

REPORT NUMBER 138-STF-11-008

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

VOLKSWAGEN DE MEXICO S.A. DE CV
2011 VOLKSWAGEN JETTA
FOUR-DOOR PASSENGER CAR
NHTSA NO. CB5800

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



FEBRUARY 10, 2012

PREPARED FOR

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ENFORCEMENT
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SECTION 1
INTRODUCTION

1.1 PURPOSE OF COMPLIANCE TEST

A 2011 Volkswagen Jetta four-door passenger car 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 2011 Volkswagen Jetta four-door passenger car. Nomenclatures applicable to the test vehicle are:

- A. Vehicle Identification Number: 3VW1K7AJ7BM049577
- B. NHTSA Number: CB5800
- C. Manufacturer: Volkswagen de Mexico S.A. de C.V.
- D. Manufacture Date: 12/2010

1.3 TEST DATE

The test vehicle was tested during the time period August 1 – September 9, 2011.

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 eight tire deflation scenarios. This LLVW included the UVW and the weights of driver, one passenger, and test equipment. The vehicle was loaded to its UVW plus Vehicle Capacity Weight (VCW) for seven 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 Cumulative 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.

Four malfunction scenarios were performed on the Volkswagen Jetta. Two scenarios were performed with the vehicle loaded to UVW + VCW. The first malfunction was simulated by removing the TPMS fuse; the second by disconnecting the ABS/ESP module. The vehicle was loaded to LLVW for the remaining malfunction scenarios. The third simulation was accomplished by disconnecting the right front ABS wheel speed sensor, and the fourth by replacing the right front tire with a tire having a smaller diameter than the original equipment tire.

2.2 SUMMARY OF RESULTS

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

- A. Left front
- B. Left front and left rear
- C. Left front, left rear, right rear, and right front
- D. Left front and right rear
- E. Left rear and right rear
- F. Left front, left rear, and right rear
- G. Right rear
- H. Left front, right rear, and right front

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

- I. Left front and right front
- J. Left rear, right rear, and right front
- K. Left rear and right front
- L. Right front
- M. Left rear
- N. Right front and right rear
- O. Left front, left rear, and right front

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

Two malfunction detection scenarios were performed on the test vehicle at UWW + VCW:

- P. TPMS fuse was removed.
- Q. ABS/ESP module was disconnected

Two malfunction detection scenarios were performed on the test vehicle at LLVW:

- R. ABS wheel speed sensor was disconnected.
- S. The right front tire was replaced with a tire having a smaller diameter.

In all four scenarios, the vehicle's combination malfunction telltale properly operated per the standard's requirements.

SECTION 3
TEST DATA

FMVSS No. 138 – TEST DATA SUMMARY

TEST DATES: August 1 – September 9, 2011 LAB: U.S. DOT San Angelo Test Facility

VIN: 3VW1K7AJ7BM049577 VEHICLE NHTSA NUMBER: CB5800

CERTIFICATION LABEL BUILD DATE: 12/2010

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

REMARKS: None

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

TEST DATE: August 1, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800 VIN: 3VW1K7AJ7BM049577

CERTIFICATION LABEL BUILD DATE: 12/2010 ENGINE: 2.0 liter, 4 cylinder

MY/MAKE/MODEL/BODY STYLE: 2011 Volkswagen Jetta four-door passenger car

TIRE CONDITIONING:

(X) Tires used more than 100 km. Actual odometer reading : 105 km (65 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 and ECU: Continental Teves

Software: NIRA Dynamics AE

Source: Manufacturer supplied information

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

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

Source: Manufacturer supplied information

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

TPMS MALFUNCTION INDICATOR TYPE:

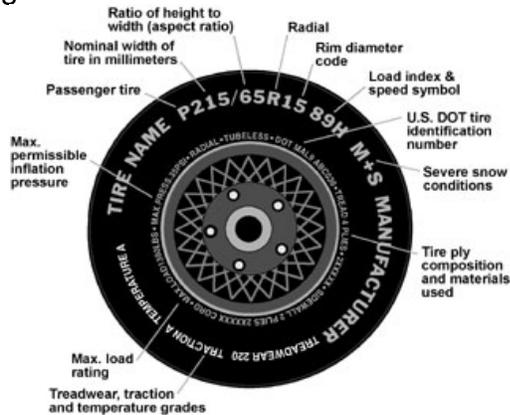
() None () Dedicated Telltale (X) Combination low tire pressure/malfunction telltale

**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	195/65R15	220 kPa (32 psi)	Vehicle Placard
Rear	195/65R15	220 kPa (32 psi)	Vehicle Placard
Spare	195/65R15	220 kPa (32 psi)	Vehicle Placard

INSTALLED TIRE DATA
Diagram - PASSENGER CAR Tire Labeling



Front and Rear Axles

Tire Size and Load Index / Speed Rating: 195/65R15 91H

Manufacturer/Tire Name: Continental ContiProContact

Sidewall Max Load Rating: 615 kg (1,356 lbs)

Max Inflation Pressure: 350 kPa (51 psi)

Sidewall Construction (number of plies and ply material): 1 rayon

Tread Construction (number of plies and ply material): 1 rayon, 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 the 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	<u>220 kPa</u> x .75 = <u>165</u> kPa	<u>220 kPa</u> x .75 = <u>165</u> kPa
(B) Information from FMVSS 138 Table 1 below, Tire types are: Inflation pressure Minimum activation pressures from Table 1	(X) P-metric-Standard load () P-metric-Extra Load Load Range () C, () D, or () E (X) Maximum or () Rated <u>350</u> kPa (51 psi) <u>140</u> kPa (20 psi)	(X) P-metric-Standard load () P-metric-Extra Load Load Range () C, () D, or () E (X) Maximum or () Rated <u>350</u> kPa (51 psi) <u>140</u> kPa (20 psi)
(C) Telltale Warning Activation Pressure is the higher of Part (A) or (B)	<u>165</u> kPa (24 psi)	<u>165</u> kPa (24 psi)
(D) Pressure at which to deflate tire(s) = (C) – 7 kPa	<u>158</u> kPa (23 psi)	<u>158</u> kPa (23 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, 300, or 350	35, 44, or 51	140 140 140	20 20 20
P-metric - Extra Load	280 or 340	41 or 49	160 160	23 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: August 1, 2011

APPROVED BY: Kenneth H. Yates

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

TEST DATE: August 1, 2011 LAB: U.S. DOT San Angelo Test Facility

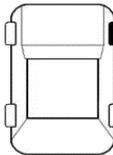
VEHICLE NHTSA NUMBER: CB5800

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: Inside speedometer, next to 120 mph

Identify Telltale Symbol Used (check box above figure).

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

Note any words or additional symbols used: None

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

TPMS Malfunction Telltale

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

Note any words or additional symbols used: None

DATA SHEET 3 (Sheet 1 of 51)
TPMS OPERATIONAL PERFORMANCE

TEST DATE: August 1, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Time: Start: 1:00 pm End: 1:40 pm

Ambient Temperature: Start: 36.6°C (97.9°F) End: 36.2°C (97.2°F)

Odometer Reading: Start: 105 km (65 mi)

Fuel Level: Start: Full

Weather Conditions: Sunny

Time vehicle remained with engine off and tires shielded from direct sunlight
(1 hour minimum): 2 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: Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	38.4°C (101.1°F)	39.4°C (102.9°F)	40.4°C (104.7°F)	39.8°C (103.6°F)

DATA SHEET 3 (Sheet 2 of 51)
TPMS OPERATIONAL PERFORMANCE

VEHICLE WEIGHT:

Vehicle Ratings from Certification Label:

GVWR: 4,012 lbs
GAWR (front): 2,006 lbs
GAWR (rear): 2,116 lbs

Vehicle Capacity Weight:

Vehicle Capacity Weight 495 kg (1,091 lbs)

Measured Unloaded Vehicle Weight:

LF	<u>369 kg (813 lbs)</u>	LR	<u>282 kg (621 lbs)</u>
RF	<u>381 kg (841 lbs)</u>	RR	<u>278 kg (612 lbs)</u>
Front		Rear	
Axle	<u>750 kg (1,654 lbs)</u>	Axle	<u>560 kg (1,233 lbs)</u>
Total Vehicle <u>1,310 kg (2,887 lbs)</u>			

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

LF	<u>419 kg (923 lbs)</u>	LR	<u>325 kg (717 lbs)</u>
RF	<u>431 kg (950 lbs)</u>	RR	<u>321 kg (708 lbs)</u>
Front		Rear	
Axle	<u>850 kg (1,873 lbs) (≤ GAWR)</u>	Axle	<u>646 kg (1,425 lbs) (≤ GAWR)</u>
Total Vehicle <u>1,496 kg (3,298 lbs) (not greater than GVWR)</u>			

Note: For scenarios A through D, this Total Vehicle Weight measures the vehicle loaded to Lightly Loaded Vehicle Weight (LLVW), 186 kg (411 lbs) of driver, passenger, and test equipment.

RECORDED BY: Todd P. Groghan

DATE: August 1, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 3 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO A – Left Front Tire Deflation at LLVW

TEST DATE: August 9, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 2 of 51) 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: Ambient Temperature: <u>32.5C (90.5°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	33.2°C (91.8°F)	33.4°C (92.1°F)	33.4°C (92.1°F)	33.4°C (92.1°F)
San Angelo Test Facility Shop Floor Temp	33.6°C (92.5°F)	33.8°C (92.8°F)	34.0°C (93.2°F)	33.8°C (92.8°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 15:46:04 UTC End: 16:12:41 UTC
 Trip Odometer Reading: Start: 69.2 km (43.0 mi) End: 100.9 km (62.7 mi)
 Ambient Temperature: Start: 32.7°C (90.9°F) End: 34.6°C (94.3°F)
 Roadway Temperature: Start: 42.8°C (109.0°F) End: 44.8°C (112.6°F)
 Weather Conditions: Sunny, light breeze

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 96
10:24 minutes (cumulative stopwatch time) 17.2 km (10.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 96
9:49 minutes (cumulative stopwatch time) 14.5 km (9.0 mi) distance

Max speed: 99.6 km/h (61.9 mph)

Total Cumulative Driving Time: 20:13 minutes (VBox processed data)

DATA SHEET 3 (Sheet 4 of 51)
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	242.4 kPa (35.2 psi)	242.6 kPa (35.2 psi)	242.0 kPa (35.1 psi)	244.2 kPa (35.4 psi)
Tire Sidewall Temp	48.4°C (119.1°F)	47.4°C (117.3°F)	49.4°C (120.9°F)	54.4°C (129.9°F)
San Angelo Test Facility Shop Floor Temp	35.2°C (95.4°F)	35.6°C (96.1°F)	35.8°C (96.4°F)	35.8°C (96.4°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	158.0 kPa (22.9 psi)			

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 97

Total distance to illumination: 4.8 km (3.0 mi)

Time to illumination: 1:48 minutes (cumulative stopwatch time)

Max speed: 95.5 km/h (59.3 mph)

Total Cumulative Driving Time: 1:48 minutes (VBox processed data)

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 5 of 51)
TPMS OPERATIONAL PERFORMANCE

SCENARIO A – Left 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: Ambient Temperature: <u>37.1°C (98.8°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	152.1 kPa (22.1 psi)	232.2 kPa (33.7 psi)	229.7 kPa (33.3 psi)	232.3 kPa (33.7 psi)
Tire Sidewall Temp	43.6°C (110.5°F)	44.2°C (111.6°F)	43.4°C (110.1°F)	46.0°C (114.8°F)
San Angelo Test Facility Shop Floor Temp	36.6°C (97.9°F)	36.6°C (97.9°F)	36.8°C (98.2°F)	36.6°C (97.9°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Left front tire was deflated at LLVW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 9, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 6 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO B – Left Front and Left Rear Tire Deflation at LLVW

TEST DATE: August 12, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 2 of 51) 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: Ambient Temperature: <u>28.3°C (82.9°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	29.0°C (84.2°F)	28.8°C (83.8°F)	29.6°C (85.3°F)	29.4°C (84.9°F)
San Angelo Test Facility Shop Floor Temp	30.6°C (87.1°F)	30.8°C (87.4°F)	31.2°C (88.2°F)	31.0°C (87.8°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 14:49:13 UTC End: 15:14:37 UTC
 Trip Odometer Reading: Start: 115.1 km (71.5 mi) End: 146.8 km (91.2 mi)
 Ambient Temperature: Start: 28.3°C (82.9°F) End: 28.8°C (83.8°F)
 Roadway Temperature: Start: 35.6°C (96.1°F) End: 35.0°C (95.0°F)
 Weather Conditions: Sunny, light breeze

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 98
10:53 minutes (cumulative stopwatch time) 17.2 km (10.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 98
9:19 minutes (cumulative stopwatch time) 14.5 km (9.0 mi) distance

Max speed: 97.3 km/h (60.5 mph)

Total Cumulative Driving Time: 20:12 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 7 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO B – Left Front and Left 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: Inflation Pressure	238.3 kPa (34.6 psi)	237.7 kPa (34.5 psi)	236.4 kPa (34.3 psi)	239.0 kPa (34.7 psi)
Tire Sidewall Temp	38.8°C (101.8°F)	41.2°C (106.2°F)	38.8°C (101.8°F)	38.6°C (101.5°F)
San Angelo Test Facility Shop Floor Temp	31.4°C (88.5°F)	31.8°C (89.2°F)	32.2°C (90.0°F)	32.4°C (90.3°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 (X)LR ()RR ()RF Inflation Pressure	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)		

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 99

Total distance to illumination: 7.4 km (4.6 mi)

Time to illumination: 3:32 minutes (cumulative stopwatch time)

Max speed: 93.4 km/h (58.0 mph)

Total Cumulative Driving Time: 3:32 minutes (VBox processed data)

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 8 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO B – Left Front and 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: Ambient Temperature: <u>28.1°C (82.6°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	151.6 kPa (22.0 psi)	152.0 kPa (22.0 psi)	225.3 kPa (32.7 psi)	226.8 kPa (32.9 psi)
Tire Sidewall Temp	34.4°C (93.9°F)	35.2°C (95.4°F)	35.2°C (95.4°F)	37.0°C (98.6°F)
San Angelo Test Facility Shop Floor Temp	31.8°C (89.2°F)	32.2°C (90.0°F)	32.4°C (90.3°F)	32.4°C (90.3°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Left front and left rear tires were deflated at LLVW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 12, 2011

APPROVED BY: Kenneth H. Yates

DATA SHEET 3 (Sheet 9 of 51)
TPMS OPERATIONAL PERFORMANCE
SCENARIO C – Left Front, Left Rear, Right Rear,
and Right Front Tire Deflation at LLVW

TEST DATE: August 16, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 2 of 51) 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: Ambient Temperature: <u>26.8°C (80.2°F)</u> Vehicle cool down period: <u>overnight</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	27.8°C (82.0°F)	28.0°C (82.4°F)	28.4°C (83.1°F)	28.6°C (83.5°F)
San Angelo Test Facility Shop Floor Temp	29.2°C (84.6°F)	29.6°C (85.3°F)	30.2°C (86.4°F)	30.0°C (86.0°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:06:34 UTC End: 13:32:00 UTC
Trip Odometer Reading: Start: 168.5 km (104.7 mi) End: 200.2 km (124.4 mi)
Ambient Temperature: Start: 26.8°C (80.2°F) End: 27.2°C (81.0°F)
Roadway Temperature: Start: 27.6°C (81.7°F) End: 26.2°C (79.2°F)
Weather Conditions: Sunny, light breeze

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 100
10:53 minutes (cumulative stopwatch time) 17.2 km (10.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 100
9:20 minutes (cumulative stopwatch time) 14.5 km (9.0 mi) distance

Max speed: 97.9 km/h (60.8 mph)

Total Cumulative Driving Time: 20:13 minutes (VBox processed data)

DATA SHEET 3 (Sheet 10 of 51)
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: Inflation Pressure	237.8 kPa (34.5 psi)	237.5 kPa (34.4 psi)	237.1 kPa (34.4 psi)	238.5 kPa (34.6 psi)
Tire Sidewall Temp	41.2°C (106.2°F)	37.2°C (99.0°F)	39.6°C (103.3°F)	40.8°C (105.4°F)
San Angelo Test Facility Shop Floor Temp	30.2°C (86.4°F)	30.8°C (87.4°F)	30.8°C (87.4°F)	31.0°C (87.8°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 (X)LR (X)RR (X)RF Inflation Pressure	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 101

Total distance to illumination: 8.5 km (5.3 mi)

Time to illumination: 4:03 minutes (cumulative stopwatch time)

Max speed: 96.5 km/h (60.0 mph)

Total Cumulative Driving Time: 4:03 minutes (VBox processed data)

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 51)
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: Ambient Temperature: <u>30.2°C (86.4°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	153.7 kPa (22.3 psi)	154.3 kPa (22.4 psi)	154.5 kPa (22.4 psi)	154.1 kPa (22.4 psi)
Tire Sidewall Temp	34.0°C (93.2°F)	34.8°C (94.6°F)	34.6°C (94.3°F)	36.2°C (97.2°F)
San Angelo Test Facility Shop Floor Temp	31.2°C (88.2°F)	31.6°C (88.9°F)	31.8°C (89.2°F)	31.8°C (89.2°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require
activation of the reset button in the glove box. Upon activation of the reset feature, the
low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 16, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 12 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO D – Left Front and Right Rear Tire Deflation at LLVW

TEST DATE: August 16, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 2 of 51) 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: Ambient Temperature: <u>30.7°C (87.3°F)</u> Vehicle cool down period: <u>67</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	34.0°C (93.2°F)	34.8°C (94.6°F)	34.6°C (94.3°F)	36.2°C (97.2°F)
San Angelo Test Facility Shop Floor Temp	31.2°C (88.2°F)	31.6°C (88.9°F)	31.8°C (89.2°F)	31.8°C (89.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 15:22:27 UTC End: 15:47:25 UTC
 Trip Odometer Reading: Start: 221.9 km (137.9 mi) End: 253.6 km (157.6 mi)
 Ambient Temperature: Start: 30.7°C (87.3°F) End: 31.7°C (89.1°F)
 Roadway Temperature: Start: 35.4°C (95.7°F) End: 42.4°C (108.3°F)
 Weather Conditions: Sunny, windy

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 102
10:54 minutes (cumulative stopwatch time) 17.2 km (10.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 102
9:24 minutes (cumulative stopwatch time) 14.5 km (9.0 mi) distance

Max speed: 99.3 km/h (61.7 mph)

Total Cumulative Driving Time: 20:18 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 13 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO D – Left Front and 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: Inflation Pressure	238.6 kPa (34.6 psi)	235.7 kPa (34.2 psi)	239.0 kPa (34.7 psi)	237.9 kPa (34.5 psi)
Tire Sidewall Temp	45.6°C (114.1°F)	44.8°C (112.6°F)	45.8°C (114.4°F)	50.4°C (122.7°F)
San Angelo Test Facility Shop Floor Temp	33.2°C (91.8°F)	33.2°C (91.8°F)	33.6°C (92.5°F)	33.6°C (92.5°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 (X)RR ()RF Inflation Pressure	158.0 kPa (22.9 psi)		158.0 kPa (22.9 psi)	

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 103

Total distance to illumination: 10.1 km (6.3 mi)

Time to illumination: 5:13 minutes (cumulative stopwatch time)

Max speed: 96.6 km/h (60.0 mph)

Total Cumulative Driving Time: 5:13 minutes (VBox processed data)

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 14 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO D – Left Front and 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: Ambient Temperature: <u>34.7°C (94.5°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	152.0 kPa (22.0 psi)	225.2 kPa (32.7 psi)	151.7 kPa (22.0 psi)	225.6 kPa (32.7 psi)
Tire Sidewall Temp	47.2°C (117.0°F)	40.0°C (104.0°F)	40.2°C (104.4°F)	41.0°C (105.8°F)
San Angelo Test Facility Shop Floor Temp	34.2°C (93.6°F)	34.4°C (93.9°F)	34.8°C (94.6°F)	34.4°C (93.9°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Left front and right rear tires were deflated at LLVW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 16, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 15 of 51)
TPMS OPERATIONAL PERFORMANCE**

TEST DATE: August 23, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Time: Start: 11:25 am End: 11:50 am

Ambient Temperature: Start: 33.4°C (92.1°F) End: 34.2°C (93.6°F)

Odometer Reading: Start: 711 km (442 mi)

Fuel Level: Start: Full

Weather Conditions: Sunny, breezy

Time vehicle remained with engine off and tires shielded from direct sunlight:
(1 hour minimum): 60 minutes

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	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	35.6°C (96.1°F)	35.6°C (96.1°F)	35.8°C (96.4°F)	36.2°C (97.2°F)

DATA SHEET 3 (Sheet 16 of 51)
TPMS OPERATIONAL PERFORMANCE

VEHICLE WEIGHT:

Vehicle Ratings from Certification Label:

GVWR: 4,012 lbs
GAWR (front): 2,006 lbs
GAWR (rear): 2,116 lbs

Vehicle Capacity Weight:

Vehicle Capacity Weight 495 kg (1,091 lbs)

Measured Unloaded Vehicle Weight:

LF	<u>367 kg (810 lbs)</u>	LR	<u>283 kg (624 lbs)</u>
RF	<u>383 kg (844 lbs)</u>	RR	<u>276 kg (609 lbs)</u>
Front		Rear	
Axle	<u>750 kg (1,654 lbs)</u>	Axle	<u>559 kg (1,233 lbs)</u>
Total Vehicle <u>1,309 kg (2,887 lbs)</u>			

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

LF	<u>414 kg (912 lbs)</u>	LR	<u>329 kg (725 lbs)</u>
RF	<u>429 kg (947 lbs)</u>	RR	<u>323 kg (712 lbs)</u>
Front		Rear	
Axle	<u>843 kg (1,859 lbs) (≤ GAWR)</u>	Axle	<u>652 kg (1,437 lbs) (≤ GAWR)</u>
Total Vehicle <u>1,495 kg (3,296 lbs) (not greater than GVWR)</u>			

Note: For scenarios E through H, this Total Vehicle Weight measures the vehicle loaded to Lightly Loaded Vehicle Weight (LLVW), 186 kg (409 lbs) of driver, passenger, and test equipment.

RECORDED BY: Todd P. Groghan

DATE: August 23, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 17 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO E – Left Rear and Right Rear Tire Deflation at LLVW

TEST DATE: August 24, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 16 of 51) 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: Ambient Temperature: <u>27.5°C (81.5°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	29.4°C (84.9°F)	28.6°C (83.5°F)	28.6°C (83.5°F)	29.2°C (84.6°F)
San Angelo Test Facility Shop Floor Temp	31.8°C (89.2°F)	32.2°C (90.0°F)	32.4°C (90.3°F)	31.6°C (88.9°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:05:53 UTC End: 13:30:37 UTC
 Trip Odometer Reading: Start: 675.4 km (419.7 mi) End: 707.1 km (439.4 mi)
 Ambient Temperature: Start: 27.5°C (81.5°F) End: 28.4°C (83.1°F)
 Roadway Temperature: Start: 31.0°C (87.8°F) End: 31.2°C (88.2°F)
 Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 104
10:54 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 104
9:19 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 98.5 km/h (61.2 mph)

Total Cumulative Driving Time: 20:13 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 18 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO E – Left Rear and 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: Inflation Pressure	234.6 kPa (34.0 psi)	234.8 kPa (34.1 psi)	235.7 kPa (34.2 psi)	235.7 kPa (34.2 psi)
Tire Sidewall Temp	42.4°C (108.3°F)	39.2°C (102.6°F)	40.4°C (104.7°F)	44.8°C (112.6°F)
San Angelo Test Facility Shop Floor Temp	31.8°C (89.2°F)	31.8°C (89.2°F)	32.2°C (90.0°F)	32.4°C (90.3°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 (X)LR (X)RR ()RF Inflation Pressure		158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)	

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 105

Total distance to illumination: 6.9 km (4.3 mi)

Time to illumination: 3:13 minutes (cumulative stopwatch time)

Max speed: 92.6 km/h (57.5 mph)

Total Cumulative Driving Time: 3:13 minutes (VBox processed data)

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 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO E – Left Rear and 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: Ambient Temperature: <u>31.0°C (87.8°F)</u> Vehicle cool down period: <u>61</u> minutes				
Inflation Pressure	225.2 kPa (32.7 psi)	153.3 kPa (22.2 psi)	152.4 kPa (22.1 psi)	225.5 kPa (32.7 psi)
Tire Sidewall Temp	35.8°C (96.4°F)	35.2°C (95.4°F)	35.2°C (95.4°F)	36.8°C (98.2°F)
San Angelo Test Facility Shop Floor Temp	32.6°C (90.7°F)	33.2°C (91.8°F)	33.2°C (91.8°F)	33.2°C (91.8°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Left rear and right rear tires were deflated at LLVW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 24, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 20 of 51)
TPMS OPERATIONAL PERFORMANCE**

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

TEST DATE: August 25, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 16 of 51) 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: Ambient Temperature: <u>28.0°C (82.4°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	30.2°C (86.4°F)	30.0°C (86.0°F)	29.8°C (85.6°F)	30.2°C (86.4°F)
San Angelo Test Facility Shop Floor Temp	31.8°C (89.2°F)	32.2°C (90.0°F)	32.0°C (89.6°F)	31.8°C (89.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:04:00 UTC End: 13:29:03 UTC
 Trip Odometer Reading: Start: 724.7 km (450.3 mi) End: 756.6 km (470.1 mi)
 Ambient Temperature: Start: 28.0°C (82.4°F) End: 28.9°C (84.0°F)
 Roadway Temperature: Start: 31.2°C (88.2°F) End: 30.6°C (87.1°F)
 Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 106
10:54 minutes (cumulative stopwatch time) 17.5 km (10.9 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 106
9:27 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 99.6 km/h (61.9 mph)

Total Cumulative Driving Time: 20:21 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 21 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO F – Left Front, Left Rear, and 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: Inflation Pressure	233.5 kPa (33.9 psi)	232.4 kPa (33.7 psi)	233.6 kPa (33.9 psi)	234.7 kPa (34.0 psi)
Tire Sidewall Temp	41.6°C (106.9°F)	38.4°C (101.1°F)	40.4°C (104.7°F)	43.4°C (110.1°F)
San Angelo Test Facility Shop Floor Temp	32.2°C (90.0°F)	32.4°C (90.3°F)	32.8°C (91.0°F)	32.8°C (91.0°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 (X)LR (X)RR ()RF Inflation Pressure	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)	

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 107

Total distance to illumination: 10.5 km (6.5 mi)

Time to illumination: 5:24 minutes (cumulative stopwatch time)

Max speed: 94.2 km/h (58.5 mph)

Total Cumulative Driving Time: 5:24 minutes (VBox processed data)

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 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO F – Left Front, Left Rear, and 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: Ambient Temperature: <u>31.3°C (88.3°F)</u> Vehicle cool down period: <u>62</u> minutes				
Inflation Pressure	154.0 kPa (22.3 psi)	154.3 kPa (22.4 psi)	153.7 kPa (22.3 psi)	225.3 kPa (32.7 psi)
Tire Sidewall Temp	38.4°C (101.1°F)	36.6°C (97.9°F)	35.6°C (96.1°F)	36.8°C (98.2°F)
San Angelo Test Facility Shop Floor Temp	34.2°C (93.6°F)	34.0°C (93.2°F)	34.2°C (93.6°F)	33.8°C (92.8°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 25, 2011

APPROVED BY: Kenneth H. Yates

DATA SHEET 3 (Sheet 23 of 51)
TPMS OPERATIONAL PERFORMANCE
SCENARIO G – Right Rear Tire Deflation at LLVW

TEST DATE: August 25, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 16 of 51) 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: Ambient Temperature: <u>31.4°C (88.5°F)</u> Vehicle cool down period: <u>70</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	38.4°C (101.1°F)	36.6°C (97.9°F)	35.6°C (96.1°F)	36.8°C (98.2°F)
San Angelo Test Facility Shop Floor Temp	34.2°C (93.6°F)	34.0°C (93.2°F)	34.2°C (93.6°F)	33.8°C (92.8°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 15:20:43 UTC End: 15:46:39 UTC
Trip Odometer Reading: Start: 782.3 km (486.1 mi) End: 814.0 km (505.8 mi)
Ambient Temperature: Start: 31.4°C (88.5°F) End: 32.6°C (90.7°F)
Roadway Temperature: Start: 40.8°C (105.4°F) End: 44.2°C (111.6°F)
Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 108
10:54 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 108
9:21 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 97.1 km/h (60.3 mph)

Total Cumulative Driving Time: 20:15 minutes (VBox processed data)

DATA SHEET 3 (Sheet 24 of 51)
TPMS OPERATIONAL PERFORMANCE
SCENARIO G – 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: Inflation Pressure	236.8 kPa (34.3 psi)	235.3 kPa (34.1 psi)	239.5 kPa (34.7 psi)	237.2 kPa (34.4 psi)
Tire Sidewall Temp	50.8°C (123.4°F)	45.8°C (114.4°F)	46.6°C (115.9°F)	48.8°C (119.8°F)
San Angelo Test Facility Shop Floor Temp	35.4°C (95.7°F)	35.8°C (96.4°F)	35.8°C (96.4°F)	36.0°C (96.8°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			158.0 kPa (22.9 psi)	

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 109

Total distance to illumination: 4.7 km (2.9 mi)

Time to illumination: 1:46 minutes (cumulative stopwatch time)

Max speed: 91.2 km/h (56.7 mph)

Total Cumulative Driving Time: 1:47 minutes (VBox processed data)

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 25 of 51)
TPMS OPERATIONAL PERFORMANCE
SCENARIO G – 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: Ambient Temperature: <u>36.1°C (97.0°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	225.3 kPa (32.7 psi)	224.7 kPa (32.6 psi)	151.3 kPa (21.9 psi)	225.1 kPa (32.6 psi)
Tire Sidewall Temp	42.4°C (108.3°F)	41.2°C (106.2°F)	40.2°C (104.4°F)	42.6°C (108.7°F)
San Angelo Test Facility Shop Floor Temp	35.2°C (95.4°F)	35.8°C (96.4°F)	35.8°C (96.4°F)	35.4°C (95.7°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Right rear tire was deflated at LLVW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 25, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 26 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO H – Left Front, Right Rear, and Right Front Tire Deflation at LLVW

TEST DATE: August 26, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 16 of 51) 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: Ambient Temperature: <u>26.4°C (79.5°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	28.6°C (83.5°F)	28.2°C (82.8°F)	28.4°C (83.1°F)	28.6°C (83.5°F)
San Angelo Test Facility Shop Floor Temp	30.8°C (87.4°F)	31.0°C (87.8°F)	31.2°C (88.2°F)	31.2°C (88.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:14:55 UTC End: 13:39:55 UTC
 Trip Odometer Reading: Start: 828.3 km (514.7 mi) End: 859.9 km (534.3 mi)
 Ambient Temperature: Start: 26.4°C (79.5°F) End: 27.4°C (81.3°F)
 Roadway Temperature: Start: 29.6°C (85.3°F) End: 31.4°C (88.5°F)
 Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 110
10:53 minutes (cumulative stopwatch time) 17.2 km (10.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 110
9:23 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 97.7 km/h (60.7 mph)

Total Cumulative Driving Time: 20:16 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 27 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO H – Left Front, 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: Inflation Pressure	237.2 kPa (34.4 psi)	236.2 kPa (34.3 psi)	237.5 kPa (34.4 psi)	238.2 kPa (34.5 psi)
Tire Sidewall Temp	41.4°C (106.5°F)	37.4°C (99.3°F)	39.2°C (102.6°F)	42.8°C (109.0°F)
San Angelo Test Facility Shop Floor Temp	31.4°C (88.5°F)	32.0°C (89.6°F)	32.2°C (90.0°F)	32.4°C (90.3°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 (X)RR (X)RF Inflation Pressure	158.0 kPa (22.9 psi)		158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 111

Total distance to illumination: 7.4 km (4.6 mi)

Time to illumination: 3:41 minutes (cumulative stopwatch time)

Max speed: 93.9 km/h (58.3 mph)

Total Cumulative Driving Time: 3:41 minutes (VBox processed data)

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 28 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO H – Left Front, 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: Ambient Temperature: <u>28.8°C (83.8°F)</u> Vehicle cool down period: <u>62</u> minutes				
Inflation Pressure	154.6 kPa (22.4 psi)	227.3 kPa (33.0 psi)	153.3 kPa (22.2 psi)	153.8 kPa (22.3 psi)
Tire Sidewall Temp	36.2°C (97.2°F)	35.2°C (95.4°F)	33.8°C (92.8°F)	36.2°C (97.2°F)
San Angelo Test Facility Shop Floor Temp	32.4°C (90.3°F)	32.6°C (90.7°F)	32.6°C (90.7°F)	32.4°C (90.3°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 26, 2011

APPROVED BY: Kenneth H. Yates

DATA SHEET 3 (Sheet 29 of 51)
TPMS OPERATIONAL PERFORMANCE

TEST DATE: August 17, 2011 LAB: U.S. DOT San Angelo Test Facility
 VEHICLE NHTSA NUMBER: CB5800

Time: Start: 7:15 am End: 9:10 am
 Ambient Temperature: Start: 28.0°C (82.4°F) End: 28.6°C (83.5°F)
 Odometer Reading: Start: 314 km (195 mi)
 Fuel Level: Start: Full
 Weather Conditions: Sunny

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

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	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	29.8°C (85.6°F)	29.2°C (84.6°F)	29.4°C (84.9°F)	29.8°C (85.6°F)

**DATA SHEET 3 (Sheet 30 of 51)
TPMS OPERATIONAL PERFORMANCE**

VEHICLE WEIGHT:

Vehicle Ratings from Certification Label:

GVWR: 4,012 lbs
GAWR (front): 2,006 lbs
GAWR (rear): 2,116 lbs

Vehicle Capacity Weight:

Vehicle Capacity Weight 495 kg (1,091 lbs)

Measured Unloaded Vehicle Weight:

LF	<u>367 kg (810 lbs)</u>	LR	<u>283 kg (623 lbs)</u>
RF	<u>382 kg (843 lbs)</u>	RR	<u>277 kg (611 lbs)</u>
Front Axle	<u>749 kg (1,653 lbs)</u>	Rear Axle	<u>560 kg (1,234 lbs)</u>
Total Vehicle <u>1,309 kg (2,887 lbs)</u>			

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

LF	<u>418 kg (921 lbs)</u>	LR	<u>480 kg (1,059 lbs)</u>
RF	<u>433 kg (954 lbs)</u>	RR	<u>474 kg (1,044 lbs)</u>
Front Axle	<u>851 kg (1,875 lbs) (≤ GAWR)</u>	Rear Axle	<u>954 kg (2,103 lbs) (≤ GAWR)</u>
Total Vehicle <u>1,805 kg (3,978 lbs) (not greater than GVWR)</u>			

Note: For scenarios I through O, this Total Vehicle Weight measures the vehicle loaded to Unloaded Vehicle Weight (UVW) and Vehicle Capacity Weight (VCW), 495 kg (1,091 lbs) of driver, passenger, test equipment, and ballast.

RECORDED BY: Todd P. Groghan

DATE: August 17, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 31 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO I – Left Front and Right Front Tire Deflation at UVW + VCW

TEST DATE: August 17, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>29.8°C (85.6°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	31.4°C (88.5°F)	31.0°C (87.8°F)	31.0°C (87.8°F)	32.2°C (90.0°F)
San Angelo Test Facility Shop Floor Temp	31.2°C (88.2°F)	31.8°C (89.2°F)	31.8°C (89.2°F)	31.8°C (89.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 14:59:36 UTC End: 15:24:58 UTC
 Trip Odometer Reading: Start: 282.0 km (175.2 mi) End: 313.7 km (194.9 mi)
 Ambient Temperature: Start: 30.2°C (86.4°F) End: 31.3°C (88.3°F)
 Roadway Temperature: Start: 36.6°C (97.9°F) End: 39.8°C (103.6°F)
 Weather Conditions: Sunny, light breeze

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 112
10:53 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 112
9:22 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 101.6 km/h (63.1 mph)

Total Cumulative Driving Time: 20:15 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 32 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO I – Left Front and Right 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: Inflation Pressure	238.8 kPa (34.6 psi)	245.3 kPa (35.6 psi)	245.6 kPa (35.6 psi)	239.8 kPa (34.8 psi)
Tire Sidewall Temp	47.8°C (118.0°F)	46.2°C (115.2°F)	51.8°C (125.2°F)	45.8°C (114.4°F)
San Angelo Test Facility Shop Floor Temp	33.2°C (91.8°F)	36.4°C (97.5°F)	34.8°C (94.6°F)	34.2°C (93.6°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: (X)LF ()LR ()RR (X)RF Inflation Pressure	158.0 kPa (22.9 psi)			158.0kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 113

Total distance to illumination: 6.8 km (4.2 mi)

Time to illumination: 2:58 minutes (cumulative stopwatch time)

Max speed: 93.9 km/h (58.3 mph)

Total Cumulative Driving Time: 2:58 minutes (VBox processed data)

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 33 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO I – Left Front and Right 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: Ambient Temperature: <u>34.2°C (93.6°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	153.8 kPa (22.3 psi)	229.7 kPa (33.3 psi)	229.9 kPa (33.3 psi)	152.5 kPa (22.1 psi)
Tire Sidewall Temp	42.0°C (107.6°F)	43.4°C (110.1°F)	42.4°C (108.3°F)	42.8°C (109.0°F)
San Angelo Test Facility Shop Floor Temp	34.6°C (94.3°F)	34.8°C (94.6°F)	34.8°C (94.6°F)	34.8°C (94.6°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 17, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 34 of 51)
TPMS OPERATIONAL PERFORMANCE**

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

TEST DATE: August 18, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>28.2°C (82.8°F)</u> Vehicle cool down period: <u>overnight</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	29.8°C (85.6°F)	29.8°C (85.6°F)	29.8°C (85.6°F)	29.8°C (85.6°F)
San Angelo Test Facility Shop Floor Temp	31.2°C (88.2°F)	31.6°C (88.9°F)	31.4°C (88.5°F)	31.2°C (88.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:05:56 UTC End: 13:32:20 UTC
 Trip Odometer Reading: Start: 331.4 km (205.9 mi) End: 363.1 km (225.6 mi)
 Ambient Temperature: Start: 28.2°C (82.8°F) End: 28.9°C (84.0°F)
 Roadway Temperature: Start: 29.8°C (85.6°F) End: 31.2°C (88.2°F)
 Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 114
10:53 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 114
9:27 minutes (cumulative stopwatch time) 15.9 km (9.9 mi) distance

Max speed: 99.8 km/h (62.0 mph)

Total Cumulative Driving Time: 20:20 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 35 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO J – Left Rear, Right Rear, and Right 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: Inflation Pressure	235.6 kPa (34.2 psi)	241.9 kPa (35.1 psi)	240.7 kPa (34.9 psi)	236.7 kPa (34.3 psi)
Tire Sidewall Temp	42.0°C (107.6°F)	45.8°C (114.4°F)	44.2°C (111.6°F)	45.4°C (113.7°F)
San Angelo Test Facility Shop Floor Temp	31.8°C (89.2°F)	32.2°C (90.0°F)	32.6°C (90.7°F)	32.4°C (90.3°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 (X)LR (X)RR (X)RF Inflation Pressure		158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 115

Total distance to illumination: 8.4 km (5.2 mi)

Time to illumination: 3:58 minutes (cumulative stopwatch time)

Max speed: 95.2 km/h (59.2 mph)

Total Cumulative Driving Time: 3:58 minutes (VBox processed data)

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 36 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO J – Left Rear, Right Rear, and Right 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: Ambient Temperature: <u>31.2°C (88.2°F)</u> Vehicle cool down period: <u>64</u> minutes				
Inflation Pressure	226.5 kPa (32.9 psi)	150.4 kPa (21.8 psi)	151.5 kPa (22.0 psi)	152.8 kPa (22.2 psi)
Tire Sidewall Temp	38.2°C (100.8°F)	37.4°C (99.3°F)	39.6°C (103.3°F)	39.4°C (102.9°F)
San Angelo Test Facility Shop Floor Temp	33.4°C (92.1°F)	33.6°C (92.5°F)	33.6°C (92.5°F)	33.6°C (92.5°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 18, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 37 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO K – Left Rear and Right Front Tire Deflation at UVW + VCW

TEST DATE: August 18, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>31.7°C (89.1°F)</u> Vehicle cool down period: <u>75</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	38.2°C (100.8°F)	37.4°C (99.3°F)	39.6°C (103.3°F)	39.4°C (102.9°F)
San Angelo Test Facility Shop Floor Temp	33.4°C (92.1°F)	33.6°C (92.5°F)	33.6°C (92.5°F)	33.6°C (92.5°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 15:31:38 UTC End: 15:57:20 UTC
 Trip Odometer Reading: Start: 384.8 km (239.1 mi) End: 416.5 km (258.8 mi)
 Ambient Temperature: Start: 31.7°C (89.1°F) End: 32.7°C (90.9°F)
 Roadway Temperature: Start: 42.2°C (108.0°F) End: 44.8°C (112.6°F)
 Weather Conditions: Sunny, light breeze

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 116
10:56 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 116
9:17 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 97.6 km/h (60.6 mph)

Total Cumulative Driving Time: 20:13 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 38 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO K – Left Rear and Right 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: Inflation Pressure	236.5 kPa (34.3 psi)	241.5 kPa (35.0 psi)	241.8 kPa (35.1 psi)	237.4 kPa (34.4 psi)
Tire Sidewall Temp	50.0°C (122.0°F)	51.8°C (125.2°F)	54.2°C (129.6°F)	52.6°C (126.7°F)
San Angelo Test Facility Shop Floor Temp	34.2°C (93.6°F)	34.8°C (94.6°F)	35.2°C (95.4°F)	34.8°C (94.6°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 (X)LR ()RR (X)RF Inflation Pressure		158.0 kPa (22.9 psi)		158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 117

Total distance to illumination: 9.0 km (5.6 mi)

Time to illumination: 1:47 minutes (cumulative stopwatch time)

Max speed: 94.1 km/h (58.5 mph)

Total Cumulative Driving Time: 4:32 minutes (VBox processed data)

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 39 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO K – Left Rear and Right 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: Ambient Temperature: <u>34.8°C (94.6°F)</u> Vehicle cool down period: <u>60</u> minutes				
Inflation Pressure	224.7 kPa (32.6 psi)	150.3 kPa (21.8 psi)	225.8 kPa (32.7 psi)	151.5 kPa (22.0 psi)
Tire Sidewall Temp	42.2°C (108.0°F)	44.0°C (111.2°F)	42.8°C (109.0°F)	43.4°C (110.1°F)
San Angelo Test Facility Shop Floor Temp	34.8°C (94.6°F)	34.5°C (94.1°F)	35.6°C (96.1°F)	35.6°C (96.1°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 18, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 40 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO L – Right Front Tire Deflation at UVW + VCW

TEST DATE: August 19, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>29.8°C (85.6°F)</u> Vehicle cool down period: <u>61</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	36.2°C (97.2°F)	36.4°C (97.5°F)	36.8°C (98.2°F)	37.0°C (98.6°F)
San Angelo Test Facility Shop Floor Temp	32.4°C (90.3°F)	32.6°C (90.7°F)	33.0°C (91.4°F)	32.8°C (91.0°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 14:58:48 UTC End: 15:24:53 UTC
 Trip Odometer Reading: Start: 480.4 km (298.5 mi) End: 511.9 km (318.1 mi)
 Ambient Temperature: Start: 30.0°C (86.0°F) End: 32.1°C (89.8°F)
 Roadway Temperature: Start: 37.4°C (99.3°F) End: 40.2°C (104.4°F)
 Weather Conditions: Sunny, breezy

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 118
10:51 minutes (cumulative stopwatch time) 17.2 km (10.7 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 118
9:20 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 99.3 km/h (61.7 mph)

Total Cumulative Driving Time: 20:11 minutes (VBox processed data)

DATA SHEET 3 (Sheet 41 of 51)
TPMS OPERATIONAL PERFORMANCE
SCENARIO L – Right 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: Inflation Pressure	238.2 kPa (34.5 psi)	240.1 kPa (34.8 psi)	240.2 kPa (34.8 psi)	236.4 kPa (34.3 psi)
Tire Sidewall Temp	49.4°C (120.9°F)	50.2°C (122.4°F)	51.6°C (124.9°F)	51.8°C (125.2°F)
San Angelo Test Facility Shop Floor Temp	32.8°C (91.0°F)	33.6°C (92.5°F)	34.0°C (93.2°F)	33.8°C (92.8°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 ()RR (X)RF Inflation Pressure				158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 119

Total distance to illumination: 5.1 km (3.2mi)

Time to illumination: 1:30 minutes (cumulative stopwatch time)

Max speed: 88.9 km/h (55.2 mph)

Total Cumulative Driving Time: 1:30 minutes (VBox processed data)

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 42 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO L – Right 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: Ambient Temperature: <u>34.8°C (94.6°F)</u> Vehicle cool down period: <u>62</u> minutes				
Inflation Pressure	226.9 kPa (32.9 psi)	224.0 kPa (32.5 psi)	223.9 kPa (32.5 psi)	151.1 kPa (21.9 psi)
Tire Sidewall Temp	41.4°C (106.5°F)	40.4°C (104.7°F)	40.8°C (105.4°F)	43.2°C (109.8°F)
San Angelo Test Facility Shop Floor Temp	34.6°C (94.3°F)	35.2°C (95.4°F)	35.2°C (95.4°F)	35.8°C (96.4°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Right front tire was deflated at UVW + VCW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 19, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 43 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO M – Left Rear Tire Deflation at UVW + VCW

TEST DATE: August 22, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>27.4°C (81.3°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	29.2°C (84.6°F)	29.2°C (84.6°F)	29.4°C (84.9°F)	29.4°C (84.9°F)
San Angelo Test Facility Shop Floor Temp	30.8°C (87.4°F)	31.2°C (88.2°F)	31.4°C (88.5°F)	31.2°C (88.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:17:42 UTC End: 13:43:14 UTC
 Trip Odometer Reading: Start: 526.9 km (327.4 mi) End: 558.4 km (347.0 mi)
 Ambient Temperature: Start: 26.9°C (80.4°F) End: 28.0°C (82.4°F)
 Roadway Temperature: Start: 30.2°C (86.4°F) End: 31.6°C (88.9°F)
 Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 120
10:54 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 120
9:20 minutes (cumulative stopwatch time) 14.2 km (8.8 mi) distance

Max speed: 97.2 km/h (60.4 mph)

Total Cumulative Driving Time: 20:14 minutes (VBox processed data)

DATA SHEET 3 (Sheet 44 of 51)
TPMS OPERATIONAL PERFORMANCE
SCENARIO M – Left Rear 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: Inflation Pressure	237.5 kPa (34.4 psi)	242.8 kPa (35.2 psi)	242.1 kPa (35.1 psi)	239.1 kPa (34.7 psi)
Tire Sidewall Temp	38.8°C (101.8°F)	44.8°C (112.6°F)	45.6°C (114.1°F)	45.0°C (113.0°F)
San Angelo Test Facility Shop Floor Temp	31.4°C (88.5°F)	32.2°C (90.0°F)	32.4°C (90.3°F)	32.0°C (89.6°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 (X)LR ()RR ()RF Inflation Pressure		158.0 kPa (22.9 psi)		

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 121

Total distance to illumination: 4.2 km (2.6 mi)

Time to illumination: 1:35 minutes (cumulative stopwatch time)

Max speed: 81.1 km/h (50.4 mph)

Total Cumulative Driving Time: 1:35 minutes (VBox processed data)

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 45 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO M – Left 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: Ambient Temperature: <u>31.4°C (88.5°F)</u> Vehicle cool down period: <u>69</u> minutes				
Inflation Pressure	227.6 kPa (33.0 psi)	150.1 kPa (21.8 psi)	227.2 kPa (33.0 psi)	228.0 kPa (33.1 psi)
Tire Sidewall Temp	37.2°C (99.0°F)	36.8°C (98.2°F)	36.4°C (97.5°F)	36.4°C (97.5°F)
San Angelo Test Facility Shop Floor Temp	32.6°C (90.7°F)	33.2°C (91.8°F)	33.2°C (91.8°F)	32.8°C (91.0°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: Re-adjusted Inflation Pressure:				
	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

Left rear was deflated at UVW + VCW.

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 22, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 46 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO N – Right Front and Right Rear Tire Deflation at UVW + VCW

TEST DATE: August 22, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>31.8°C (89.2°F)</u> Vehicle cool down period: <u>79</u> minutes				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	37.2°C (99.0°F)	36.8°C (98.2°F)	36.4°C (97.5°F)	36.4°C (97.5°F)
San Angelo Test Facility Shop Floor Temp	32.6°C (90.7°F)	33.2°C (91.8°F)	33.2°C (91.8°F)	32.8°C (91.0°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 15:36:50 UTC End: 16:02:51 UTC
 Trip Odometer Reading: Start: 572.8 km (355.9 mi) End: 604.5 km (375.6 mi)
 Ambient Temperature: Start: 31.8°C (89.2°F) End: 32.8°C (91.0°F)
 Roadway Temperature: Start: 43.2°C (109.8°F) End: 45.0°C (113.0°F)
 Weather Conditions: Sunny, light breeze

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 122
10:56 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 122
9:24 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 99.6 km/h (61.9 mph)

Total Cumulative Driving Time: 20:20 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 47 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO N – Right Front and Right Rear 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: Inflation Pressure	237.9 kPa (34.5 psi)	241.3 kPa (35.0 psi)	242.1 kPa (35.1 psi)	238.5 kPa (34.6 psi)
Tire Sidewall Temp	50.6°C (123.1°F)	51.2°C (124.2°F)	53.4°C (128.1°F)	52.4°C (126.3°F)
San Angelo Test Facility Shop Floor Temp	34.4°C (93.9°F)	35.0°C (95.0°F)	35.2°C (95.4°F)	34.6°C (94.3°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 (X)RF Inflation Pressure			158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 123

Total distance to illumination: 6.0 km (3.7 mi)

Time to illumination: 2:32 minutes (cumulative stopwatch time)

Max speed: 81.9 km/h (50.9 mph)

Total Cumulative Driving Time: 2:32 minutes (VBox processed data)

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 48 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO N – Right Front 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: Ambient Temperature: <u>35.5°C (95.9°F)</u> Vehicle cool down period: <u>66</u> minutes				
Inflation Pressure	226.4 kPa (32.8 psi)	227.1 kPa (32.9 psi)	149.9 kPa (21.7 psi)	151.4 kPa (22.0 psi)
Tire Sidewall Temp	41.6°C (106.9°F)	43.2°C (109.8°F)	42.2°C (108.0°F)	42.8°C (109.0°F)
San Angelo Test Facility Shop Floor Temp	35.6°C (96.1°F)	36.4°C (97.5°F)	36.4°C (97.5°F)	36.0°C (96.8°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 22, 2011

APPROVED BY: Kenneth H. Yates

**DATA SHEET 3 (Sheet 49 of 51)
TPMS OPERATIONAL PERFORMANCE**

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

TEST DATE: August 23, 2011 LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Note: See Data Sheet 3 (Sheet 30 of 51) 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: Ambient Temperature: <u>28.1°C (82.6°F)</u> Vehicle cool down period: <u>overnight</u>				
Inflation Pressure	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)
Tire Sidewall Temp	29.8°C (85.6°F)	29.8°C (85.6°F)	29.8°C (85.6°F)	29.8°C (85.6°F)
San Angelo Test Facility Shop Floor Temp	31.4°C (88.5°F)	31.8°C (89.2°F)	32.0°C (89.6°F)	31.8°C (89.2°F)

SYSTEM CALIBRATION/LEARNING PHASE:

Time: Start: 13:13:26 UTC End: 13:38:43 UTC
 Trip Odometer Reading: Start: 622.2 km (386.6 mi) End: 653.9 km (406.3 mi)
 Ambient Temperature: Start: 28.1°C (82.6°F) End: 28.9°C (84.0°F)
 Roadway Temperature: Start: 30.8°C (87.4°F) End: 32.2°C (90.0°F)
 Weather Conditions: Sunny, calm

Driving in first direction:

Starting point: GAFB south gate Direction: see chart, page 124
10:52 minutes (cumulative stopwatch time) 17.4 km (10.8 mi) distance

Driving in opposite direction:

Starting point: US 87 crossover overpass Direction: see chart, page 124
9:24 minutes (cumulative stopwatch time) 14.3 km (8.9 mi) distance

Max speed: 97.6 km/h (60.6 mph)

Total Cumulative Driving Time: 20:16 minutes (VBox processed data)

**DATA SHEET 3 (Sheet 50 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO O – Left Front, Left Rear, and Right 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: Inflation Pressure	236.0 kPa (34.2 psi)	240.5 kPa (34.9 psi)	240.0 kPa (34.8 psi)	237.1 kPa (34.4 psi)
Tire Sidewall Temp	43.4°C (110.1°F)	44.8°C (112.6°F)	45.8°C (114.4°F)	46.2°C (115.2°F)
San Angelo Test Facility Shop Floor Temp	32.0°C (89.6°F)	32.8°C (91.0°F)	33.2°C (91.8°F)	33.2°C (91.8°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 (X)LR ()RR (X)RF Inflation Pressure	158.0 kPa (22.9 psi)	158.0 kPa (22.9 psi)		158.0 kPa (22.9 psi)

TELLTALE ILLUMINATION:

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 125

Total distance to illumination: 9.3 km (5.8 mi)

Time to illumination: 4:51 minutes (cumulative stopwatch time)

Max speed: 93.3 km/h (58.0 mph)

Total Cumulative Driving Time: 4:51 minutes (VBox processed data)

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 51 of 51)
TPMS OPERATIONAL PERFORMANCE**

SCENARIO O – Left Front, Left Rear, and Right 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: Ambient Temperature: <u>31.7°C (89.1°F)</u> Vehicle cool down period: <u>66</u> minutes				
Inflation Pressure	152.4 kPa (22.1 psi)	150.2 kPa (21.8 psi)	224.8 kPa (32.6 psi)	152.2 kPa (22.1 psi)
Tire Sidewall Temp	36.6°C (97.9°F)	36.2°C (97.2°F)	35.8°C (96.4°F)	37.6°C (99.7°F)
San Angelo Test Facility Shop Floor Temp	33.0°C (91.4°F)	33.8°C (92.8°F)	33.6°C (92.5°F)	33.6°C (92.5°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: Re-adjusted Inflation Pressure:	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)	220.0 kPa (31.9 psi)

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

TEST RESULTS

TPMS Performance Test Results (PASS/FAIL)

PASS

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

REMARKS: Upon re-adjusting tire pressure, the manufacturer instructions also require activation of the reset button in the glove box. Upon activation of the reset feature, the low inflation pressure telltale extinguished.

RECORDED BY: Todd P. Groghan

DATE: August 23, 2011

APPROVED BY: Kenneth H. Yates

DATA SHEET 4 (Sheet 1 of 8)
Scenario P – Malfunction Detection Test –
TPMS Fuse Removal

TEST DATE: August 18, 2011

LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Time: Start: 12:45 pm End: 12:55 pm

Odometer Reading: Start: 473 km (294 mi) End: 473 km (294 mi)

Ambient Temperature: Start: 34.8°C (94.6°F) End: 34.8°C (94.6°F)

Fuel Level: Start: 3/4

Note: See Data Sheet 3 (Sheet 30 of 51) for Test Weight.

TPMS TYPE: () Direct (X) 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: TPMS fuse was removed from the under-hood fuse box. (See Figure 5.16)

MALFUNCTION TELLTALE ILLUMINATION

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

Combination Malfunction Telltale

Driving in first direction:

Starting point: San Angelo Test Facility shop

Combination malfunction telltale illuminated 3 seconds after ignition on. Driving was not necessary.

COMBINATION MALFUNCTION TELLTALE ILLUMINATES (FLASHING AND ILLUMINATION SEQUENCE) WITHIN 20 MINUTES:

(X)YES ()NO

DATA SHEET 4 (Sheet 2 of 8)
Scenario P – Malfunction Detection Test –
TPMS Fuse Removal

After 5 minutes with the ignition locking system in the “Off” or “Lock” position, does the combination low tire pressure/malfunction telltale flash for a period of at least 60 seconds but no longer than 90 seconds, and then remain illuminated when the ignition locking system is activated to the “On” or “Run” position? YES NO (fail)

Time it takes before telltale starts flashing 3 seconds

Time telltale remains flashing 65 seconds

Time telltale remains illuminated >60 seconds
(Verified for a minimum of 60 seconds)

Deactivate the ignition locking system and then re-start the vehicle engine. Does the telltale’s illumination sequence repeat when the ignition locking system is activated and the engine running? YES NO (fail)

Extinguishment Phase:

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

COMBINATION MALFUNCTION TELLTALE EXTINGUISHED: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (FAIL)

TPMS MALFUNCTION PERFORMANCE TEST RESULTS (PASS/FAIL) PASS
TPMS fuse was removed from under-hood fuse block at UVW + VCW.

REMARKS: After re-insertion of the fuse and ignition-on, the low inflation pressure
 telltale extinguished immediately after lamp check.

RECORDED BY: Todd P. Groghan

DATE: August 18, 2011

APPROVED BY: Kenneth H. Yates

DATA SHEET 4 (Sheet 3 of 8)
Scenario Q – Malfunction Detection Test –
TPMS ABS/ESP Module Disconnection

TEST DATE: August 18, 2011

LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Time: Start: 1:02 pm End: 1:15 pm

Odometer Reading: Start: 473 km (294 mi) End: 473 km (294 mi)

Ambient Temperature: Start: 34.8°C (94.6°F) End: 34.8°C (94.6°F)

Roadway Temperature: Start: NA End: NA

Fuel Level: Start: 3/4

Note: See Data Sheet 3 (Sheet 30 of 51) for Test Weight.

TPMS TYPE: () Direct (X) 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: ABS/ESP module was disconnected (see
Figure 5.17).

MALFUNCTION TELLTALE ILLUMINATION

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

Combination Malfunction Telltale

Driving in first direction:

Starting point: San Angelo Test Facility shop

Combination malfunction telltale illuminated 3 seconds after ignition on. Driving was not necessary.

COMBINATION MALFUNCTION TELLTALE ILLUMINATES (FLASHING AND ILLUMINATION SEQUENCE) WITHIN 20 MINUTES:

(X)YES ()NO

DATA SHEET 4 (Sheet 5 of 8)
Scenario R – Malfunction Detection Test –
ABS Wheel Speed Sensor Disconnection

TEST DATE: August 23, 2011

LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Time: Start: 12:30 pm End: 12:50 pm

Odometer Reading: Start: 711 km (442 mi) End: 711 km (442 mi)

Ambient Temperature: Start: 32.3°C (90.1°F) End: 33.5°C (92.3°F)

Roadway Temperature: Start: NA End: NA

Fuel Level: Start: Full

Note: See Data Sheet 3 (Sheet 16 of 51) for Test Weight.

TPMS TYPE: () Direct (X) 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: Right front ABS wheel speed sensor was
disconnected (see Figure 5.18).

MALFUNCTION TELLTALE ILLUMINATION

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

Combination Malfunction Telltale

Driving in first direction:

Starting point: San Angelo Test Facility shop

Combination malfunction telltale immediately after ignition on. Driving was not necessary.

COMBINATION MALFUNCTION TELLTALE ILLUMINATES (FLASHING AND ILLUMINATION SEQUENCE) WITHIN 20 MINUTES:

(X)YES ()NO

DATA SHEET 4 (Sheet 7 of 8)
Scenario S – Malfunction Detection Test –
Right Front Tire Replacement

TEST DATE: September 8, 2011

LAB: U.S. DOT San Angelo Test Facility

VEHICLE NHTSA NUMBER: CB5800

Time: Start: 16:11:32 End: 16:15:37

Trip Odometer Reading: Start: 1,262.4 km (784.4 mi) End: 1,266.7 km (787.1 mi)

Ambient Temperature: Start: 27.4°C (81.3°F) End: 27.6°C (81.7°F)

Roadway Temperature: Start: NA End: NA

Fuel Level: Start: 7/8

Note: See Data Sheet 3 (Sheet 16 of 51) for Test Weight.

TPMS TYPE: () Direct (X) 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: A tire of smaller diameter (185/55R15) was installed on the spare tire wheel, then fitted to the right front location on the vehicle (see Figure 5.19).

MALFUNCTION TELLTALE ILLUMINATION

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

Combination Malfunction Telltale

Driving in first direction:

Starting point: San Angelo Test Facility shop Direction: see chart, page 113
3:09 minutes (cumulative stopwatch time) 4.3 km (2.7 mi) distance

Max speed: 87.0 km/h (54.1 mph)

Total Cumulative Driving Time: 3:09 minutes (VBox processed data)

COMBINATION MALFUNCTION TELLTALE ILLUMINATES (FLASHING AND ILLUMINATION SEQUENCE) WITHIN 20 MINUTES:

YES () NO

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

TEST

DATE: August 1, 2011

LAB: San Angelo Test Facility

VEHICLE

NHTSA NO: CB5800

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:
(X)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 (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."

The above statement in the English language is provided verbatim in owner's manual:
(X)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:
(X)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: August 1, 2011

APPROVED BY: Kenneth H. Yates

SECTION 4
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

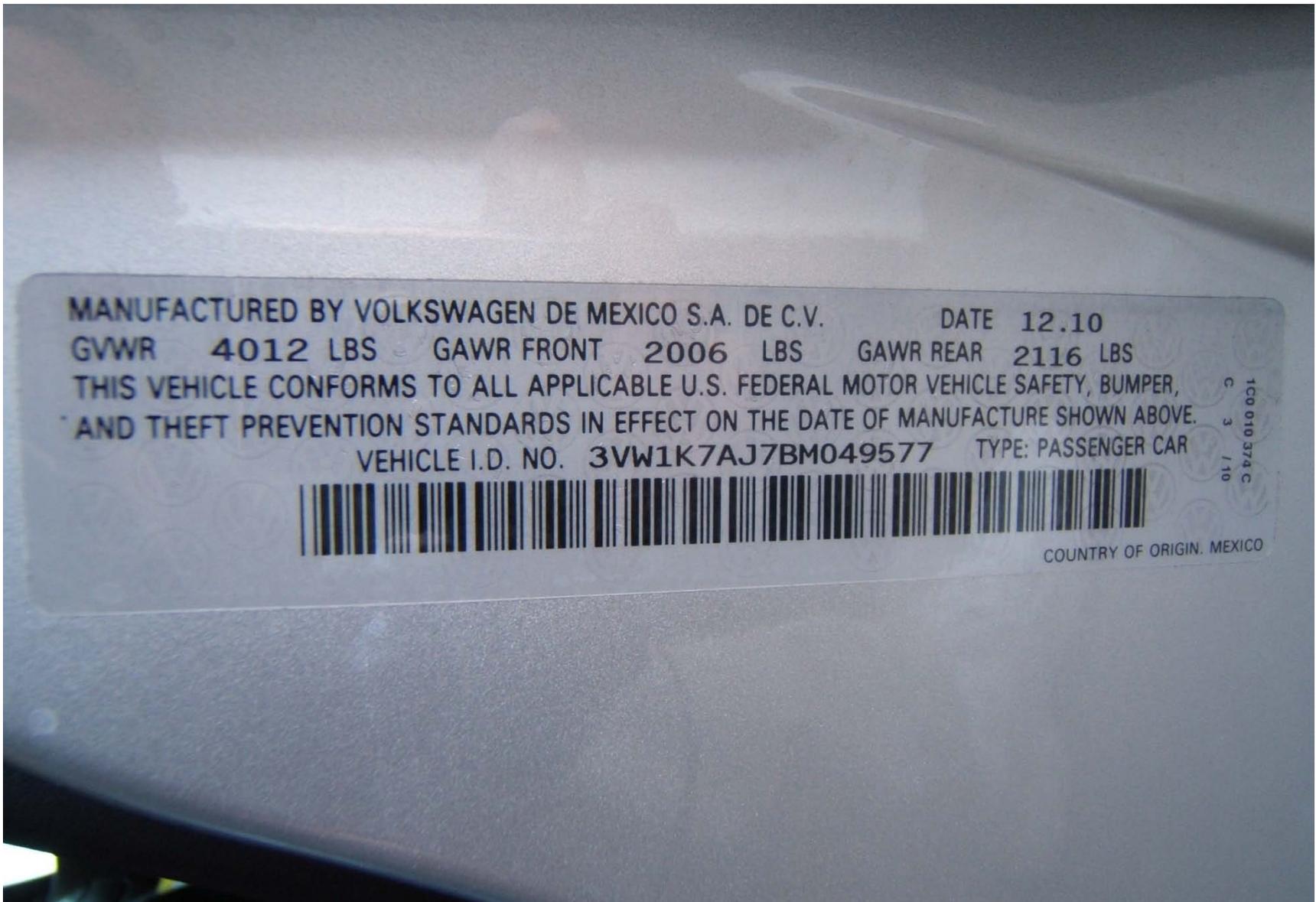
EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO	CAL. DATE	NEXT CAL. DATE
STOPWATCH	WESTCLOX QUARTZ STOPWATCH	N/A	N/A	N/A
VBOX RECORDING DEVICE	RACELOGIC VBOX III	SERIAL # 030209	12/02/2010	12/12/2011
AMBIENT TEMPERATURE GAUGE	FLUKE 179 DIGITAL THERMOMETER	SERIAL # 84740316	03/03/2011	03/03/2012
LASER TEMPERATURE GAUGE (TIRES AND GROUND)	RAYTEK MINITEMP MT6	SERIAL # MAG4000042598	04/22/2011	04/22/2012
AIR PRESSURE GAUGE	ASHCROFT GENERAL PURPOSE DIGITAL GAUGE	MODEL # D1005PS 02L 100 PSI SERIAL # 20017398-01	12/17/2010	12/17/2011
FLOOR SCALES (VEHICLE & BALLAST)	INTERCOMP SW DELUXE SCALES	PART #100156 SERIAL #27032382	6/30/2011	6/30/2012

SECTION 5
PHOTOGRAPHS



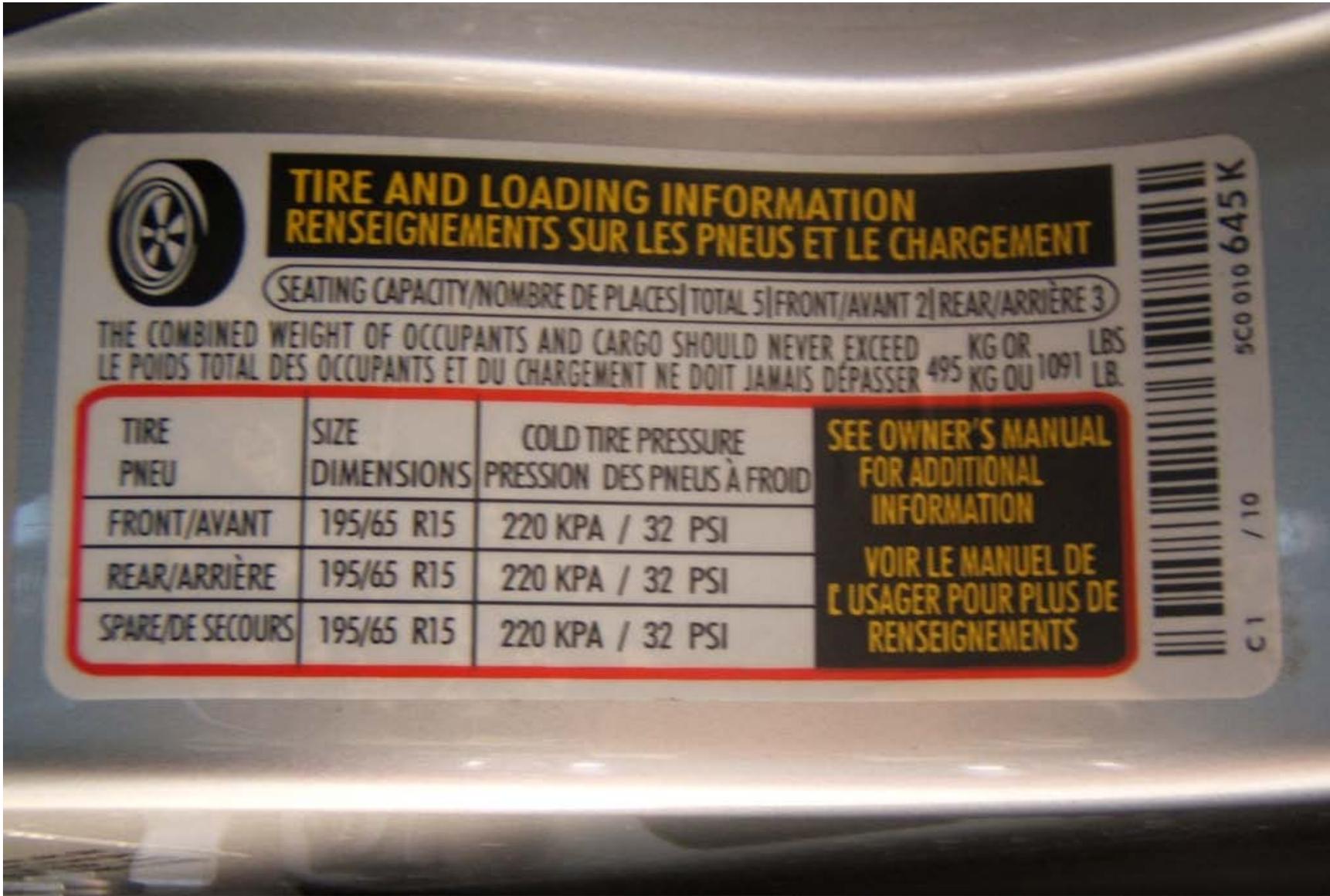
2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO.138

FIGURE 5.1
¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO.138

FIGURE 5.2
VEHICLE CERTIFICATION LABEL



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 FMVSS NO. 138

FIGURE 5.3
 VEHICLE PLACARD



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FMVSS NO. 138

FIGURE 5.4
TIRE SHOWING BRAND



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FMVSS NO. 138

FIGURE 5.5
TIRE SHOWING MODEL



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NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.6
TIRE SHOWING SIZE AND LOAD INDEX /SPEED RATING



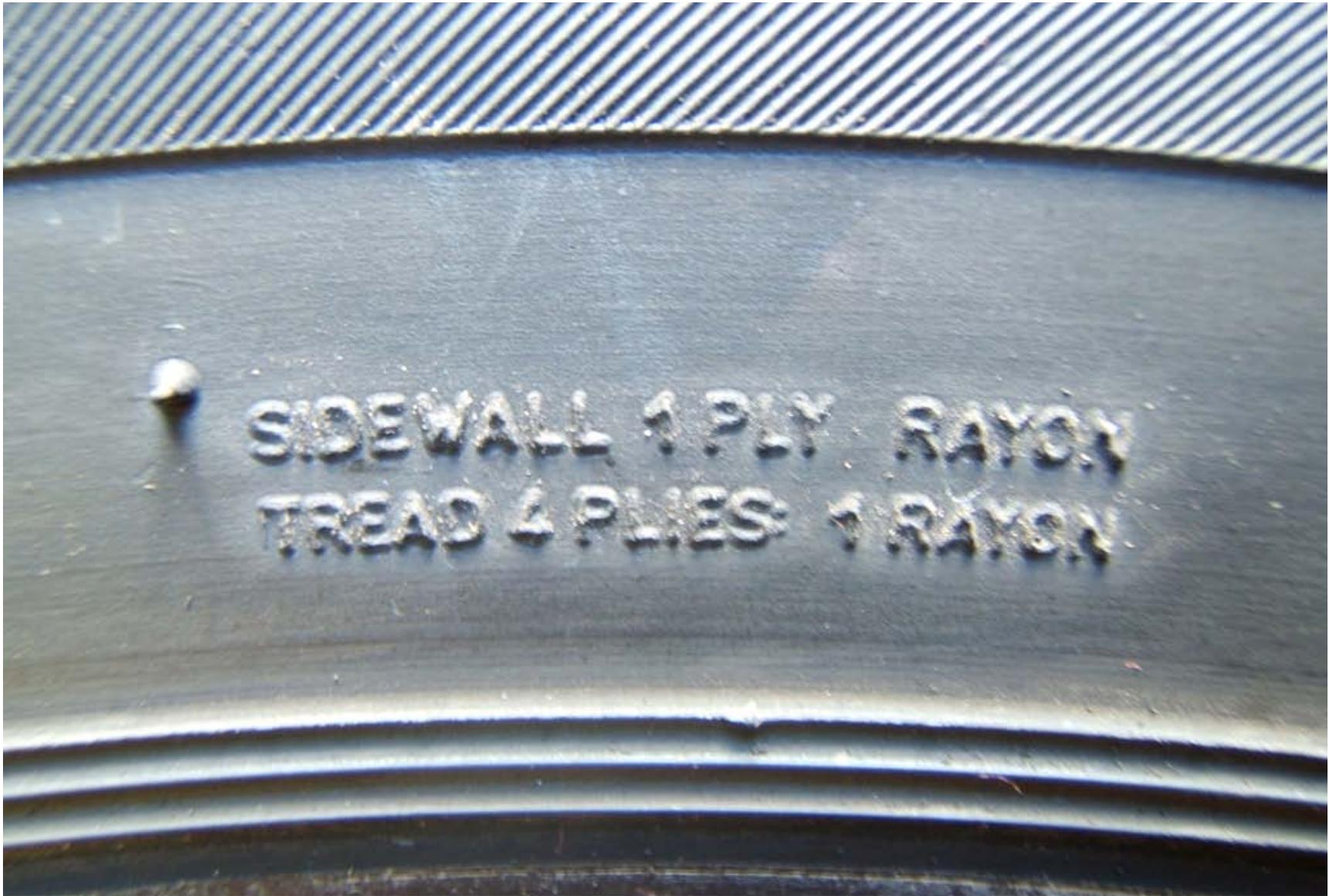
2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.7
TIRE SHOWING DOT SERIAL NUMBER



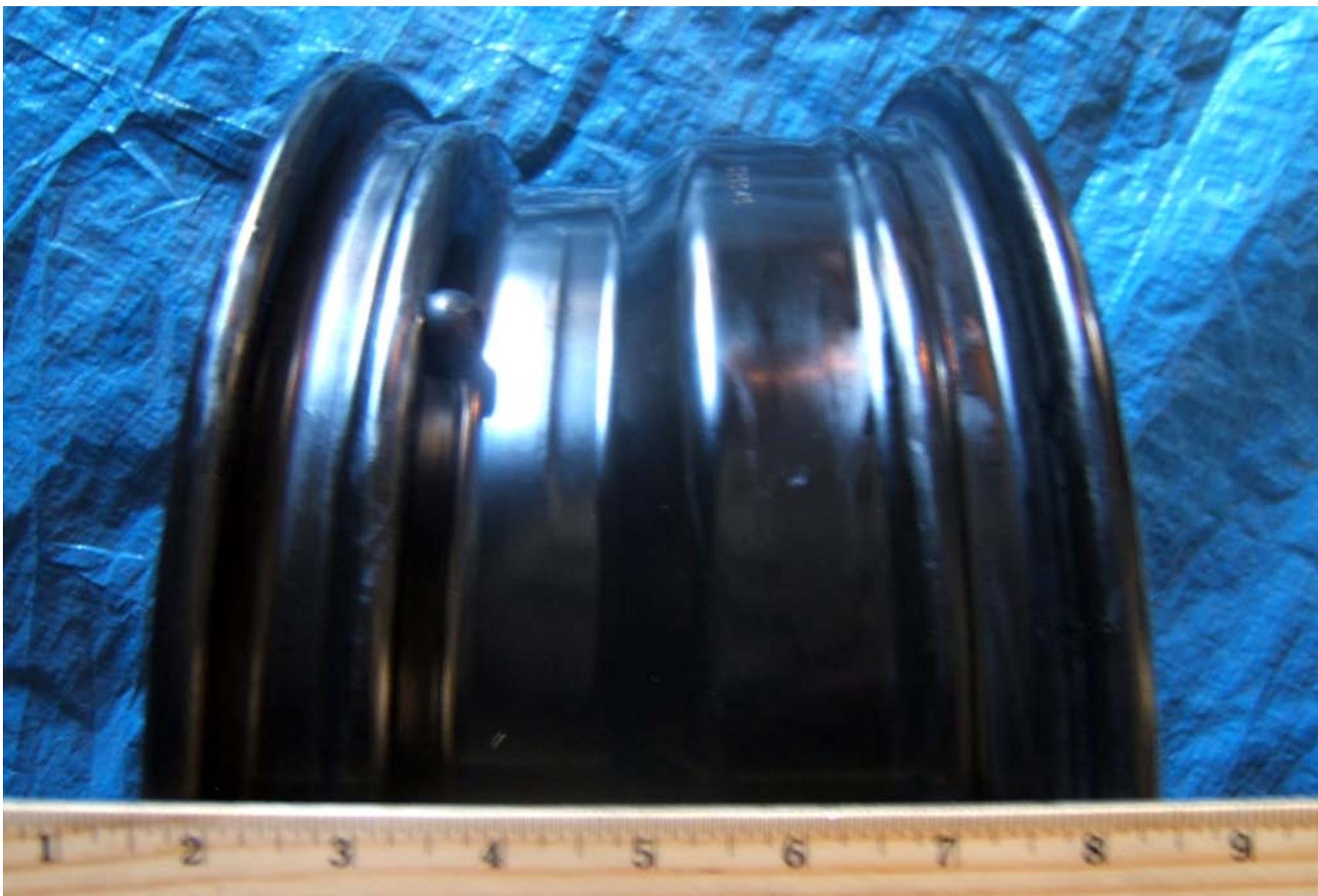
2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

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



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.9
TIRE SHOWING SIDEWALL / TREAD CONSTRUCTION



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NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.10
RIM SHOWING RIM CONTOUR FOR
FULL WIDTH OF CROSS SECTION



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.11
DISPLAY SHOWING COMBINATION LOW TIRE PRESSURE
WARNING / TPMS MALFUNCTION WARNING TELLTALE



2011 VOLKSWAGEN JETTA
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FMVSS NO 138

FIGURE 5.12
TEST INSTRUMENTATION INSTALLED IN VEHICLE



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.13
VEHICLE REAR SEAT BALLAST FOR UVW + VCW LOAD



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.14
VEHICLE CARGO AREA BALLAST FOR UVW + VCW LOAD



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.15
VEHICLE ON WEIGHT SCALES



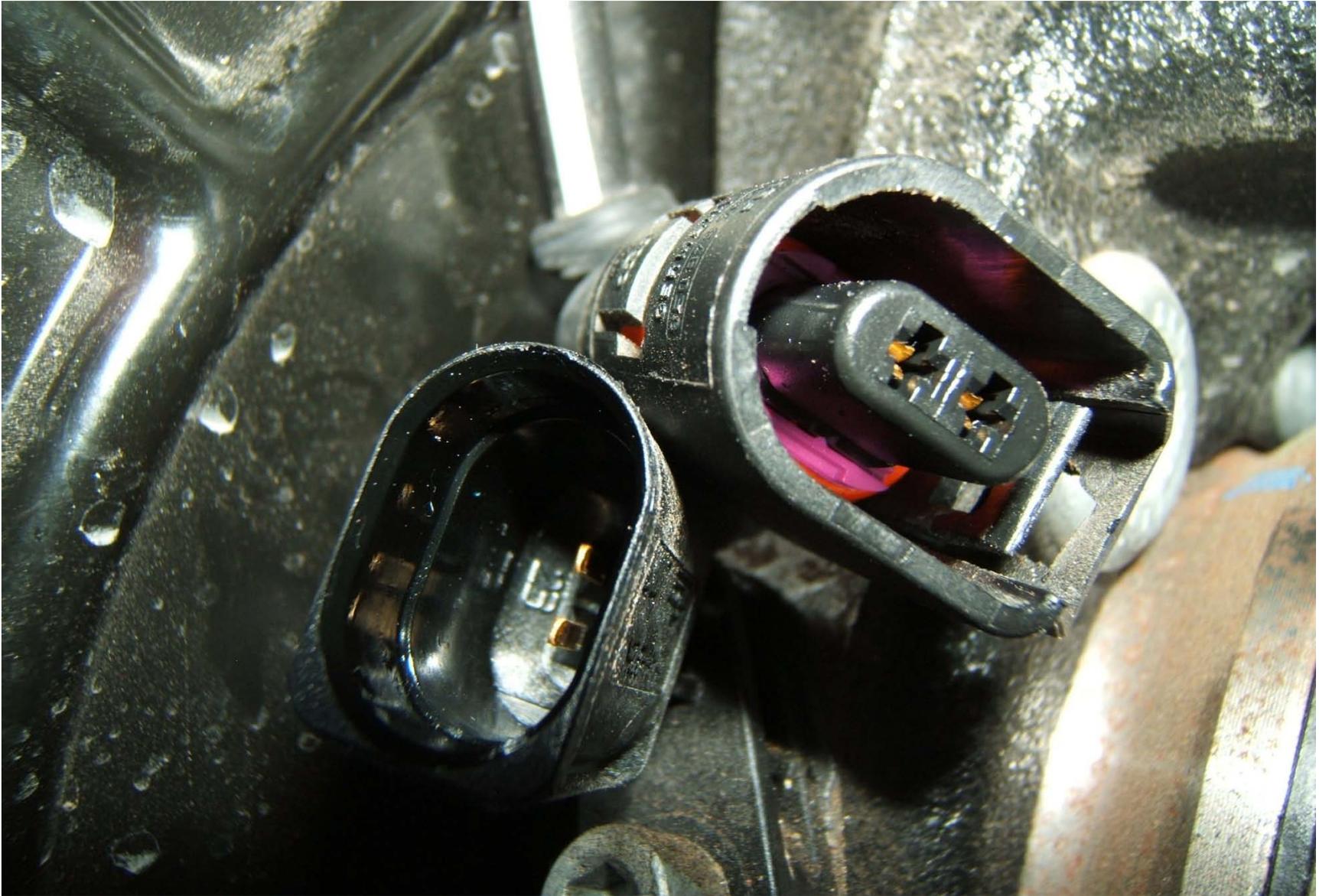
2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.16
MALFUNCTION DETECTION SCENARIO P -
TPMS FUSE REMOVAL



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.17
MALFUNCTION DETECTION SCENARIO Q -
TPMS ABS/ESP MODULE DISCONNECTION



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

FIGURE 5.18
MALFUNCTION DETECTION SCENARIO R -
ABS WHEEL SPEED SENSOR DISCONNECTION



2011 VOLKSWAGEN JETTA
NHTSA NO. CB5800
FMVSS NO. 138

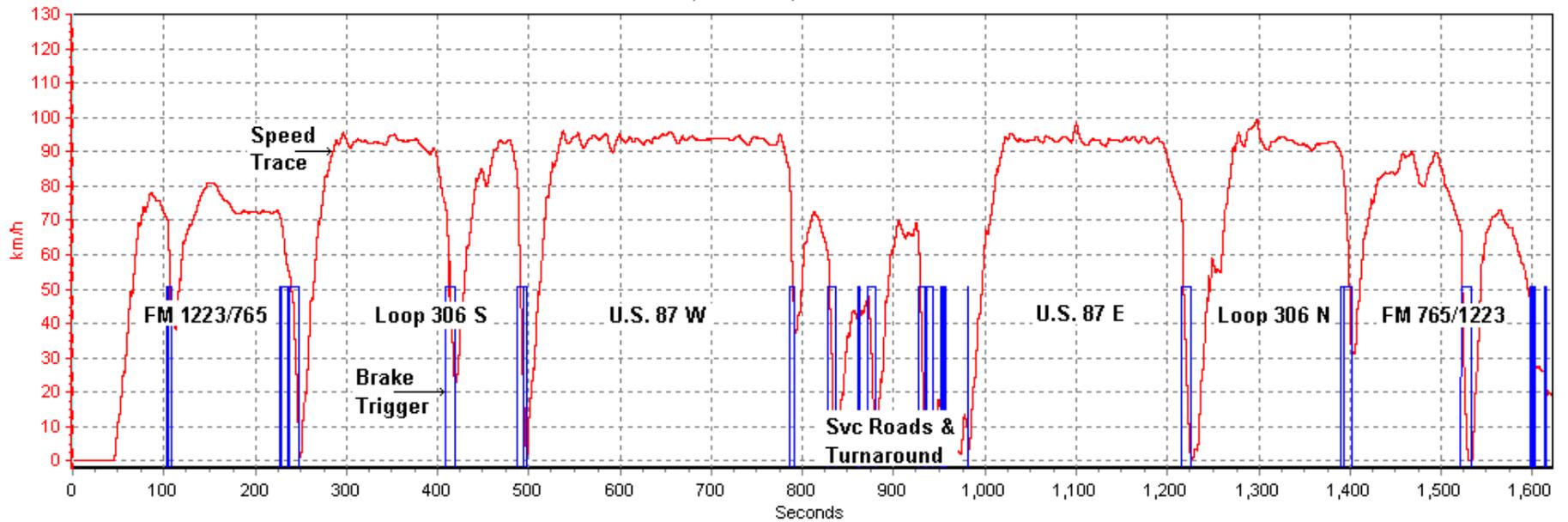
FIGURE 5.19
MALFUNCTION DETECTION SCENARIO S -
RIGHT FRONT TIRE REPLACEMENT

SECTION 6
TEST PLOTS

Scenario A: Left Front Tire at LLVW
Test Date: 8/9/11
Data File Time: 27:02 minutes
Cumulative Driving Time: 20:13 minutes
Start Point: GAFB south gate

Calibration Phase:

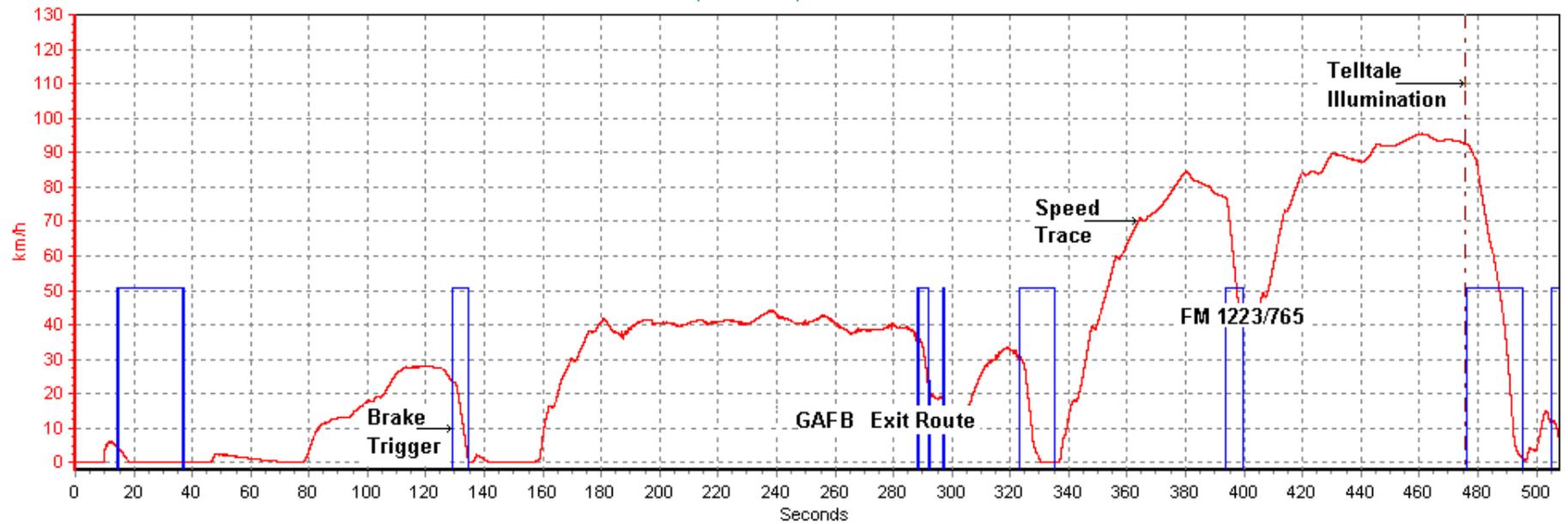
2011 VW Jetta (CB5800) LF Calibration LLVW



Scenario A: Left Front Tire at LLVW
Test Date: 8/9/11
Data File Time: 8:28 minutes
Cumulative Driving Time: 1:48 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

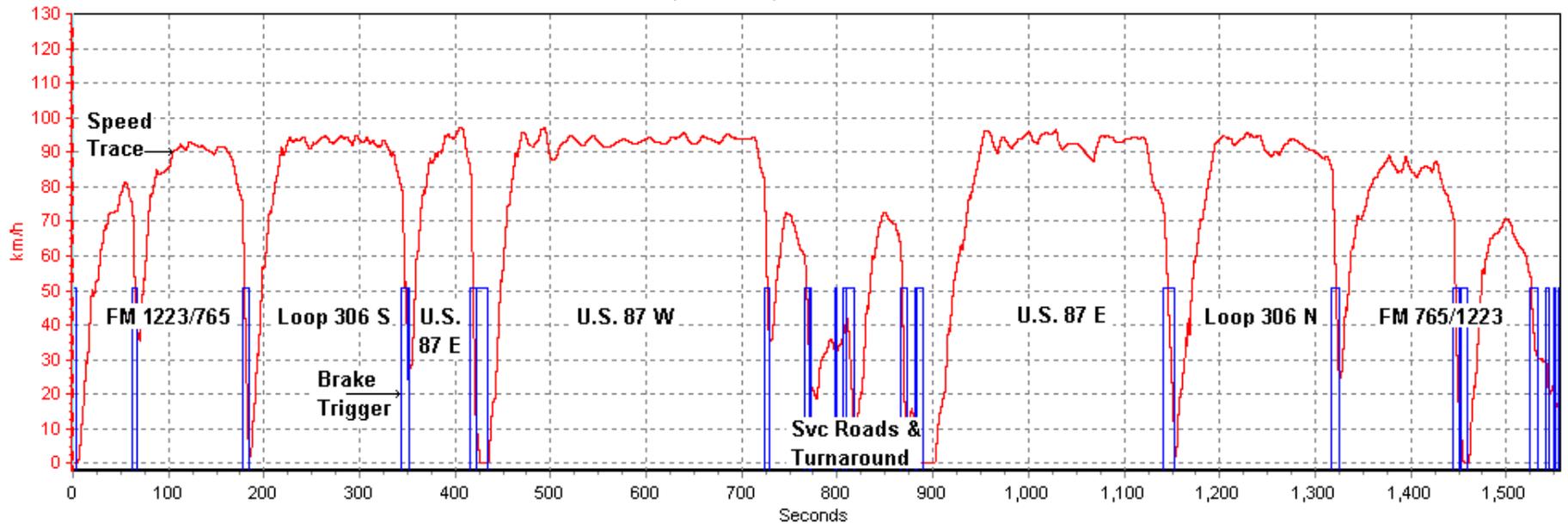
2011 VW Jetta (CB5800) LF Illumination LLVW



Scenario B: Left Front, Left Rear Tires at LLVW
Test Date: 8/12/11
Data File Time: 25:56 minutes
Cumulative Driving Time: 20:12minutes
Start Point: GAFB south gate

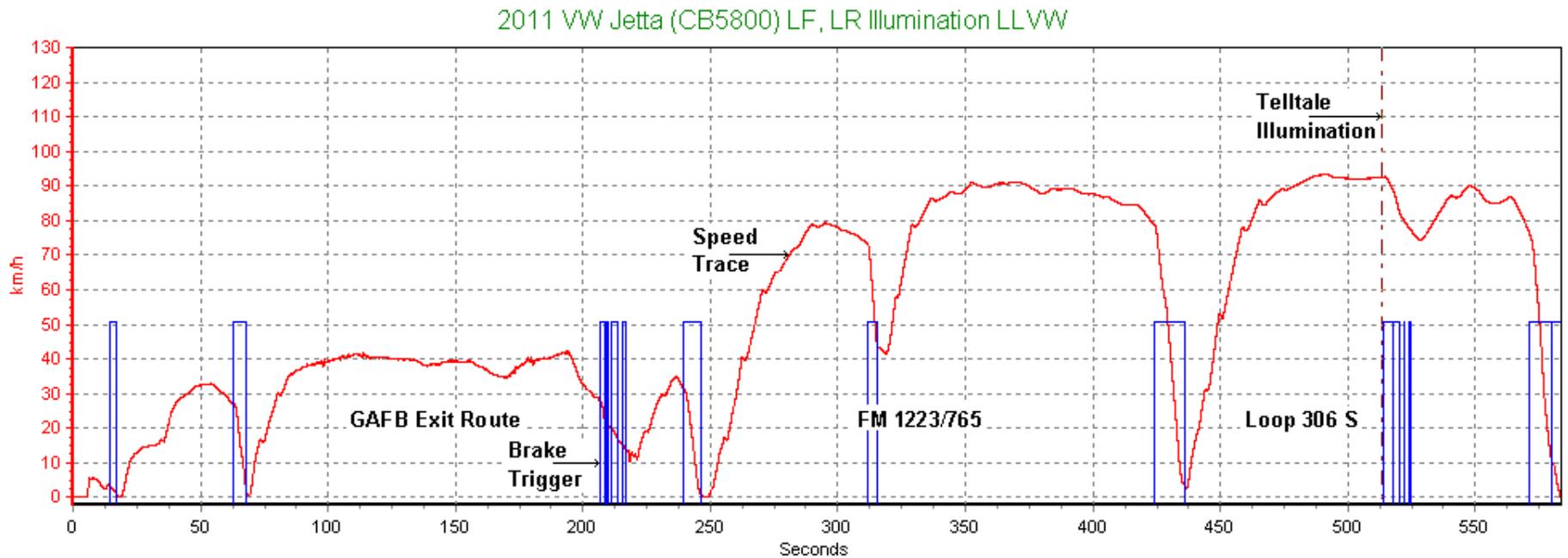
Calibration Phase:

2011 VW Jetta (CB5800) LF, LR Calibration LLVW



Scenario B: Left Front, Left Rear Tires at LLVW
Test Date: 8/12/11
Data File Time: 9:44 minutes
Cumulative Driving Time: 3:32 minutes
Start Point: San Angelo Test Facility shop

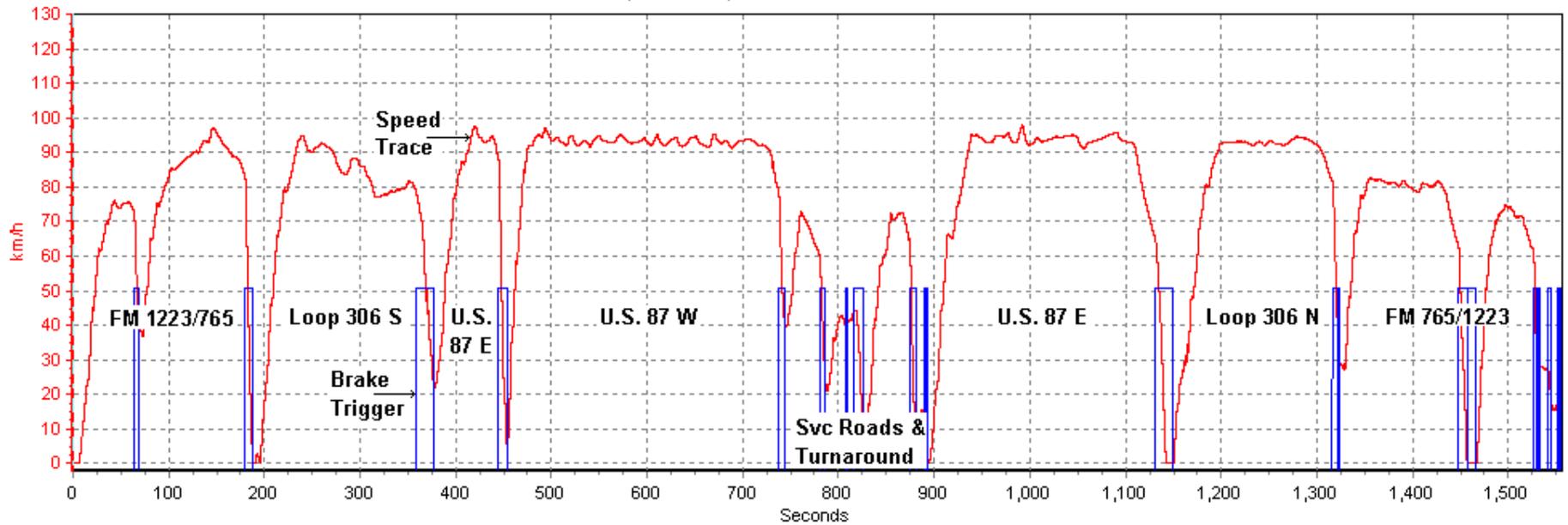
Detection Phase:



Scenario C: Left Front, Left Rear, Right Rear, Right Front Tires at LLVW
Test Date: 8/16/11
Data File Time: 25:56 minutes
Cumulative Driving Time: 20:13 minutes
Start Point: GAFB south gate

Calibration Phase:

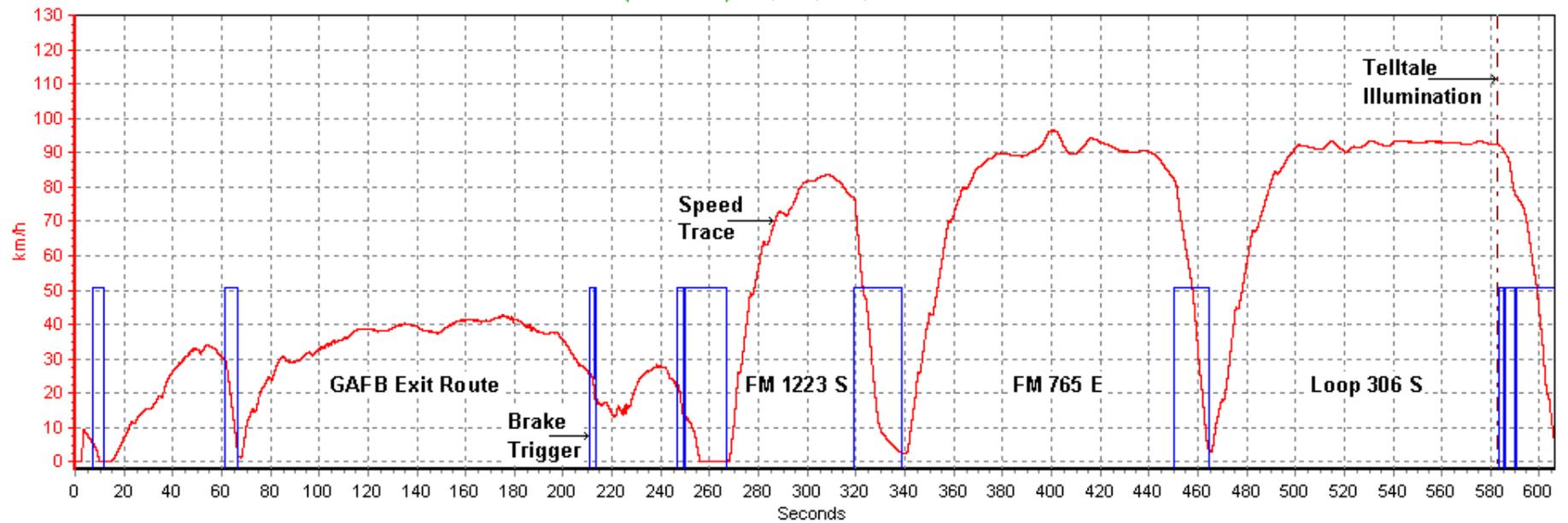
2011 VW Jetta (CB5800) LF, LR, RR, RF Calibration LLVW



Scenario C: Left Front, Left Rear, Right Rear, Right Front Tires at LLVW
Test Date: 8/16/11
Data File Time: 10:06 minutes
Cumulative Driving Time: 4:03 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

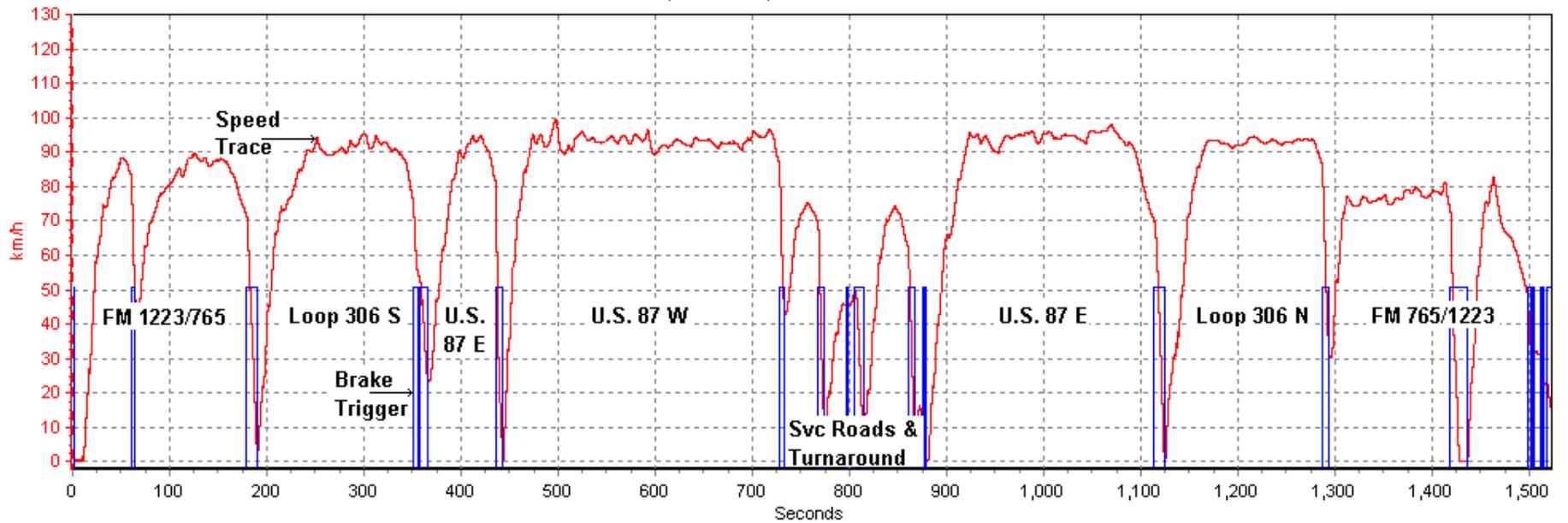
2011 VW Jetta (CB5800) LF, LR, RR, RF Illumination LLVW



Scenario D: Left Front, Right Rear Tires at LLVW
Test Date: 8/16/11
Data File Time: 25:24 minutes
Cumulative Driving Time: 20:18 minutes
Start Point: GAFB south gate

Calibration Phase:

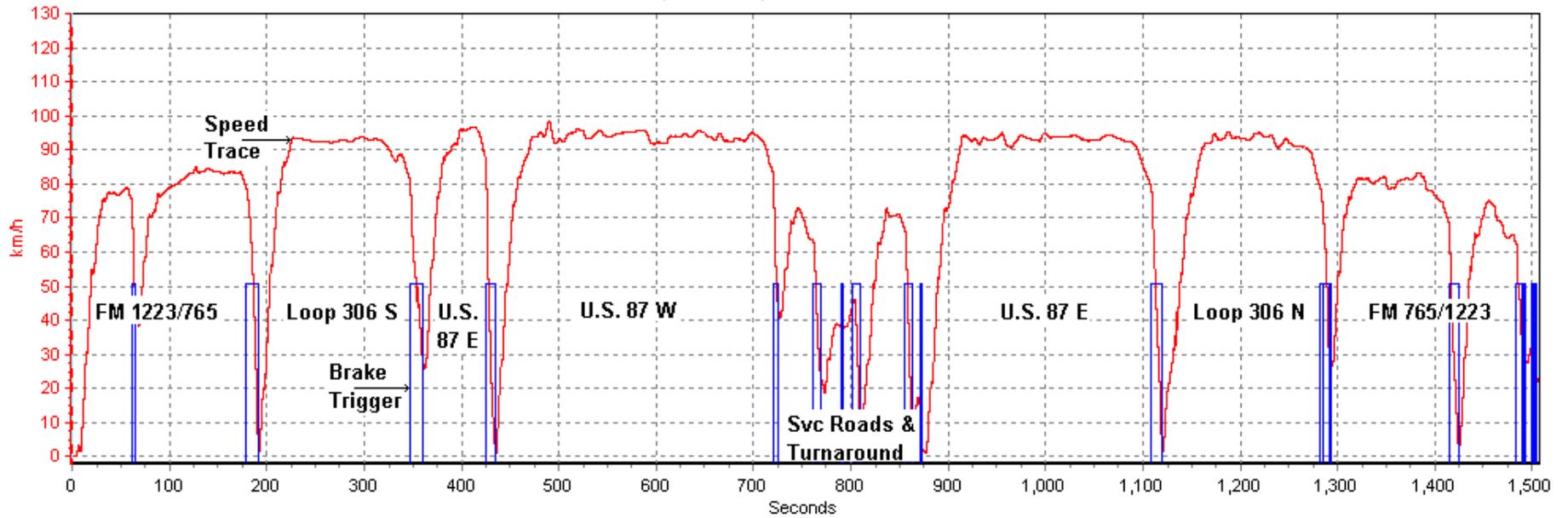
2011 VW Jetta (CB5800) LF, RR Calibration LLVW



Scenario E: Left Rear, Right Rear Tires at LLVW
Test Date: 8/24/11
Data File Time: 25:07 minutes
Cumulative Driving Time: 20:13 minutes
Start Point: GAFB south gate

Calibration Phase:

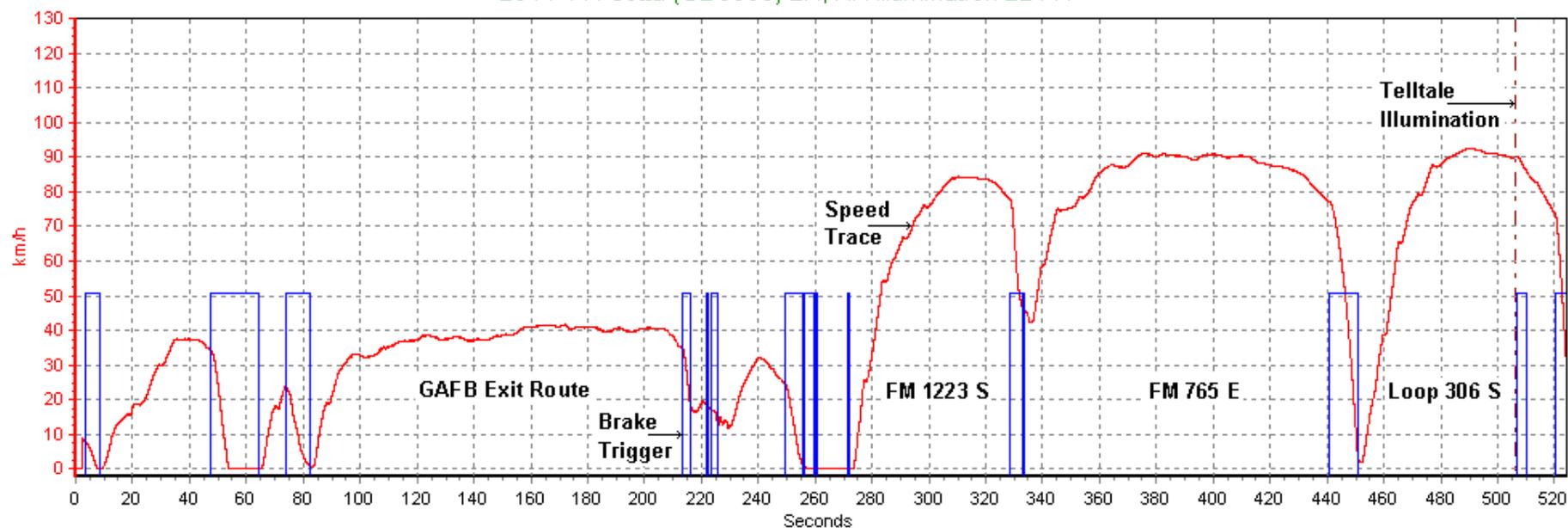
2011 VW Jetta (CB5800) LR, RR Calibration LLVW



Scenario E: Left Rear, Right Rear Tires at LLVW
Test Date: 8/24/11
Data File Time: 8:44 minutes
Cumulative Driving Time: 3:13 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

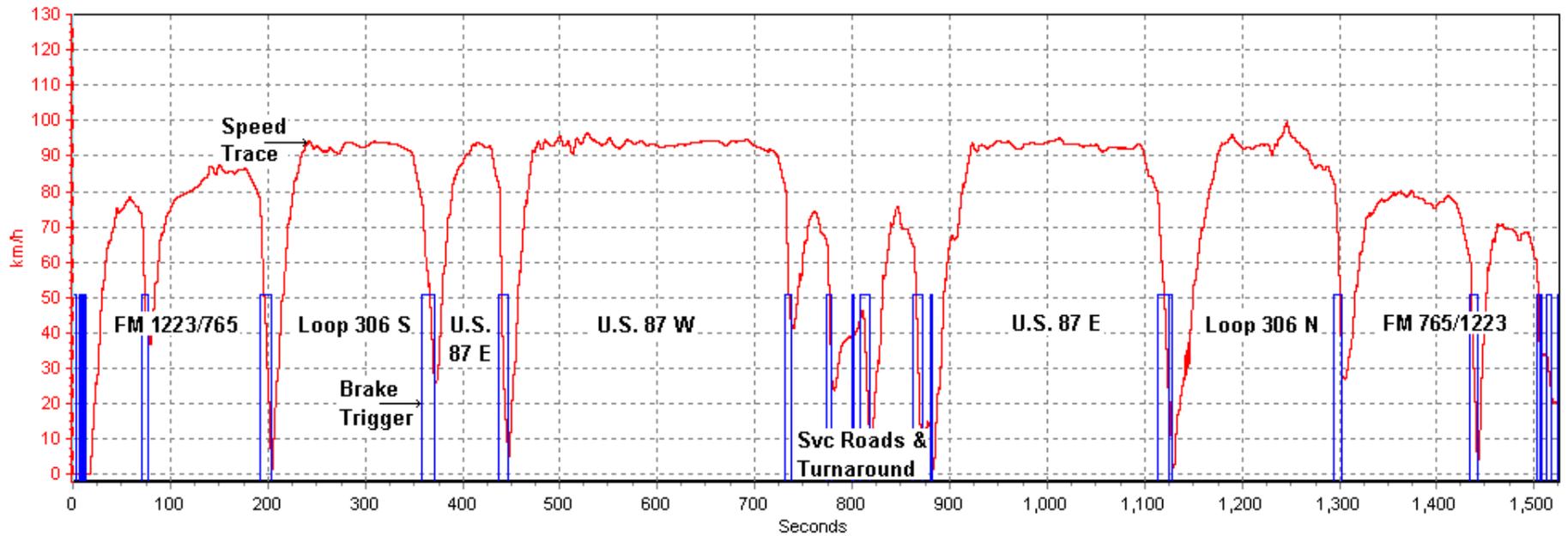
2011 VW Jetta (CB5800) LR, RR Illumination LLVW



Scenario F: Left Front, Left Rear, Right Rear Tires at LLVW
Test Date: 8/25/11
Data File Time: 25:26 minutes
Cumulative Driving Time: 20:21 minutes
Start Point: GAFB south gate

Calibration Phase:

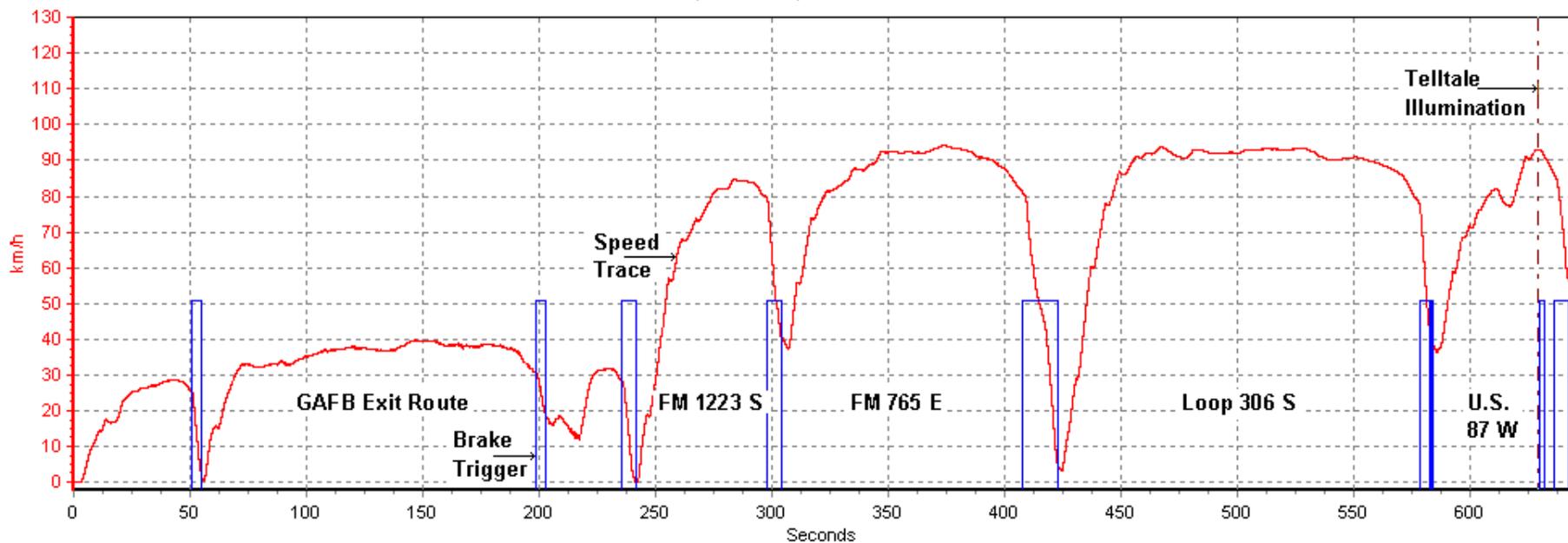
2011 VW Jetta (CB5800) LF, LR, RR Calibration LLVW



Scenario F: Left Front, Left Rear, Right Rear Tires at LLVW
Test Date: 8/25/11
Data File Time: 10:45 minutes
Cumulative Driving Time: 5:24 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

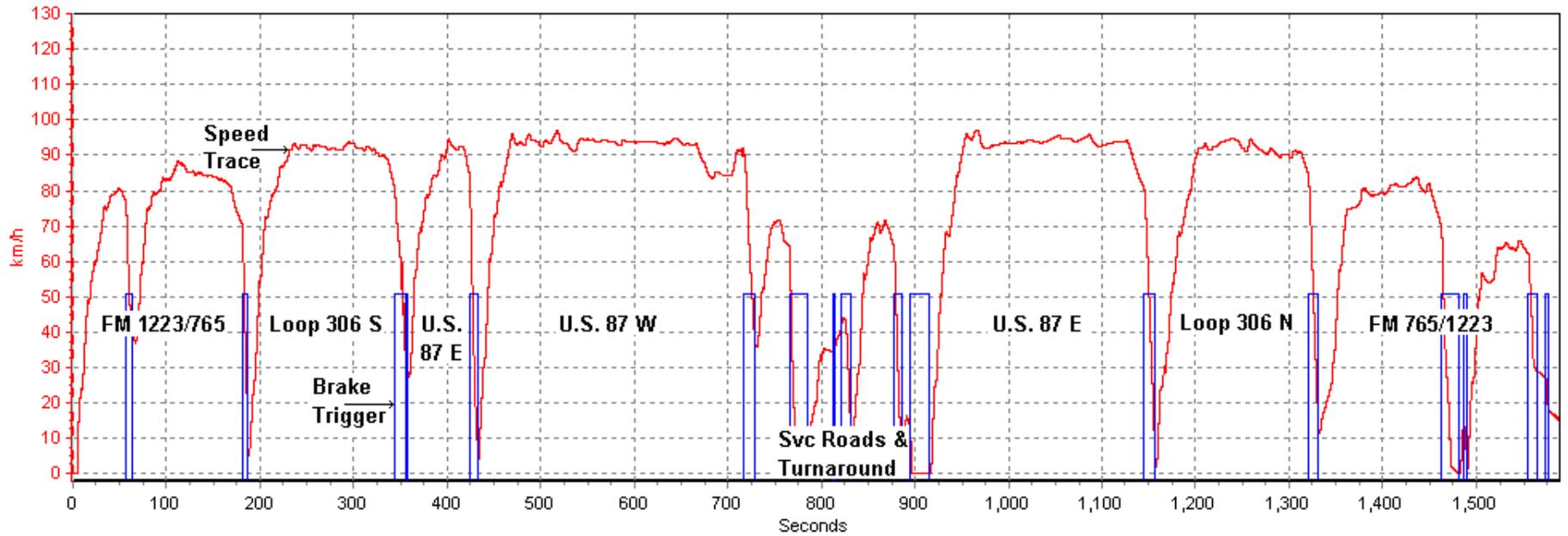
2011 VW Jetta (CB5800) LF, LR, RR Illumination LLVW



Scenario G: Right Rear Tire at LLVW
Test Date: 8/25/11
Data File Time: 26:29 minutes
Cumulative Driving Time: 20:15 minutes
Start Point: GAFB south gate

Calibration Phase:

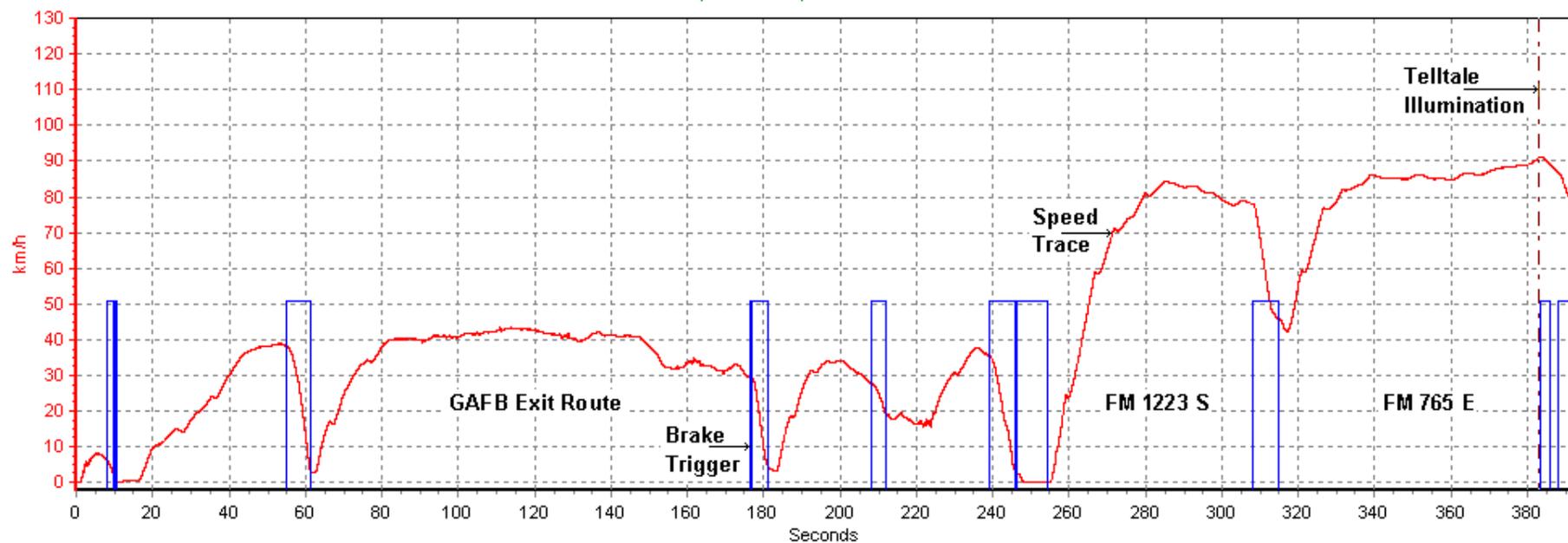
2011 VW Jetta (CB5800) RR Calibration LLVW



Scenario G: Right Rear Tire at LLVW
Test Date: 8/25/11
Data File Time: 6:33 minutes
Cumulative Driving Time: 1:47 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

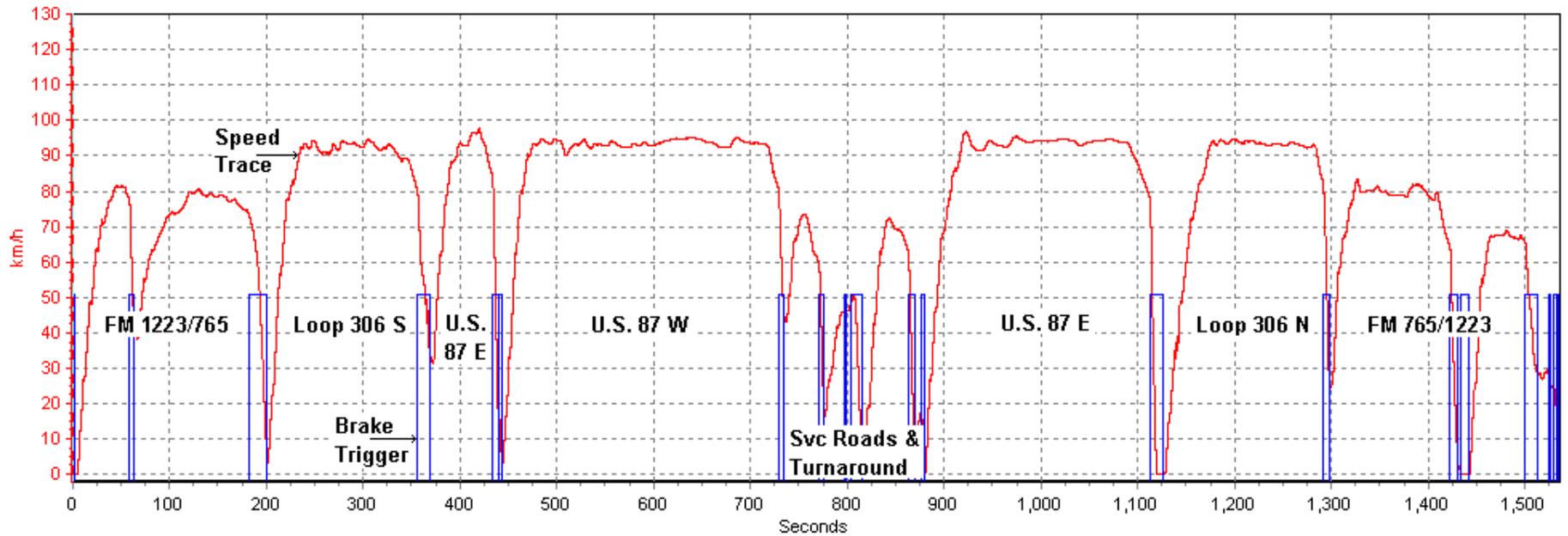
2011 VW Jetta (CB5800) RR Illumination LLVW



Scenario H: Left Front, Right Rear, Right Front Tires at LLVW
Test Date: 8/26/11
Data File Time: 25:36 minutes
Cumulative Driving Time: 20:16 minutes
Start Point: GAFB south gate

Calibration Phase:

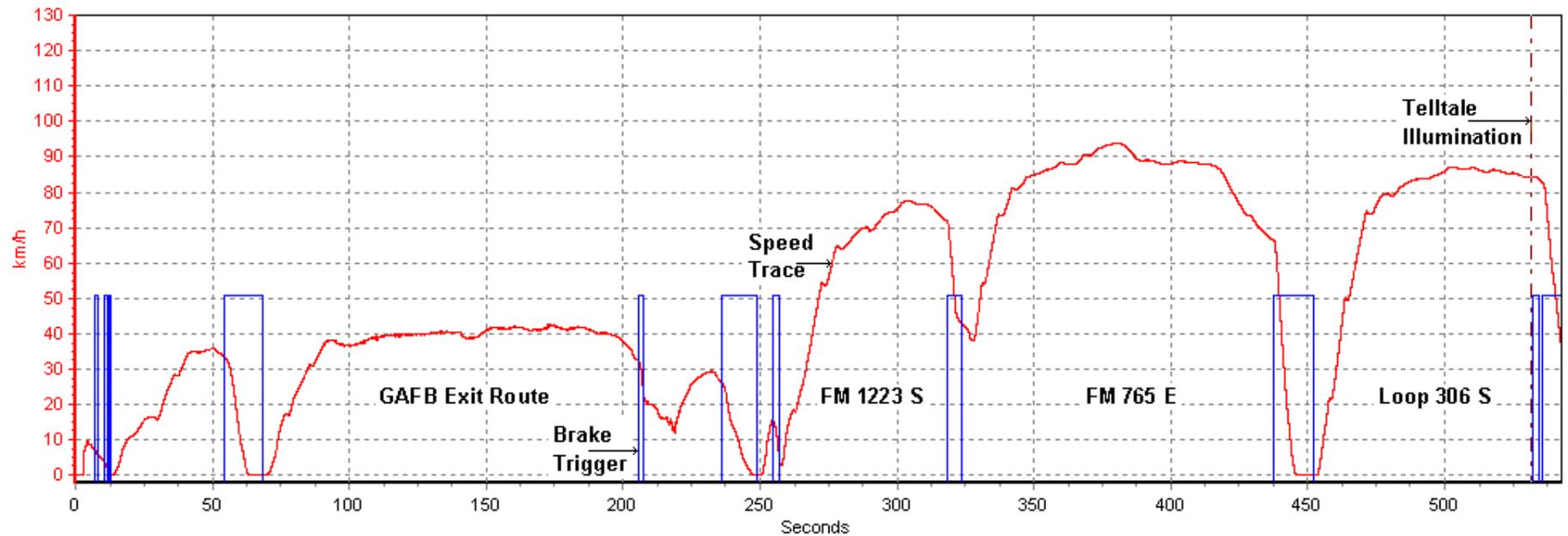
2011 VW Jetta (CB5800) LF, RR, RF Calibration LLVW



Scenario H: Left Front, Right Rear, Right Front Tires at LLVW
Test Date: 8/26/11
Data File Time: 9:03 minutes
Cumulative Driving Time: 3:41 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

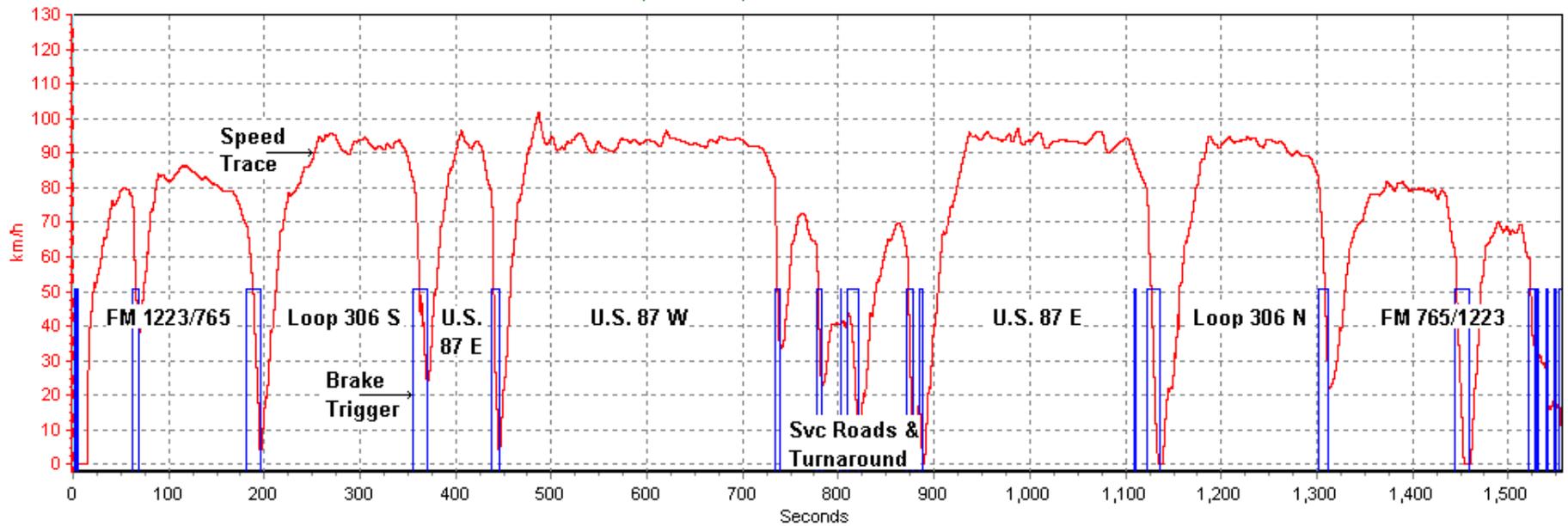
2011 VW Jetta (CB5800) LF, RR, RF Illumination LLVW



Scenario I: Left Front, Right Front Tires at UVW + VCW
Test Date: 8/17/11
Data File Time: 25:56 minutes
Cumulative Driving Time: 20:15 minutes
Start Point: GAFB south gate

Calibration Phase:

2011 VW Jetta (CB5800) LF, RF Calibration UVW+VCW



Scenario I: Left Front, Right Front Tires at UVW + VCW
Test Date: 8/17/11
Data File Time: 9:44 minutes
Cumulative Driving Time: 2:58 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

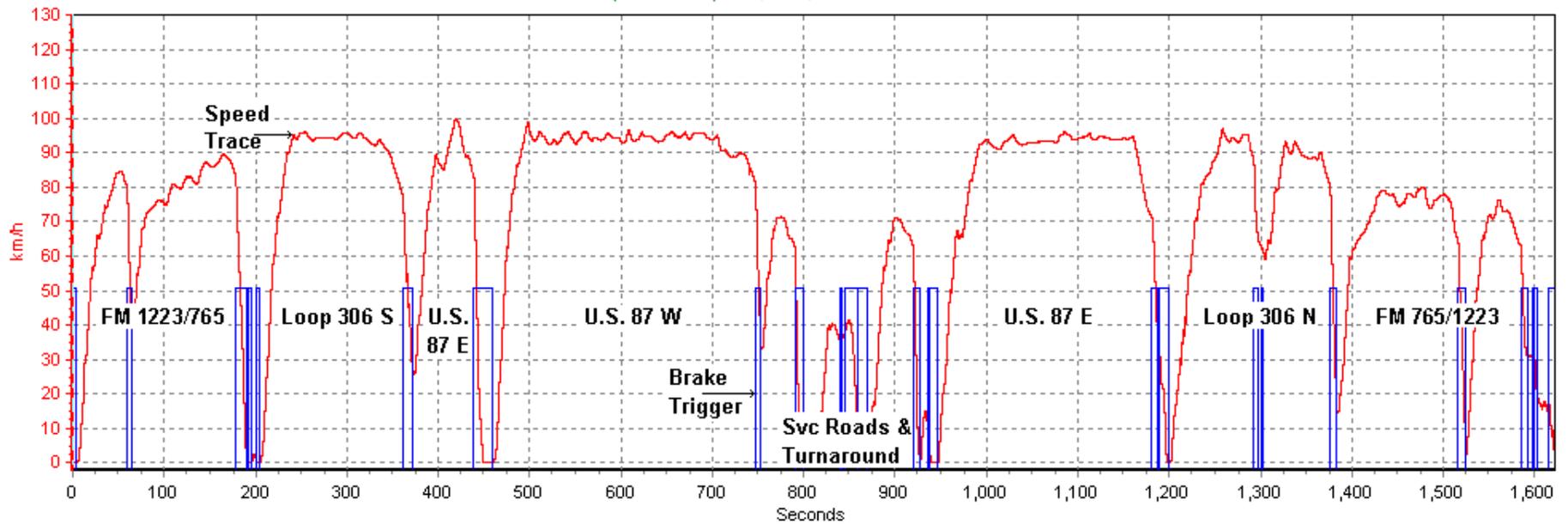
2011 VW Jetta (CB5800) LF, RF Illumination UVW+VCW



Scenario J: Left Rear, Right Rear, Right Front Tires at UVW + VCW
Test Date: 8/18/11
Data File Time: 27:02 minutes
Cumulative Driving Time: 20:20 minutes
Start Point: GAFB south gate

Calibration Phase:

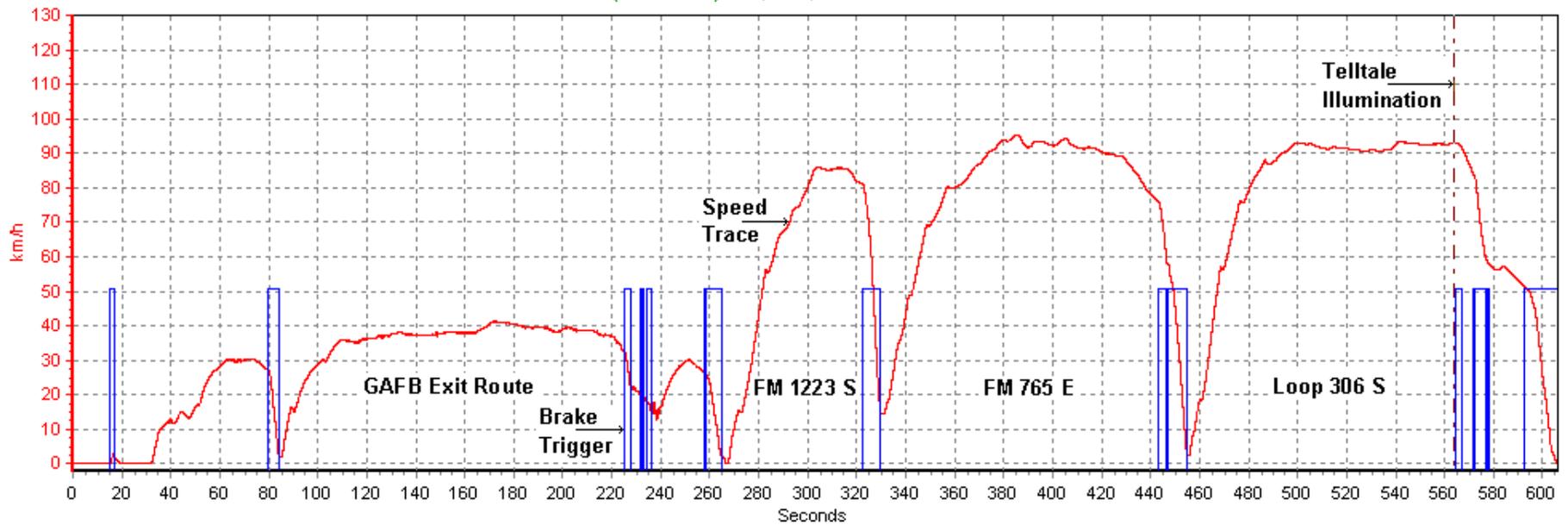
2011 VW Jetta (CB5800) LR, RR, RF Calibration UVW+VCW



Scenario J: Left Rear, Right Rear, Right Front Tires at UVW + VCW
Test Date: 8/18/11
Data File Time: 10:06 minutes
Cumulative Driving Time: 3:58 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

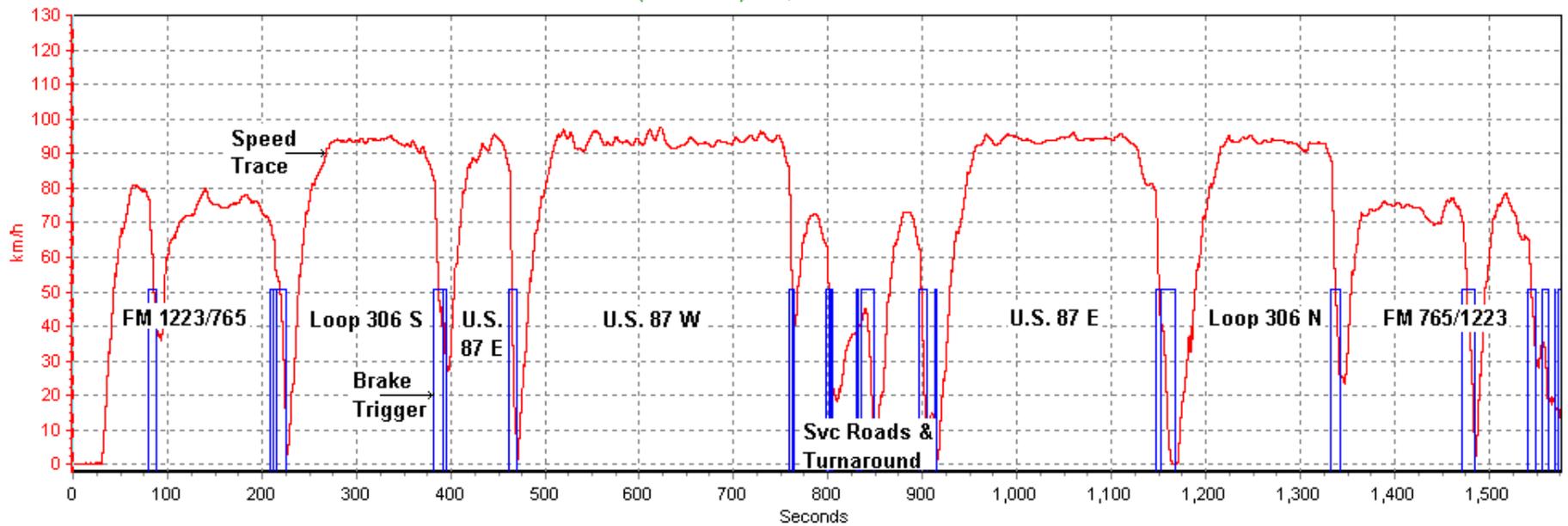
2011 VW Jetta (CB5800) LR, RR, RF Illumination UVW+VCW



Scenario K: Left Rear, Right Front Tires at UVW + VCW
Test Date: 8/18/11
Data File Time: 26:17 minutes
Cumulative Driving Time: 20:13 minutes
Start Point: GAFB south gate

Calibration Phase:

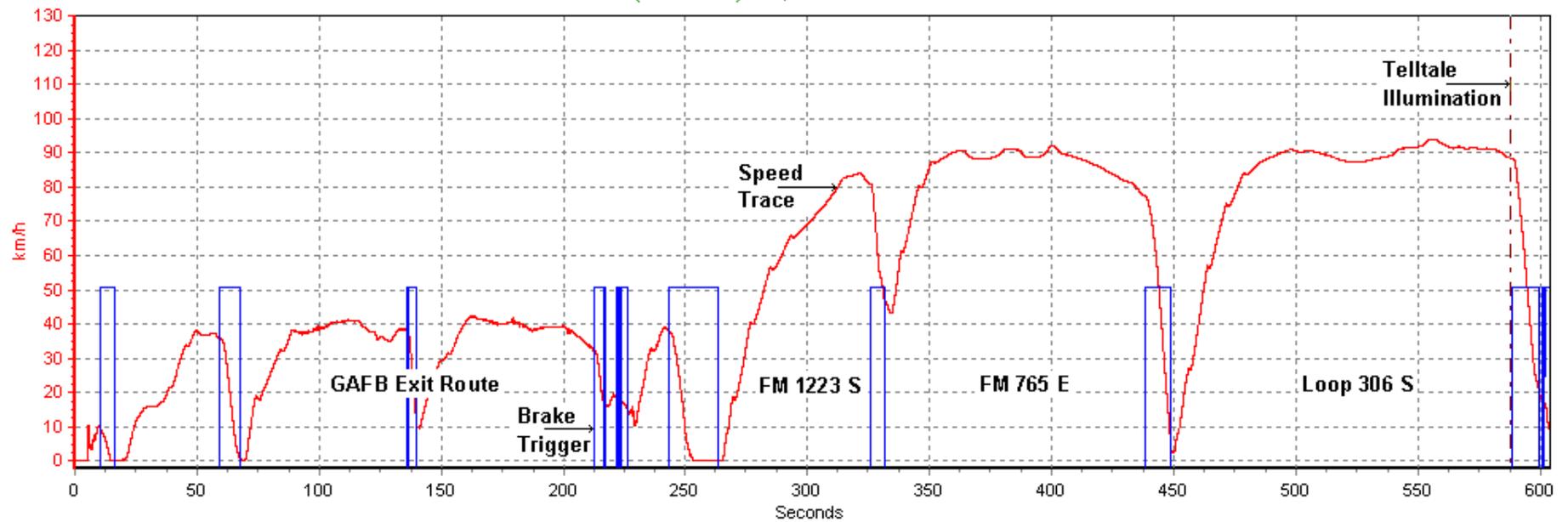
2011 VW Jetta (CB5800) LR, RF Calibration UVW+VCW



Scenario K: Left Rear, Right Front Tires at UVW + VCW
Test Date: 8/18/11
Data File Time: 10:04 minutes
Cumulative Driving Time: 4:32 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

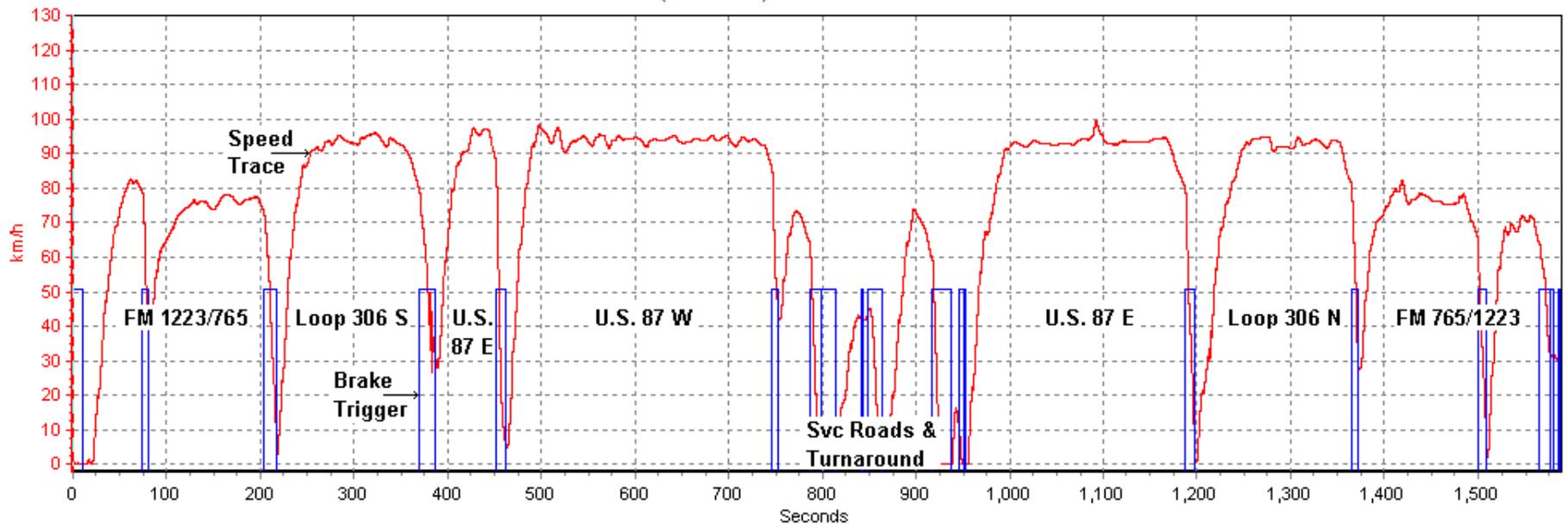
2011 VW Jetta (CB5800) LR, RF Illumination UVW+VCW



Scenario L: Right Front Tire at UVW + VCW
Test Date: 8/19/11
Data File Time: 26:29 minutes
Cumulative Driving Time: 20:11 minutes
Start Point: GAFB south gate

Calibration Phase:

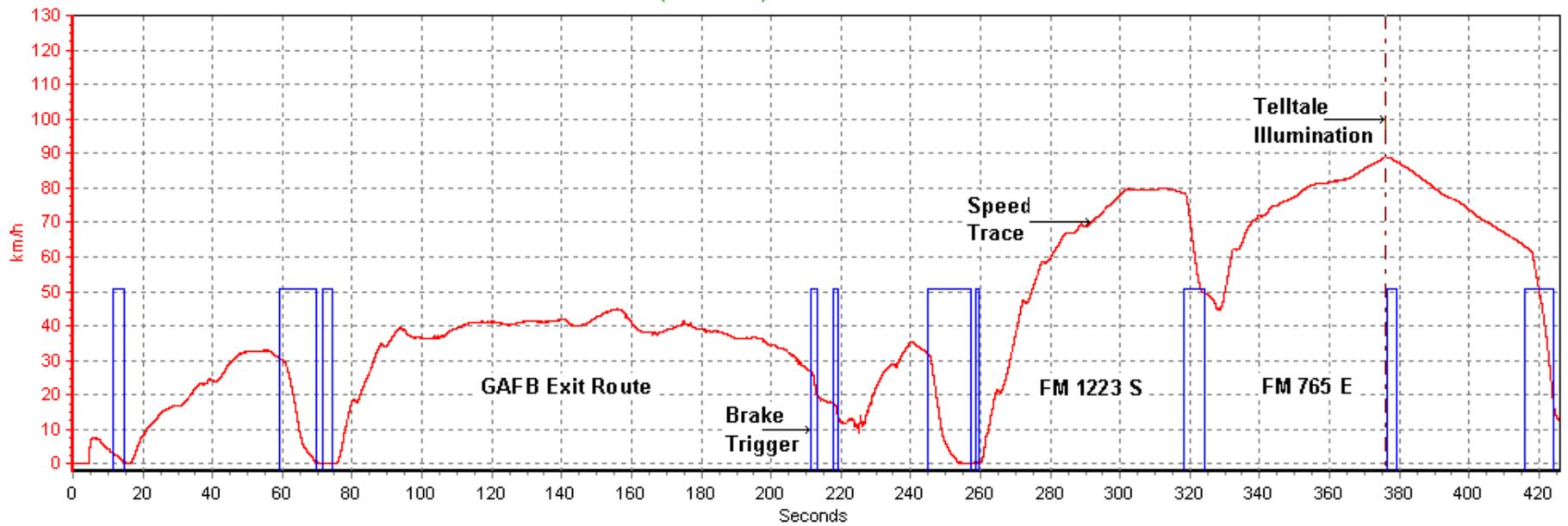
2011 VW Jetta (CB5800) RF Calibration UVW+VCW



Scenario L: Right Front Tire at UVW + VCW
Test Date: 8/19/11
Data File Time: 7:06 minutes
Cumulative Driving Time: 1:30 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

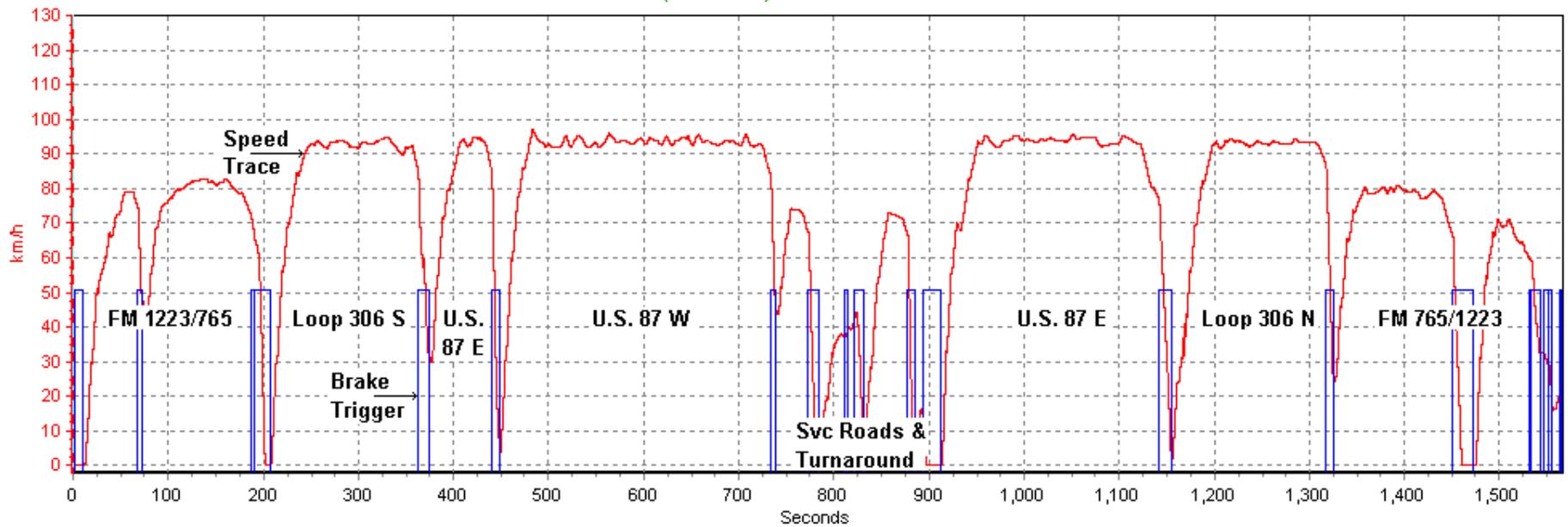
2011 VW Jetta (CB5800) RF Illumination UVW+VCW



Scenario M: Left Rear Tire at UVW + VCW
Test Date: 8/22/11
Data File Time: 26:07 minutes
Cumulative Driving Time: 20:14 minutes
Start Point: GAFB south gate

Calibration Phase:

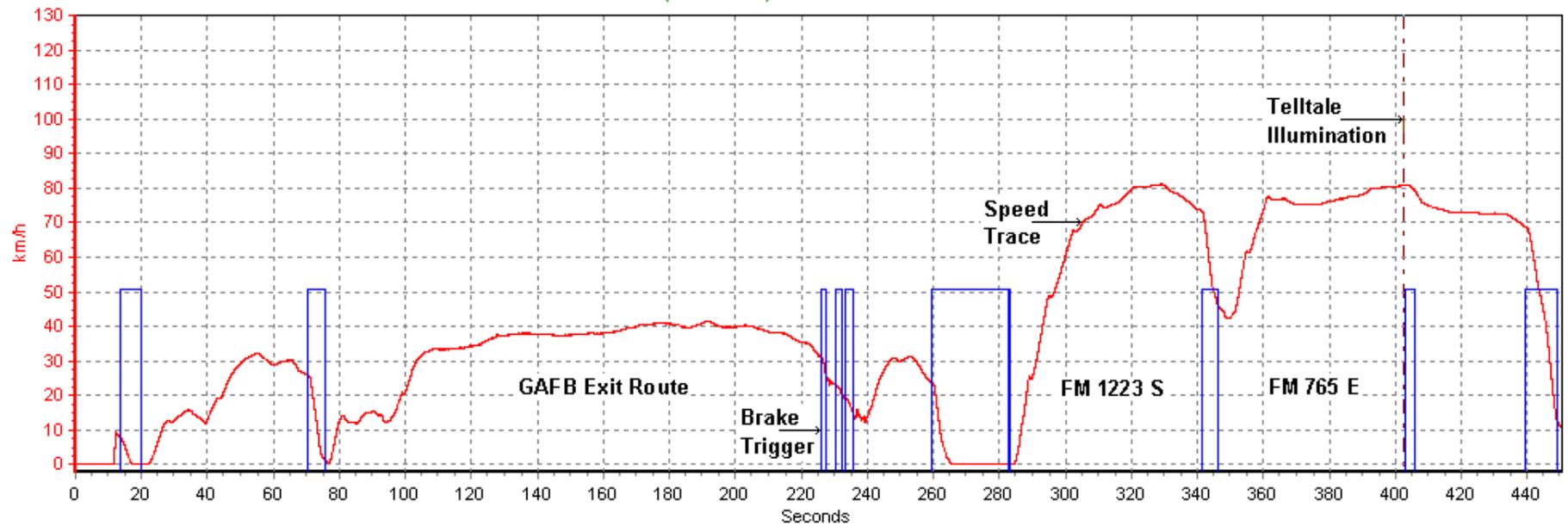
2011 VW Jetta (CB5800) LR Calibration UVW+VCW



Scenario M: Left Rear Tire at UVW + VCW
Test Date: 8/22/11
Data File Time: 7:31 minutes
Cumulative Driving Time: 1:35 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

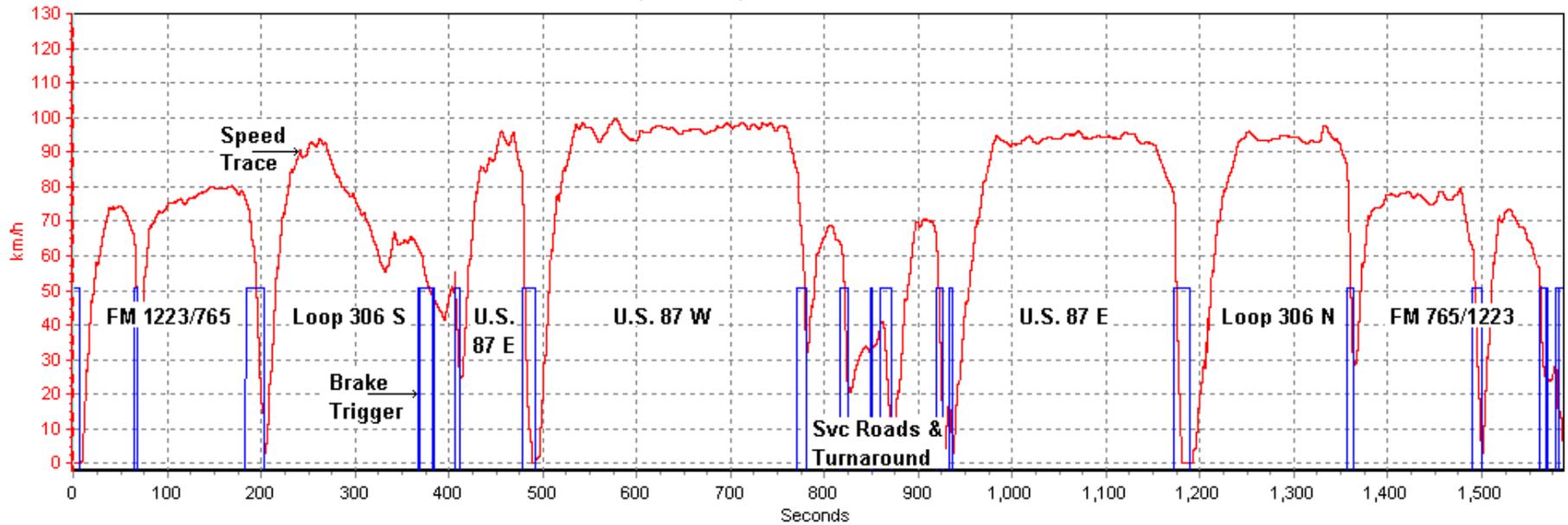
2011 VW Jetta (CB5800) LR Illumination UVW+VCW



Scenario N: Right Rear, Right Front Tires at UVW + VCW
Test Date: 8/22/11
Data File Time: 26:27 minutes
Cumulative Driving Time: 20:20 minutes
Start Point: GAFB south gate

Calibration Phase:

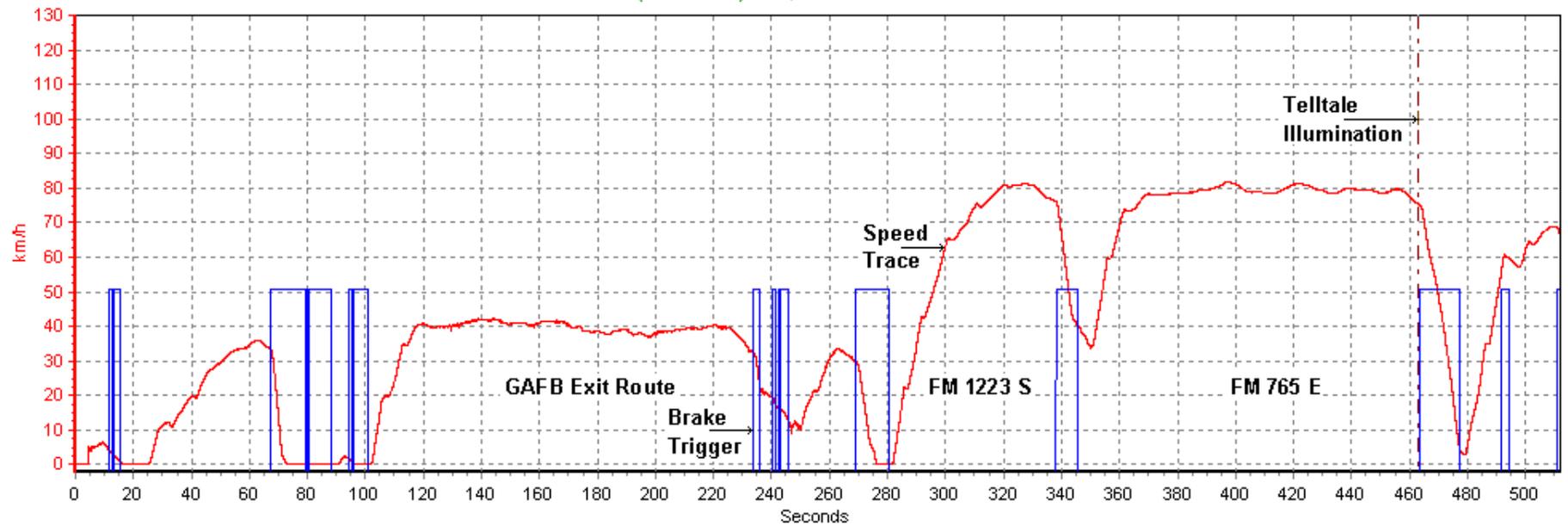
2011 VW Jetta (CB5800) RR, RF Calibration UVW+VCW



Scenario N: Right Rear, Right Front Tires at UVW + VCW
Test Date: 8/22/11
Data File Time: 8:32 minutes
Cumulative Driving Time: 2:32 minutes
Start Point: San Angelo Test Facility shop

Detection Phase:

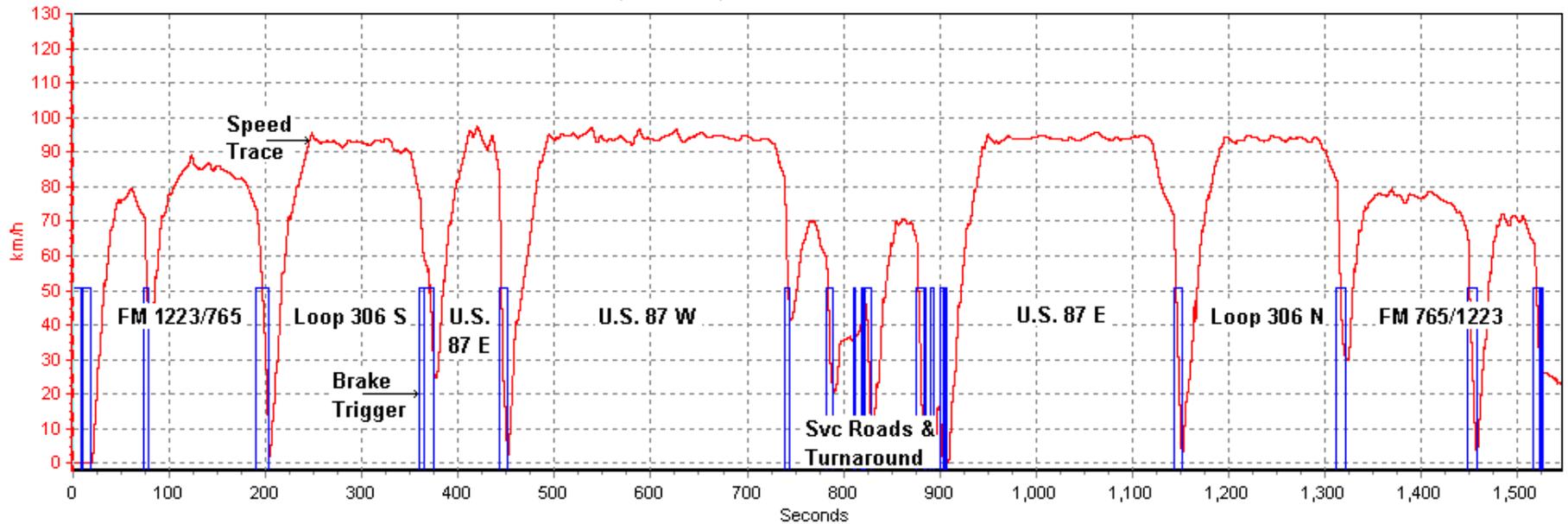
2011 VW Jetta (CB5800) RR, RF Illumination UVW+VCW



Scenario O: Left Front, Left Rear, Right Front Tires at UVW + VCW
Test Date: 8/23/11
Data File Time: 25:46 minutes
Cumulative Driving Time: 20:16 minutes
Start Point: GAFB south gate

Calibration Phase:

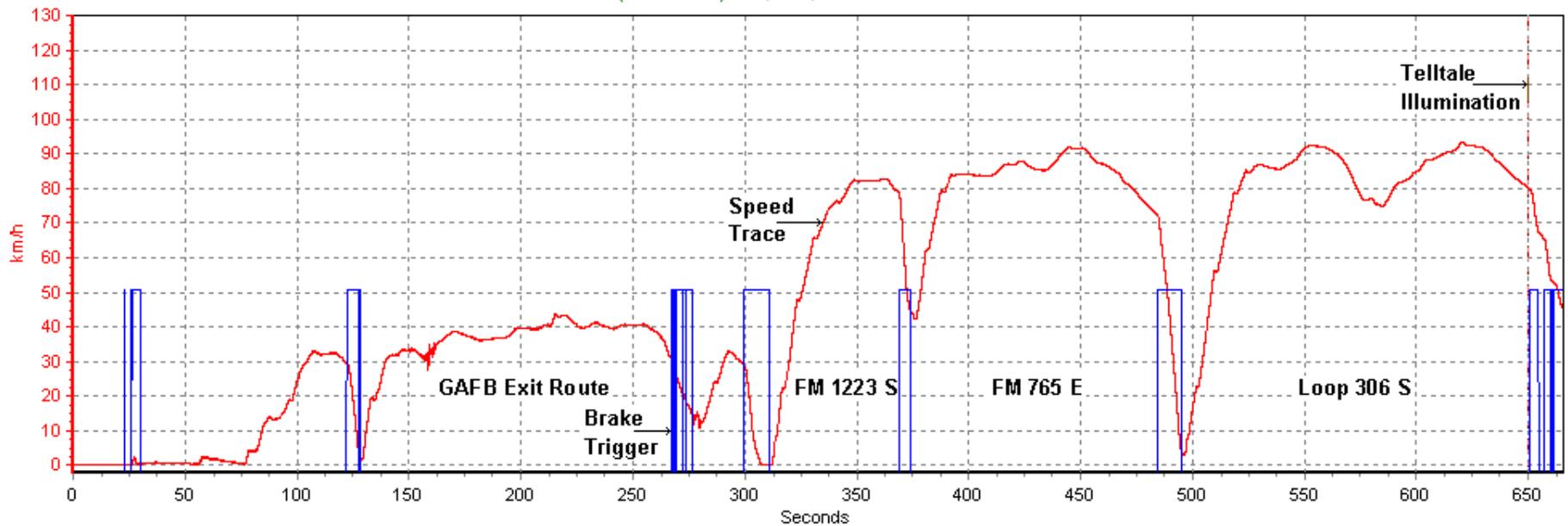
2011 VW Jetta (CB5800) LF, LR, RF Calibration UVW+VCW



Scenario O: Left Front, Left Rear, Right Front Tires at UVW + VCW
Test Date: 8/23/11
Data File Time: 11:06 minutes
Cumulative Driving Time: 4:51 minutes
Start Point: San Angelo Test Facility shop

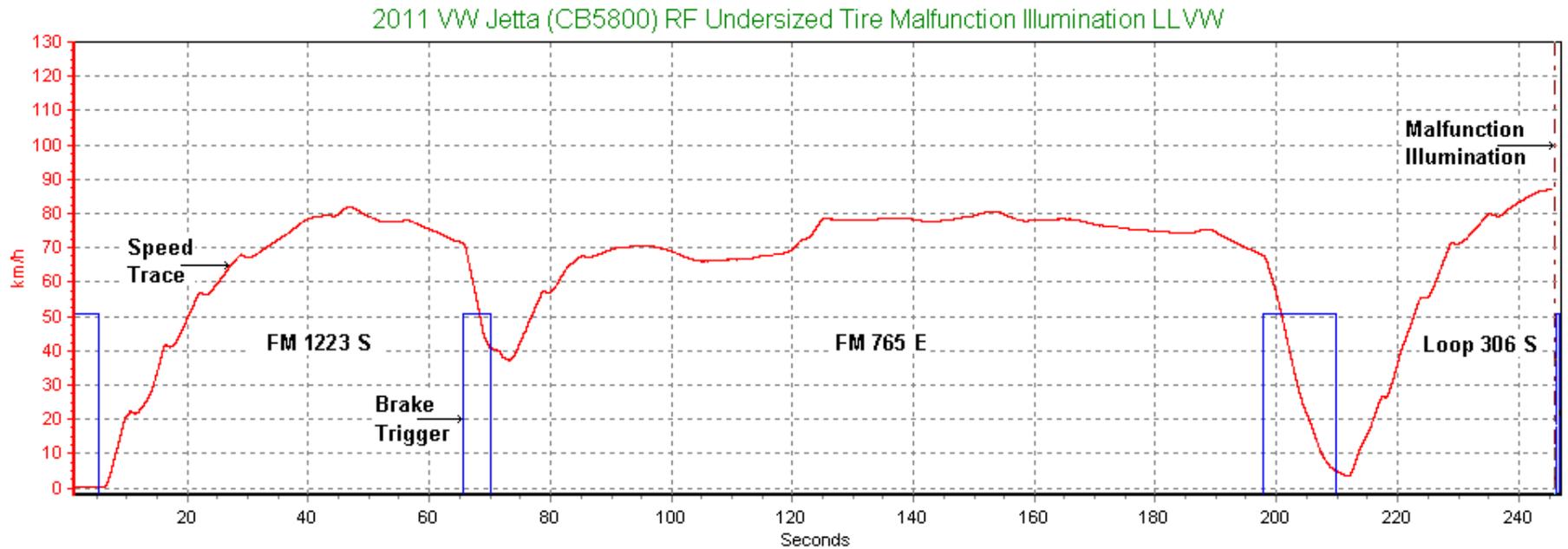
Detection Phase:

2011 VW Jetta (CB5800) LF, LR, RF Illumination UVW+VCW



Scenario S: Malfunction Detection Test – Right Front Tire Replacement
Test Date: 9/8/11
Data File Time: 4:06 minutes
Cumulative Driving Time: 3:09 minutes
Start Point: San Angelo Test Facility shop

Malfunction Telltale Illumination:



SECTION 7
OWNER'S MANUAL PAGES

Indicator light

Please first read and note the introductory information and heed the WARNINGS  on page 207.

Symbol	Possible cause or meaning ⇒ 	Proper response
	Lights up and a chime sounds once: The inflation pressure of one or more tires is significantly lower than the benchmark pressure set by the driver – or a tire has structural damage. Depending on vehicle equipment, the message "Please check tires!" will appear in the instrument cluster display.	 Stop safely as soon as possible! Reduce speed immediately! Avoid fast cornering and hard braking! Check the condition and inflation pressure of all tires. Have damaged tires replaced.
	Flashes for about 70 seconds and then stays on: System malfunction.	Check and if necessary adjust the tire inflation pressure in all four tires. If they are correct, switch the ignition off and back on. If the indicator light flashes again and then stays on and does not go out after checking and adjusting the air pressure in all four tires and pressing the Reset button, take the vehicle to an authorized Volkswagen dealer or an authorized Volkswagen Service Facility. Have the system checked.

When the ignition is switched on, several warning and indicator lights come on briefly for a function check. They go out after a few seconds.

WARNING

Incorrect tire pressures and/or under-inflation can cause sudden tire failure, loss of control, collision, serious personal injury, or even death.

- When the warning symbol  appears in the instrument cluster, stop the vehicle as soon as it is safe to do so and inspect the tires.
- Incorrect tire pressure and/or under-inflation can cause increased tire wear and can affect the handling of the vehicle and its stopping ability.
- Incorrect tire pressure and/or under-inflation can also lead to sudden tire failure, including a blowout and sudden deflation, causing loss of vehicle control.
- The driver is responsible for the correct tire pressures for all tires on the vehicle. The recommended tire pressure values are listed on a sticker inside the driver's door ⇒ page 269, fig. 144.
- The TPMS can only work correctly when all tires on the vehicle are filled to the correct cold tire inflation pressure.

While driving

WARNING (continued)

- Using incorrect tire pressure values can cause accidents or other damage. Always set and maintain the correct specified cold tire pressure values for the tires installed on the vehicle so that TPMS can do its job.
- Always inflate tires to the recommended and correct tire pressure before driving off.
- Driving with under-inflated tires causes them to flex more, letting them get too hot, which can result in tread separation, sudden tire failure, and loss of control.
- Excessive speed and/or overloading can cause heat build-up, sudden tire failure, and loss of control.
- If the tire pressure is too low or too high, the tires will wear prematurely and the vehicle will not handle well.
- If the tire is not "flat" and you do not have to change the tire or wheel immediately, drive at reduced speed to the nearest service station to check the tire pressure and add air as required.
- When replacing tires or wheel rims on vehicles equipped with TPMS, always read and heed the information and all WARNINGS in the section "Tires and wheels" ⇒ page 263.

WARNING

Failure to heed warning lights and instrument cluster text messages can cause the vehicle to break down in traffic and result in a collision and serious personal injury.

- Never ignore warning lights or text WARNINGS.
- Always stop the vehicle as soon as it is safe to do so.

 An acoustic warning sounds the first time low tire pressure is detected. If a system malfunction is detected, no acoustic warning sounds..

 Driving for a longer period of time on rough roads or with a dynamic and sporty style can make the TPMS system temporarily unavailable. The indicator light will come on, signaling a malfunction, but will go out again once road condition or driving style change. ◀

Tire Pressure Monitoring System and Reset button

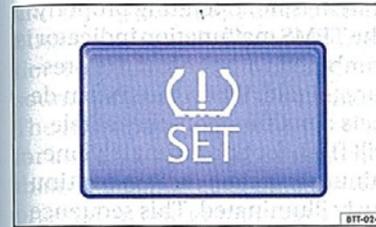


Fig. 125 Reset button for the Tire Pressure Monitoring System (in the glove compartment).

Please first read and note the introductory information and heed the WARNINGS  on page 207.

Your vehicle's Tire Pressure Monitoring System (TPMS) indirectly checks the tire pressure of all four tires while you are driving by using the Anti-lock Brake System (ABS) sensors to monitor the tread circumference (rolling circumference) and vibration characteristics of the individual tires.

The tread circumference of a tire can change:

- If a tire's inflation pressure is too low.
- If the tire's tread is damaged or the tire is structurally damaged.
- If one side of the vehicle is more heavily loaded than the other.
- If there is more weight on one axle than the other (such as when towing a trailer).
- If there are snow chains on the tires.
- If a compact spare wheel has been mounted.
- If a wheel was replaced on each axle.
- If a tire was changed.
- If the tire pressure was changed, or wheels were rotated or replaced, but the TPMS was not reset.
- If snow chains are used. Using snow chains can cause the system to give false warnings because snow chains increase tire circumference.

The Tire Pressure Monitoring System  may not react at first or may not react at all when you are ▶

Driver assistance systems

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driving in a sporty manner, or on snow-covered or unpaved roads, when you are driving with snow chains, or in certain other situations. A change in the tread circumference of a tire is signaled by the Tire Pressure Monitoring System indicator in the instrument cluster (telltale).

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.

While driving

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.

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 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.

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.

Re-setting and reconfirming the benchmark tire pressure

The Reset button for the Tire Pressure Monitoring System is in the glove compartment ⇒ page 209, fig. 125. The Reset button resets the benchmark tire pressure used by the TPMS to the current tire pressure in the tires based on the circumference of the tires. To reset the TPMS, switch on the ignition and then press and hold the Reset button until you hear a confirmation chime. The chime usually sounds after a couple of seconds. The Reset button must be pressed for at least 2 seconds but no more than 30 seconds each time the tire pressure in one or more tires has been adjusted or after one or more tires has been changed, exchanged, or repaired. The new tire pressures are stored in the system only after at least 20 minutes of normal driving.

If you use the Reset button to reset the benchmark tire pressure when your tires do not have the correct tire pressure, this will prevent the TPMS from working properly. It may then give false warnings or may not give any warning even if the tire pressure is too low.

For this reason, it is vital to make certain that all four tires are inflated to the correct pressure when they are cold before pressing the Reset button. Cold

tire tires are tires that have not been driven more than a couple of miles (kilometers) at low speed within the last three hours.

Use the Reset button to reset the benchmark TPMS pressure in the following situations:

- After installing tires on your vehicle that have recommended cold tire inflation pressures that are different from the tires that were taken off.
- After any tire on your vehicle has been removed and remounted, even if the same tire and wheel rim that were taken off are re-installed (for instance, after repair).
- After any tire on your vehicle is changed and replaced by another tire, even if the replacement tire is the same type and is inflated to the same pressure as the tire it replaced.
- After adjusting the tire pressure of any tire on the vehicle to its correct cold tire inflation pressure, either by putting air in one or more tires or by letting air out. Do this even though air was only added (or let out) to bring the tire to the inflation pressure it should have had all along.
- After rotating the front and rear wheels ⇒ page 263.
- After mounting the compact spare tire.

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⚠ WARNING

Improper use of the Reset button can cause the TPMS to give false warnings or to give no warning despite dangerously low tire pressure. Make certain the tire inflation pressure of all tires is correct before using the Reset button.

⚠ WARNING

Incorrect tire pressure can cause sudden tire failure, loss of vehicle control and serious personal injury.

- Always check and correct air pressure in all four tires, particularly after changing, exchanging, or repairing tires.
- After that, always make sure that all 4 tires are inflated to the correct tire pressure for the tires installed on the vehicle. Then push the Reset button for the Tire Pressure Monitoring System (TPMS) so that it can properly monitor the pressure in the tires.

⚠ WARNING (continued)

- Press and hold the Reset button until the confirmation chime sounds. Hold the Reset button for at least 2 seconds, but not more than 30 seconds.
- See the tire pressure label ⇒ page 269 and the Owner's Literature for recommended cold tire inflation pressure and other important information.
- When replacing tires or wheel rims on vehicles equipped with TPMS, always read and heed all of the information and WARNINGS ⇒ page 263.

i The Tire Pressure Monitoring System stops working if there is an ESP/ABS malfunction ⇒ page 181.

i After a low tire pressure warning, the vehicle must stand and must not be driven for at least one minute before the Reset button ⇒ page 209, fig. 125 can be used to store a new benchmark tire pressure. ◀