  | <u>547 kg (1,206 lbs)</u>   | RR   | <u>425 kg (938 lbs)</u>   |
| Front                                     |                             | Rear |                           |
| Axle                                      | <u>1,108 kg (2,443 lbs)</u> | Axle | <u>871 kg (1,921 lbs)</u> |
| Total Vehicle <u>1,979 kg (4,364 lbs)</u> |                             |      |                           |

**Measured Test Weight: ( ) LLVW(+50, -0 kg) ( X ) UVW + VCW ( ) GVWR(+0, -50 kg)**

|   |                                       |      |                                       |
|---|---------------------------------------|------|---------------------------------------|
| LF  | <u>621 kg (1,368 lbs)</u>             | LR   | <u>698 kg (1,539 lbs)</u>             |
| RF  | <u>601 kg (1,326 lbs)</u>             | RR   | <u>671 kg (1,480 lbs)</u>             |
| Front   |                                       | Rear |                                       |
| Axle  | <u>1,222 kg (2,694 lbs)</u> ( ≤ GAWR) | Axle | <u>1,369 kg (3,019 lbs)</u> ( ≤ GAWR) |
| Total Vehicle <u>2,591 kg (5,713 lbs)</u> (not greater than GVWR) |                                       |      |                                       |

Note: For scenarios D through F, this Total Vehicle Weight measures the vehicle loaded to Unloaded Vehicle Weight (UVW) and Vehicle Capacity Weight (VCW), 612 kg (1,349 lbs) of driver, passenger, test equipment, and ballast.

RECORDED BY: Todd P. Groghan

DATE: May 11, 2010

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 14 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**  
**SCENARIO D – Left Front Tire Deflation at UVW + VCW**

TEST DATE: May 12, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Note: See Data Sheet 3 (Sheet 13 of 22) for Test Weight.

**TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES  
BEFORE CALIBRATION PHASE:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After loading vehicle to UVW + VCW, positioning vehicle at selected test start point, and vehicle cool down period:<br>Ambient Temperature: <u>25.4°C (77.7°F)</u> Vehicle cool down period: <u>overnight</u> |                         |                         |                         |                         |
| Inflation Pressure  | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp  | 25.4°C<br>(77.7°F)      | 25.4°C<br>(77.7°F)      | 25.4°C<br>(77.7°F)      | 25.2°C<br>(77.4°F)      |
| San Angelo Test Facility Shop Floor Temp  | 25.2°C<br>(77.4°F)      | 25.2°C<br>(77.4°F)      | 25.2°C<br>(77.4°F)      | 25.2°C<br>(77.4°F)      |

**SYSTEM CALIBRATION/LEARNING PHASE:**

Time of Data Acquisition: Start: 13:06:29 UTC End: 13:31:53 UTC  
Trip Odometer Reading: Start: 319.0 km (198.2 mi) End: 350.8 km (218.0 mi)  
Ambient Temperature: Start: 25.4°C (77.7°F) End: 25.4°C (77.7°F)  
Roadway Temperature: Start: 26.4°C (79.5°F) End: 27.6°C (81.7°F)

Driving in first direction:

Starting point: GAFB north gate Direction: see chart, page 66  
10:14 minutes (stopwatch time) 15.8 km (9.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 66  
10:26 minutes (stopwatch time) 16.1 km (10.0 mi) distance

**Max speed:** 96.7 km/h (60.1 mph)

**Total Driving Time:** 20:42 minutes (VBox time)

**DATA SHEET 3 (Sheet 15 of 22)**  
**TPMS OPERATIONAL PERFORMANCE**  
**SCENARIO D – Left Front Tire Deflation at UVW + VCW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER CALIBRATION PHASE:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Immediately, after vehicle is stopped, engine off:<br>Inflation Pressure | 250.7 kPa<br>(36.4 psi) | 262.5 kPa<br>(38.1 psi) | 265.0 kPa<br>(38.4 psi) | 251.5 kPa<br>(36.5 psi) |
| Tire Sidewall Temp   | 40.8°C<br>(105.4°F)     | 38.2°C<br>(100.8°F)     | 40.6°C<br>(105.1°F)     | 40.2°C<br>(104.4°F)     |
| San Angelo Test Facility Shop Floor Temp                                 | 26.4°C<br>(79.5°F)      | 26.0°C<br>(78.8°F)      | 26.4°C<br>(79.5°F)      | 25.8°C<br>(78.4°F)      |

**SYSTEM DETECTION PHASE:**

**LOCATION AND PRESSURE(S) OF DEFLATED TIRE(S):**

| Execution Procedure   | LF Tire                 | LR Tire | RR Tire | RF Tire |
|---|-------------------------|---------|---------|---------|
| Indicate Location of Tire(s) Deflated:<br>( X )LF ( )LR ( )RR ( )RF<br>Inflation Pressure | 165.5 kPa<br>(24.0 psi) |         |         |         |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop

Illumination at 0:49 minutes (stopwatch time – non-cumulative)

0.2 km (0.1 mi) distance

Driving above 50 km/h was not necessary.

**TEST RESULTS**

**TELLTALE ILLUMINATES WITHIN 20 MINUTES:                    ( X )YES   ( )NO (fail)**

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?                    ( X )YES   ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?                    ( X )YES   ( )NO (fail)

**DATA SHEET 3 (Sheet 16 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO D – Left Front Tire Deflation at UVW + VCW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER TELLTALE ILLUMINATION:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After vehicle cool down period:<br>Ambient Temperature: <u>25.4°C (77.7°F)</u> Vehicle cool down period: <u>62</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 157.5 kPa<br>(22.8 psi) | 245.1 kPa<br>(35.5 psi) | 247.1 kPa<br>(35.8 psi) | 238.4 kPa<br>(34.6 psi) |
| Tire Sidewall Temp   | 30.4°C<br>(86.7°F)      | 28.2°C<br>(82.8°F)      | 30.4°C<br>(86.7°F)      | 32.4°C<br>(90.3°F)      |
| San Angelo Test Facility Shop Floor Temp   | 25.4°C<br>(77.7°F)      | 25.2°C<br>(77.4°F)      | 25.2°C<br>(77.4°F)      | 25.2°C<br>(77.4°F)      |

After the cool down period of a minimum of one hour, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?

YES     NO (fail)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After illumination verification:<br>Re-adjusted Inflation Pressure: | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |

Is it necessary to drive the vehicle to extinguish the telltale?       YES     NO

Starting point:    San Angelo Test Facility shop

1:21 minutes (stopwatch time – non-cumulative)      0.2 km (0.1 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)**

**PASS**

Left front tire was deflated at UVW + VCW.

**REMARKS:** None

RECORDED BY:    Todd P. Groghan

DATE:    May 12, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 3 (Sheet 17 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO E – Left Front, Right Rear Tire Deflation at UVW + VCW**

TEST DATE: May 12, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Note: See Data Sheet 3 (Sheet 13 of 22) for Test Weight.

**TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES  
BEFORE CALIBRATION PHASE:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After loading vehicle to UVW + VCW, positioning vehicle at selected test start point, and vehicle cool down period:<br>Ambient Temperature: <u>26.4°C (79.5°F)</u> Vehicle cool down period: <u>62</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp   | 29.2°C<br>(84.6°F)      | 26.8°C<br>(80.2°F)      | 28.4°C<br>(83.1°F)      | 29.8°C<br>(85.6°F)      |
| San Angelo Test Facility Shop Floor Temp   | 25.2°C<br>(77.4°F)      | 25.4°C<br>(77.7°F)      | 25.6°C<br>(78.1°F)      | 25.2°C<br>(77.4°F)      |

**SYSTEM CALIBRATION/LEARNING PHASE:**

Time of Data Acquisition: Start: 16:05:30 UTC End: 16:30:54 UTC  
 Trip Odometer Reading: Start: 353.3 km (219.5 mi) End: 385.1 km (239.3 mi)  
 Ambient Temperature: Start: 26.4°C (79.5°F) End: 27.4°C (81.3°F)  
 Roadway Temperature: Start: 33.4°C (92.1°F) End: 34.8°C (94.6°F)

Driving in first direction:

Starting point: GAFB north gate Direction: see chart, page 67  
10:11 minutes (stopwatch time) 15.6 km (9.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 67  
10:24 minutes (stopwatch time) 16.3 km (10.1 mi) distance

**Max speed:** 98.4 km/h (61.1 mph)

**Total Driving Time:** 20:37 minutes (VBox time)

**DATA SHEET 3 (Sheet 18 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO E – Left Front, Right Rear Tire Deflation at UVW + VCW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER CALIBRATION PHASE:**

| <b>Execution Procedure</b>   | <b>LF Tire</b>          | <b>LR Tire</b>          | <b>RR Tire</b>          | <b>RF Tire</b>          |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Immediately, after vehicle is stopped, engine off:<br>Inflation Pressure | 249.7 kPa<br>(36.2 psi) | 263.7 kPa<br>(38.2 psi) | 265.3 kPa<br>(38.5 psi) | 248.8 kPa<br>(36.1 psi) |
| Tire Sidewall Temp   | 44.2°C<br>(111.6°F)     | 41.4°C<br>(106.5°F)     | 42.8°C<br>(109.0°F)     | 41.4°C<br>(106.5°F)     |
| San Angelo Test Facility Shop Floor Temp                                 | 26.6°C<br>(79.9°F)      | 26.2°C<br>(79.2°F)      | 26.2°C<br>(79.2°F)      | 25.6°C<br>(78.1°F)      |

**SYSTEM DETECTION PHASE:**

**LOCATION AND PRESSURE(S) OF DEFLATED TIRE(S):**

| <b>Execution Procedure</b>  | <b>LF Tire</b>          | <b>LR Tire</b> | <b>RR Tire</b>          | <b>RF Tire</b> |
|---|-------------------------|----------------|-------------------------|----------------|
| Indicate Location of Tire(s) Deflated:<br>( X )LF ( )LR ( X )RR ( )RF<br>Inflation Pressure | 165.5 kPa<br>(24.0 psi) |                | 173.0 kPa<br>(25.1 psi) |                |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop

Illumination at 0:51 minutes (stopwatch time – non-cumulative)

0.2 km (0.1 mi) distance

Driving above 50 km/h was not necessary.

**TEST RESULTS**

**TELLTALE ILLUMINATES WITHIN 20 MINUTES:                    ( X )YES   ( )NO (fail)**

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
( X )YES   ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
( X )YES   ( )NO (fail)



**DATA SHEET 3 (Sheet 19 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO E – Left Front, Right Rear Tire Deflation at UVW + VCW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER TELLTALE ILLUMINATION:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After vehicle cool down period:<br>Ambient Temperature: <u>26.5°C (79.7°F)</u> Vehicle cool down period: <u>62</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 156.0 kPa<br>(22.6 psi) | 244.6 kPa<br>(35.5 psi) | 160.8 kPa<br>(23.3 psi) | 234.5 kPa<br>(34.0 psi) |
| Tire Sidewall Temp   | 31.6°C<br>(88.9°F)      | 29.8°C<br>(85.6°F)      | 32.4°C<br>(90.3°F)      | 33.6°C<br>(92.5°F)      |
| San Angelo Test Facility Shop Floor Temp   | 26.0°C<br>(78.8°F)      | 25.8°C<br>(78.4°F)      | 26.8°C<br>(80.2°F)      | 25.8°C<br>(78.4°F)      |

After the cool down period of a minimum of one hour, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?

YES     NO (fail)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After illumination verification:<br>Re-adjusted Inflation Pressure: | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |

Is it necessary to drive the vehicle to extinguish the telltale?       YES     NO

Starting point:    San Angelo Test Facility shop

0:53 minutes (stopwatch time – non-cumulative)      0.2 km (0.1 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)**

PASS

Left front and right rear tires were deflated at UVW + VCW.

**REMARKS:**    None

RECORDED BY:    Todd P. Groghan

DATE:    May 12, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 3 (Sheet 20 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO F – Left Front, Left Rear, and Right Rear Tire Deflation at UVW + VCW**

TEST DATE: May 13, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Note: See Data Sheet 3 (Sheet 13 of 22) for Test Weight.

**TIRE INFLATION PRESSURES AND TIRE/SURFACE TEMPERATURES  
BEFORE CALIBRATION PHASE:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After loading vehicle to UVW + VCW, positioning vehicle at selected test start point, and vehicle cool down period:<br>Ambient Temperature: <u>23.8°C (74.8°F)</u> Vehicle cool down period: <u>overnight</u> |                         |                         |                         |                         |
| Inflation Pressure  | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |
| Tire Sidewall Temp  | 24.4°C<br>(75.9°F)      | 24.2°C<br>(75.6°F)      | 24.4°C<br>(75.9°F)      | 24.4°C<br>(75.9°F)      |
| San Angelo Test Facility Shop Floor Temp  | 24.4°C<br>(75.9°F)      | 24.4°C<br>(75.9°F)      | 24.6°C<br>(76.3°F)      | 24.4°C<br>(75.9°F)      |

**SYSTEM CALIBRATION/LEARNING PHASE:**

Time of Data Acquisition: Start: 13:02:36 UTC End: 13:28:02 UTC  
 Trip Odometer Reading: Start: 387.2 km (240.6 mi) End: 419.1 km (260.4 mi)  
 Ambient Temperature: Start: 23.8°C (74.8°F) End: 23.8°C (74.8°F)  
 Roadway Temperature: Start: 23.4°C (74.1°F) End: 25.4°C (77.7°F)

Driving in first direction:

Starting point: GAFB north gate Direction: see chart, page 68  
10:13 minutes (stopwatch time) 15.8 km (9.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 68  
10:29 minutes (stopwatch time) 16.1 km (10.0 mi) distance

**Max speed:** 98.7 km/h (61.3 mph)

**Total Driving Time:** 20:44 minutes (VBox time)

**DATA SHEET 3 (Sheet 21 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO F – Left Front, Left Rear, and Right Rear Tire Deflation at UVW + VCW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER CALIBRATION PHASE:**

| <b>Execution Procedure</b>   | <b>LF Tire</b>          | <b>LR Tire</b>          | <b>RR Tire</b>          | <b>RF Tire</b>          |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| Immediately, after vehicle is stopped, engine off:<br>Inflation Pressure | 250.5 kPa<br>(36.3 psi) | 262.5 kPa<br>(38.1 psi) | 264.5 kPa<br>(38.4 psi) | 250.4 kPa<br>(36.3 psi) |
| Tire Sidewall Temp   | 39.0°C<br>(102.2°F)     | 37.4°C<br>(99.3°F)      | 37.8°C<br>(100.0°F)     | 37.4°C<br>(99.3°F)      |
| San Angelo Test Facility Shop Floor Temp                                 | 24.6°C<br>(76.3°F)      | 24.6°C<br>(76.3°F)      | 24.8°C<br>(76.6°F)      | 24.6°C<br>(76.3°F)      |

**SYSTEM DETECTION PHASE:**

**LOCATION AND PRESSURE(S) OF DEFLATED TIRE(S):**

| <b>Execution Procedure</b>  | <b>LF Tire</b>          | <b>LR Tire</b>          | <b>RR Tire</b>          | <b>RF Tire</b> |
|---|-------------------------|-------------------------|-------------------------|----------------|
| Indicate Location of Tire(s) Deflated:<br>( X )LF ( X )LR ( X )RR ( )RF<br>Inflation Pressure | 165.5 kPa<br>(24.0 psi) | 173.0 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) |                |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop

Illumination at 1:24 minutes (stopwatch time – non-cumulative)

0.2 km (0.1 mi) distance

Driving above 50 km/h was not necessary.

**TEST RESULTS**

**TELLTALE ILLUMINATES WITHIN 20 MINUTES: ( X )YES ( )NO (fail)**

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
( X )YES ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?  
( X )YES ( )NO (fail)

**DATA SHEET 3 (Sheet 22 of 22)  
TPMS OPERATIONAL PERFORMANCE**

**SCENARIO F – Left Front, Left Rear, and Right Rear Tire Deflation at UVW + VCW**

**TIRE INFLATION PRESSURES AND TEMPERATURES AFTER TELLTALE ILLUMINATION:**

| Execution Procedure  | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|--|-------------------------|-------------------------|-------------------------|-------------------------|
| After vehicle cool down period:<br>Ambient Temperature: <u>23.1°C (73.6°F)</u> Vehicle cool down period: <u>63</u> minutes |                         |                         |                         |                         |
| Inflation Pressure   | 156.3 kPa<br>(22.7 psi) | 162.0 kPa<br>(23.5 psi) | 161.1 kPa<br>(23.4 psi) | 237.0 kPa<br>(34.4 psi) |
| Tire Sidewall Temp   | 30.6°C<br>(87.1°F)      | 27.8°C<br>(82.0°F)      | 26.6°C<br>(79.9°F)      | 29.2°C<br>(84.6°F)      |
| San Angelo Test Facility Shop Floor Temp   | 24.4°C<br>(75.9°F)      | 24.2°C<br>(75.6°F)      | 24.4°C<br>(75.9°F)      | 24.6°C<br>(76.3°F)      |

After the cool down period of a minimum of one hour, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?

YES     NO (fail)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure   | LF Tire                 | LR Tire                 | RR Tire                 | RF Tire                 |
|---|-------------------------|-------------------------|-------------------------|-------------------------|
| After illumination verification:<br>Re-adjusted Inflation Pressure: | 230.0 kPa<br>(33.4 psi) | 240.0 kPa<br>(34.8 psi) | 240.0 kPa<br>(34.8 psi) | 230.0 kPa<br>(33.4 psi) |

Is it necessary to drive the vehicle to extinguish the telltale?       YES     NO

Starting point:    San Angelo Test Facility shop

1:29 minutes (stopwatch time – non-cumulative)      0.3 km (0.2 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)**

**PASS**

Left front, left rear, and right rear tires were deflated at UVW + VCW.

**REMARKS:**    None

RECORDED BY:    Todd P. Groghan

DATE:    May 13, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 4 (Sheet 1 of 4)**  
**Scenario G – Malfunction Detection Test at LLVW –**  
**Spare Installed on Right Front**

TEST DATE: May 10, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

Time of Data Acquisition: Start: 17:46:37 UTC End: 18:10:39 UTC

Trip Odometer Reading: Start: 238.7 km (148.3 mi) End: 265.4 km (164.9 mi)

Ambient Temperature: Start: 29.6°C (85.3°F) End: 31.3°C (88.3°F)

Roadway Temperature: Start: 43.4°C (110.1°F) End: 39.8°C (103.6°F)

Fuel Level: Start: Full

Note: See Data Sheet 3 (Sheet 2 of 22) for Test Weight.

TPMS TYPE: (  ) Direct (  ) Indirect (  ) Other Describe: \_\_\_\_\_

TPMS MALFUNCTION TELLTALE:

(  ) Dedicated stand-alone (  ) Combination low tire pressure warning/malfunction telltale

**METHOD OF MALFUNCTION SIMULATION:**

Describe method of malfunction simulation: Spare tire without TPMS sensor was  
applied to right front at LLVW.

**MALFUNCTION TELLTALE ILLUMINATION**

(after ignition locking system is activated to “On” (“Run”) position):

**Dedicated Malfunction Telltale**

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 69  
26.7 km (16.6 mi) distance

Max speed: 99.6 km/h (61.9 mph)

Total Driving Time: 15:56 minutes (VBox time)

|  |
|--|
| <b>TELLTALE ILLUMINATES WITHIN 20 MINUTES:</b> ( <input checked="" type="checkbox"/> ) YES ( <input type="checkbox"/> ) NO |
|--|

**DATA SHEET 4 (Sheet 2 of 4)**  
**Scenario G – Malfunction Detection Test at LLVW –**  
**Spare Installed on Right Front**

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position?                    ( X )YES   ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated for at least 60 seconds when the ignition locking system is activated to the “On” or “Run” position?                    ( X )YES   ( )NO (fail)

**Extinguishment Phase:**

Restore the TPMS to normal operation. Is it necessary to drive the vehicle to extinguish the telltale?                    ( X )YES   ( )NO

Starting point:    San Angelo Test Facility shop  
1:22 minutes (stopwatch time – non-cumulative)        0.2 km (0.1 mi) distance

|   |
|---|
| <b>DEDICATED MALFUNCTION TELLTALE EXTINGUISHED:</b><br><b>( X )YES   ( )NO (FAIL)</b> |
|---|

**TPMS MALFUNCTION PERFORMANCE TEST RESULTS (PASS/FAIL)**                    PASS  
Spare without TPMS sensor was applied to right front at LLVW.

**REMARKS:** None

RECORDED BY:    Todd P. Groghan

DATE:    May 10, 2010

APPROVED BY:    Kenneth H. Yates

**DATA SHEET 4 (Sheet 3 of 4)**  
**Scenario H – Malfunction Detection Test –**  
**TPMS Fuse Removed**

TEST DATE: May 11, 2010 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CA5305

|                        |                                   |                                 |
|------------------------|-----------------------------------|---------------------------------|
| Time:                  | Start: <u>2:15 pm</u>             | End: <u>2:35 pm</u>             |
| Trip Odometer Reading: | Start: <u>318.2 km (197.7 mi)</u> | End: <u>318.2 km (197.7 mi)</u> |
| Ambient Temperature:   | Start: <u>29.9°C (85.8°F)</u>     | End: <u>29.9°C (85.8°F)</u>     |
| Roadway Temperature:   | Start: <u>N/A</u>                 | End: <u>N/A</u>                 |
| Fuel Level:            | Start: <u>Full</u>                |                                 |

Note: See Data Sheet 3 (Sheet 2 of 22) for Test Weight.

TPMS TYPE: (  ) Direct (  ) Indirect (  ) Other Describe: \_\_\_\_\_

TPMS MALFUNCTION TELLTALE:

(  ) Dedicated stand-alone (  ) Combination low tire pressure warning/malfunction telltale

**METHOD OF MALFUNCTION SIMULATION:**

Describe method of malfunction simulation: TPMS fuse in driver-side kick panel was removed.

**MALFUNCTION TELLTALE ILLUMINATION**

(after ignition locking system is activated to “On” (“Run”) position):

**Dedicated Malfunction Telltale**

Telltale illuminated immediately upon start-up. Driving was not necessary

|  |
|--|
| <b>TELLTALE ILLUMINATES WITHIN 20 MINUTES:</b> ( <input checked="" type="checkbox"/> )YES ( <input type="checkbox"/> )NO |
|--|

**DATA SHEET 4 (Sheet 4 of 4)**  
**Scenario H – Malfunction Detection Test –**  
**TPMS Fuse Removed**

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the telltale re-illuminate and stay illuminated when the ignition locking system is activated to the “On” or “Run” position? ( X )YES ( )NO (fail)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale re-illuminate and stay illuminated for at least 60 seconds when the ignition locking system is activated to the “On” or “Run” position? ( X )YES ( )NO (fail)

**Extinguishment Phase:**

Restore the TPMS to normal operation. Is it necessary to drive the vehicle to extinguish the telltale? ( )YES ( X )NO

|  |
|--|
| <b>DEDICATED MALFUNCTION TELLTALE EXTINGUISHED:</b><br>( X )YES ( )NO (FAIL) |
|--|

**TPMS MALFUNCTION PERFORMANCE TEST RESULTS (PASS/FAIL) PASS**  
TPMS fuse was removed.

**REMARKS:** None

**RECORDED BY:** Todd P. Groghan

**DATE:** May 11, 2010

**APPROVED BY:** Kenneth H. Yates



**DATA SHEET 5 (Sheet 1 of 3)**  
**TPMS WRITTEN INSTRUCTIONS**

TEST  
DATE: May 7, 2010

LAB: San Angelo Test Facility

VEHICLE  
NHTSA NO: CA5305

**The following statement, in the English language, is provided verbatim in the Owner's Manual.** (X)YES ( )NO

"Each tire, including the spare (if provided), should be checked monthly when cold and inflated to the inflation pressure recommended by the vehicle manufacturer on the vehicle placard or tire inflation pressure label. (If your vehicle has tires of a different size than the size indicated on the vehicle placard or tire inflation pressure label, you should determine the proper tire inflation pressure for those tires.)

As an added safety feature, your vehicle has been equipped with a tire pressure monitoring system (TPMS) that illuminates a low tire pressure telltale when one or more of your tires is significantly under-inflated. Accordingly, when the low tire pressure telltale illuminates, you should stop and check your tires as soon as possible, and inflate them to the proper pressure. Driving on a significantly under-inflated tire causes the tire to overheat and can lead to tire failure. Under-inflation also reduces fuel efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.

Please note that the TPMS is not a substitute for proper tire maintenance, and it is the driver's responsibility to maintain correct tire pressure, even if under-inflation has not reached the level to trigger illumination of the TPMS low tire pressure telltale."

**DATA SHEET 5 (Sheet 2 of 3)**  
**TPMS WRITTEN INSTRUCTIONS**

**As specified, the following sections, in the English language, are required verbatim in paragraph form in the Owner's Manual:**

*The following statement is required for all vehicles certified to the standard starting on September 1, 2007 and for vehicles voluntarily equipped with a compliant TPMS MIL before that time.*

"Your vehicle has also been equipped with a TPMS malfunction indicator to indicate when the system is not operating properly."

**The above statement in the English language is provided verbatim in owner's manual:**

YES    NO

*For vehicles with a dedicated MIL telltale, add the following statement:*

"The TPMS malfunction indicator is provided by a separate telltale, which displays the symbol "TPMS" when illuminated."

**The above statement in the English language is provided verbatim in owner's manual:**

YES    NO    N/A

*For vehicles with a combined low tire pressure/MIL telltale, add the following statement:*

The TPMS malfunction indicator is combined with the low tire pressure telltale. When the system detects a malfunction, the telltale will flash for approximately one minute and then remain continuously illuminated. This sequence will continue upon subsequent vehicle start-ups as long as the malfunction exists.

**The above statement in the English language is provided verbatim in owner's manual:**

YES    NO    N/A

*The following statement is required for all vehicles certified to the standard starting on September 1, 2007 and for vehicles voluntarily equipped with a compliant TPMS MIL before that time.*

"When the malfunction indicator is illuminated, the system may not be able to detect or signal low tire pressure as intended. TPMS malfunctions may occur for a variety of reasons, including the installation of replacement or alternate tires or wheels on the vehicle that prevent the TPMS from functioning properly. Always check the TPMS malfunction telltale after replacing one or more tires or wheels on your vehicle to ensure that the replacement or alternate tires and wheels allow the TPMS to continue to function properly."

**The above statement in the English language is provided verbatim in owner's manual:**

YES    NO

**DATA INDICATES COMPLIANCE:**

**PASS/FAIL: PASS**

**DATA SHEET 5 (Sheet 3 of 3)**  
**TPMS WRITTEN INSTRUCTIONS**

**Does the Owner's Manual provide an image of the Low Tire Pressure Warning Telltale symbol (and an image of the TPMS Malfunction Telltale warning ("TPMS")), if a dedicated telltale is utilized for this function)?** ( X )YES ( )NO

**Does the Owner's Manual include the following (allowable) information?**

- Significance of the low tire pressure warning telltale illuminating
- A description of corrective action to be undertaken
- Whether the tire pressure monitoring system functions with the vehicle's spare tire (if provided)
- How to use a reset button, if one is provided
- The time for the TPMS telltale(s) to extinguish once the low tire pressure condition or the malfunction is corrected

**REMARKS:** None

RECORDED BY: Todd P. Groghan

DATE: May 7, 2010

APPROVED BY: Kenneth H. Yates

**SECTION 4**  
**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

| <b>EQUIPMENT</b>                                    | <b>DESCRIPTION</b>                              | <b>MODEL/<br/>SERIAL NO</b>                               | <b>CAL.<br/>DATE</b> | <b>NEXT<br/>CAL.<br/>DATE</b> |
|---|---|---|----------------------|-------------------------------|
| STOPWATCH   | CHAMPION<br>SPORTS TIMER                        | 910 R   | N/A                  | N/A                           |
| VBOX RECORDING<br>DEVICE                            | RACELOGIC VBOX<br>III                           | SERIAL # 030209   | 2/3/2010             | 2/3/2011                      |
| AMBIENT<br>TEMPERATURE<br>GAUGE                     | FLUKE 179 DIGITAL<br>THERMOMETER                | SERIAL # 84740316   | 2/24/2010            | 2/24/2011                     |
| LASER<br>TEMPERATURE<br>GAUGE (TIRES AND<br>GROUND) | RAYTEK ST20                                     | SERIAL<br>2065640101-0014                                 | 8/19/2009            | 8/19/2010                     |
| AIR PRESSURE<br>GAUGE                               | ASHCROFT<br>GENERAL<br>PURPOSE DIGITAL<br>GAUGE | MODEL # D1005PS<br>02L 100 PSI<br>SERIAL #<br>20017398-01 | 12/9/2009            | 12/9/2010                     |
| FLOOR SCALES<br>(VEHICLE)                           | INTERCOMP SW<br>DELUXE SCALES                   | PART # 100156<br>SERIAL # 24032382                        | 7/28/2009            | 7/28/2010                     |
| PLATFORM SCALE<br>(BALLAST)                         | HOWE<br>RICHARDSON                              | MODEL # 6401<br>SERIAL # 0181-<br>5509-26                 | 7/28/2009            | 7/28/2010                     |

SECTION 5  
PHOTOGRAPHS



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO.138

FIGURE 5.1  
¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE

MFD. BY HONDA MFG. OF ALABAMA, LLC

12/' 09

GVWR 2695KG(5941LBS)

TIRE SIZE

RIM SIZE

GAWR F 1320KG(2910LBS)

235/65R16 103T

16X7J

GAWR R 1450KG(3197LBS)

235/65R16 103T

16X7J

THIS VEHICLE CONFORMS TO ALL APPLICABLE  
FEDERAL MOTOR VEHICLE SAFETY

AND THEFT PREVENTION STANDARDS IN EFFECT  
ON THE DATE OF MANUFACTURE SHOWN ABOVE.

V.I.N.:5FNRL3H21AB039382 TYPE: MPV



SHJ A AB5 -NH700M -B -B

2010 HONDA ODYSSEY  
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FMVSS NO.138

FIGURE 5.2  
VEHICLE CERTIFICATION LABEL



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FIGURE 5.3  
 VEHICLE PLACARD





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FIGURE 5.4  
TIRE SHOWING BRAND



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FMVSS NO. 138

FIGURE 5.5  
TIRE SHOWING MODEL



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FMVSS NO. 138

FIGURE 5.6  
TIRE SHOWING SIZE AND LOAD INDEX/SPEED RATING



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.7  
TIRE SHOWING DOT SERIAL NUMBER



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.8  
TIRE SHOWING MAX LOAD RATING  
AND MAX COLD INFLATION PRESSURE



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.9  
TIRE SHOWING SIDEWALL / TREAD CONSTRUCTION



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.10  
RIM SHOWING TPMS SENSOR AND RIM  
CONTOUR FOR FULL WIDTH OF CROSS SECTION



2010 HONDA ODYSSEY  
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FMVSS NO. 138

FIGURE 5.11  
DISPLAY SHOWING LOW TIRE PRESSURE WARNING TELLTALE





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FIGURE 5.12  
DISPLAY SHOWING DEDICATED TPMS  
MALFUNCTION WARNING TELLTALE



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FMVSS NO 138

FIGURE 5.13  
TEST INSTRUMENTATION INSTALLED IN VEHICLE



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.14  
VEHICLE CARGO AREA BALLAST FOR LLVW LOAD



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
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FIGURE 5.15  
VEHICLE SECOND ROW BALLAST FOR UVW + VCW LOAD



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FMVSS NO. 138

FIGURE 5.16  
VEHICLE THIRD ROW BALLAST FOR UVW + VCW LOAD



2010 HONDA ODYSSEY  
NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.17  
VEHICLE CARGO AREA BALLAST FOR UVW + VCW LOAD



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NHTSA NO. CA5305  
FMVSS NO. 138

FIGURE 5.18  
VEHICLE ON WEIGHT SCALES



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FIGURE 5.20  
SPARE INSTALLED ON RIGHT FRONT



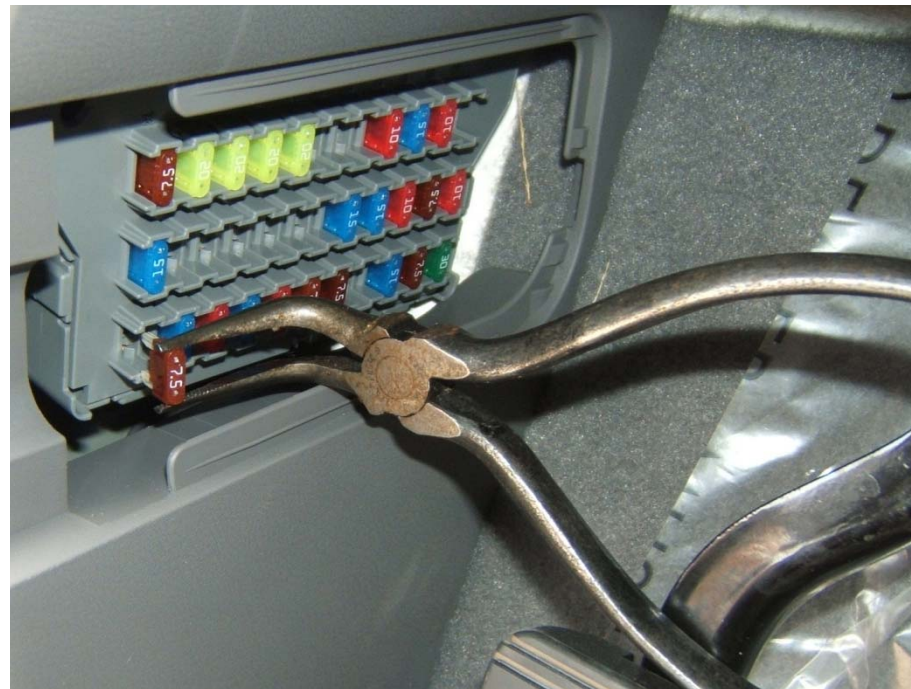
SHJ -A0

|                  |                 |                         |              |                       |               |            |                 |                  |             |             |
|------------------|-----------------|-------------------------|--------------|-----------------------|---------------|------------|-----------------|------------------|-------------|-------------|
| 23               | 24              | 25                      | 26           | 27                    | 28            | 29         | 30              | 31               | 32          | 33          |
| 7.5A             | 20A             | 20A                     | 20A          | 20A                   | (20A)         |            | 10A             | 15A              | 10A         | (7.5A)      |
| IGP              | PW<br>RR L      | PW<br>RR R              | PW<br>AS     | PW<br>DR              | SUNROOF       |            | IG<br>HAC       | IGN<br>SOL       | ACC         | HAC<br>OP   |
| 12               | 13              | 14                      | 15           | 16                    | 17            | 18         | 19              | 20               | 21          | 22          |
| 15A              | (20A)           | (20A)                   | (20A)        | (20A)                 | (20A)         | 15A        | 15A             | 10A              | 7.5A        | 10A         |
| RR ACC<br>SOCKET | L PSD<br>CLOSER | DR<br>P/SEAT<br>(SLIDE) | ADJ<br>PEDAL | DR<br>P/SEAT<br>(REC) | PTG<br>CLOSER | IG<br>ACG  | IG FUEL<br>PUMP | IG<br>WASHER     | IG<br>METER | IG<br>SRS   |
| 1                | 2               | 3                       | 4            | 5                     | 6             | 7          | 8               | 9                | 10          | 11          |
| 7.5A             | 15A             | (10A)                   | 15A          | 10A                   | 7.5A          | 7.5A       |                 | 15A              | 7.5A        | 30A         |
| TPMS             | IG<br>COIL      | DAY<br>LIGHT            | LAF          | RADIO                 | INTR<br>LIGHT | BACK<br>UP |                 | FR ACC<br>SOCKET | IG<br>OPDS  | IG<br>WIPER |

ALWAYS REPLACE WITH A NEW FUSE OF THE SAME AMPERAGE RATING.

FUSE BOX UPPER AREA

|      |
|------|
| 7.5A |
| STS  |



2010 HONDA ODYSSEY  
 NHTSA NO. CA5305  
 FMVSS NO. 138

FIGURE 5.20  
 FUSE CHART -  
 TPMS FUSE REMOVED

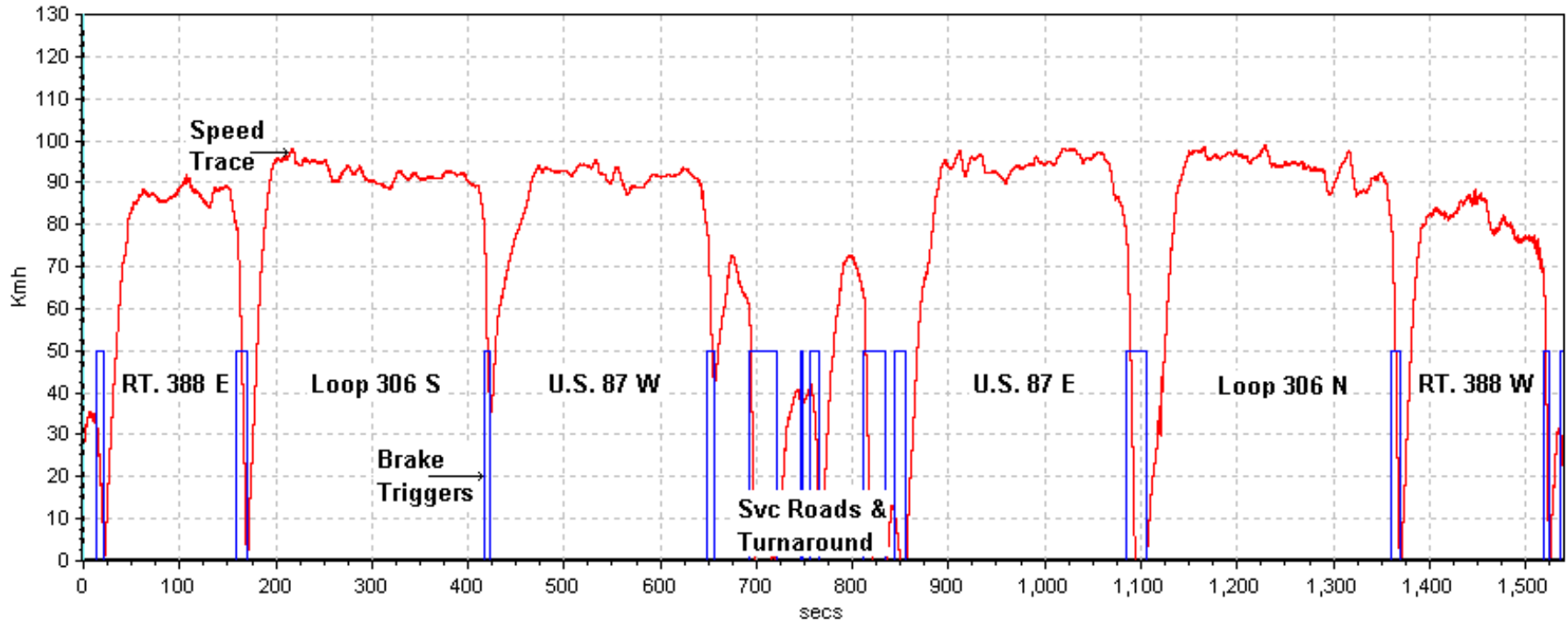
SECTION 6  
TEST PLOTS

Scenario A: Left Rear Tire at LLVW  
 Test Date: 5/7/10  
 Data File Time: 25:40 minutes  
 Cumulative Driving Time: 20:37minutes  
 Start Point: GAFB north gate

Calibration Phase:

2010 Honda Odyssey (CA5305) LR Calibration LLVW

Log Rate := 100.00 Hz



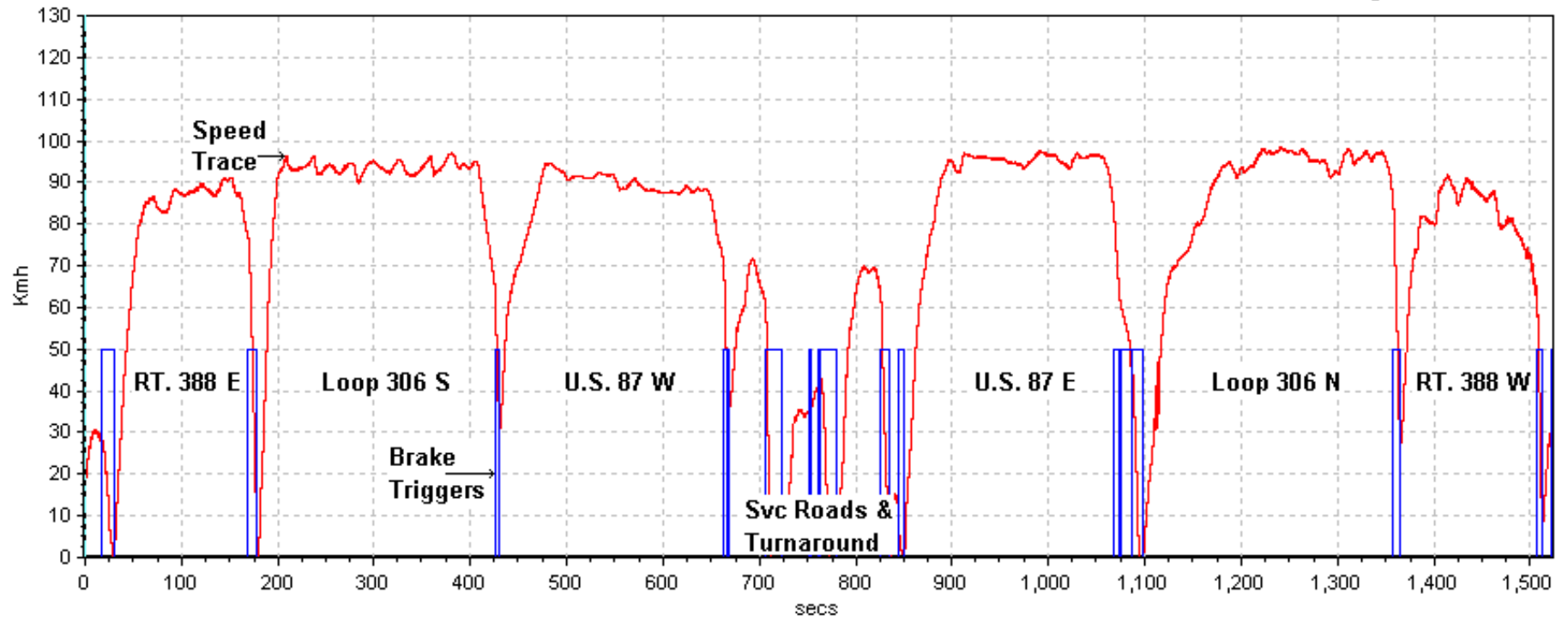
LR Detection Phase: Telltale illuminated 1:32 minutes after lamp check. Driving above 50 km/h was not necessary.

Scenario B: Left Rear, Right Rear Tires at LLVW  
Test Date: 5/10/10  
Data File Time: 25:24 minutes  
Cumulative Driving Time: 20:36 minutes  
Start Point: GAFB north gate

Calibration Phase:

2010 Honda Odyssey (CA5305) LR, RR Calibration LLVW

Log Rate := 100.00 Hz



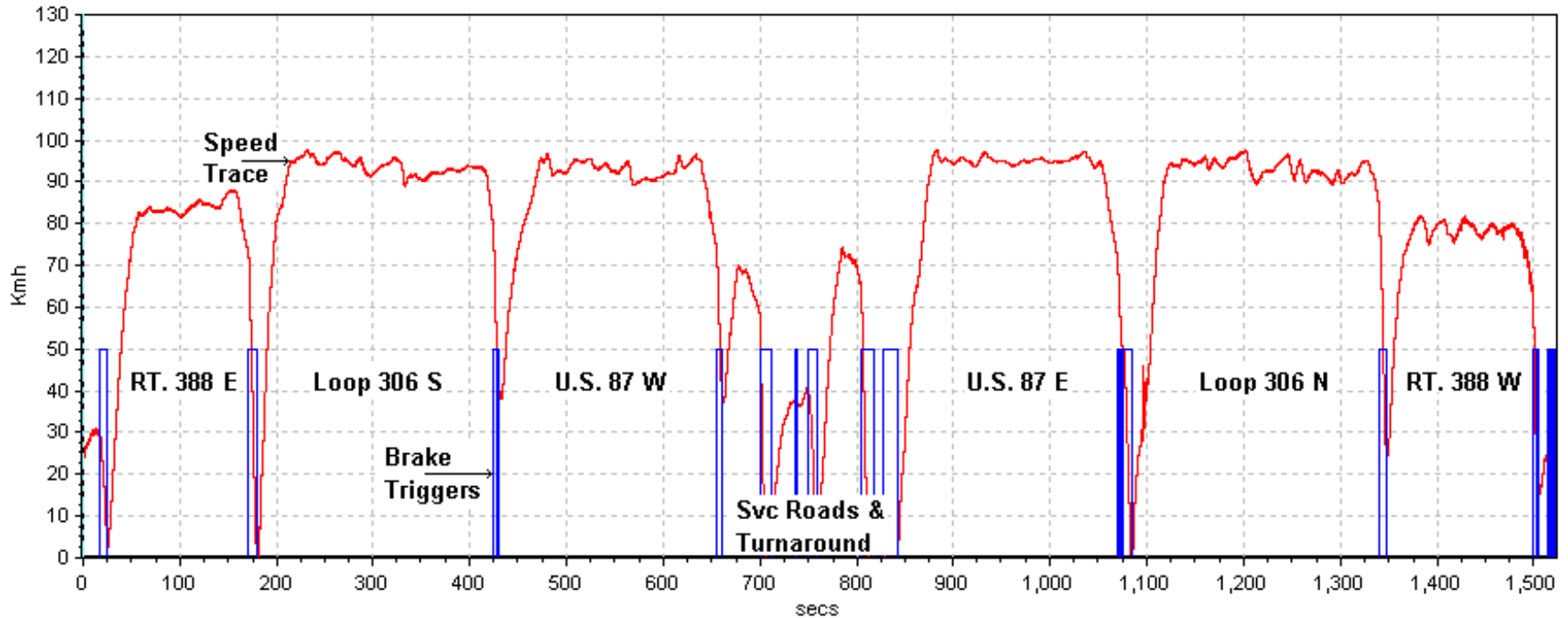
LR, RR Detection Phase: Telltale illuminated 2:17 minutes after lamp check. Driving above 50 km/h was not necessary.

Scenario C: Left Front, Left Rear, Right Rear, Right Front Tires at LLVW  
 Test Date: 5/11/10  
 Data File Time: 25:24 minutes  
 Cumulative Driving Time: 20:41 minutes  
 Start Point: GAFB north gate

Calibration Phase:

2010 Honda Odyssey (CA5305) LF, LR, RR, RF Calibration LLVW

Log Rate := 100.00 Hz



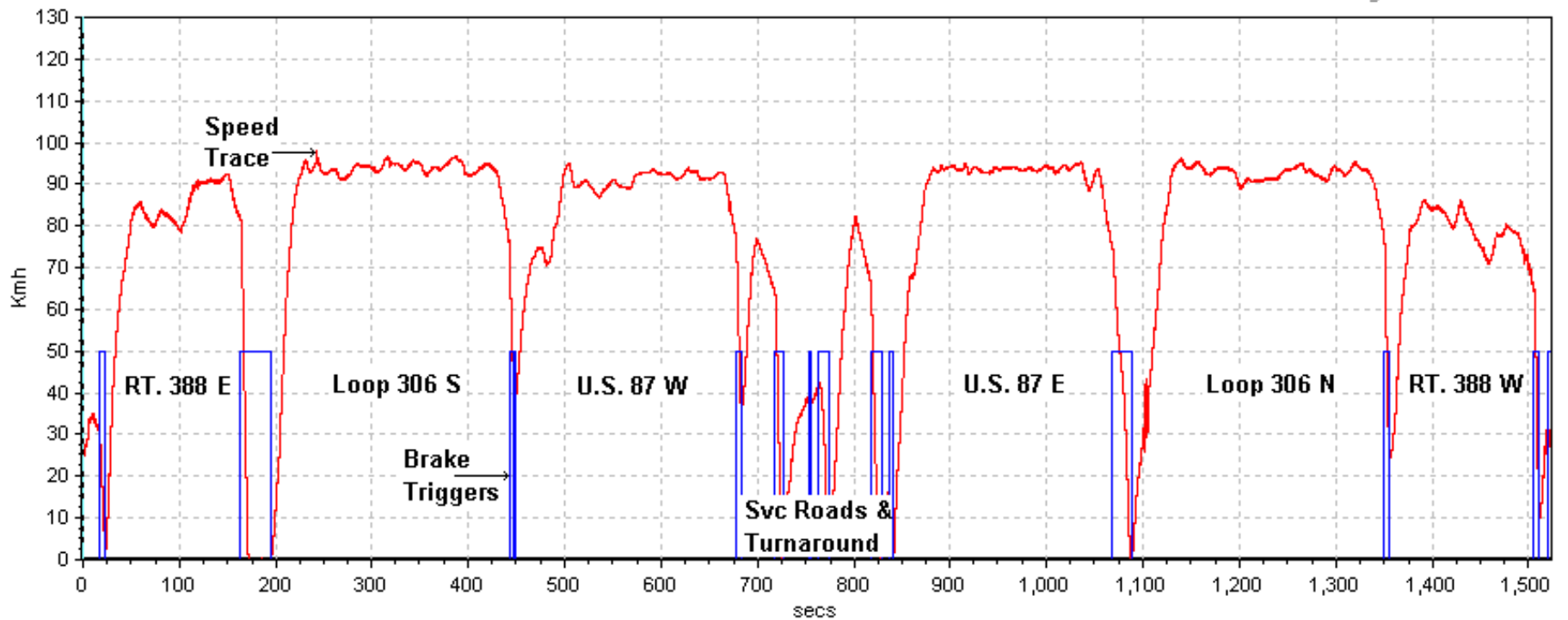
LF, LR, RR, RF Detection Phase: Telltale illuminated 1:13 minutes after lamp check. Driving above 50 km/h was not necessary.

Scenario D: Left Front Tire at UVW + VCW  
Test Date: 5/12/10  
Data File Time: 25:24 minutes  
Cumulative Driving Time: 20:42 minutes  
Start Point: GAFB north gate

Calibration Phase:

2010 Honda Odyssey (CA5305) LF Calibration UVW+VCW

Log Rate := 100.00 Hz



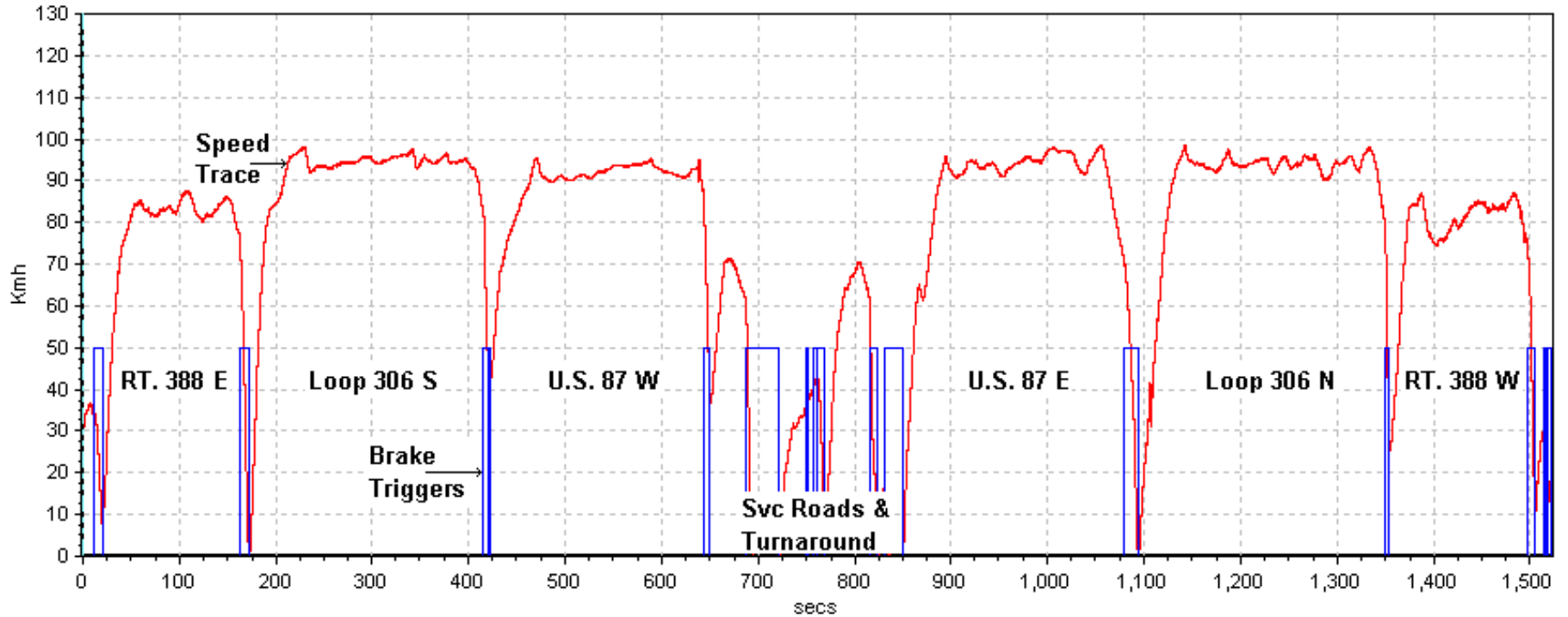
LF Detection Phase: Telltale illuminated 0:49 minutes after lamp check. Driving above 50 km/h was not necessary.

Scenario E: Left Front, Right Rear Tires at UVW + VCW  
Test Date: 5/12/10  
Data File Time: 25:24 minutes  
Cumulative Driving Time: 20:37 minutes  
Start Point: GAFB north gate

Calibration Phase:

2010 Honda Odyssey (CA5305) LF, RR Calibration UVW+VCW

Log Rate := 100.00 Hz

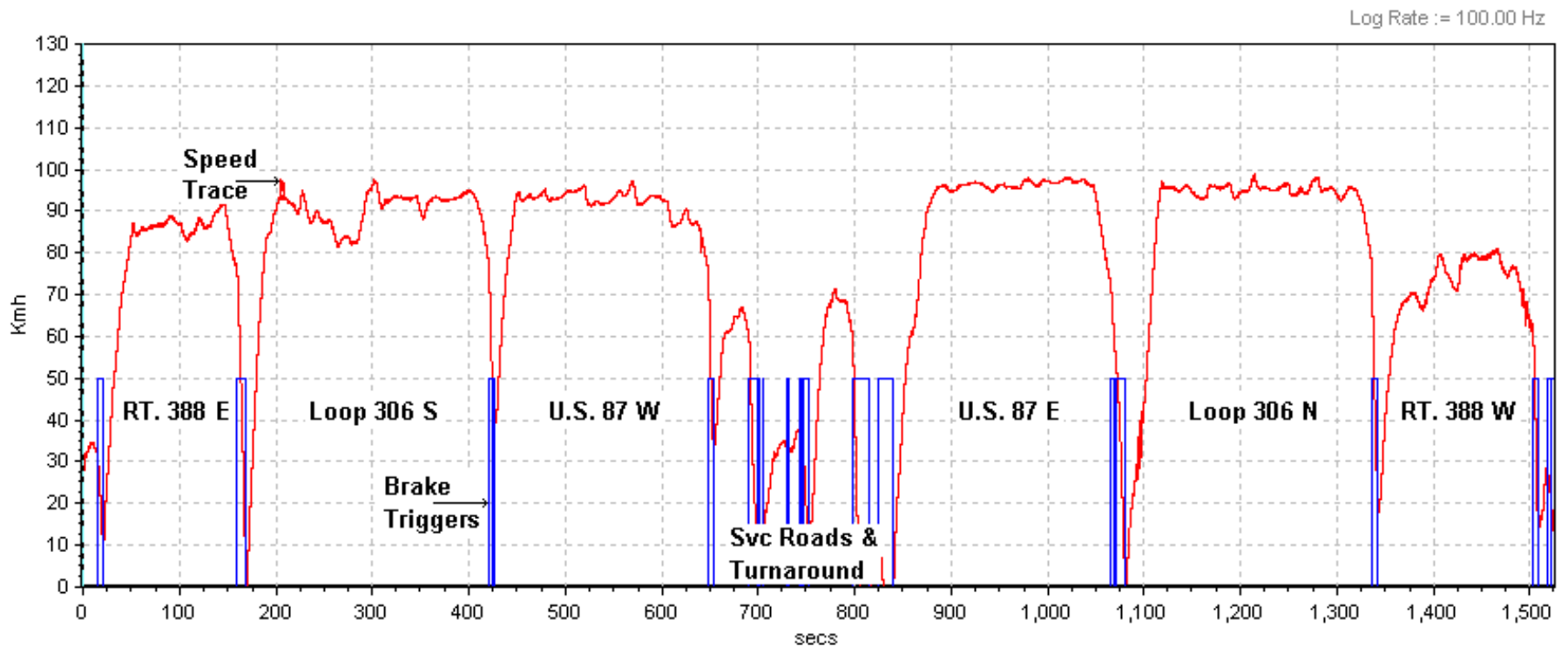


LF, RR Detection Phase: Telltale illuminated 0:51 minutes after lamp check. Driving above 50 km/h was not necessary.

Scenario F: Left Front, Left Rear, Right Rear Tires at UVW + VCW  
Test Date: 5/13/10  
Data File Time: 25:26 minutes  
Cumulative Driving Time: 20:44 minutes  
Start Point: GAFB north gate

Calibration Phase:

2010 Honda Odyssey (CA5305) LF, LR, RR Calibration UVW+VCW



LF, LR, RR Detection Phase: Telltale illuminated 1:24 minutes after lamp check. Driving above 50 km/h was not necessary.

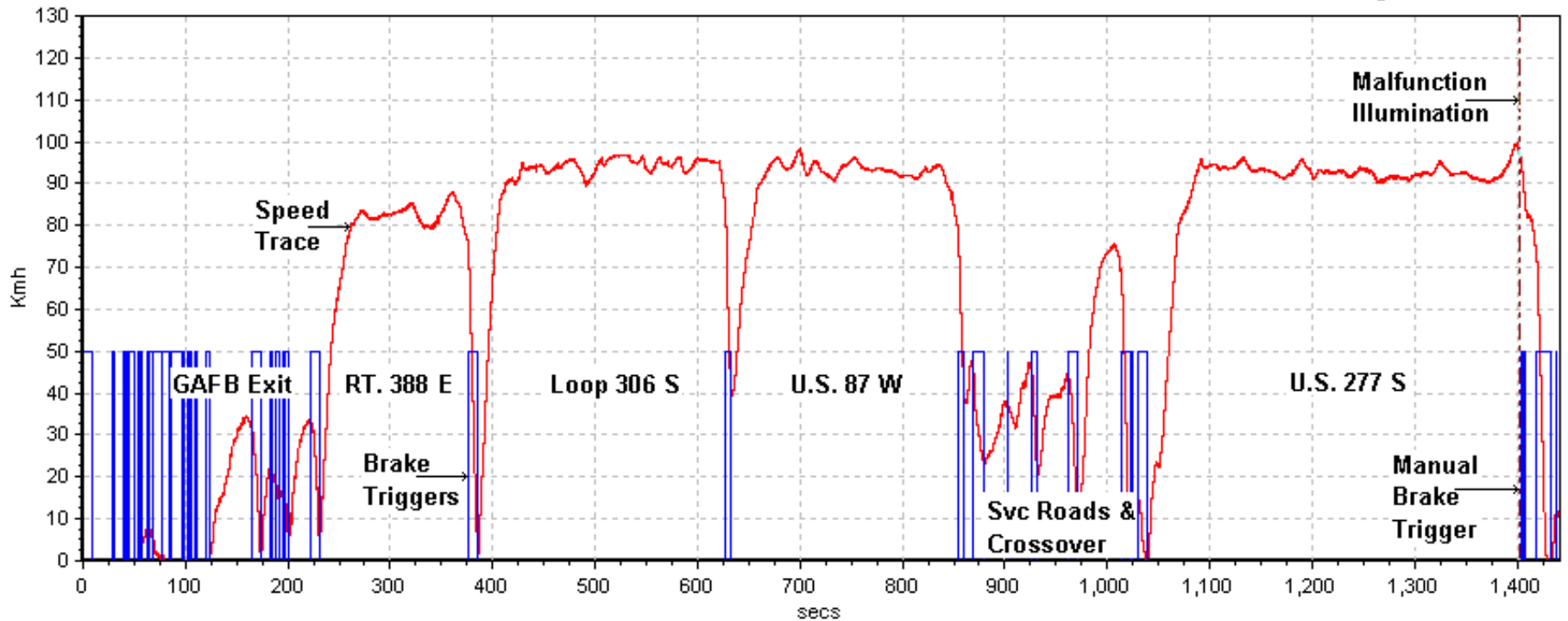


Scenario G: Malfunction Detection Test at LLVW  
Test Date: 5/10/10  
Data File Time: 24:02 minutes  
Cumulative Driving Time: 15:56 minutes  
Start Point: San Angelo Test Facility shop

Malfunction Telltale Illumination:

2010 Honda Odyssey (CA5305) RF Spare Tire Malfunction Illumination LLVW

Log Rate := 100.00 Hz



SECTION 7  
OWNER'S MANUAL PAGES

## Tire Pressure Monitoring System (TPMS) – Except Touring models

---

*On LX, EX, EX-L, and Canadian DX, SE models*

Your vehicle is equipped with a tire pressure monitoring system (TPMS) that turns on every time you start the engine and monitors the pressure in your tires while driving.

Each tire has its own pressure sensor (not including the spare tire). If the air pressure of a tire becomes significantly low while driving, the sensor in that tire immediately sends a signal that causes the low tire pressure indicator to come on.



### Low Tire Pressure Indicator

When the low tire pressure indicator is on, one or more of your tires is significantly underinflated. You should stop and check your tires as soon as possible, and inflate them to the proper pressure as indicated on the vehicle's tire information placard.

If you think you can safely drive a short distance to a service station, proceed slowly, and inflate the tire to the recommended pressure shown on the driver's doorjamb.

If the tire is flat, or if the tire pressure is too low to continue driving, replace the tire with the compact spare tire (see page 462).

If you cannot make the low tire pressure indicator go out after inflating the tires to the specified values, have your dealer check the system as soon as possible.

Driving on a significantly underinflated tire causes the tire to overheat and can lead to tire failure. Underinflation also reduces fuel efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.

Because tire pressure varies by temperature and other conditions, the low tire pressure indicator may come on unexpectedly.

## Tire Pressure Monitoring System (TPMS) – Except Touring models

---

### **Changing a Tire with TPMS**

If you have a flat tire, the low tire pressure indicator will come on. Replace the flat tire with the compact spare tire (see page 462 ).

Each wheel (except the compact spare tire wheel) is equipped with a tire pressure sensor mounted inside the tire behind the valve stem. You must use TPMS specific wheels. It is recommended that you always have your tires serviced by your dealer or qualified technician.

After you replace the flat tire with the compact spare tire, the low tire pressure indicator stays on. This is normal; the system is not monitoring the spare tire pressure. Manually check the spare tire pressure to be sure it is correct. After several miles (kilometers) driving with the compact spare tire, the TPMS indicator comes on and the low tire pressure indicator goes off.

The low tire pressure indicator or the TPMS indicator will go off, after several miles (kilometers) driving, when you replace the spare tire with the specified regular tire equipped with the tire pressure monitor sensor.

Never use a puncture-repairing agent in a flat tire. If used, you will have to replace the tire pressure sensor. Have the flat tire repaired by your dealer as soon as possible.

*As required by the FCC:*

*This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

*Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

*This device complies with Industry Canada Standard RSS-210.*

*Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference that may cause undesired operation of the device.*

## Tire Pressure Monitoring System (TPMS) – Required Federal Explanation

### *All models*

Each tire, including the spare (if provided), should be checked monthly when cold and inflated to the inflation pressure recommended by the vehicle manufacturer on the vehicle placard or tire inflation pressure label.

(If your vehicle has tires of a different size than the size indicated on the vehicle placard or tire inflation pressure label, you should determine the proper tire inflation pressure for those tires.)

As an added safety feature, your vehicle has been equipped with a tire pressure monitoring system (TPMS) that illuminates a low tire pressure telltale



when one or more of your tires is significantly under-inflated.

Accordingly, when the low tire pressure telltale illuminates, you should stop and check your tires as soon as possible, and inflate them to the proper pressure.

Driving on a significantly under inflated tire causes the tire to overheat and can lead to tire failure. Underinflation also reduces fuel efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.

Please note that the TPMS is not a substitute for proper tire maintenance, and it is the driver's responsibility to maintain correct tire pressure, even if under-inflation has not reached the level to trigger illumination of the TPMS low tire pressure telltale.

## Tire Pressure Monitoring System (TPMS) – Required Federal Explanation

---

*Except Touring models*

Your vehicle has also been equipped with a TPMS malfunction indicator to indicate when the system is not operating properly. The TPMS malfunction indicator is provided by a separate telltale, which displays the symbol “TPMS” when illuminated.

When the malfunction indicator is illuminated,

**TPMS**

the system may not be able to detect or signal low tire pressure as intended.

TPMS malfunctions may occur for a variety of reasons, including the installation of replacement or alternate tires or wheels on the vehicle that prevent the TPMS from functioning properly.

Always check the TPMS malfunction telltale after replacing one or more tires or wheels on your vehicle to ensure that the replacement or alternate tires and wheels allow the TPMS to continue to function properly.