REPORT NUMBER 138-STF-06-004

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

## NISSAN MOTOR COMPANY, LTD.
## 2006 NISSAN PATHFINDER LE
## 4X2 FOUR-DOOR MPV
## NHTSA NO. C65200

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

April 4, 2007

**FINAL REPORT**

**PREPARED FOR**

**U. S. DEPARTMENT OF TRANSPORTATION**
**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
**ENFORCEMENT**
**OFFICE OF VEHICLE SAFETY COMPLIANCE**
**400 SEVENTH STREET, SW**
**ROOM 6111 (NVS-220)**
**WASHINGTON, D.C. 20590**

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Acceptance Date: 4/4/2007

Technical Report Documentation Page

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| 7. Author(s)<br><br>David Banks, Junior Systems Analyst<br>Bob Gregg, Safety Compliance Specialist | | 8. Performing Organization Report Number<br><br>STF-DOT-06-138-004 |
| 9. Performing Organization Name and Address<br><br>U. S. DOT San Angelo Test Facility<br>131 Comanche Trail, Building 3527<br>Goodfellow AFB, Texas 76908 | | 10. Work Unit No. (TRAIS) |
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| | | 14. Sponsoring Agency Code<br><br>NVS-220 |
| 15. Supplementary Notes | | |
| 16. Abstract<br>Compliance tests were conducted on the subject 2006 Nissan Pathfinder LE 4X2 four-door MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-138-02 for the determination of FMVSS 138 compliance. Test failures identified were as follows: NONE. | | |
| 17. Key Words<br><br>Compliance Testing<br>Safety Engineering<br>FMVSS 138 | 18. Distribution Statement<br><br>Copies of this report are available from<br><br>NHTSA Technical Information Services<br>Room 2334, (NPO-411)<br>400 Seventh Street, SW<br>Washington, DC 20590<br>Email: tis@nhtsa.dot.gov<br>FAX: 202-493-2833 | |
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# SECTION 1
# INTRODUCTION

## 1.1 PURPOSE OF COMPLIANCE TEST

A 2006 Nissan Pathfinder LE 4X2 four-door MPV was tested to determine if the vehicle was in compliance with the requirements of the standard. All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure TP-138-02 dated September 14, 2005.

## 1.2 TEST VEHICLE

The test vehicle was a 2006 Nissan Pathfinder LE 4X2 four-door MPV. Nomenclatures applicable to the test vehicle are:

A. Vehicle Identification Number: 5N1AR18U06C655172

B. NHTSA No.: C65200

C. Manufacturer: Nissan Motor Company, Ltd.

D. Manufacture Date: 04/2006

## 1.3 TEST DATE

The test vehicle was tested during the time period August 29 through September 6, 2006.

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 information was 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 six tire deflation scenarios. This LLVW included the weights of driver, one passenger, and test equipment. The vehicle was loaded to its Gross Vehicle Weight Rating (GVWR) for four tire deflation scenarios. The gross vehicle weight included the weights of driver, one passenger, equipment, ballast in the rear seat, and ballast in the cargo area. 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 test, graph(s) were generated by VBOX software showing vehicle speed versus time during the test procedure calibration phase and detection phase. The graphs furnish a second-by-second analysis of each test phase. The cumulative driving time for each test 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 consisted of four parts:

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 50-100 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. Vehicle was started and driven (if necessary) between 50 -100 km/h until low tire pressure telltale illuminated.
3. Cool down phase: Vehicle was parked in the San Angelo Test Facility (SATF) garage. Tires were allowed to cool down for one hour, or until all tires excluding deflated tire(s) were within seven kPa (one psi) of vehicle placard cold inflation pressure. 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 driven (if necessary) until the telltale extinguished.

An indicant malfunction detection test was performed with the vehicle loaded to its GVWR. A malfunction was simulated by placing the full size spare tire (with no TPMS sensor) on the left rear wheel position The vehicle was driven until telltale illumination or until a minimum of 20 minutes of cumulative driving time between 50-100 km/h was attained.

## 2.2 SUMMARY OF RESULTS

Six tire deflation scenarios were performed on the test vehicle at LLVW: A. left front; B. left rear; C. right front; D. right rear; E. left front and left rear; and F. left front, left rear, right rear, right front. Four tire deflation scenarios were performed on the test vehicle at GVWR: G. left front; H. right rear; I. left front and right front; and J. left front, left rear, right rear, right front.

The data indicate compliance of the test vehicle's tire pressure monitoring system for the ten tire deflation scenarios tested. The reconfigurable display lists the tire pressures when that menu item is selected (see Figure 5.12), but does not identify the tire locations.

One indicant malfunction detection test was performed on the test vehicle at GVWR. The vehicle's combination low tire pressure warning and malfunction telltale did not indicate a malfunction. The telltale did not flash and illuminate per the standard's requirements effective September 1, 2007.

SECTION 3

TEST DATA

## FMVSS No. 138 – TEST DATA SUMMARY

TEST DATE: August 29 - September 6, 2006 LAB: U. S. DOT San Angelo Test Facility

CONTRACT: N/A VEHICLE NHTSA NUMBER: C65200

VIN: 5N1AR18U06C655172 CERTIFICATION LABEL BUILD DATE: 04/2006

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

**REMARKS:** The FMVSS 138 malfunction performance requirements do not become effective until September 1, 2007. The test vehicle is equipped with a malfunction capability that would not correctly meet the future requirements.

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

TEST DATE: August 29, 2006 LAB: U. S. DOT San Angelo Test Facility

CONTRACT: N/A VEHICLE NHTSA NUMBER: C65200

VIN: 5N1AR18U06C655172 CERTIFICATION LABEL BUILD DATE: 04/2006

MY/MAKE/MODEL/BODY STYLE: 2006 Nissan Pathfinder LE 4X2 four-door MPV

ENGINE: 4.0 L V-6

**TIRE CONDITIONING:**

( X ) Tires used more than 100 km. Actual odometer reading : 111 km (69 mi)

**VEHICLE ALIGNMENT AND WHEEL BALANCING:**

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

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

**TPMS IDENTIFICATION:**

TPMS SENSOR MAKE/MODEL: Schrader PN 70503161 [5]

TPMS TUNER MAKE/MODEL: Alps Electric Company, Ltd. PN TFWC1U

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

**TPMS MALFUNCTION INDICATOR TYPE**:

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

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

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

**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 | P265/65R17 | 240 kPa (35 psi) | Vehicle Placard |
| Rear | P265/65R17 | 240 kPa (35 psi) | Vehicle Placard |
| Spare | P265/65R17 | 240 kPa (35 psi) | Vehicle Placard |

**INSTALLED TIRE DATA (Use diagrams as reference):**

Diagram - Passenger Car Tire Labeling

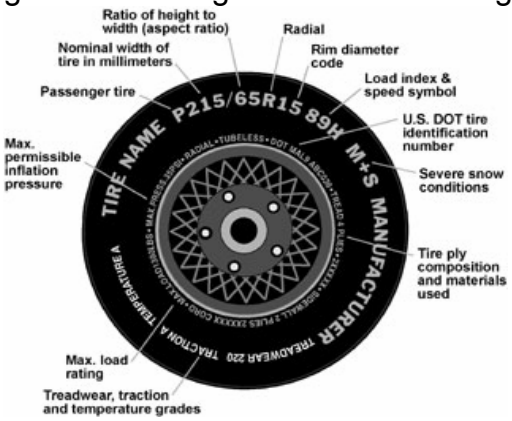
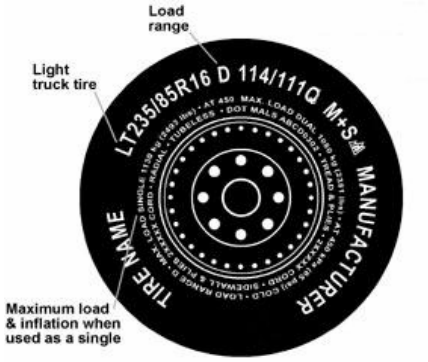



Diagram - Other Markings on Light Trucks




**Front and Rear Axles**

Tire Size (ex. P225/65R15 89H): P265/65R17 110S

Manufacturer/Tire Name: General Grabber AW

Sidewall Max Load Rating: 1,060 kg (2,337 lbs)

Max Inflation Pressure: 300 kPa (44 psi)

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

Tread Construction (number of plies and ply material): 5 ply – 2 polyester, 2 steel, 1 nylon

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

**Are all installed tires the same as designated by the vehicle manufacturer on Vehicle Placard?** ( X )YES ( )NO

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

| **Worksheet for Determining FMVSS No. 138 Telltale Warning Activation Pressure for Tires Installed on Vehicle** | | |
|---|---|---|
| **Part** | **Front Axle** | **Rear Axle** |
| **(A)** Recommended Inflation Pressure x .75 | 240 kPa x .75 = 180.0 kPa | 240 kPa x .75 = 180.0 kPa |
| **(B)** Information from FMVSS 138 Table 1 below, Tire types are:<br><br>Inflation pressure<br><br>Minimum activation pressures from Table 1 | ( X ) P-metric-Standard load<br>( ) P-metric-Extra Load<br>Load Range ( ) C, ( ) D, or ( ) E<br><br>( X ) Maximum or ( ) Rated<br>300 kPa (44 psi)<br><br>140 kPa (20 psi) | ( X ) P-metric-Standard load<br>( ) P-metric-Extra Load<br>Load Range ( ) C, ( ) D, or ( ) E<br><br>( X ) Maximum or ( ) Rated<br>300 kPa (44 psi)<br><br>140 kPa (20 psi) |
| **(C)** Telltale Warning Activation Pressure is the higher of Part (A) or (B) | 180.0 kPa (26.1 psi) | 180.0 kPa (26.1 psi) |
| **(D)** Pressure at which to deflate tire(s) = (C) – 7 kPa | 173.0 kPa (25.1 psi) | 173.0 kPa (25.1 psi) |

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

| **Tire Type** | **Maximum or Rated Inflation Pressure** | | **Minimum Activation Pressure** | |
|---|---|---|---|---|
| | **(kPa)** | **(psi)** | **(kPa)** | **(psi)** |
| 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: David K. Banks DATE: August 29, 2006

APPROVED BY: Kenneth H. Yates

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

TEST DATE: August 29, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

**TPMS Low Tire Pressure Warning Telltale**

TPMS Low Tire Pressure Warning Telltale Location: Upper left instrument cluster

Telltale is mounted inside the occupant compartment in front of and in clear view of the driver?

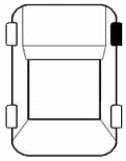
( X )YES ( )NO (fail)

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

Identify Telltale Symbol Used (check box above figure).

[X]

[ ]



[ ]

OTHER (fail)
(describe below)

Note any words or additional symbols used.

Reconfigurable display provides additional low inflation pressure warnings to driver. See Figure 5.12

**TPMS Malfunction Telltale**

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

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

**Check Telltale Lamp Functions:**

LOW TIRE PRESSURE TELLTALE AND MALFUNCTION INDICATION, IF COMBINED

Identify position of ignition locking system when telltale illuminates.

☐ OFF/LOCK ☐ Between OFF/LOCK and ON/RUN

☒ ON/RUN ☐ Between ON/RUN and START

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

Time telltale remains illuminated 1.28 seconds

Starter Interlocks:

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

**TEST RESULTS**

**Low Tire Pressure Warning Telltale (PASS/FAIL)** **PASS**

**REMARKS:** None

RECORDED BY: David K. Banks DATE: August 29, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 1 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

TEST DATE: August 29, 2006 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 9.51 am

Ambient Temperature: Start: 23.2°C (73.8°F)

Odometer Reading: Start: 155.6 km (96.7 mi)

Fuel Level: Start: Full

Weather Conditions: Overcast, light wind

Time vehicle has remained indoors with engine off and tires shielded from direct sunlight: (1 hour minimum): overnight (inside the SATF garage)

**VEHICLE WEIGHT:**
**Vehicle Ratings from Certification Label:**

GVWR: 2,631 kg (5,800 lbs)

GAWR (front): 1,259 kg (2,775 lbs)

GAWR (rear): 1,588 kg (3,500 lbs)

Tire pressures were adjusted to cold inflation pressure of 240 kPa before weighing of test load.

**Vehicle Capacity Weight:**

Vehicle Capacity Weight 507 kg (1,118 lbs)

**Measured Unloaded Vehicle Weight:**

| | | | |
|---|---|---|---|
| LF | 543 kg (1,197 lbs) | LR | 507 kg (1,118 lbs) |
| RF | 523 kg (1,153 lbs) | RR | 520 kg (1,146 lbs) |
| Front Axle | 1,066 kg (2,350 lbs) | Rear Axle | 1,027 kg (2,264 lbs) |

Total Vehicle 2,093 kg (4,614 lbs)

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

| | | | | | |
|---|---|---|---|---|---|
| LF | 587 kg (1,294 lbs) | | LR | 550 kg (1,213 lbs) | |
| RF | 569 kg (1,254 lbs) | | RR | 565 kg (1,246 lbs) | |
| Front Axle | 1,156 kg (2,548 lbs) | ( ≤ GAWR) | Rear Axle | 1,115 kg (2,459 lbs) | ( ≤ GAWR) |

Total Vehicle 2,271 kg (5,007 lbs) (not greater than GVWR)

Note: Scenarios A through F - this Total Vehicle Weight measures the vehicle loaded to LLVW, 180 kg (396 lbs) of passengers and equipment.

**DATA SHEET 3 (Sheet 2 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

TEST DATE: September 1, 2006 LAB: US DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 8:44 am

Ambient Temperature: Start: 25.9°C (78.6°F)

Odometer Reading: Start: 344.6 km (214.1 mi)

Fuel Level: Start: Full

Weather Conditions: Overcast, very light wind

Time vehicle has remained indoors with engine off and tires shielded from direct sunlight: (1 hour minimum): overnight (inside the SATF garage)

**VEHICLE WEIGHT:**
**Vehicle Ratings from Certification Label:**

GVWR: 2,631 kg (5,800 lbs)

GAWR (front): 1,259 kg (2,775 lbs)

GAWR (rear): 1,588 kg (3,500 lbs)

Tire pressures were adjusted to cold inflation pressure of 240 kPa before weighing of test load.

**Vehicle Capacity Weight:**

Vehicle Capacity Weight 507 kg (1,118 lbs)

**Measured Unloaded Vehicle Weight (from August 29):**

| | | | |
|---|---|---|---|
| LF | 543 kg (1,197 lbs) | LR | 507 kg (1,118 lbs) |
| RF | 523 kg (1,153 lbs) | RR | 520 kg (1,146 lbs) |
| Front Axle | 1,066 kg (2,350 lbs) | Rear Axle | 1,027 kg (2,264 lbs) |

Total Vehicle 2,093 kg (4,614 lbs)

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

| | | | |
|---|---|---|---|
| LF | 556 kg (1,226 lbs) | LR | 750 kg (1,653 lbs) |
| RF | 568 kg (1,252 lbs) | RR | 722 kg (1,592 lbs) |
| Front Axle | 1,124 kg (2,478 lbs) ( ≤ GAWR) | Rear Axle | 1,472 kg (3,245 lbs) ( ≤ GAWR) |

Total Vehicle 2,596 kg (5,723 lbs) (not greater than GVWR)

Note: Scenarios G through J were run with the vehicle loaded to GVWR including 503 kg (1,109 lbs) of passengers, equipment, and ballast.

**DATA SHEET 3 (Sheet 3 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO A - Left Front Tire Deflation at LLVW**

TEST DATE: August 30, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 7:26 am

Odometer Reading: Start: 155.6 km (96.7 mi)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After loading vehicle to lightly loaded vehicle weight or GVWR, positioning vehicle at selected test start point, and vehicle cool down period. Ambient Temperature: 19.0°C (66.2°F) Vehicle cool down period: overnight | | | | |
| Inflation Pressure | 240.1 kPa (34.8 psi) | 240.1 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 240.1 kPa (34.8 psi) |
| Tire Sidewall Temp | 21.4°C (70.5°F) | 23.0°C (73.4°F) | 23.4°C (74.1°F) | 22.5°C (72.5°F) |
| San Angelo Test Facility Shop Floor Temp | 24.0°C (75.2°F) | 25.6°C (78.1°F) | 25.4°C (77.7°F) | 23.0°C (73.4°F) |

Note: see Data Sheet 3 (Sheet 1 of 32) for Test Weight.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75+ 25 km/h excluding time periods when brake pedal is applied.

10:19 minutes (stopwatch time) 14.6 km (9.1 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75+ 25 km/h excluding time periods when brake pedal is applied.

10:17 minutes (stopwatch time) 14.8 km (9.2 mi) distance

**Max speed: 87.8 km/hr (54.6 mph)**

**Total Driving Time: 20:40 minutes (V-Box time)**

**DATA SHEET 3 (Sheet 4 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO A - Left 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; Inflation Pressure | 250.3 kPa (36.3 psi) | 251.9 kPa (36.5 psi) | 252.1 kPa (36.6 psi) | 249.4 kPa (36.2 psi) |
| Tire Sidewall Temp | 27.2°C (81.0°F) | 27.8°C (82.0°F) | 28.0°C (82.4°F) | 28.4°C (83.1°F) |
| San Angelo Test Facility Shop Floor Temp | 25.4°C (77.7°F) | 26.0°C (78.8°F) | 26.0°C (78.8°F) | 25.8°C (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: ( X )LF ( )LR ( )RR ( )RF Inflation Pressure | 173.0 kPa (25.1 psi) | N/A | N/A | N/A |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

Illumination during V-Box satellite acquisition - driving was not required.

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 5 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO A - Left Front Tire Deflation at LLVW**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 22.5 °C (72.5°F) Vehicle cool down period: 55 minutes | | | | |
| Inflation Pressure | 170.4 kPa (24.7 psi) | 242.9 kPa (35.2 psi) | 243.3 kPa (35.3 psi) | 244.6 kPa (35.5 psi) |
| Tire Sidewall Temp | 25.9°C (78.6°F) | 26.6°C (79.9°F) | 24.6°C (76.3°F) | 26.0°C (78.8°F) |
| San Angelo Test Facility Shop Floor Temp | 25.2°C (77.4°F) | 25.8°C (78.4°F) | 25.2°C (77.4°F) | 26.2°C (79.2°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.0 kPa (34.8 psi) | 242.9 kPa (35.2 psi) | 243.3 kPa (35.3 psi) | 244.6 kPa (35.5 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

1:06 minutes 0.3 km (0.2 mi) distance

**TEST RESULTS**

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

Left front tire was deflated at LLVW.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: August 30, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 6 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO B - Left Rear Tire Deflation at LLVW**

TEST DATE: August 30, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 9:16 am

Odometer Reading: Start: 186.7 km (116.0 mi)

Note: see Data Sheet 3 (Sheet 1 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:04 minutes (stopwatch time) 14.5 km (9.0 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:22 minutes (stopwatch time) 14.8 km (9.2 mi) distance

**Max speed: 85.8 km/hr (53.3 mph)**

**Total Driving Time: 20:27 minutes (V-Box time)**

**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; Inflation Pressure | 247.4 kPa (35.9 psi) | 256.3 kPa (37.2 psi) | 255.3 kPa (37.0 psi) | 253.7 kPa (36.8 psi) |
| Tire Sidewall Temp | 34.0°C (93.2°F) | 33.2°C (91.8°F) | 30.8°C (87.4°F) | 33.2°C (91.8°F) |
| San Angelo Test Facility Shop Floor Temp | 26.4°C (79.5°F) | 27.4°C (81.3°F) | 27.0°C (80.6°F) | 26.8°C (80.2°F) |

**DATA SHEET 3 (Sheet 7 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO B - Left Rear Tire Deflation at LLVW**

**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 ( )RR ( )RF<br>Inflation Pressure | N/A | 173.0 kPa<br>(25.1 psi) | N/A | N/A |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

46 seconds (stopwatch time) 0.3 km (0.2 mi) distance

Max speed: 45.3 km/hr (28.1 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 8 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO B - Left Rear Tire Deflation at LLVW**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 24.9°C (76.8°F) Vehicle cool down period: 57 minutes | | | | |
| Inflation Pressure | 240.2 kPa (34.8 psi) | 167.9 kPa (24.4 psi) | 246.2 kPa (35.7 psi) | 246.6 kPa (35.8 psi) |
| Tire Sidewall Temp | 27.2°C (81.0°F) | 27.4°C (81.3°F) | 27.4°C (81.3°F) | 26.6°C (79.9°F) |
| San Angelo Test Facility Shop Floor Temp | 26.2°C (79.2°F) | 26.8°C (80.2°F) | 26.8°C (80.2°F) | 26.0°C (78.8°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.2 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 246.2 kPa (35.7 psi) | 246.6 kPa (35.8 psi) |

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

Driving direction:

Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

1:13 minutes 0.6 km (0.4 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Left rear tire was deflated at LLVW.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: August 30, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 9 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO C – Right Front Tire Deflation at LLVW**

TEST DATE: August 30, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 12:13 pm

Odometer Reading: Start: 218.7 km (135.9 mi)

Note: see Data Sheet 3 (Sheet 1 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

9:57 minutes (stopwatch time) 14.6 km (9.1 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:33 minutes (stopwatch time) 14.8 km (9.2 mi) distance

**Max speed: 85.6 km/hr (53.2 mph)**

**Total Driving Time: 20:35 minutes (V-Box time)**

**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; Inflation Pressure | 254.6 kPa (36.9 psi) | 254.8 kPa (37.0 psi) | 256.0 kPa (37.1 psi) | 253.8 kPa (36.8 psi) |
| Tire Sidewall Temp | 40.1°C (104.2°F) | 39.2°C (102.6°F) | 36.6°C (97.9°F) | 37.6°C (99.7°F) |
| San Angelo Test Facility Shop Floor Temp | 28.0°C (82.4°F) | 29.0°C (84.2°F) | 28.6°C (83.5°F) | 27.4°C (81.3°F) |

**DATA SHEET 3 (Sheet 10 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO C – Right Front Tire Deflation at LLVW**

**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 ( )LR ( )RR ( X )RF<br>Inflation Pressure | N/A | N/A | N/A | 173.0 kPa<br>(25.1 psi) |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

Illumination upon vehicle start-up. Driving was not required.

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 11 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO C – Right Front Tire Deflation at LLVW**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 29.8°C (85.6°F) Vehicle cool down period: 65 minutes | | | | |
| Inflation Pressure | 244.0 kPa (35.4 psi) | 244.0 kPa (35.4 psi) | 243.3 kPa (35.3 psi) | 167.3 kPa (24.3 psi) |
| Tire Sidewall Temp | 30.8°C (87.4°F) | 32.4°C (90.3°F) | 31.4°C (88.5°F) | 30.6°C (87.1°F) |
| San Angelo Test Facility Shop Floor Temp | 28.0°C (82.4°F) | 28.4°C (83.1°F) | 29.2°C (84.6°F) | 28.4°C (83.1°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 244.0 kPa (35.4 psi) | 244.0 kPa (35.4 psi) | 243.0 kPa (35.2 psi) | 240.0 kPa (34.8 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

56 seconds 0.3 km (0.2 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Right front tire was deflated at LLVW.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: August 30, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 12 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO D – Right Rear Tire Deflation at LLVW**

TEST DATE: August 31, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 7:03 am

Odometer Reading: Start: 249.8 km (155.2 mi)

Note: see Data Sheet 3 (Sheet 1 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:05 minutes (stopwatch time) 14.5 km (9.0 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:25 minutes (stopwatch time) 15.0 km (9.3 mi) distance

**Max speed: 86.3 km/hr (53.6 mph)**

**Total Driving Time: 20:32 minutes (V-Box time)**

**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; Inflation Pressure | 250.1 kPa (36.3 psi) | 251.5 kPa (36.5 psi) | 250.8 kPa (36.4 psi) | 251.7 kPa (36.5 psi) |
| Tire Sidewall Temp | 30.9°C (87.6°F) | 29.0°C (84.2°F) | 29.8°C (85.6°F) | 30.4°C (86.7°F) |
| San Angelo Test Facility Shop Floor Temp | 27.2°C (81.0°F) | 28.8°C (83.8°F) | 28.0°C (82.4°F) | 27.9°C (82.2°F) |

**DATA SHEET 3 (Sheet 13 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO D - Right Rear Tire Deflation at LLVW**

**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 ( )LR ( X )RR ( )RF<br>Inflation Pressure | N/A | N/A | 173.0 kPa<br>(25.1 psi) | N/A |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

33 seconds (stopwatch time) 0.3 km (0.2 mi) distance

Max speed: 43.6 km/hr (27.1 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 14 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO D - Right Rear Tire Deflation at LLVW**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 24.0°C (75.2°F) Vehicle cool down period: 59 minutes | | | | |
| Inflation Pressure | 242.7 kPa (35.2 psi) | 242.7 kPa (35.2 psi) | 167.3 kPa (24.3 psi) | 244.0 kPa (35.4 psi) |
| Tire Sidewall Temp | 26.4°C (79.5°F) | 27.0°C (80.6°F) | 26.0°C (78.8°F) | 25.2°C (77.4°F) |
| San Angelo Test Facility Shop Floor Temp | 26.6°C (79.9°F) | 27.8°C (82.0°F) | 28.0°C (82.4°F) | 26.2°C (79.2°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 242.7 kPa (35.2 psi) | 242.7 kPa (35.2 psi) | 240.0 kPa (34.8 psi) | 244.0 kPa (35.4 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

11 seconds 0.05 km (0.03 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Right rear tire was deflated at LLVW.

**REMARKS**: V-Box lost power during detection phase due to accidental disconnect of power cord.

RECORDED BY: David K. Banks DATE: August 31, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 15 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO E – Left Front, Left Rear Tire Deflation at LLVW**

TEST DATE: August 31, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 8:54 am

Odometer Reading: Start: 280.7 km (174.4 mi)

Note: see Data Sheet 3 (Sheet 1 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

9:59 minutes (stopwatch time) 14.6 km (9.1 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:27 minutes (stopwatch time) 14.8 km (9.2 mi) distance

**Max speed: 86.7 km/hr (53.9 mph)**

**Total Driving Time: 20:39 minutes (V-Box time)**

**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; Inflation Pressure | 254.0 kPa (36.8 psi) | 255.6 kPa (37.1 psi) | 252.1 kPa (36.6 psi) | 255.1 kPa (37.0 psi) |
| Tire Sidewall Temp | 36.4°C (97.5°F) | 36.0°C (96.8°F) | 33.9°C (93.0°F) | 35.0°C (95.0°F) |
| San Angelo Test Facility Shop Floor Temp | 27.6°C (81.7°F) | 29.0°C (84.2°F) | 28.6°C (83.5°F) | 27.6°C (81.7°F) |

**DATA SHEET 3 (Sheet 16 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO E – Left Front, Left Rear Tire Deflation at LLVW**

**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 ( )RR ( )RF<br>Inflation Pressure | 173.1 kPa<br>(25.1 psi) | 173.1 kPa<br>(25.1 psi) | N/A | N/A |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

48 seconds (stopwatch time) 0.3 km (0.2 mi) distance

Max speed: 43.0 km/hr (26.7 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 17 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO E – Left Front, Left Rear Tire Deflation at LLVW**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 27.1°C (80.8°F) Vehicle cool down period: 74 minutes | | | | |
| Inflation Pressure | 167.3 kPa (24.3 psi) | 168.2 kPa (24.4 psi) | 241.4 kPa (35.0 psi) | 246.3 kPa (35.7 psi) |
| Tire Sidewall Temp | 28.4°C (83.1°F) | 29.4°C (84.9°F) | 29.0°C (84.2°F) | 28.4°C (83.1°F) |
| San Angelo Test Facility Shop Floor Temp | 28.4°C (83.1°F) | 29.4°C (84.9°F) | 28.8°C (83.8°F) | 27.9°C (82.2°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.0 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 241.4 Pa (35.0 psi) | 246.3 kPa (35.7 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

42 seconds 0.3 km (0.2 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Left front and left rear tires were deflated at LLVW.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: August 31, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 18 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO F – Left Front, Left Rear, Right Rear, Right Front Tire Deflation at LLVW**

TEST DATE: August 31, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 12:51 pm

Odometer Reading: Start: 312.5 km (194.2 mi)

Note: see Data Sheet 3 (Sheet 1 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:04 minutes (stopwatch time) 14.6 km (9.1 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:26 minutes (stopwatch time) 15.0 km (9.3 mi) distance

**Max speed: 88.4km/hr (54.9 mph)**

**Total Driving Time: 20:33 minutes (V-Box time)**

**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; Inflation Pressure | 257.0 kPa (37.3 psi) | 257.1 kPa (37.3 psi) | 260.1 kPa (37.7 psi) | 264.5 kPa (38.4 psi) |
| Tire Sidewall Temp | 41.0°C (105.8°F) | 40.7°C (105.3°F) | 41.0°C (105.8°F) | 41.2°C (106.2°F) |
| San Angelo Test Facility Shop Floor Temp | 29.8°C (85.6°F) | 30.4°C (86.7°F) | 30.4°C (86.7°F) | 29.0°C (84.2°F) |

**DATA SHEET 3 (Sheet 19 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO F – Left Front, Left Rear, Right Rear, Right Front Tire Deflation at LLVW**

**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 | 173.0 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) | 172.8 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

Illumination just after V-Box satellite acquisition - driving was not required.

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 20 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO F – Left Front, Left Rear, Right Rear, Right Front Tire Deflation at LLVW**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 32.2°C (90.0°F) Vehicle cool down period: 60 minutes | | | | |
| Inflation Pressure | 240.2 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 240.1 kPa (34.8 psi) | 240.2 kPa (34.8 psi) |
| Tire Sidewall Temp | 32.2°C (90.0°F) | 33.6°C (92.5°F) | 34.4°C (93.9°F) | 32.2°C (90.0°F) |
| San Angelo Test Facility Shop Floor Temp | 30.2°C (86.4°F) | 30.5°C (86.9°F) | 30.2°C (86.4°F) | 31.0°C (87.8°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.2 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 240.1 kPa (34.8 psi) | 240.2 kPa (34.8 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

1:15 minutes 0.6 km (0.4 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: David K. Banks DATE: August 31, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 21 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO G – Left Front Tire Deflation at GVWR**

TEST DATE: September 1, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 10:00 am

Odometer Reading: Start: 344.6 km (214.1 mi)

Note: see Data Sheet 3 (Sheet 2 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:10 minutes (stopwatch time) 16.1 km (10.0 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:32 minutes (stopwatch time) 15.8 km (9.8 mi) distance

**Max speed: 84.0 km/hr (52.2 mph)**

**Total Driving Time: 20:46 minutes (V-Box time)**

**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; Inflation Pressure | 254.1 kPa (36.9 psi) | 259.3 kPa (37.6 psi) | 258.0 kPa (37.4 psi) | 252.5 kPa (36.6 psi) |
| Tire Sidewall Temp | 37.4°C (99.3°F) | 38.6°C (101.5°F) | 37.2°C (99.0°F) | 36.2°C (97.2°F) |
| San Angelo Test Facility Shop Floor Temp | 29.9°C (85.8°F) | 31.4°C (88.5°F) | 31.8°C (89.2°F) | 29.6°C (85.3°F) |

**DATA SHEET 3 (Sheet 22 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO G – Left Front Tire Deflation at GVWR**

**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 | 173.0 kPa<br>(25.1 psi) | N/A | N/A | N/A |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

53 seconds (stopwatch time) 0.5 km (0.3 mi) distance

Max speed: 44.8 km/hr (27.8 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 23 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO G – Left Front Tire Deflation at GVWR**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 28.6°C (83.5°F) Vehicle cool down period: 64 minutes | | | | |
| Inflation Pressure | 166.7 kPa (24.2 psi) | 246.7 kPa (35.8 psi) | 245.3 kPa (35.6 psi) | 242.8 kPa (35.2 psi) |
| Tire Sidewall Temp | 31.4°C (88.5°F) | 33.0°C (91.4°F) | 31.8°C (89.2°F) | 30.2°C (86.4°F) |
| San Angelo Test Facility Shop Floor Temp | 29.4°C (84.9°F) | 31.4°C (88.5°F) | 31.2°C (88.2°F) | 29.0°C (84.2°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.0 kPa (34.8 psi) | 246.5 kPa (35.8 psi) | 245.3 Pa (35.6 psi) | 242.8 kPa (35.2 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

55 seconds 0.3 km (0.2 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Left front tire was deflated at GVWR.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: September 1, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 24 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO H – Right Rear Tire Deflation at GVWR**

TEST DATE: September 1, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 12:05 pm

Odometer Reading: Start: 379.3 km (235.7 mi)

**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: Inflation Pressure | 240.0 kPa (34.8 psi) | 240.1 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 240.0 kPa (34.8 psi) |
| Tire Sidewall Temp | 27.2°C (81.0°F) | 27.0°C (80.6°F) | 27.0°C (80.6°F) | 27.4°C (81.3°F) |
| San Angelo Test Facility Shop Floor Temp | 27.8°C (82.0°F) | 29.2°C (84.6°F) | 29.2°C (84.6°F) | 28.2°C (82.8°F) |
| Adjusted pre-test inflation pressure to recommended cold pressure | 240.0 kPa (34.8 psi) | 240.1 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 240.0 kPa (34.8 psi) |

Note: see Data Sheet 3 (Sheet 2 of 32) for Test Weight.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:18 minutes (stopwatch time) 14.5 km (9.0 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:24 minutes (stopwatch time) 15.0 km (9.3 mi) distance

**Max speed: 88.5 km/hr (55.0 mph)**

**Total Driving Time: 20:46 minutes (V-Box time)**

**DATA SHEET 3 (Sheet 25 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO H – Right Rear Tire Deflation at GVWR**

**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; Inflation Pressure | 254.3 kPa (36.9 psi) | 264.3 kPa (38.3 psi) | 262.7 kPa (38.1 psi) | 257.6 kPa (37.4 psi) |
| Tire Sidewall Temp | 42.6°C (108.7°F) | 42.6°C (108.7°F) | 40.9°C (105.6°F) | 40.6°C (105.1°F) |
| San Angelo Test Facility Shop Floor Temp | 30.6°C (87.1°F) | 32.6°C (90.7°F) | 31.8°C (89.2°F) | 29.8°C (85.6°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: ( )LF ( )LR ( X )RR ( )RF Inflation Pressure | N/A | N/A | 172.8 kPa (25.1 psi) | N/A |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

1:11 minutes (stopwatch time) 0.3 km (0.2 mi) distance

Max speed: 41.1 km/hr (25.5 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 26 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO H – Right Rear Tire Deflation at GVWR**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 32.8°C (91.0°F) Vehicle cool down period: 93 minutes | | | | |
| Inflation Pressure | 243.0 kPa (35.2 psi) | 246.7 kPa (35.8 psi) | 163.6 kPa (23.7 psi) | 246.1 kPa (35.7 psi) |
| Tire Sidewall Temp | 32.6°C (90.7°F) | 35.4°C (95.7°F) | 33.4°C (92.1°F) | 32.4°C (90.3°F) |
| San Angelo Test Facility Shop Floor Temp | 30.4°C (86.7°F) | 32.6°C (90.7°F) | 32.4°C (90.3°F) | 30.4°C (86.7°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 243.0 kPa (35.2 psi) | 246.7 kPa (35.8 psi) | 240.1 Pa (34.8 psi) | 246.1 kPa (35.7 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

46 seconds 0.5 km (0.3 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Right rear tire was deflated at GVWR.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: September 1, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 27 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO I – Left Front, Right Front Tire Deflation at GVWR**

TEST DATE: September 5, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 9:03 am

Odometer Reading: Start: 414.6 km (257.6 mi)

Note: see Data Sheet 3 (Sheet 2 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:04 minutes (stopwatch time) 14.8 km (9.2 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:28 minutes (stopwatch time) 15.6 km (9.7 mi) distance

**Max speed: 87.6 km/hr (54.4 mph)**

**Total Driving Time: 20:45 minutes (V-Box time)**

**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; Inflation Pressure | 254.4 kPa (36.9 psi) | 258.8 kPa (37.5 psi) | 259.5 kPa (37.6 psi) | 254.7 kPa (36.9 psi) |
| Tire Sidewall Temp | 30.4°C (86.7°F) | 30.6°C (87.1°F) | 30.2°C (86.4°F) | 29.2°C (84.6°F) |
| San Angelo Test Facility Shop Floor Temp | 24.4°C (75.9°F) | 24.6°C (76.3°F) | 24.6°C (76.3°F) | 24.4°C (75.9°F) |

**DATA SHEET 3 (Sheet 28 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO I – Left Front, Right Front Tire Deflation at GVWR**

**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 ( X )RF<br>Inflation Pressure | 173.1 kPa<br>(25.1 psi) | N/A | N/A | 173.0 kPa<br>(25.1 psi) |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

1:06 minutes (stopwatch time) 0.6 km (0.4 mi) distance

Max speed: 41.4 km/hr (25.7 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 29 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO I – Left Front, Right Front Tire Deflation at GVWR**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 23.3°C (73.9°F) Vehicle cool down period: 61 minutes | | | | |
| Inflation Pressure | 168.2 kPa (24.4 psi) | 244.0 kPa (35.4 psi) | 245.0 kPa (35.5 psi) | 168.9 kPa (24.5 psi) |
| Tire Sidewall Temp | 25.6°C (78.1°F) | 27.2°C (81.0°F) | 25.6°C (78.1°F) | 25.2°C (77.4°F) |
| San Angelo Test Facility Shop Floor Temp | 24.8°C (76.6°F) | 26.0°C (78.8°F) | 25.6°C (78.1°F) | 25.0°C (77.0°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.1 kPa (34.8 psi) | 244.0 kPa (35.4 psi) | 245.0 Pa (35.5 psi) | 240.0 kPa (34.8 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

1:14 minutes 1.0 km (0.6 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Left front and right front tires were deflated at GVWR.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: September 5, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 30 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO J – Left Front, Left Rear, Right Rear, Right Front Tire Deflation at GVWR**

TEST DATE: September 5, 2006 LAB: U. S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: C65200

Time: Start: 10:55 am

Odometer Reading: Start: 447.4 km (278.0 mi)

Note: see Data Sheet 3 (Sheet 2 of 32) for Test Weight. Tire pressures were re-adjusted to cold inflation pressure of 240 kPa before calibration phase.

**SYSTEM CALIBRATION/LEARNING PHASE:**
(V-Box time – see Section 6 test plots)

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time (10 – 15 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:07 minutes (stopwatch time) 14.6 km (9.1 mi) distance

Driving in opposite direction:

Starting point: Brodnax Road / Highway 87 Direction: north
Cumulative vehicle driving time (5 – 10 minutes) at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal is applied.

10:28 minutes (stopwatch time) 14.8 km (9.2 mi) distance

**Max speed: 89.0 km/hr (55.3 mph)**

**Total Driving Time: 20:38 minutes (V-Box time)**

**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; Inflation Pressure | 248.0 kPa (36.0 psi) | 259.1kPa (37.6 psi) | 260.0 kPa (37.7 psi) | 246.6 kPa (35.8 psi) |
| Tire Sidewall Temp | 32.4°C (90.3°F) | 31.8°C (89.2°F) | 31.0°C (87.8°F) | 29.9°C (85.8°F) |
| San Angelo Test Facility Shop Floor Temp | 25.4°C (77.7°F) | 26.6°C (79.9°F) | 26.6°C (79.9°F) | 25.4°C (77.7°F) |

**DATA SHEET 3 (Sheet 31 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO J – Left Front, Left Rear, Right Rear, Right Front Tire Deflation at GVWR**

**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 | 173.0 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) | 173.2 kPa<br>(25.1 psi) | 173.0 kPa<br>(25.1 psi) |

**TELLTALE ILLUMINATION:**

Starting point: San Angelo Test Facility shop Direction: south

**Did the telltale illuminate?** ( X )YES ( )NO

Time and Distance to Illuminate:

31 seconds (stopwatch time) 0.3 km (0.2 mi) distance

Max speed: 42.8 km/hr (26.6 mph)

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

Does the vehicle have a telltale that identifies which tire(s) is (are) under-inflated?
( )YES ( X )NO

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)

**DATA SHEET 3 (Sheet 32 of 32)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO J – Left Front, Left Rear, Right Rear, Right Front Tire Deflation at GVWR**

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)

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

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After vehicle cool down period: Ambient Temperature: 25.1°C (77.2°F) Vehicle cool down period: 75 minutes | | | | |
| Inflation Pressure | 168.6 kPa (24.5 psi) | 167.8 kPa (24.3 psi) | 166.9 kPa (24.2 psi) | 169.4 kPa (24.6 psi) |
| Tire Sidewall Temp | 26.6°C (79.9°F) | 29.2°C (84.6°F) | 28.0°C (82.4°F) | 26.6°C (79.9°F) |
| San Angelo Test Facility Shop Floor Temp | 26.4°C (79.5°F) | 27.4°C (81.3°F) | 26.6°C (79.9°F) | 25.8°C (78.4°F) |

After the cool down period of approximately one hour, restart 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)

**TELLTALE EXTINGUISHMENT:**

**RE-ADJUSTED TIRE INFLATION PRESSURES:**

| Execution Procedure | LF Tire | LR Tire | RR Tire | RF Tire |
|---|---|---|---|---|
| After cool down period; Re-adjusted Inflation Pressure: | 240.1 kPa (34.8 psi) | 240.0 kPa (34.8 psi) | 240.0 Pa (34.8 psi) | 240.0 kPa (34.8 psi) |

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

Driving direction:
Starting point: SATF shop Direction: south

Time and Distance to Extinguish:

1:24 minutes 1.0 km (0.6 mi) distance

**TEST RESULTS**

**TPMS Performance Test Results (PASS/FAIL)** **PASS**
Left front, left rear, right rear, right front tires were deflated at GVWR.

**REMARKS**: None

RECORDED BY: David K. Banks DATE: September 5, 2006

APPROVED BY: Kenneth H. Yates

**DATA SHEET 4 (Sheet 1 of 2)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO K – Malfunction Detection Test at GVWR**

TEST DATE: September 5, 2006 LAB: SATF VEHICLE NHTSA NO: C75100

| | | | | |
|---|---|---|---|---|
| Time: | Start: | 1:20 pm | End: | 2:01 pm |
| Ambient Temperature: | Start: | 25.1°C (69.8°F) | End: | 26.0°C (78.8°F) |
| Odometer Reading | Start: | 480.2 km (298.4 mi) | End: | 526.4 km (327.1 mi) |
| Fuel Level | Start: | ¾ tank | End: | Just under ¾ tank |

Note: See Data Sheet 3 (Sheet 2 of 32) for Test Weight.

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

TPMS MALFUNCTION TELLTALE:
( )Dedicated stand-alone ( X )Combination low tire pressure warning/malfunction telltale

**METHOD OF MALFUNCTION SIMULATION:**

Describe method of malfunction simulation: Full size spare tire assembly without sensor was installed on left rear wheel position.

**MALFUNCTION TELLTALE ILLUMINATION**
**(after ignition locking system is activated to "On" ("Run") position):**

***Combination Low Tire Pressure Warning /Malfunction Telltale***

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: south
Cumulative vehicle driving time at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal was applied. Drive the vehicle for 15-17 minutes or until the telltale illuminates, whichever occurs first.

**Did the telltale illuminate? ( )YES ( X )NO**

20:00 minutes (stopwatch time) 23.0 km (14.3 mi) distance

Driving in opposite direction:

Starting point: Highway 277 Direction: north
Cumulative vehicle driving time at a vehicle speed of 75± 25 km/h excluding time periods when brake pedal was applied. Drive the vehicle for 5-10 minutes or until the telltale illuminates, whichever occurs first.

**Did the telltale illuminate? ( )YES ( X )NO**

19:01 minutes (stopwatch time) 23.2 km (14.4 mi) distance

**Max speed: 88.8 km/hr (55.2 mph)**

**Total Driving Time: 39:40 minutes (V-Box time)**

**DATA SHEET 4 (Sheet 2 of 2)**
**TPMS OPERATIONAL PERFORMANCE**

**SCENARIO K – Malfunction Detection Test at GVWR**

**COMBINATION MALFUNCTION TELLTALE ILLUMINATES (FLASHING AND ILLUMINATION SEQUENCE) WITHIN 20 MINUTES: ( )YES ( X )NO**

**N/A (Indicant test only)**

**TPMS MALFUNCTION PERFORMANCE TEST RESULTS (PASS/FAIL)**
Full size spare tire assembly with no sensor was installed on left rear wheel position at GVWR.

**REMARKS**: FMVSS 138 malfunction performance requirements do not become effective until September 1, 2007.

RECORDED BY: David K. Banks DATE: September 5, 2006

APPROVED BY: Kenneth H. Yates

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

TEST DATE: September 6, 2006 LAB: SATF VEHICLE NHTSA NO: C75100

**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

**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.

Statement is provided verbatim: ( )YES ( )NO ( X )N/A

*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.

Statement is provided verbatim: ( )YES ( )NO ( X )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.

Statement is provided verbatim: ( )YES ( )NO ( X )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."

Statement is provided verbatim: ( )YES ( )NO ( X )N/A

DATA INDICATES COMPLIANCE: PASS/FAIL PASS/FAIL: N/A

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

**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**: FMVSS 138 malfunction performance requirements do not become effective until September 1, 2007.

RECORDED BY: David K. Banks DATE: September 6, 2006

APPROVED BY: Kenneth H. Yates

## SECTION 4

## INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

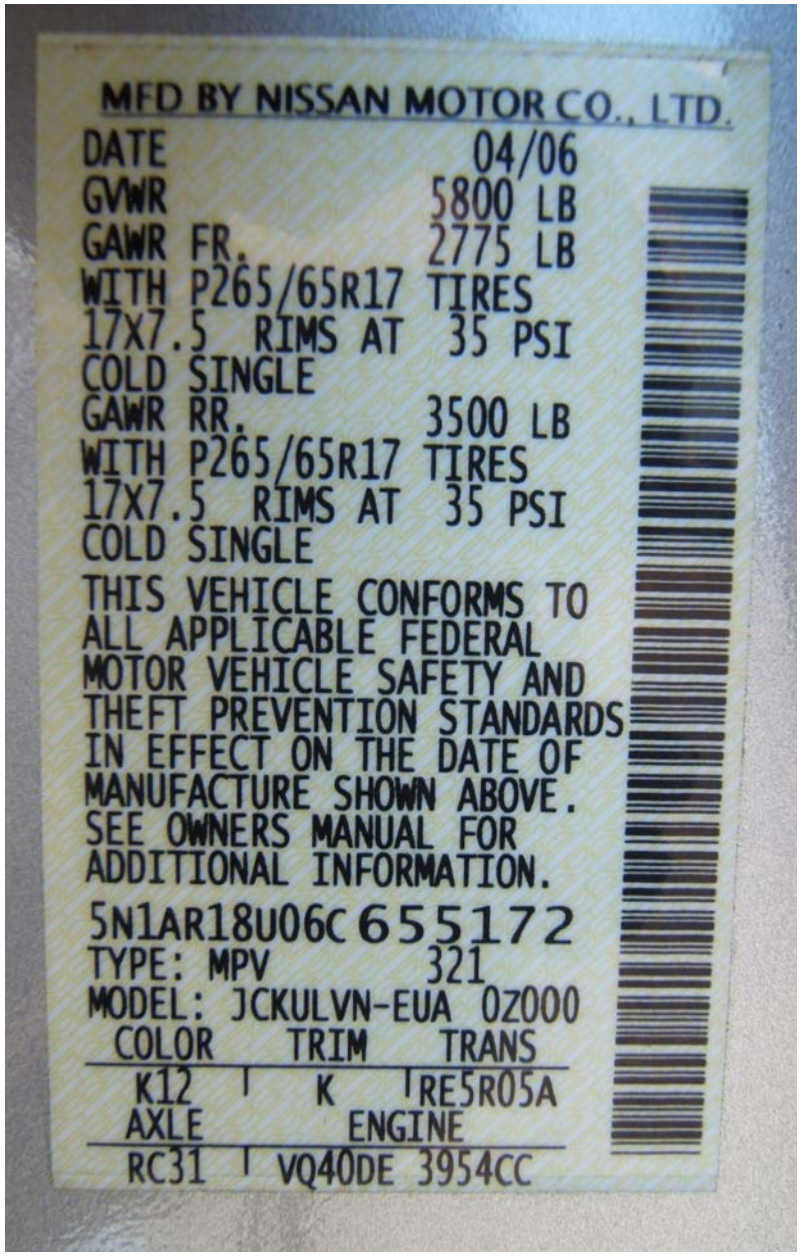
| EQUIPMENT | DESCRIPTION | MODEL/ SERIAL NO | CAL. DATE | NEXT CAL. DATE |
|---|---|---|---|---|
| STOPWATCH | WESTCLOX QUARTZ STOPWATCH | NONE | N/A | N/A |
| V-BOX RECORDING DEVICE | RACELOGIC V-BOX III | SERIAL #030209 | 2/23/2006 | 2/23/2007 |
| AMBIENT TEMPERATURE GAUGE | FLUKE 50D K/J THERMOMETER | SERIAL #80840101 | 7/26/2006 | 7/26/2007 |
| LASER TEMPERATURE GAUGE (TIRES AND GROUND) | RAYNGER ST20 PRO NON-CONTACT INFRARED THERMOMETER | SERIAL #2065640101-0014 | 8/10/2006 | 8/10/2007 |
| AIR PRESSURE GAUGE | ASHCROFT GENERAL PURPOSE DIGITAL GAUGE | MODEL #25C1005 PS02L100-B1 SERIAL #1003098 | 12/15/2005 | 12/15/2006 |
| FLOOR SCALES (VEHICLE) | INTERCOMP SW DELUXE SCALES | PART #100156 SERIAL #27032382 | 8/10/2006 | 8/10/2007 |
| ASHCROFT MASTER PRESSURE GAUGE | ASHCROFT (KILOPASCALS) | MODEL #1082 SERIAL #COO0618 STD. #40584 | 11/2/2005 | 11/2/2006 |
| PLATFORM SCALE (BALLAST) | HOWE RICHARDSON | MODEL #6401 SERIAL #0181-5509-26 | 8/10/2006 | 8/10/2007 |

SECTION 5

PHOTOGRAPHS


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.1
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE




2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.2
VEHICLE CERTIFICATION LABEL


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.3
VEHICLE PLACARD


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.4
TIRE SHOWING BRAND


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.5
TIRE SHOWING MODEL


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.6
TIRE SHOWING SIZE


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.7
TIRE SHOWING DOT SERIAL NUMBER


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

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


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.9
TIRE SHOWING SIDEWALL/TREAD CONSTRUCTION


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

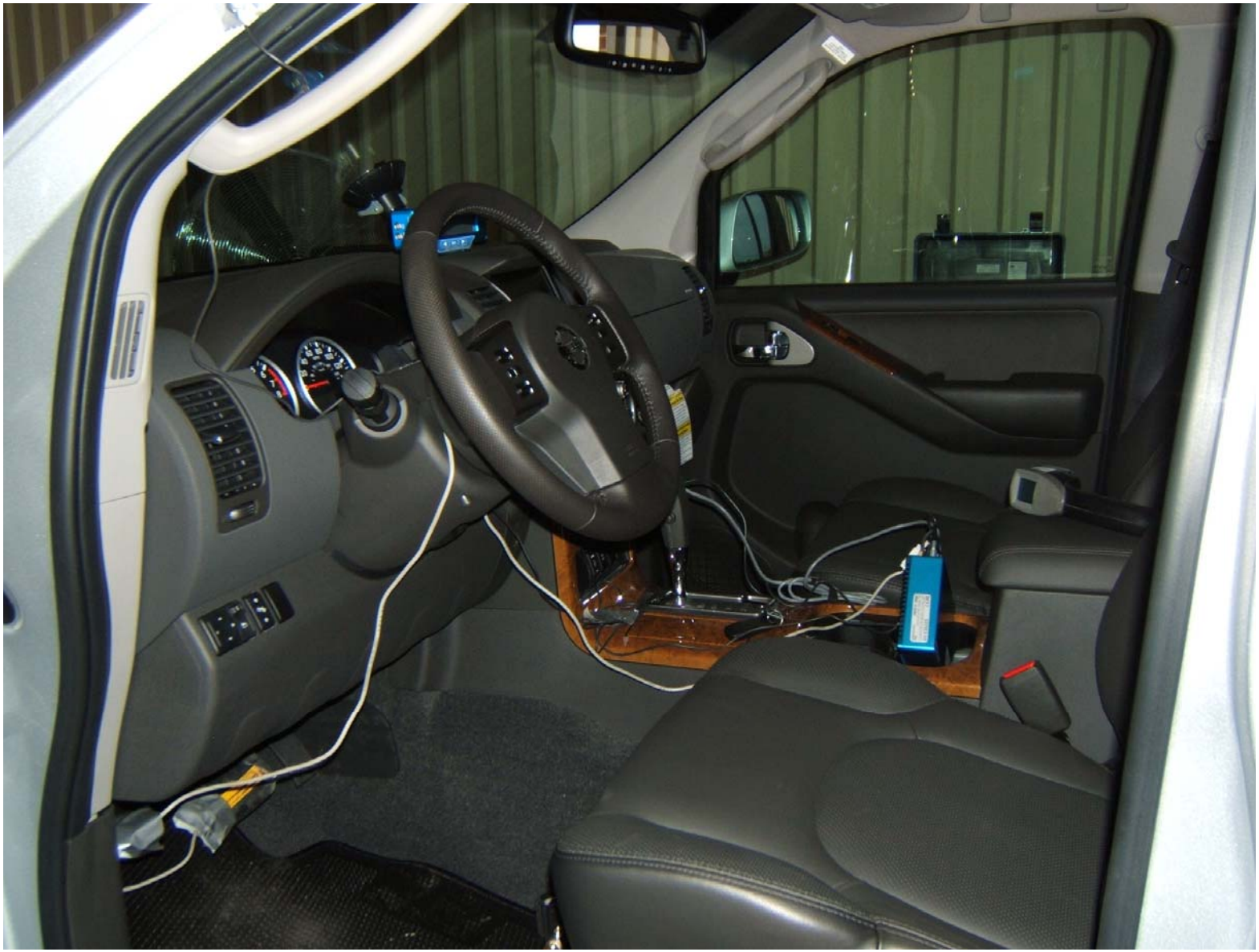
FIGURE 5.10
RIM SHOWING VALVE STEM


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.11
INSTRUMENT PANEL SHOWING COMBINATION LOW TIRE PRESSURE WARNING AND MALFUNCTION TELLTALE


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.12
TIRE PRESSURE INFORMATION FROM RECONFIGURABLE DISPLAY



2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO 138

FIGURE 5.13
TEST INSTRUMENTATION MOUNTED ON VEHICLE

2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.14
VEHICLE REAR SEAT BALLAST FOR GVWR LOAD

2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO. 138

FIGURE 5.15
VEHICLE CARGO AREA BALLAST FOR GVWR LOAD


2006 NISSAN PATHFINDER LE MPV
NHTSA NO. C65200
FMVSS NO 138

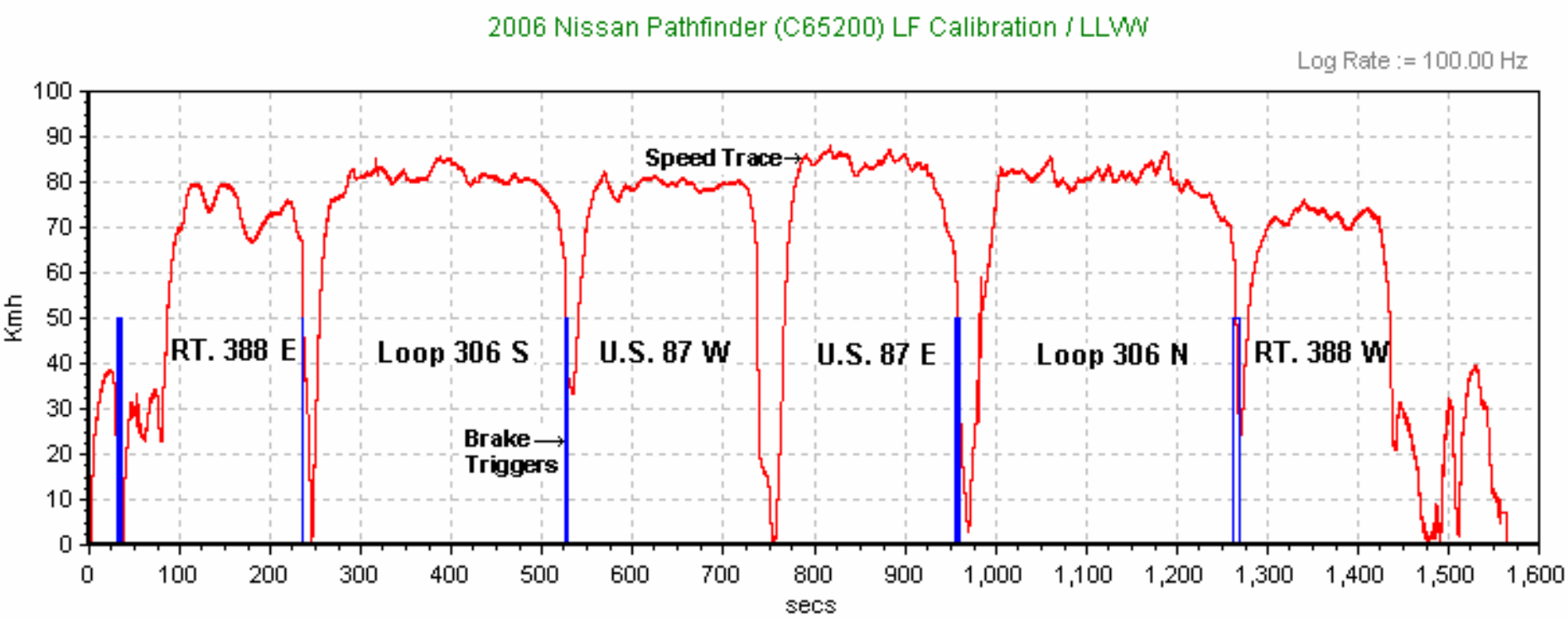
FIGURE 5.16
VEHICLE ON WEIGHT SCALES

SECTION 6

TEST PLOTS

| | |
|---|---|
| Scenario A: | Left Front Tire |
| Test Date: | 8/30/06 |
| Data File Time: | 26:04 minutes |
| Cumulative Driving Time: | 20:40 minutes |
| Start Point: | SATF shop |

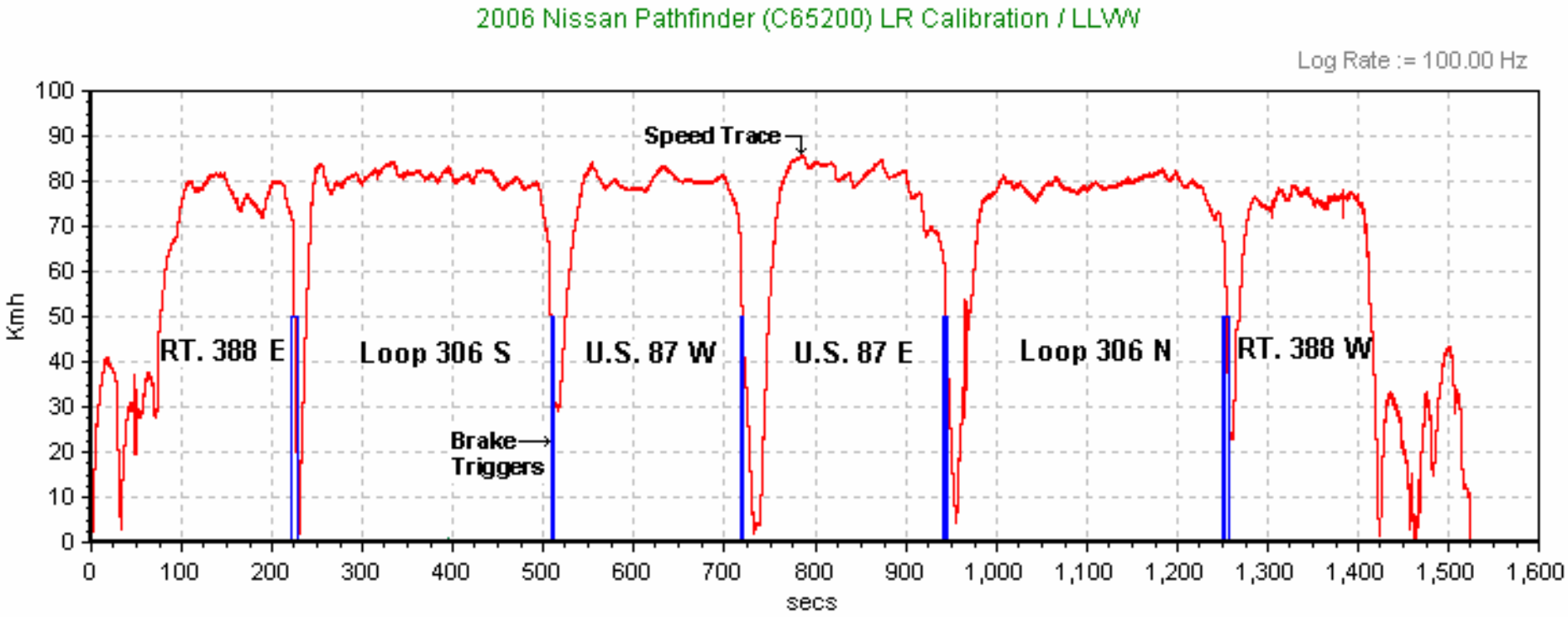
Calibration Phase




LF Detection Phase: Illumination during V-Box satellite acquisition - driving was not required.

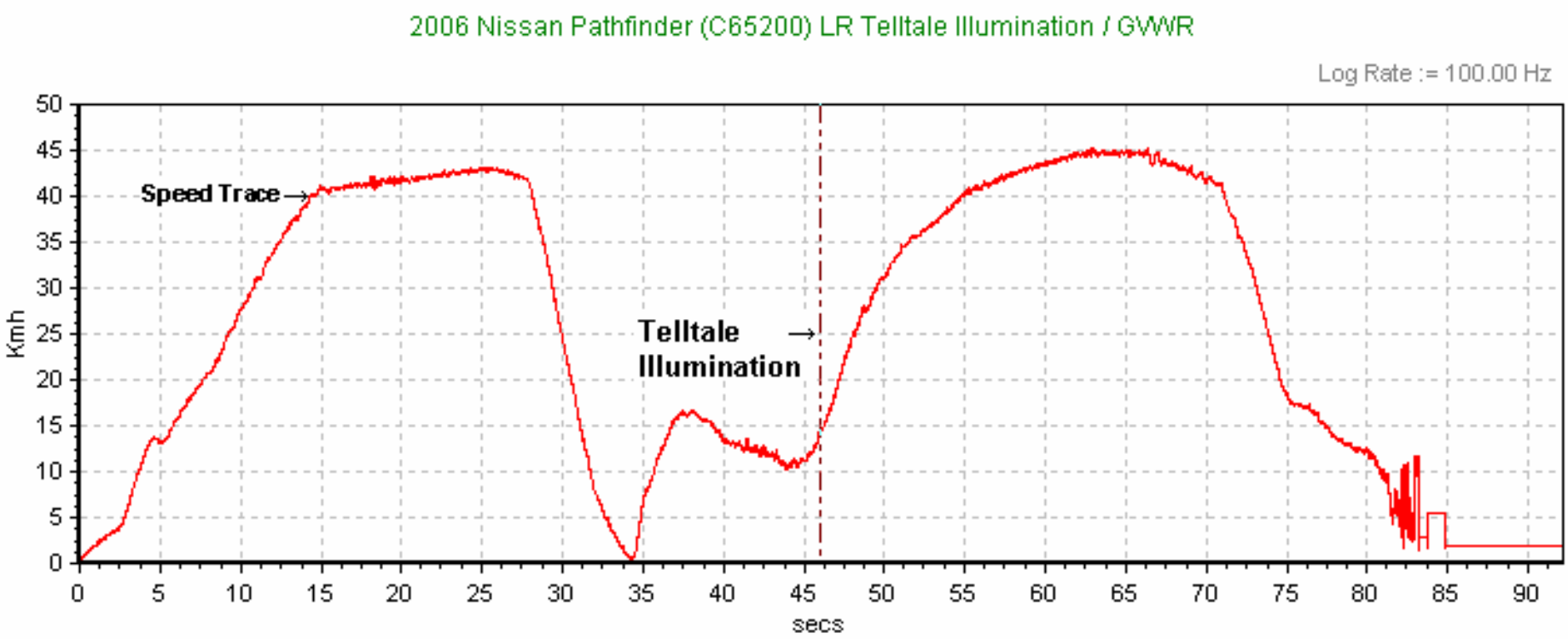
| | |
|---|---|
| Scenario B: | Left Rear Tire |
| Test Date: | 8/30/06 |
| Data File Time: | 25:26 minutes |
| Cumulative Driving Time: | 20:27 minutes |
| Start Point: | SATF shop |

Calibration Phase



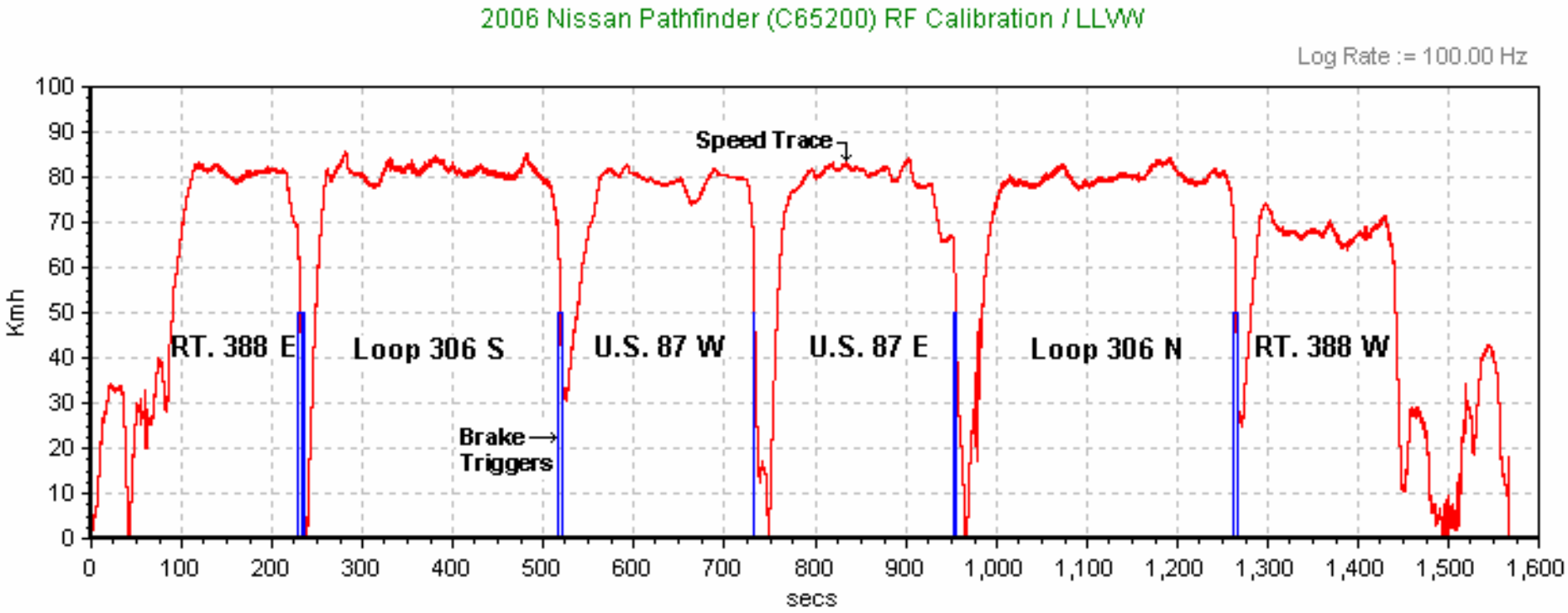
Scenario B: Left Rear Tire
Test Date: 8/30/06
Data File Time: 1:32 minutes
Illumination: 46 seconds
Start Point: SATF shop

Detection Phase



| | |
|---|---|
| Scenario C: | Right Front Tire |
| Test Date: | 8/30/06 |
| Data File Time: | 26:07 minutes |
| Cumulative Driving Time: | 20:35 minutes |
| Start Point: | SATF shop |

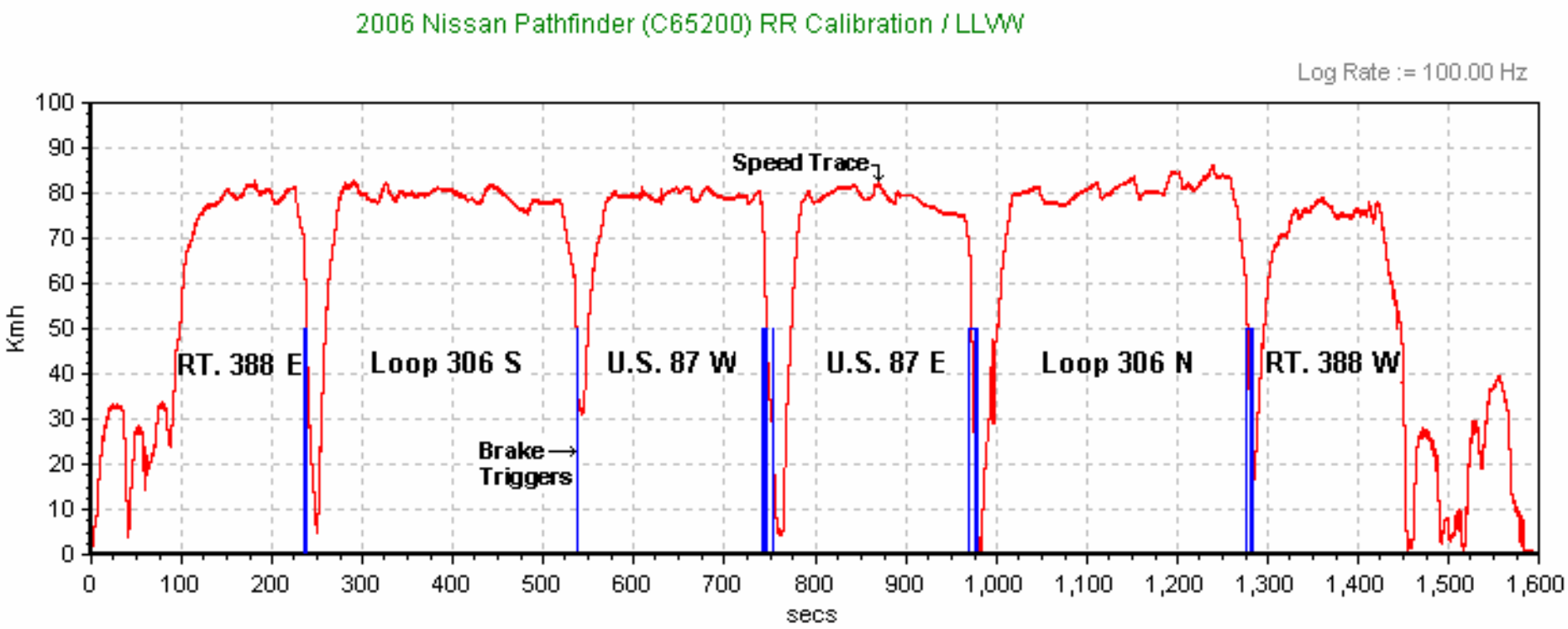
Calibration Phase




RF Detection Phase: Illumination upon vehicle start-up. Driving was not required.

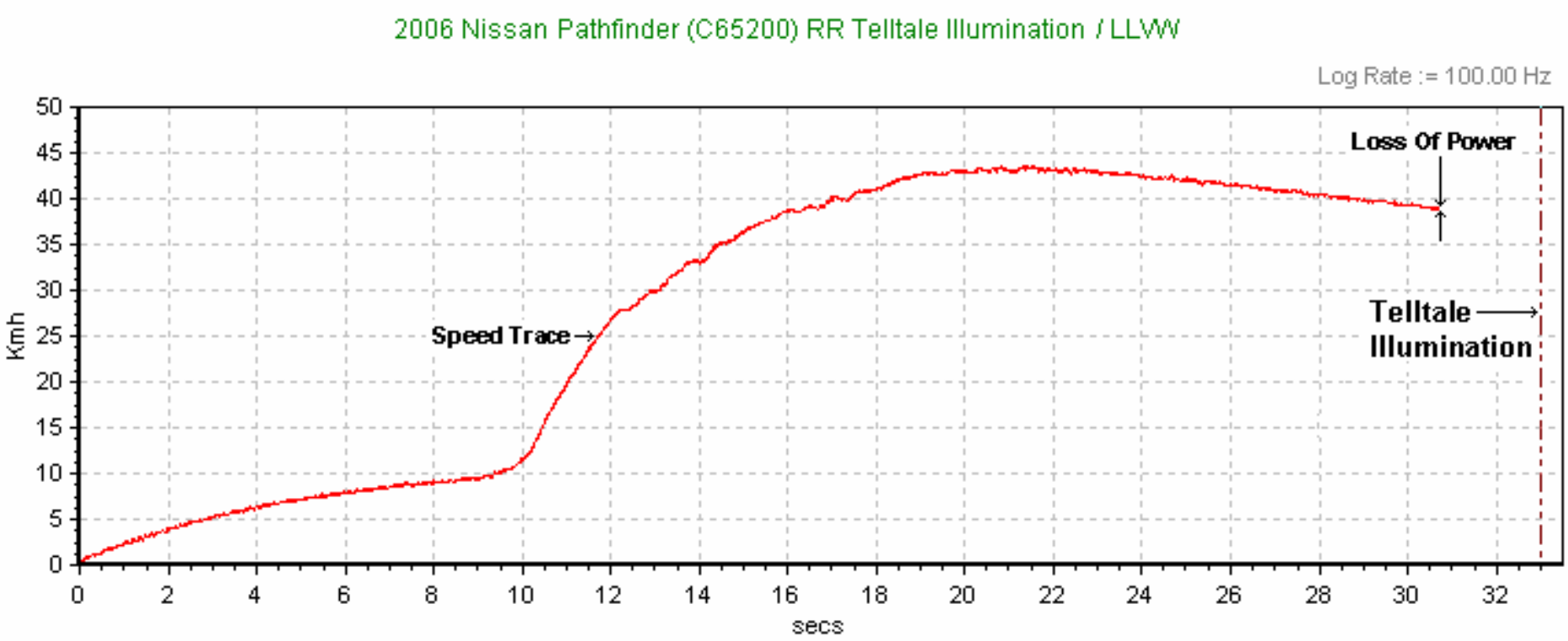
| | |
|---|---|
| Scenario D: | Right Rear Tire |
| Test Date: | 8/31/06 |
| Data File Time: | 26:33 minutes |
| Cumulative Driving Time: | 20:32 minutes |
| Start Point: | SATF shop |

Calibration Phase



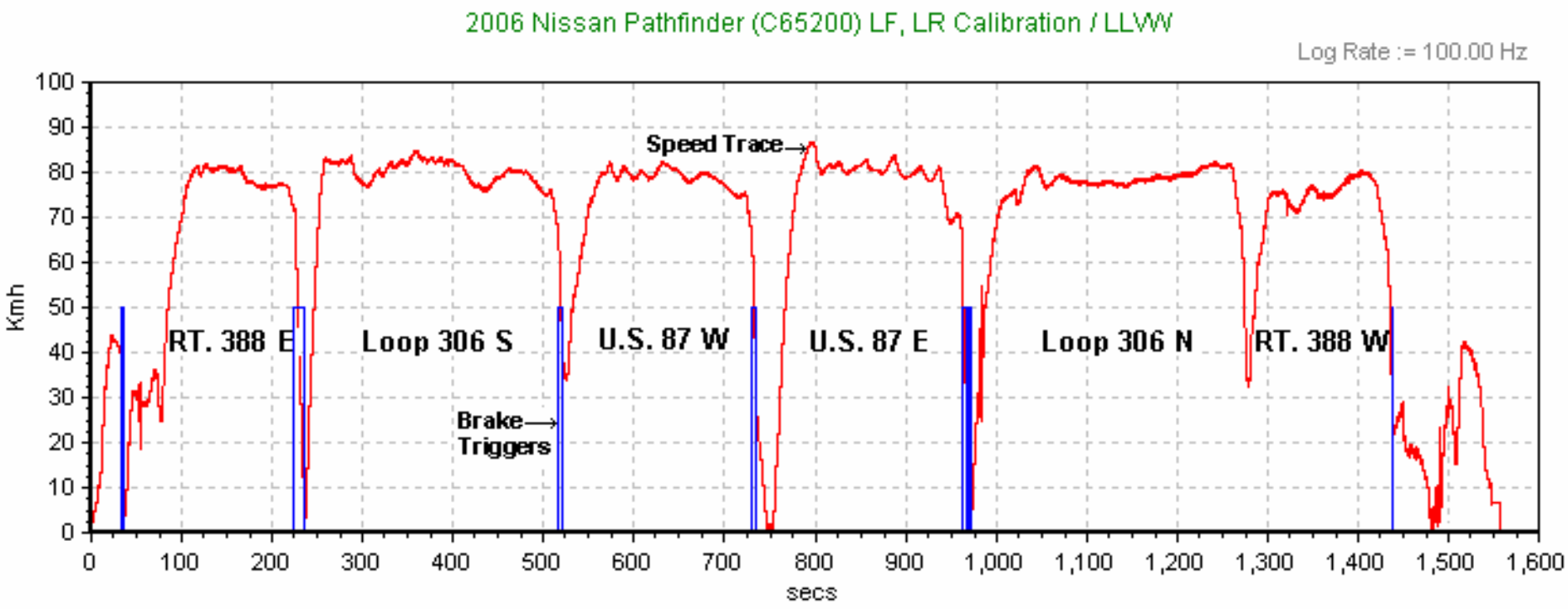
Scenario D: Right Rear Tire
Test Date: 8/31/06
Data File Time: Chart incomplete due to loss of V-Box power
Illumination: 33 seconds
Start Point: SATF shop

Detection Phase



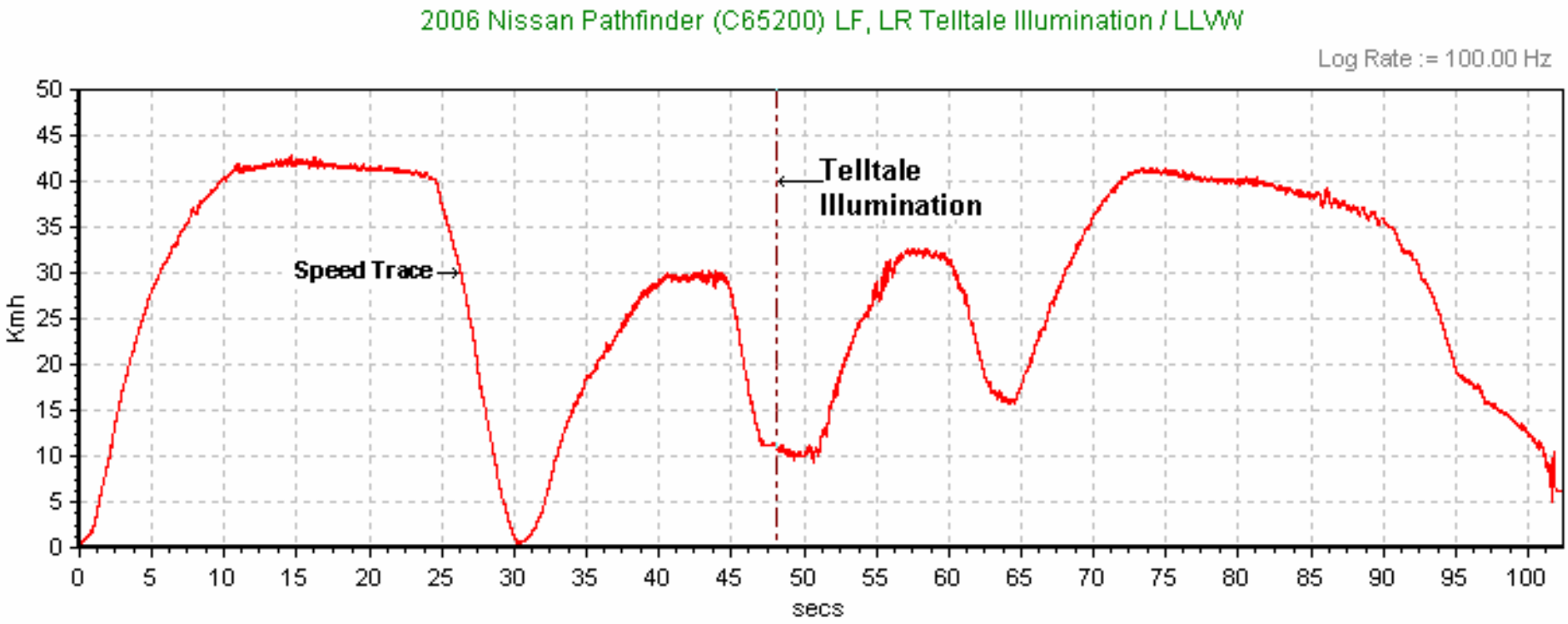
| | |
|---|---|
| Scenario E: | Left Front, Left Rear Tires |
| Test Date: | 8/31/06 |
| Data File Time: | 25:58 minutes |
| Cumulative Driving Time: | 20:39 minutes |
| Start Point: | SATF shop |

Calibration Phase



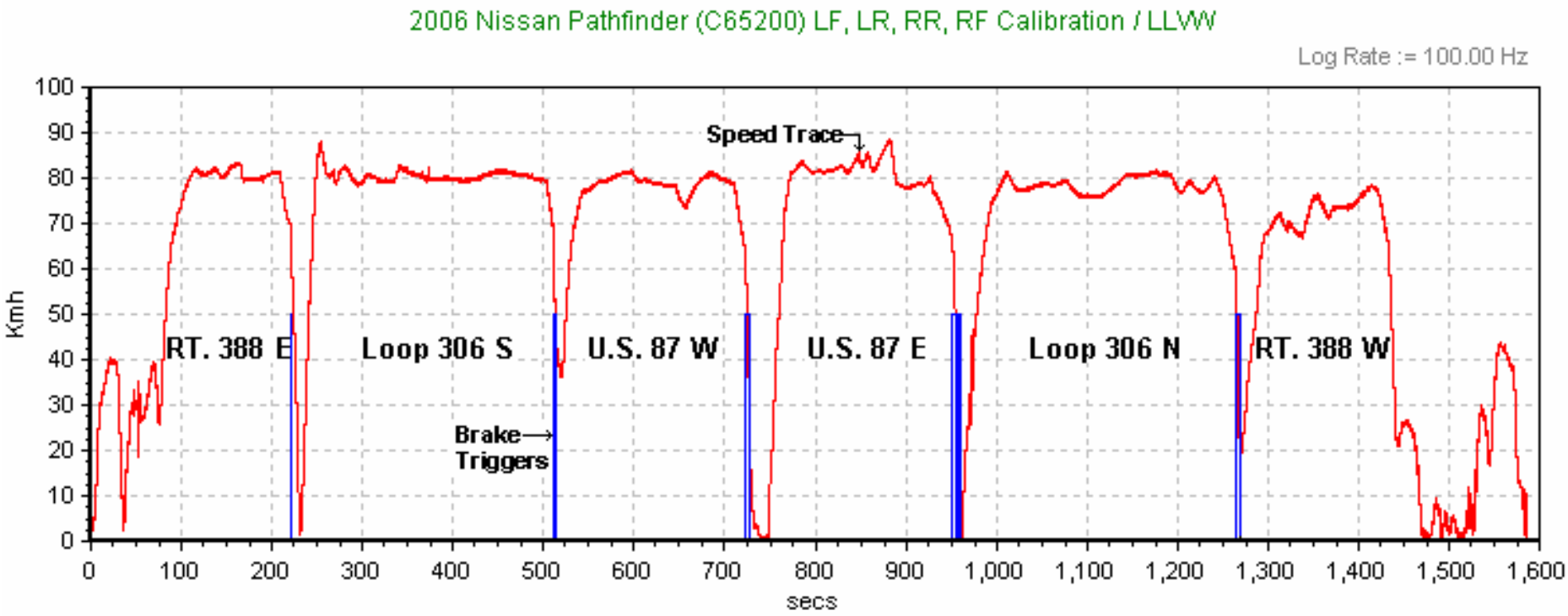
Scenario E: Left Front, Left Rear Tires
Test Date: 8/31/06
Data File Time: 1:42 minutes
Illumination: 48 seconds
Start Point: SATF shop

Detection Phase



| | |
|---|---|
| Scenario F: | Left Front, Left Rear, Right Rear, Right Front Tires |
| Test Date: | 8/31/06 |
| Data File Time: | 26:27 minutes |
| Cumulative Driving Time: | 20:33 minutes |
| Start Point: | SATF shop |

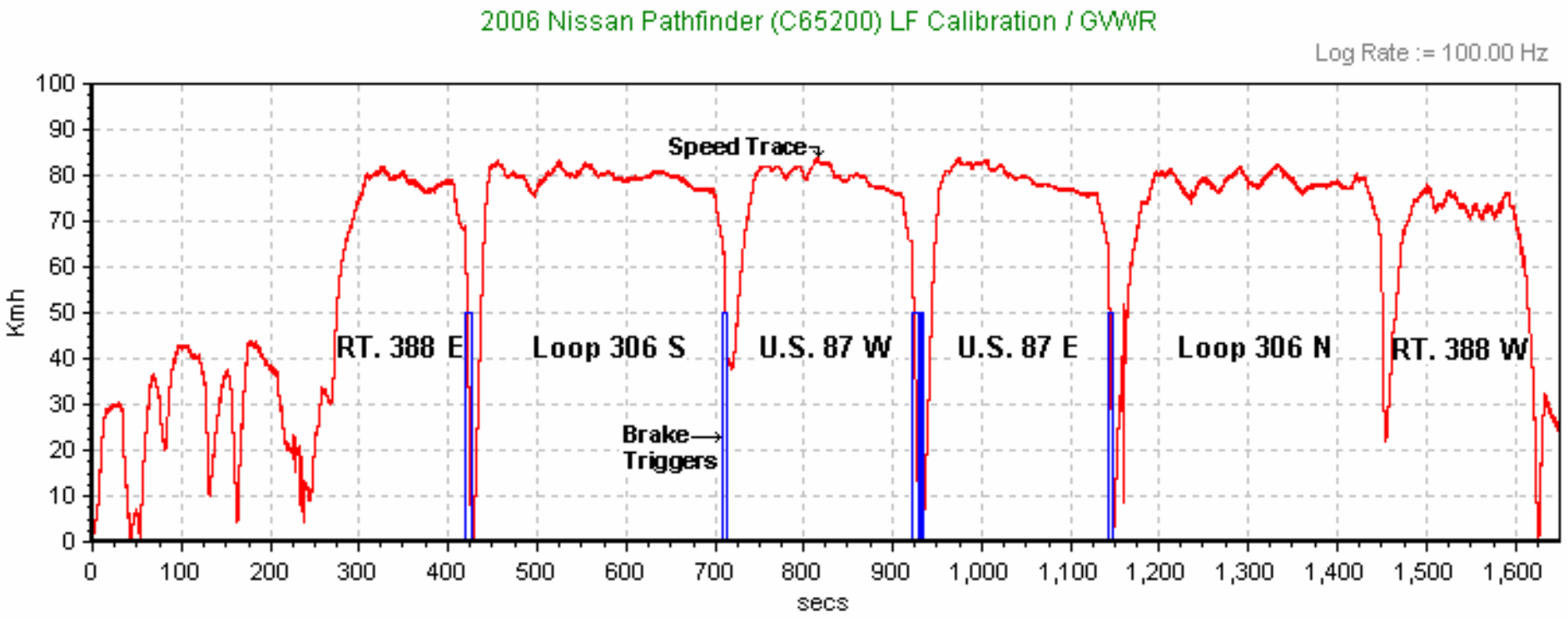
Calibration Phase




LF, LR, RR, RF Detection Phase: Illumination just after V-Box satellite acquisition - driving was not required.

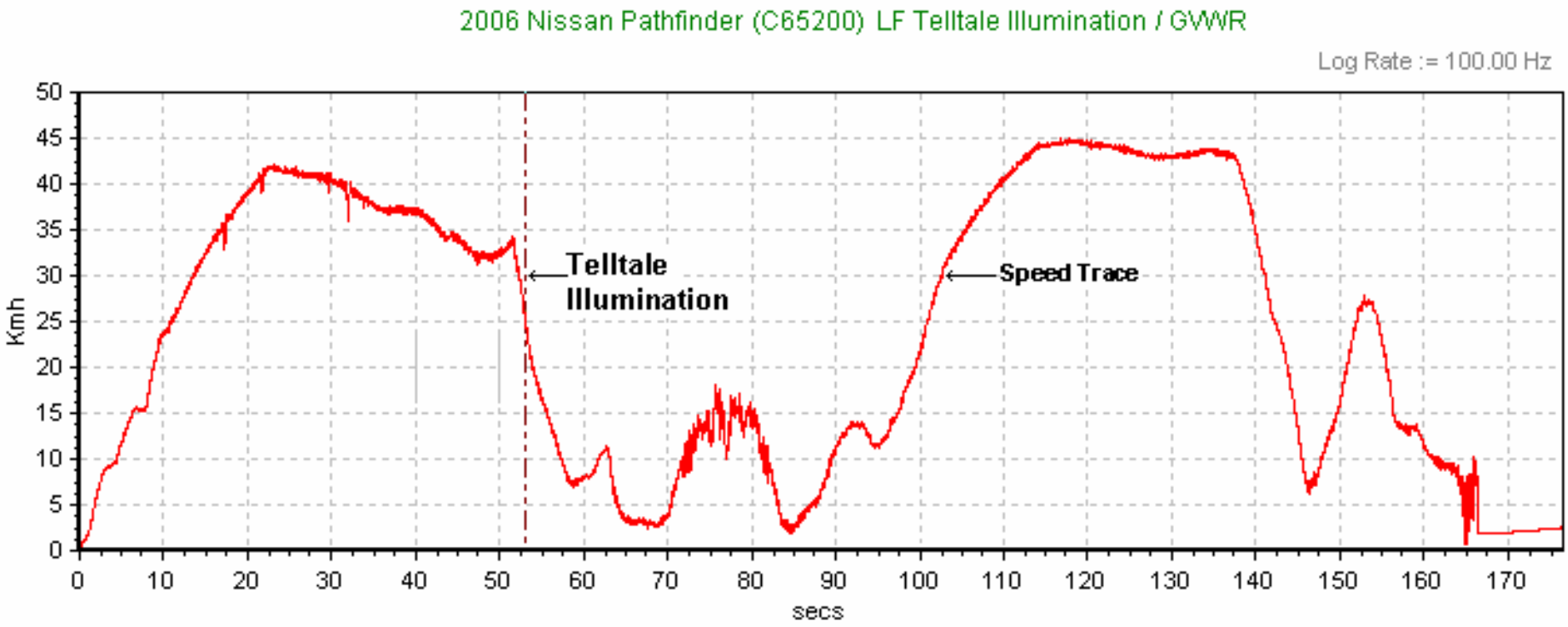
| | |
|---|---|
| Scenario G: | Left Front Tire |
| Test Date: | 9/1/06 |
| Data File Time: | 30:42 minutes |
| Cumulative Driving Time: | 20:46 minutes |
| Start Point: | SATF shop |

Calibration Phase



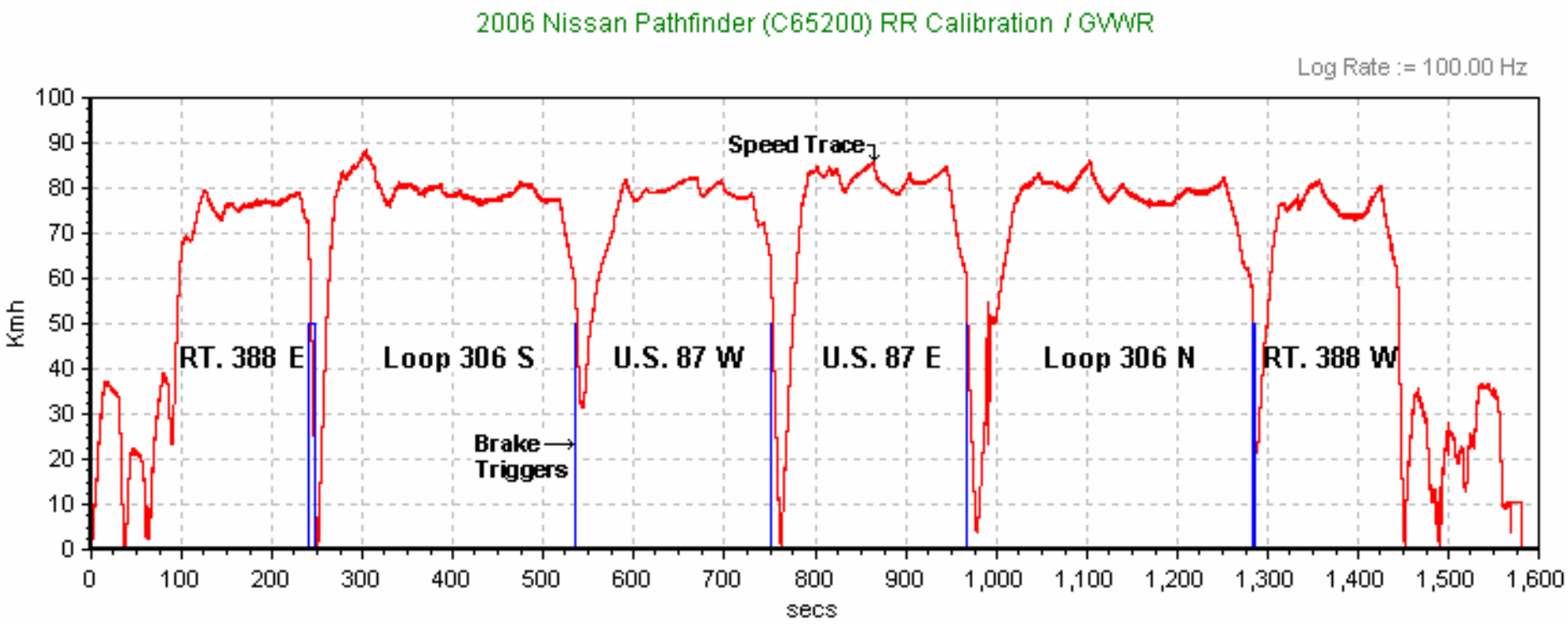
Scenario G: Left Front Tire
Test Date: 9/1/06
Data File Time: 2:57 minutes
Illumination: 53 seconds
Start Point: SATF shop

Detection Phase



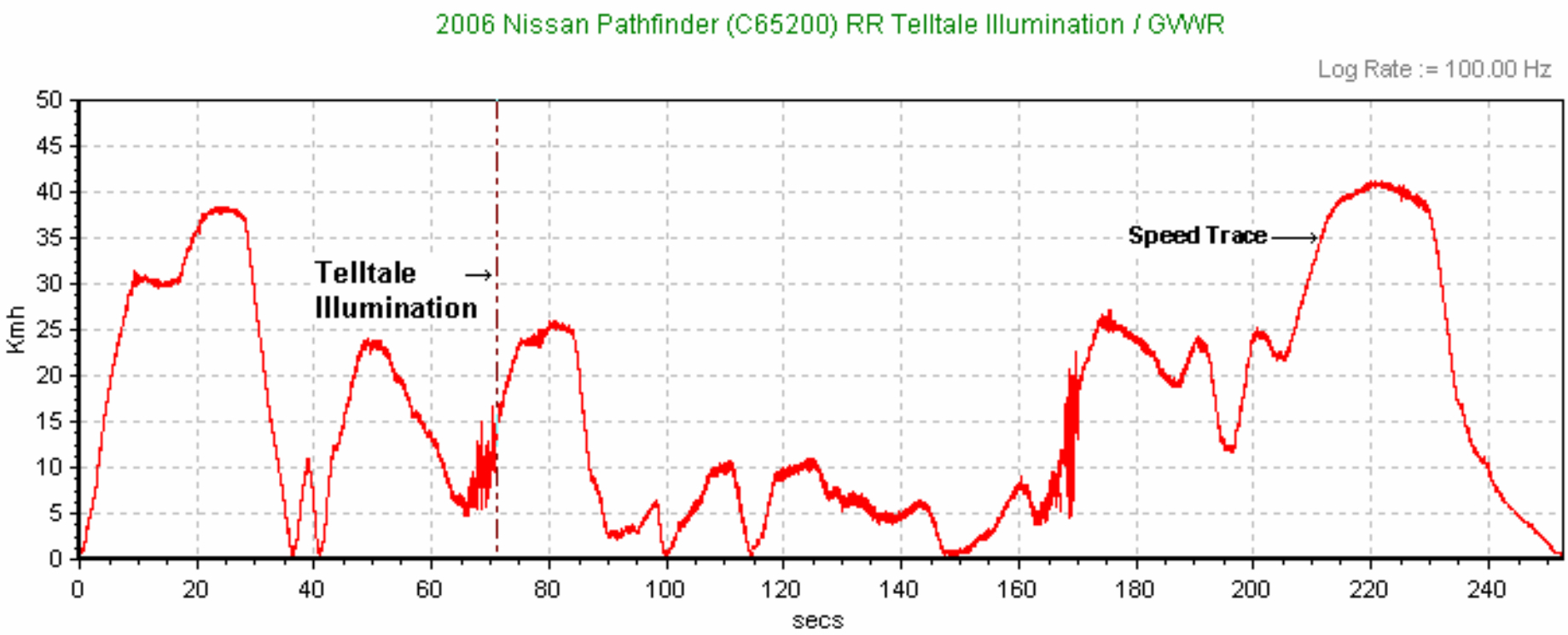
| | |
|---|---|
| Scenario H: | Right Rear Tire |
| Test Date: | 9/1/06 |
| Data File Time: | 26:20 minutes |
| Cumulative Driving Time: | 20:46 minutes |
| Start Point: | SATF shop |

Calibration Phase



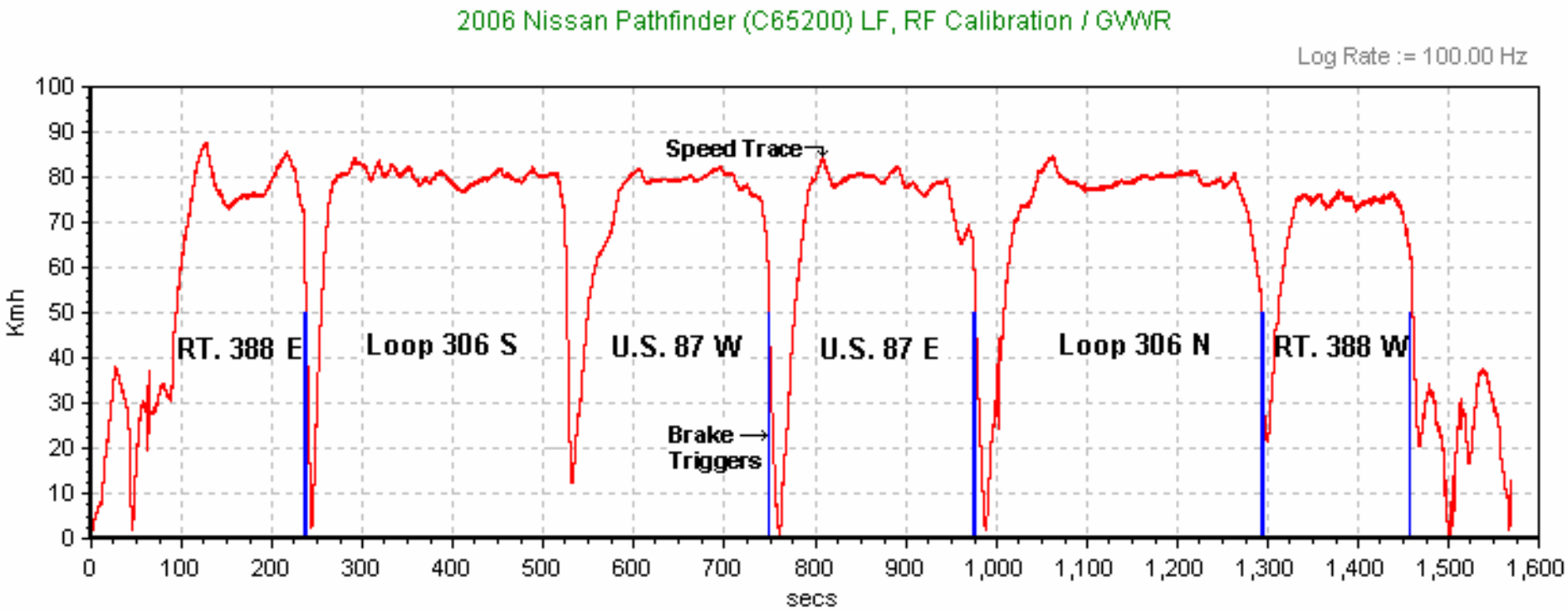
Scenario H: Right Rear Tire
Test Date: 9/1/06
Data File Time: 4:13 minutes
Illumination: 1:11 minutes
Start Point: SATF shop

Detection Phase



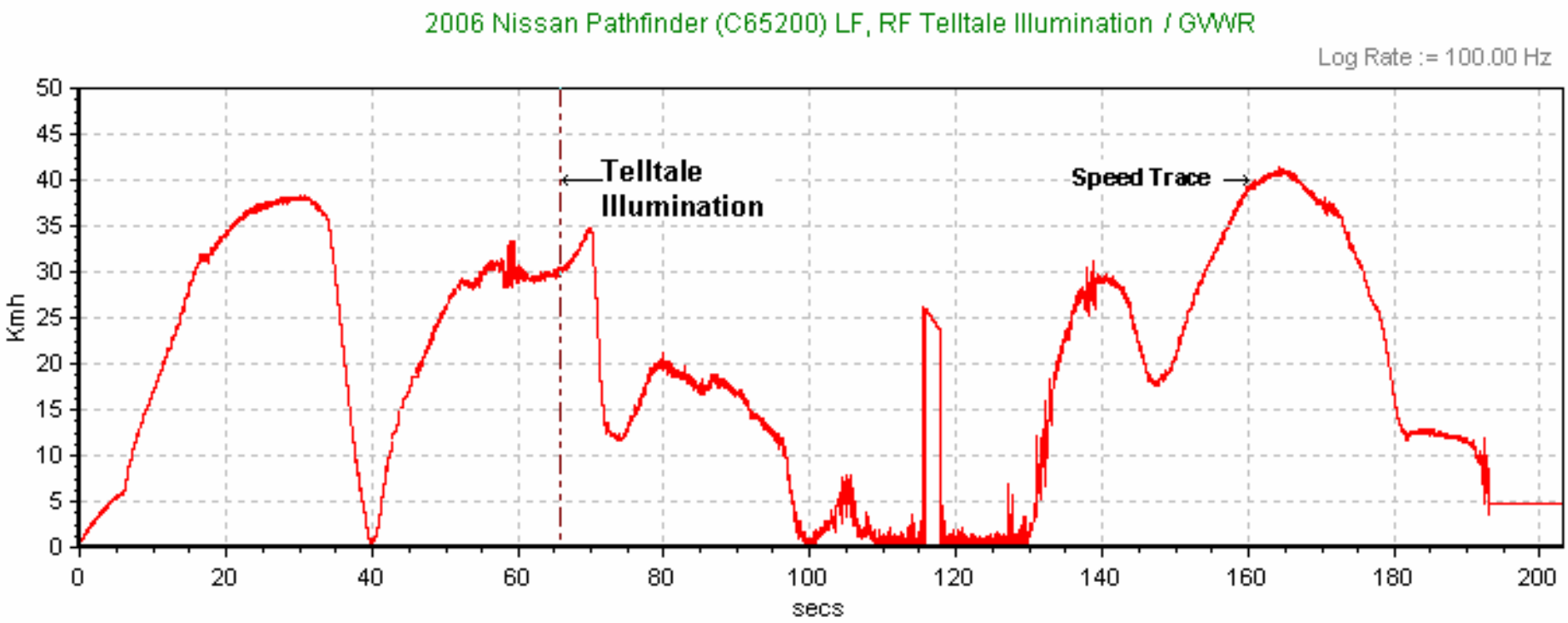
| | |
|---|---|
| Scenario I: | Left Front, Right Front Tires |
| Test Date: | 9/5/06 |
| Data File Time: | 26:17 minutes |
| Cumulative Driving Time: | 20:45 minutes |
| Start Point: | SATF shop |

Calibration Phase



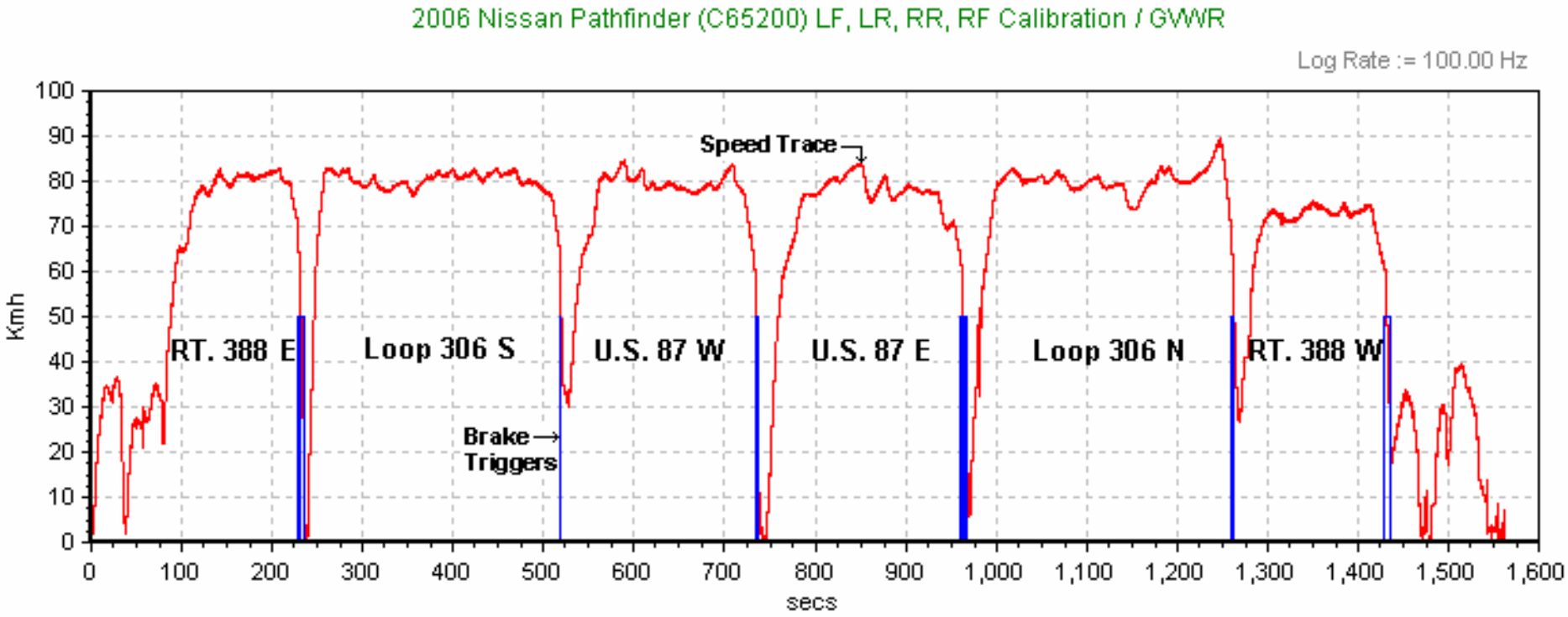
Scenario I: Left Front, Right Front Tires
Test Date: 9/5/06
Data File Time: 3:23 minutes
Illumination: 1:06 minutes
Start Point: SATF shop

Detection Phase



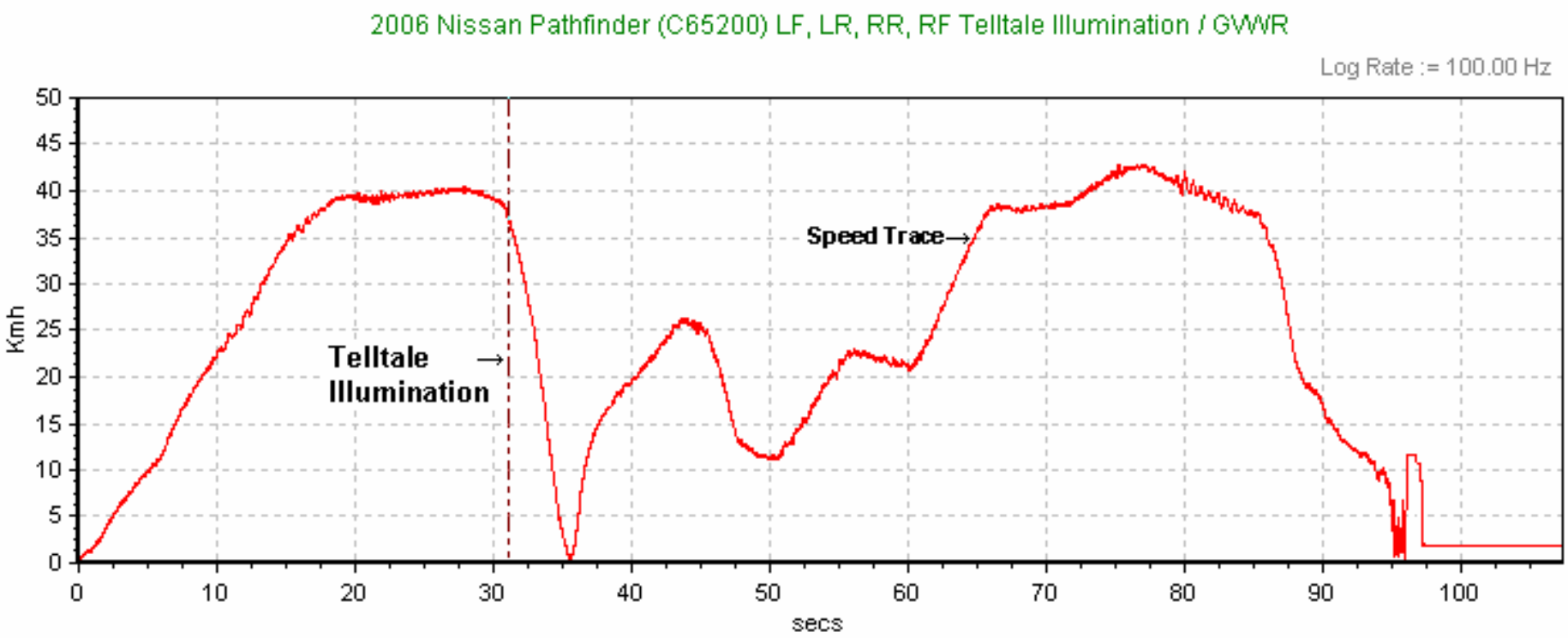
| | |
|---|---|
| Scenario J: | Left Front, Left Rear, Right Rear, Right Front Tires |
| Test Date: | 9/5/06 |
| Data File Time: | 26:03 minutes |
| Cumulative Driving Time: | 20:38 minutes |
| Start Point: | SATF shop |

Calibration Phase



Scenario J: Left Front, Left Rear, Right Rear, Right Front Tires
Test Date: 9/5/06
Data File Time: 1:47 minutes
Illumination: 31 seconds
Start Point: SATF shop

Detection Phase



Scenario K: Spare without Sensor Installed on Left Rear
Test Date: 9/5/06
Data File Time: 39:40 minutes
Illumination: NONE
Start Point: SATF shop

Malfunction Detection