SAFETY COMPLIANCE TESTING FOR FMVSS 126
Electronic Stability Control Systems

Ford Motor Company
2011 Ford Transit Connect
NHTSA No. CB0206

TRANSPORTATION RESEARCH CENTER INC.
10820 State Route 347
East Liberty, Ohio 43319

April 20, 2011

FINAL REPORT

Prepared Under Contract No.: DTNH22-08-D-00097

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
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Approved By: Ken Webster
Approval Date: 3/29/11

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   Transportation Research Center Inc.
   10820 State Route 347
   East Liberty, OH 43319

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21. Author(s)
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    Ken Webster, Manager, DDO Project Operations

    TRC-DOT-126-11-001

Abstract
A test was conducted on a 2011 Ford Transit Connect, NHTSA No. CB0206, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-126-02 for the determination of FMVSS 126 compliance.

Test failures identified were as follows: None
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1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this test is to determine if the test vehicle, a MY 2011 Ford Transit Connect meets the minimum equipment and performance requirements stated in Federal Motor Vehicle Safety Standard (FMVSS) 126, "Electronic Stability Control Systems."

This standard establishes performance and equipment requirements for Electronic Stability Control (ESC) Systems installed in passenger cars, multipurpose passenger vehicles, trucks, and buses with a gross vehicle weight rating of 4,536 kilograms or less.

2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS

Testing of the MY 2011 Ford Transit Connect was conducted at Transportation Research Center Inc. (TRC Inc.) in accordance with NHTSA TP-126-02, dated November 19, 2008.

The vehicle was inspected to ensure it was equipped with an ESC System that:
- Augments vehicle directional stability by applying and adjusting brake torques individually at each wheel to induce a correcting yaw moment to a vehicle;
- Is computer controlled with the computer using a closed-loop algorithm to limit vehicle oversteer and to limit vehicle understeer;
- Has a means to determine the vehicle’s yaw rate and to estimate its side slip or side slip derivative with respect to time;
- Has a means to monitor driver steering inputs;
- Has an algorithm to determine the need, and a means to modify engine torque, as necessary, to assist the driver in maintaining control of the vehicle, and
- Is operational over the full speed range of the vehicle (except at vehicle speeds less than 20km/h (12.4mph), when being driven in reverse, or during system initialization).

The vehicle was subjected to a 0.7Hz Sine with Dwell (SWD) Steering Maneuver to ensure that it would meet the stability and responsiveness requirements of the standard as follows:
- At 1.0 second after completion of a required sine with dwell steering input, the yaw rate of the vehicle must not exceed 35 percent of the first peak value of yaw rate recorded after the steering wheel angle changes sign (between first and second peaks during the same test run).
- At 1.75 seconds after completion of a required sine with dwell steering input, the yaw rate of the vehicle must not exceed 20 percent of the first peak value of yaw rate recorded after the steering wheel angle changes sign (between first and second peaks during the same test run).
- The lateral displacement of the vehicle center of gravity with respect to its initial straight path must be at least 1.83 m (6 feet) (for vehicles with a GVWR of 3,500 kg (7,716 lb) or less) when computed 1.07 seconds after the Beginning of Steer (BOS) at the specified steering wheel angles.

System malfunction simulations were executed to verify vehicle could identify and indicate a malfunction.

The vehicle's ESC System appears to meet the performance and equipment requirements as required by FMVSS 126. The test results are summarized on the following summary sheet.
2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS …continued

DATA SUMMARY (Sheet 1 of 2)

VEHICLE MAKE/MODEL/BODY STYLE: Ford / Transit Connect / Truck

VEHICLE NHTSA NO.: CB0206 VIN: NM0LS7DN6BT050535

VEHICLE TYPE: Truck DATE OF MANUFACTURE: 11/10

LABORATORY: Transportation Research Center Inc.

REQUIREMENTS PASS/FAIL

ESC Equipment and Operational Characteristics (Data Sheet 2)

The vehicle is to be equipped with an ESC System that meets the equipment PASS and operational characteristics requirements. (S126, S5.1, S5.6)

ESC Malfunction Telltale (Data Sheet 3)

The vehicle is equipped with a telltale that indicates one or more PASS ESC System malfunctions. (S126, S5.3)

“ESC Off” and other System Controls and Telltale (Data Sheet 3 & 4)

The vehicle is equipped with an ESC off telltale indicating the vehicle See Remarks has been put into a mode that renders the ESC System unable to satisfy the performance requirements of the standard, if such a mode exists. (S5.5.1)

If provided, off control and other system controls as well as the ESC off telltale meets the operational requirements (S126, S5.4, S5.4.1, S5.4.2, S5.5.4, and S5.5.9)
2.0 TEST PROCEDURE AND DISCUSSION OF RESULTS …continued

DATA SUMMARY (Sheet 2 of 2)

REQUIREMENTS

If provided, off control and other system controls as well as the ESC off telltale meets the operational requirements (S126, S5.4, S5.4.1, S5.4.2, S5.5.4, and S5.5.9)

See Remarks

Vehicle Lateral Stability (Data Sheet 8)

Yaw Rate Ratio at 1 second after COS is less than 35% of peak value. (S126, S5.2.1) 

PASS

Yaw Rate Ratio at 1.75 seconds after COS is less than 20% of peak value. (S126, S5.2.2)

PASS

Vehicle Responsiveness (Data Sheet 8)

Lateral displacement at 1.07 seconds after BOS is at least 1.83 m (6 feet) for vehicles with a GVWR of 3,500 kg (7,716 lbs.) or less, and 1.52 m (5 feet) for vehicles with a GVWR greater than 3,500 kg (7,716 lbs.). (S126 S5.2.3)

PASS

ESC Malfunction Warning (Data Sheet 9)

Warning is provided to driver after malfunction occurrence. (S126. S5.3)

PASS

Malfunction telltale stayed illuminated as long as malfunction existed and must extinguish after malfunction was corrected. (S126, S5.3.7)

PASS

REMARKS

The 2011 Ford Transit Connect does not have an ESC Off Control, therefore it does not have an ESC Off telltale.
3.0 TEST DATA

DATA SHEET 1 (Sheet 1 of 2)
TEST VEHICLE INSPECTION AND TEST PREPARATION

VEHICLE MAKE/MODEL/BODY STYLE: ____ Ford / Transit Connect / Truck ____

NHTSA No.: ____ CB0206 ____ TEST DATE: ____ 3-07-11 ____

VIN: ____ NM0LS7DN6BT050535 ____ MANUFACTURE DATE: ____ 11/10 ____

GVWR: 2,270 KG  FRONT GAWR: 1,130 KG  REAR GAWR: 1,243 KG

SEATING POSITIONS:  FRONT 2  MID 0  REAR 0

ODOMETER READING AT START OF TEST:  ____ 20 (32) ____ Miles (Kilometers)

DESIGNATED TIRE SIZE(S) FROM VEHICLE LABELING:

Front Axle  P205 / 65R 15 95T  Rear Axle  P205 / 65R 15 95T

INSTALLED TIRE SIZE(S) ON VEHICLE:

<table>
<thead>
<tr>
<th>From Tire Sidewall</th>
<th>Front Axle</th>
<th>Rear Axle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer and Model</td>
<td>Continental ContiProContact</td>
<td>Continental ContiProContact</td>
</tr>
<tr>
<td>Tire Size Designation</td>
<td>P205 / 65R 15 95T</td>
<td>P205 / 65R 15 95T</td>
</tr>
</tbody>
</table>

Are installed tire sizes same as labeled tire sizes?  ____ Yes  ____ No
If no, contact COTR for further guidance.

DRIVE CONFIGURATIONS (MARK ALL THAT APPLY):

____ X  Two Wheel Drive (2WD):  (X) Front Wheel Drive  ( ) Rear Wheel Drive
____ All Wheel Drive (AWD)
____ Four Wheel Drive Automatic – differential not locked full time (4WD Automatic)
____ Four Wheel Drive High Gear Unlocked Center Differential
____ Four Wheel Drive High Gear Locked Center Differential
____ Four Wheel Drive Low Gear Unlocked Center Differential
____ Four Wheel Drive Low Gear Locked Center Differential
____ Other (define ________________________________ )
DATA SHEET 1 (Sheet 2 of 2)
TEST VEHICLE INSPECTION AND TEST PREPARATION

DRIVE CONFIGURATIONS AND MODES: (ex. default, performance, off)
(For each of the vehicle’s drive configurations identify available operating modes)

Drive Configuration 2WD
Mode(s) default

Drive Configuration
Mode(s)

Drive Configuration
Mode(s)

VEHICLE STABILITY SYSTEMS (Check applicable technologies):

X ESC  X Traction Control  X Roll Stability Control

Active Suspension  X Electronic Throttle Control  Active Steering

X ABS

List other systems; ____________________________________________

REMARKS:

RECORDED BY: Alan Ida DATE: 3-07-11
APPROVED BY: Ken Webster DATE: 3-28-11
3.0 TEST DATA....continued

DATA SHEET 2 (Sheet 1 of 2)
ESC SYSTEM HARDWARE AND OPERATIONAL CHARACTERISTICS

VEHICLE MAKE/MODEL/BODY STYLE: ____Ford / Transit Connect / Truck____

NHTSA No.:______CB0206_________ TEST DATE: 3-09-11____

ESC SYSTEM IDENTIFICATION:

Manufacturer / Model _Continental Teves – MK60EC ESC System Diagonal Brake Split_

ESC SYSTEM HARDWARE (Check applicable hardware):

X Electronic Control Unit     X Hydraulic Control Unit
X Wheel Speed Sensors        X Steering Angle Sensor
X Yaw Rate Sensor            X Lateral Acceleration Sensor

List other components; ____________________________________________

ESC SYSTEM OPERATIONAL CHARACTERISTICS:

System is capable of generating brake torques at each wheel     X Yes (PASS)     _____ No (FAIL)
List and describe component(s): _Hydraulic Control Unit_ 

System is capable of determining yaw rate                   X Yes (PASS)     _____ No (FAIL)
List and describe component(s): _Yaw Rate Sensor in RSC03 sensor cluster_

System is capable of monitoring driver steering input        X Yes (PASS)     _____ No (FAIL)
List and describe component(s): _Steering input calculated, based on an absolute steering wheel angle signal_

System is capable of estimating side slip or side slip derivation X Yes (PASS)     _____ No (FAIL)
List and describe component(s): _The ESC continuously evaluates measured data from the steering angle, wheel speed, yaw rate, and lateral acceleration sensors and calculates the vehicle deviation by comparing the driver’s input with the actual behavior of the vehicle. If the actual vehicle behavior deviates from the expected vehicle behavior, the ESC triggers suitable measures to maintain the vehicle stability._

7
ESC SYSTEM OPERATIONAL CHARACTERISTICS (continued):

System is capable of modifying engine torque during ESC activation.  

<table>
<thead>
<tr>
<th>Yes (PASS)</th>
<th>No (FAIL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Method used to modify engine torque:  
For the 2011 Ford Transit Connect, the torque output is managed by reducing air flow, altering spark timing, and/or selectively turning off fuel injectors. This is also the standard order for reducing torque output during a torque reduction request. Every torque reduction is independent and the powertrain action is based on the amount of torque reduction being requested. If the requested torque reduction can be achieved by using air reduction only, then that would be the only means used.

System is capable of activation at speeds of 20 km/h (12.4 mph) and higher.  

<table>
<thead>
<tr>
<th>Yes (PASS)</th>
<th>No (FAIL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Speed system becomes active.  

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14.4 km/h (8.9 mph)</td>
</tr>
</tbody>
</table>

System is capable of activation during the following driving phases (acceleration, deceleration, coasting, and during activation of ABS or traction control).  

<table>
<thead>
<tr>
<th>Yes (PASS)</th>
<th>No (FAIL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Driving phases that the system is capable of activation.  
ESC is active under all driving situations, except backwards, driving at low velocity (less than 14.4 km/h) or if ESC is disabled by optional ESC-off switch or ESC off-road switch.

Vehicle manufacturer submitted documentation explaining how the ESC system mitigates understeer?  

<table>
<thead>
<tr>
<th>Yes (PASS)</th>
<th>No (FAIL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

DATA INDICATES COMPLIANCE  

<table>
<thead>
<tr>
<th>PASS/FI Alb</th>
<th>PASS</th>
</tr>
</thead>
</table>

RECORDED BY:  
Alan Ida  
DATE: 3-22-11

APPROVED BY:  
Ken Webster  
DATE: 3-28-11
DATA SHEET 3 (Sheet 1 of 2)
ESC MALFUNCTION AND OFF TELLTALES

VEHICLE MAKE/MODEL/BODY STYLE: Ford / Transit Connect / Truck

VEHICLE NHTSA NO. CB0206  TEST DATE: 3-23-11

ESC Malfunction Telltale

Vehicle is equipped with malfunction telltale?  X Yes (Pass)  No (Fail)

Telltale Location Instrument cluster, below the speedometer

Telltale Color Yellow

Telltale symbol or abbreviation used.

X Vehicle uses this symbol

ESC Vehicles uses this abbreviation

Neither symbol or abbreviation is used

If different than identified above, make note of any message, symbol or abbreviation used.

Is telltale part of a common space?  Yes  No

Is telltale also used to indicate activation of the ESC system?  X Yes  No

If yes, explain telltale operation during ESC activation: The ESC telltale flashes
DATA SHEET 3 (Sheet 2 of 2)
ESC MALFUNCTION AND OFF TELLTALES

“ESC OFF” Telltale (if provided)

Vehicle is equipped with “ESC Off” telltale? _____ Yes  _____ No

Is “ESC OFF” telltale combined with “ESC Malfunction” telltale utilizing a two part telltale? _____ Yes  _____ No

Telltale Location    N/A

Telltale Color     N/A

Telltale symbol or abbreviation used.

Or ESC OFF

Vehicle uses this symbol

Vehicle uses this abbreviation

Neither symbol or abbreviation is used

If different than identified above, make note of any message, symbol or abbreviation used.

N/A

Is telltale part of a common space? _____ Yes  _____ No

DATA INDICATES COMPLIANCE  PASS/FAIL  PASS

(Vehicle is compliant if equipped with a malfunction telltale)

REMARKS:
The 2011 Ford Transit Connect does not have an ESC Off Control, therefore it does not have an ESC Off telltale.

RECORDED BY: Alan Ida    DATE: 3-23-11
APPROVED BY: Ken Webster  DATE: 3-28-11
“ESC OFF” Controls Identification and Operational Check:

Is the vehicle equipped with a control or controls whose purpose is to deactivate the ESC system or place the ESC system in a mode or modes that may no longer satisfy the performance requirements of the standard?

[ ] Yes [ ] No

Type of control or controls provided?

- [ ] Dedicated “ESC Off” control
- [ ] Multi-functional control with an “ESC Off” mode
- [ ] Other (describe)

Identify each control location, labeling and selectable modes.

First Control:

<table>
<thead>
<tr>
<th>Location</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling</td>
<td></td>
</tr>
<tr>
<td>Modes</td>
<td></td>
</tr>
</tbody>
</table>

Identify standard or default drive configuration

[ ] N/A

Verify standard or default drive configuration selected.

[ ] Yes [ ] No

Does the “ESC Off” telltale illuminate upon activation of the dedicated ESC off control or selection of the “ESC Off” mode on the multi-function control?

[ ] Yes [ ] No (fail)

Does the “ESC Off” telltale extinguish when the ignition is cycled from “On” (“Run”) to “Lock” or “Off” and then back again to the “On” (“Run”) position?

[ ] Yes [ ] No (fail)

If no, describe how the off control functions:

________________________________________________________________________

________________________________________________________________________
DATA SHEET 4 (Sheet 2 of 3)
ESC AND ANCILLARY SYSTEM CONTROLS

If a multi-function control is provided, cycle through each mode setting on the control and record which modes illuminate the “ESC Off” telltale. Also, for those modes that illuminate the ESC Off” telltale identify if the telltale extinguishes upon cycling the ignition system.

<table>
<thead>
<tr>
<th>Control Modes</th>
<th>“ESC Off” telltale illuminates upon activation of control? (Yes/No)</th>
<th>“ESC Off” telltale extinguishes upon cycling ignition? (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each mode that illuminates the “ESC Off” telltale, did the telltale extinguish when the ignition was cycled from “On” (“Run”) to “Lock” or “Off” and then back again to the “On” (“Run”) position?

_____ Yes    _____ No (fail)

Other System Controls that have an ancillary effect on ESC Operation:

Is the vehicle equipped with any ancillary controls that upon activation may deactivate the ESC System or place the ESC System in a mode or modes that may no longer satisfy the performance requirements of the standard?

_____ Yes    ____X____ No

List and describe each control (i.e. alternate drive configuration selection controls):

Ancillary Control: System N/A
Control Description
Labeling

Ancillary Control: System N/A
Control Description
Labeling
3.0 TEST DATA....continued

DATA SHEET 4 (Sheet 3 of 3)
ESC AND ANCILLARY SYSTEM CONTROLS

Activate each control listed above and record whether the control illuminates the “ESC Off” telltale. Also, record warnings or messages provided regarding the ESC System.

<table>
<thead>
<tr>
<th>Ancillary Control</th>
<th>Control Activates “ESC Off” Telltale? (Yes/No)</th>
<th>Warnings or Messages Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For those controls that illuminate the “ESC Off” telltale above identify if the “ESC Off” telltale extinguishes upon cycling the ignition system.

<table>
<thead>
<tr>
<th>Ancillary Control</th>
<th>“ESC Off” telltale extinguishes upon cycling ignition? (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

For each control that illuminates the “ESC Off” telltale, did the telltale extinguish when the ignition is cycled from “On” (“Run”) to “Lock” or “Off” and then back again to the “On” (“Run”) position? If the control activated places the vehicle into a low-range four-wheel drive configuration designed for low-speed, off-road driving, the ESC System may remain turned off after the ignition has been cycled off and then back on and therefore the “ESC Off” telltale may not extinguish.

______ Yes  ____ No (fail)

DATA INDICATES COMPLIANCE: PASS/FAIL __PASS___

REMARKS:

RECORDED BY: Alan Ida  DATE: 3-23-11
APPROVED BY: Ken Webster  DATE: 3-28-11
3.0 TEST DATA....continued

DATA SHEET 5 (Sheet 1 of 3)
VEHICLE AND TEST TRACK DATA

VEHICLE MAKE/MODEL/BODY STYLE:   ____ Ford / Transit Connect / Truck ____

NHTSA No.: CB0206               TEST DATE: 3-17-11

Test Track Requirements:
Test Surface Slope (0-1 %)   ___ 1 ___ %
Peak Friction Coefficient (at least 0.9)   ___ 0.94 ___

Full Fluid Levels: Fuel    X    Coolant   X    Other Fluids   __Washer__(specify)

Tire Pressures:
Required:
Front Axle __276 kPa__  Rear Axle __338 kPa__
Actual:
LF: __276 kPa__  RF: __276 kPa__  LR: __338 kPa__  RR: __338 kPa__

Vehicle Dimensions:
Track Width __149.9 cm__  Wheelbase __291.5 cm__
Roof Height __198.3 cm__

Vehicle weight ratings:
GAWR Front __1,130__ KG  GAWR Rear __1,243__ KG

Unloaded Vehicle Weight (UVW):
Front Axle __866.4__ KG  Left Front __437.8__ KG  Right Front __428.6__ KG
Rear Axle __670.4__ KG  Left Rear __337.6__ KG  Right Rear __332.8__ KG
Total UVW __1,536.8__ KG

Baseline Weight and Outrigger Selection (only for MPVs, Trucks, Buses)
Calculated Baseline Weight (UVW+ 73 kg) __1,609.8__ KG

Outrigger size required ("Standard" or "Heavy")
Standard - Baseline weight under 2,722 kg (6,000 lbs.)
Heavy - Baseline weight equal to or greater than 2,722 kg (6,000 lbs.)
3.0 TEST DATA….continued

DATA SHEET 5 (Sheet 2 of 3)
VEHICLE AND TEST TRACK DATA

UVW with Outriggers (only for MPVs, Trucks, Buses)

Front Axle____ 935.6  KG
Left Front____ 469.0  KG
Right Front____ 466.6  KG

Rear Axle____ 714.0  KG
Left Rear____ 363.2  KG
Right Rear____ 350.8  KG

Total UVW w/ Outriggers____1,649.6___KG

Loaded Vehicle Weight w/ Driver and Instrumentation (No Ballast)

Front Axle____ 1,014.2  KG
Left Front____ 515.8  KG
Right Front____ 498.4  KG

Rear Axle____  770.8  KG
Left Rear____ 396.6  KG
Right Rear____ 374.2  KG

Total Loaded Vehicle Weight____  1,785.0___KG

Ballast Required = [UVW w/ Outriggers + 168 KG] - Total Loaded Weight w/ Driver and Instrumentation

= [1,649.6 KG + 168 KG] - 1,785.0 KG

= 32.6 KG

Total Loaded Vehicle Weight

Front Axle____ 1,029.8  KG
Left Front____ 518.2  KG
Right Front____ 511.6  KG

Rear Axle____  787.8  KG
Left Rear____ 401.6  KG
Right Rear____ 386.2  KG

Total Loaded Vehicle Weight____ 1,817.6___KG
3.0 TEST DATA....continued

DATA SHEET 5 (Sheet 3 of 3)
VEHICLE AND TEST TRACK DATA

Center of Gravity and Inertial Sensing System Location at Loaded Vehicle Condition

x-distance (longitudinal)  Point of reference is the front axle centerline.  
                          (Positive from front axle toward rear of vehicle.)

y-distance (lateral)     Point of reference is the vehicle centerline.  
                          (Positive from the center toward the right.)

z-distance (vertical)   Point of reference is the ground plane.  
                          (Positive from the ground up.)

Locations:

<table>
<thead>
<tr>
<th></th>
<th>Center of Gravity</th>
<th>Inertial Sensing System</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-distance</td>
<td>126.3 cm</td>
<td>161.7 cm</td>
</tr>
<tr>
<td>y-distance</td>
<td>-0.9 cm</td>
<td>-1.6 cm</td>
</tr>
<tr>
<td>z-distance</td>
<td>75.3 cm</td>
<td>100.4 cm</td>
</tr>
</tbody>
</table>

Distance Between Ultrasonic Sensors:  171.5 cm

TEST TRACK DATA MEETS REQUIREMENTS:  YES/NO  YES
If no, explain:  

REMARKS:

RECORDED BY:  Alan Ida  DATE:  3-17-11
APPROVED BY:  Ken Webster  DATE:  3-28-11
3.0 TEST DATA….continued

DATA SHEET 6 (Sheet 1 of 3)
BRAKE AND TIRE CONDITIONING

VEHICLE MAKE/MODEL/BODY STYLE: ____ Ford / Transit Connect / Truck ____

VEHICLE NHTSA No.: ____ CB0206 ____

Measured Cold Tire Pressures:  
- LF 276 kPa  
- RF 276 kPa  
- LR 338 kPa  
- RR 338 kPa

Wind Speed ____ 5.0 ____ m/sec  
(10m/sec (22mph) max for passenger cars; 5m/s (11mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F)) ____ 9.4 °C

Brake Conditioning  
Time: ___10:45 AM_____  Date: ___3-17-11_____

56 km/h (35 mph) Brake Stops
- Number of stops executed (10 required) ____ 10 ____ stops
- Observed deceleration rate range (.5g target) ____ 0.50 – 0.55 ____ g

72 km/h (45 mph) Brake Stops
- Number of stops executed (3 required) ____ 3 ____ stops
- Number of stops ABS activated (3 required) ____ 3 ____ stops
- Observed deceleration rate range ____ 0.90 – 0.97 ____ g

72 km/h (45 mph) Brake Cool Down Period
- Duration of cool down period (5 minutes min.) ____ 5:13 ____ minutes
3.0 TEST DATA....continued

DATA SHEET 6 (Sheet 2 of 3)
BRAKE AND TIRE CONDITIONING

Tire Conditioning Series No. 1    Time: 9:34 AM    Date: 3-18-11

Measured Tire Pressures:    LF 283 kPa    RF 283 kPa
LR 345 kPa    RR 341 kPa

Wind Speed 3.6 m/sec
(10m/sec (22mph) max for passenger cars; 5m/s (11mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F))    13.9°C

<table>
<thead>
<tr>
<th>30 meter (100 ft) Diameter Circle Maneuver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1-3</td>
</tr>
<tr>
<td>4-6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 Hz 5 Cycle Sinusoidal Steering Maneuver to Determine Steering Wheel Angle For 0.5-0.6g Lateral Acceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

Steering wheel angle that corresponds to a peak 0.5–0.6g lateral acceleration; 70 degrees

<table>
<thead>
<tr>
<th>1 Hz 10 Cycle Sinusoidal Steering Maneuver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Runs</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1-3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

* The steering wheel angle used for cycle 10 should be twice the angle used for cycles 1-9.
DATA SHEET 6 (Sheet 3 of 3)
BRAKE AND TIRE CONDITIONING

Tire Conditioning Series No. 2

Measured Tire Pressures:
- LF __290__ kPa
- RF __290__ kPa
- LR __348__ kPa
- RR __352__ kPa

Wind Speed __2.7__ m/sec
(10 m/sec (22 mph) max for passenger cars; 5 m/s (11 mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F)) __16.1__ °C

### 30 meter (100 ft) Diameter Circle Maneuver

<table>
<thead>
<tr>
<th>Test Runs</th>
<th>Steering Direction</th>
<th>Target Lateral Acceleration (g)</th>
<th>Observed Lateral Acceleration (g)</th>
<th>Observed Vehicle Speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>clockwise</td>
<td>0.5-0.6</td>
<td>0.55</td>
<td>32.2</td>
</tr>
<tr>
<td>4-6</td>
<td>counterclockwise</td>
<td>0.5-0.6</td>
<td>0.55</td>
<td>32.2</td>
</tr>
</tbody>
</table>

### 1 Hz 5 Cycle Sinusoidal Steering Maneuver to Determine Steering Wheel Angle For 0.5-0.6g Lateral Acceleration

<table>
<thead>
<tr>
<th>Test Runs</th>
<th>Vehicle Speed Km/h (mph)</th>
<th>Steering Wheel Angle (degrees)</th>
<th>Target Peak Lateral Acceleration (g)</th>
<th>Observed Peak Lateral Acceleration (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56±2 (35±1)</td>
<td>N/A</td>
<td>0.5-0.6</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>56±2 (35±1)</td>
<td></td>
<td>0.5-0.6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>56±2 (35±1)</td>
<td></td>
<td>0.5-0.6</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>56±2 (35±1)</td>
<td></td>
<td>0.5-0.6</td>
<td></td>
</tr>
</tbody>
</table>

Steering wheel angle that corresponds to a peak 0.5–0.6g lateral acceleration: __70__ degrees

### 1 Hz 10 Cycle Sinusoidal Steering Maneuver

<table>
<thead>
<tr>
<th>Test Runs</th>
<th>Vehicle Speed (mph)</th>
<th>Steering Wheel Angle (degrees)</th>
<th>Target Peak Lateral Acceleration (g)</th>
<th>Observed Peak Lateral Acceleration (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 3</td>
<td>56±2 (35±1)</td>
<td>70 (cycles 1-10)</td>
<td>0.5-0.6</td>
<td>0.50</td>
</tr>
<tr>
<td>4</td>
<td>56±2 (35±1)</td>
<td>70 (cycles 1-9)</td>
<td>0.5-0.6</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>140 (cycle 10)*</td>
<td>N/A</td>
<td>0.87</td>
<td></td>
</tr>
</tbody>
</table>

* The steering wheel angle used for cycle 10 should be twice the angle used for cycles 1-9.

REMARKS:

RECORDED BY: Alan Ida                  DATE: 3-18-11
APPROVED BY: Ken Webster              DATE: 3-28-11
3.0 TEST DATA....continued

DATA SHEET 7 (1 of 2)
SLOWLY INCREASING STEER (SIS) MANEUVER

VEHICLE MAKE/MODEL/BODY STYLE: Ford / Transit Connect / Truck

VEHICLE NHTSA No.: CB0206 TEST DATE: 3-18-11

Wind Speed 3.1 m/sec
(10m/sec (22mph) max for passenger cars; 5m/s (11mph) max. for MPVs and Trucks)

Ambient Temperature (7°C (45°F) - 40°C (104°F)) 13.9°C

Static Data File Number: 0008

Selected Drive Configuration: 2WD

Selected Mode: default

Preliminary Left Steer Maneuver:

Lateral Acceleration measured at 30 degrees steering wheel angle \(a_y,30\) degrees

\[ a_{y,30\ degrees} = 0.36 \text{ g} \]

Assuming a linear relationship the following ratio should be used to calculate the steering wheel angle at .55g.

\[ \frac{30\ degrees}{a_{y,30\ degrees}} = \frac{\delta_{SIS}}{0.55\ g} \]

\[ \delta_{SIS} = 46 \text{ degrees @ 0.55g} \]

\[ \delta_{SIS} = 40^* \text{ degrees (rounded)} \]

Steering Wheel Angle at Corrected 0.3 g Lateral Acceleration:

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Initial Steer Direction</th>
<th>Time Clock (5 min max between runs)</th>
<th>Steering Wheel Angle to nearest 0.1 degree (degrees)</th>
<th>All Conditions Met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0012</td>
<td>Left</td>
<td>9:52 am</td>
<td>-29.3</td>
<td>Yes</td>
</tr>
<tr>
<td>0014</td>
<td>Left</td>
<td>9:58 am</td>
<td>-28.8</td>
<td>Yes</td>
</tr>
<tr>
<td>0015</td>
<td>Left</td>
<td>10:01 am</td>
<td>-29.5</td>
<td>Yes</td>
</tr>
<tr>
<td>0021</td>
<td>Right</td>
<td>10:23 am</td>
<td>29.3</td>
<td>Yes**</td>
</tr>
<tr>
<td>0022</td>
<td>Right</td>
<td>10:26 am</td>
<td>29.7</td>
<td>Yes</td>
</tr>
<tr>
<td>0023</td>
<td>Right</td>
<td>10:29 am</td>
<td>29.7</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.0 TEST DATA….continued

DATA SHEET 7 (2 of 2)
SLOWLY INCREASING STEER (SIS) MANEUVER

Average Overall Steering Wheel Angle:

\[
\delta_{0.3 \text{ g}, \text{overall}} = \left( |\delta_{0.3 \text{ g}, \text{left (1)}}| + |\delta_{0.3 \text{ g}, \text{left (2)}}| + |\delta_{0.3 \text{ g}, \text{left (3)}}| + \delta_{0.3 \text{ g}, \text{right (1)}} + \delta_{0.3 \text{ g}, \text{right (2)}} + \delta_{0.3 \text{ g}, \text{right (3)}} \right) / 6
\]

\[
\delta_{0.3 \text{ g}, \text{overall}} = 29.4 \text{ degrees} \quad \text{[to nearest 0.1 degree]}
\]

REMARKS:

*The Slowly Increasing Steer maneuvers were initially rounded up to 50 degrees, which exceeded 0.6g lateral acceleration. Therefore, the SIS maneuvers were rounded down to 40 degrees in order to maintain a lateral acceleration between 0.5g to 0.6g.

* The time clock between maneuvers 0015 and 0021 indicates more than 5 minutes since maneuvers 0016 through 0020 were omitted due to lateral acceleration and vehicle speed not meeting the requirements.

RECORDED BY: Alan Ida
DATE: 3-18-11

APPROVED BY: Ken Webster
DATE: 3-28-11
### Lateral Stability Test Series No. 1 – Counterclockwise Initial Steer Direction

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Clock Time (1.5 – 5 min between each test run)</th>
<th>Commanded Steering Wheel Angle¹ (degrees)</th>
<th>Yaw Rates (degrees/sec)</th>
<th>YRR at 1.0 sec after COS [%]</th>
<th>YRR at 1.75 sec after COS [%]</th>
<th>Pass/ Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scalar</td>
<td>Angle</td>
<td>$\psi_{Peak}$</td>
<td>$\dot{\psi}_{1.0sec}$</td>
<td>$\dot{\psi}_{1.75sec}$</td>
<td>%</td>
</tr>
<tr>
<td>0030</td>
<td>12:33 pm</td>
<td>1.5° $\delta_{0.3g}$</td>
<td>44</td>
<td>12.33</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
<tr>
<td>0031</td>
<td>12:38 pm</td>
<td>2.0° $\delta_{0.3g}$</td>
<td>59</td>
<td>16.82</td>
<td>-0.06</td>
<td>-0.03</td>
</tr>
<tr>
<td>0032</td>
<td>12:42 pm</td>
<td>2.5° $\delta_{0.3g}$</td>
<td>74</td>
<td>20.74</td>
<td>-0.18</td>
<td>-0.20</td>
</tr>
<tr>
<td>0038</td>
<td>1:14 pm</td>
<td>3.0° $\delta_{0.3g}$</td>
<td>88</td>
<td>24.23</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>0039</td>
<td>1:17 pm</td>
<td>3.5° $\delta_{0.3g}$</td>
<td>103</td>
<td>28.22</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>0040</td>
<td>1:52 pm</td>
<td>4.0° $\delta_{0.3g}$</td>
<td>118</td>
<td>31.68</td>
<td>0.15</td>
<td>-0.02</td>
</tr>
<tr>
<td>0041</td>
<td>1:55 pm</td>
<td>4.5° $\delta_{0.3g}$</td>
<td>132</td>
<td>34.86</td>
<td>0.40</td>
<td>0.05</td>
</tr>
<tr>
<td>0042</td>
<td>1:59 pm</td>
<td>5.0° $\delta_{0.3g}$</td>
<td>147</td>
<td>37.39</td>
<td>0.24</td>
<td>-0.14</td>
</tr>
<tr>
<td>0043</td>
<td>2:03 pm</td>
<td>5.5° $\delta_{0.3g}$</td>
<td>162</td>
<td>40.64</td>
<td>0.52</td>
<td>0.31</td>
</tr>
<tr>
<td>0044</td>
<td>2:07 pm</td>
<td>6.0° $\delta_{0.3g}$</td>
<td>176</td>
<td>43.31</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>0045</td>
<td>2:11 pm</td>
<td>6.5° $\delta_{0.3g}$</td>
<td>191</td>
<td>47.59</td>
<td>0.32</td>
<td>0.17</td>
</tr>
<tr>
<td>0046</td>
<td>2:15 pm</td>
<td>7.0° $\delta_{0.3g}$</td>
<td>206</td>
<td>49.09</td>
<td>-0.07</td>
<td>-0.18</td>
</tr>
<tr>
<td>0047</td>
<td>2:19 pm</td>
<td>7.5° $\delta_{0.3g}$</td>
<td>221</td>
<td>50.74</td>
<td>0.44</td>
<td>0.06</td>
</tr>
<tr>
<td>0048</td>
<td>2:23 pm</td>
<td>8.0° $\delta_{0.3g}$</td>
<td>235</td>
<td>50.46</td>
<td>0.26</td>
<td>-0.04</td>
</tr>
<tr>
<td>0049</td>
<td>2:25 pm</td>
<td>8.5° $\delta_{0.3g}$</td>
<td>250</td>
<td>50.26</td>
<td>-0.07</td>
<td>0.17</td>
</tr>
<tr>
<td>0050</td>
<td>2:39 pm</td>
<td>9.0° $\delta_{0.3g}$</td>
<td>265</td>
<td>49.32</td>
<td>0.18</td>
<td>0.16</td>
</tr>
<tr>
<td>0051</td>
<td>2:42 pm</td>
<td>9.2° $\delta_{0.3g}$</td>
<td>270</td>
<td>50.06</td>
<td>0.16</td>
<td>0.09</td>
</tr>
</tbody>
</table>

1. Maneuver execution should continue until a steering wheel angle magnitude factor of 6.5°$\delta_{0.3g}$ overall or 270 degrees is utilized, whichever is greater provided the calculated magnitude of 6.5°$\delta_{0.3g}$ overall is less than or equal to 300 degrees. If 6.5°$\delta_{0.3g}$ overall is less than 270 degrees maneuver execution should continue by increasing the steering wheel angle magnitude by multiples of 0.5°$\delta_{0.3g}$ overall without exceeding the 270 degree steering wheel angle.
### Lateral Stability Test Series No. 2 – Clockwise Initial Steer Direction

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Clock Time (1.5 – 5 min between each test run)</th>
<th>Commanded Steering Wheel Angle¹ (degrees)</th>
<th>Yaw Rates (degrees/sec)</th>
<th>YRR at 1.0 sec after COS [&lt; 35%]</th>
<th>YRR at 1.75 sec after COS [&lt; 20%]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Scalar</td>
<td>Angle</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>0052</td>
<td>2:46 pm</td>
<td>1.5° 0.3 g</td>
<td>44</td>
<td>-13.34</td>
<td>0.09</td>
</tr>
<tr>
<td>0053</td>
<td>2:50 pm</td>
<td>2.0° 0.3 g</td>
<td>59</td>
<td>-18.25</td>
<td>0.20</td>
</tr>
<tr>
<td>0054</td>
<td>2:53 pm</td>
<td>2.5° 0.3 g</td>
<td>74</td>
<td>-22.19</td>
<td>0.03</td>
</tr>
<tr>
<td>0055</td>
<td>2:57 pm</td>
<td>3.0° 0.3 g</td>
<td>88</td>
<td>-25.70</td>
<td>-0.17</td>
</tr>
<tr>
<td>0056</td>
<td>3:00 pm</td>
<td>3.5° 0.3 g</td>
<td>103</td>
<td>-30.54</td>
<td>-0.44</td>
</tr>
<tr>
<td>0057</td>
<td>3:03 pm</td>
<td>4.0° 0.3 g</td>
<td>118</td>
<td>-32.52</td>
<td>-0.27</td>
</tr>
<tr>
<td>0058</td>
<td>3:07 pm</td>
<td>4.5° 0.3 g</td>
<td>132</td>
<td>-36.44</td>
<td>-0.36</td>
</tr>
<tr>
<td>0059</td>
<td>3:10 pm</td>
<td>5.0° 0.3 g</td>
<td>147</td>
<td>-37.82</td>
<td>-0.29</td>
</tr>
<tr>
<td>0060</td>
<td>3:13 pm</td>
<td>5.5° 0.3 g</td>
<td>162</td>
<td>-41.09</td>
<td>-0.65</td>
</tr>
<tr>
<td>0061</td>
<td>3:16 pm</td>
<td>6.0° 0.3 g</td>
<td>176</td>
<td>-44.18</td>
<td>-0.30</td>
</tr>
<tr>
<td>0062</td>
<td>3:20 pm</td>
<td>6.5° 0.3 g</td>
<td>191</td>
<td>-46.97</td>
<td>-0.36</td>
</tr>
<tr>
<td>0063</td>
<td>3:23 pm</td>
<td>7.0° 0.3 g</td>
<td>206</td>
<td>-49.44</td>
<td>-0.18</td>
</tr>
<tr>
<td>0064</td>
<td>3:26 pm</td>
<td>7.5° 0.3 g</td>
<td>221</td>
<td>-50.68</td>
<td>-0.43</td>
</tr>
<tr>
<td>0065</td>
<td>3:30 pm</td>
<td>8.0° 0.3 g</td>
<td>235</td>
<td>-52.85</td>
<td>-0.41</td>
</tr>
<tr>
<td>0066</td>
<td>3:36 pm</td>
<td>8.5° 0.3 g</td>
<td>250</td>
<td>-52.48</td>
<td>-0.55</td>
</tr>
<tr>
<td>0068</td>
<td>3:40 pm</td>
<td>9.0° 0.3 g</td>
<td>265</td>
<td>-51.49</td>
<td>-0.23</td>
</tr>
<tr>
<td>0069</td>
<td>3:44 pm</td>
<td>9.5° 0.3 g</td>
<td>270</td>
<td>-51.90</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

1. Maneuver execution should continue until a steering wheel angle magnitude factor of 6.5°* 0.3 g, overall or 270 degrees is utilized, whichever is greater provided the calculated 6.5°* 0.3 g, overall is less than or equal to 300 degrees. If 6.5°* 0.3 g, overall is less than 270 degrees maneuver execution should continue by increasing the steering wheel angle magnitude by multiples of 0.5°* 0.3 g, overall without exceeding the 270 degree steering wheel angle.

During execution of the sines with dwell maneuvers were any of the following events observed?

- Rim-to-pavement contact: _____ Yes X No
- Tire debeading: _____ Yes X No
- Loss of pavement contact of vehicle tires: _____ Yes X No
- Did the test driver experience any vehicle loss of control or spinout?: _____ Yes X No

If “Yes” explain the event and consult with the COTR.
# 3.0 TEST DATA….continued

## DATA SHEET 8 (3 of 3)

### VEHICLE LATERAL STABILITY AND RESPONSIVENESS

#### Responsiveness – Lateral Displacement

<table>
<thead>
<tr>
<th>Maneuver #</th>
<th>Initial Steer Direction</th>
<th>Commanded Steering Wheel Angle ((5.0^\circ \delta_{0.3 g}, \text{overall or greater}))</th>
<th>Scalar</th>
<th>Angle (degrees)</th>
<th>Distance (m)</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>0042</td>
<td>Counter Clockwise</td>
<td>5.0(^\circ) \delta_{0.3 g}</td>
<td>147</td>
<td>2.99</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0043</td>
<td>Counter Clockwise</td>
<td>5.5(^\circ) \delta_{0.3 g}</td>
<td>162</td>
<td>3.06</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0044</td>
<td>Counter Clockwise</td>
<td>6.0(^\circ) \delta_{0.3 g}</td>
<td>176</td>
<td>3.17</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0045</td>
<td>Counter Clockwise</td>
<td>6.5(^\circ) \delta_{0.3 g}</td>
<td>191</td>
<td>3.22</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0046</td>
<td>Counter Clockwise</td>
<td>7.0(^\circ) \delta_{0.3 g}</td>
<td>206</td>
<td>3.21</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0047</td>
<td>Counter Clockwise</td>
<td>7.5(^\circ) \delta_{0.3 g}</td>
<td>221</td>
<td>3.26</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0048</td>
<td>Counter Clockwise</td>
<td>8.0(^\circ) \delta_{0.3 g}</td>
<td>235</td>
<td>3.24</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0049</td>
<td>Counter Clockwise</td>
<td>8.5(^\circ) \delta_{0.3 g}</td>
<td>250</td>
<td>3.33</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0050</td>
<td>Counter Clockwise</td>
<td>9.0(^\circ) \delta_{0.3 g}</td>
<td>265</td>
<td>3.30</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0051</td>
<td>Counter Clockwise</td>
<td>9.2(^\circ) \delta_{0.3 g}</td>
<td>270</td>
<td>3.29</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0059</td>
<td>Clockwise</td>
<td>5.0(^\circ) \delta_{0.3 g}</td>
<td>147</td>
<td>2.86</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0060</td>
<td>Clockwise</td>
<td>5.5(^\circ) \delta_{0.3 g}</td>
<td>162</td>
<td>2.96</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0061</td>
<td>Clockwise</td>
<td>6.0(^\circ) \delta_{0.3 g}</td>
<td>176</td>
<td>2.98</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0062</td>
<td>Clockwise</td>
<td>6.5(^\circ) \delta_{0.3 g}</td>
<td>191</td>
<td>3.09</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0063</td>
<td>Clockwise</td>
<td>7.0(^\circ) \delta_{0.3 g}</td>
<td>206</td>
<td>3.15</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0064</td>
<td>Clockwise</td>
<td>7.5(^\circ) \delta_{0.3 g}</td>
<td>221</td>
<td>3.17</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0065</td>
<td>Clockwise</td>
<td>8.0(^\circ) \delta_{0.3 g}</td>
<td>235</td>
<td>3.24</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0066</td>
<td>Clockwise</td>
<td>8.5(^\circ) \delta_{0.3 g}</td>
<td>250</td>
<td>3.19</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0068</td>
<td>Clockwise</td>
<td>9.0(^\circ) \delta_{0.3 g}</td>
<td>265</td>
<td>3.34</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>0069</td>
<td>Clockwise</td>
<td>9.2(^\circ) \delta_{0.3 g}</td>
<td>270</td>
<td>3.26</td>
<td>Pass</td>
<td></td>
</tr>
</tbody>
</table>

1. Lateral displacement should be \(\geq 1.83\) m (6 ft) for vehicles with a GVWR of 3,500 kg (7,716 lb) or less; and \(\geq 1.52\) m (5 ft) for vehicles with a GVWR greater than 3,500 kg (7,716 lb).

**DATA INDICATES COMPLIANCE:** PASS/Fail _PASS_

**REMARKS:**

---

**RECORDED BY:** Alan Ida  
**DATE:** 3-18-11  
**APPROVED BY:** Ken Webster  
**DATE:** 3-28-11
DATA SHEET 9 (Sheet 1 of 2)
MALFUNCTION WARNING TEST

VEHICLE MAKE/MODEL/BODY STYLE: Ford / Transit Connect / Truck

VEHICLE NHTSA No.: CB0206
TEST DATE: 3-23-11

METHOD OF MALFUNCTION SIMULATION:
Describe method of malfunction simulation: Disconnect the Left Front wheel speed sensor connector.

MALFUNCTION TELLTALE ILLUMINATION:
Telltale illuminates and remains illuminated after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

X Yes  No

Time for telltale to illuminate after ignition system is activated.
0 Seconds (must be within 2 minutes)  Pass  Fail

ESC SYSTEM RESTORATION:
Telltale extinguishes after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

X Yes  No

Time for telltale to extinguish after ignition system is activated and vehicle speed of 48+8 km/h (30+5 mph) is reached.
0 Second (must be within 2 minutes)  Pass  Fail

DATA INDICATES COMPLIANCE:  PASS/FAIL  PASS

REMARKS:
The vehicle did not require driving to illuminate or extinguish the malfunction telltales. When the wheel speed sensor was disconnected, both the ESC and ABS malfunction telltales illuminated. After the wheel speed sensor connector was restored, both the ESC and ABS malfunction telltales extinguished.

RECORDED BY: Alan Ida  DATE: 3-23-11
APPROVED BY: Ken Webster  DATE: 3-28-11
MALFUNCTION WARNING TEST

VEHICLE MAKE/MODEL/BODY STYLE: __Ford / Transit Connect / Truck__

VEHICLE NHTSA No.: __CB0206__ TEST DATE: __3-23-11__

METHOD OF MALFUNCTION SIMULATION:
Describe method of malfunction simulation: __Disconnect the steering wheel angle sensor connector.____

MALFUNCTION TELTALTE ILLUMINATION:
Telltale illuminates and remains illuminated after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

____X____ Yes ______ No

Time for telltale to illuminate after ignition system is activated.
_____ 0 _____ Seconds (must be within 2 minutes) _______X____ Pass ______ Fail

ESC SYSTEM RESTORATION:
Telltale extinguishes after ignition locking system is activated and if necessary the vehicle is driven at least 2 minutes.

____X____ Yes ______ No

Time for telltale to extinguish after ignition system is activated.
_____ 0 _____ Second (must be within 2 minutes) _______X____ Pass ______ Fail

DATA INDICATES COMPLIANCE: __PASS/FAIL__ __PASS__

REMARKS:
The vehicle did not require driving to illuminate or extinguish the ESC malfunction telltale. After the steering wheel angle sensor connector was restored, the ESC malfunction telltale extinguished.

RECORDED BY: __Alan Ida__ DATE: __3-23-11__
APPROVED BY: __Ken Webster__ DATE: __3-28-11__
**4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

<table>
<thead>
<tr>
<th>Type</th>
<th>Output Description</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Specifications</th>
<th>Serial Number</th>
<th>Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire Pressure Gauge</td>
<td>Vehicle Tire Pressure</td>
<td>0-60psi</td>
<td>0.5 psi</td>
<td>±0.5% of applied pressure</td>
<td>Moroso Model: 89562</td>
<td>N/A</td>
<td>By: TRC</td>
</tr>
<tr>
<td>Platform Scales</td>
<td>Vehicle Total, Wheel, and Axle Load</td>
<td>0-2500 lb/4 pads</td>
<td>0.5 lb</td>
<td>±1.0% of applied load</td>
<td>Mettler Toledo Model: JXGA1000</td>
<td>5225831-5JC</td>
<td>By: Mettler Toledo</td>
</tr>
<tr>
<td>Automated Steering Machine</td>
<td>Handwheel Angle</td>
<td>±800 deg</td>
<td>0.25 deg</td>
<td>±0.25 deg</td>
<td>Heitz Automotive Testing Model: Sprint 3</td>
<td>60303</td>
<td>By: ATI-Heitz</td>
</tr>
<tr>
<td>Multi-Axis Inertial Sensing</td>
<td>Longitudinal, Lateral, and Vertical</td>
<td>Accelometers: ±2</td>
<td>Accelerometers: ≤10 ug</td>
<td>Accelerometers: ≤0.05% of full range</td>
<td>BEI Technologies Model: MotionPAK MP-1</td>
<td>0768</td>
<td>By: BEI Tech.</td>
</tr>
<tr>
<td>System</td>
<td>Acceleration Rate Sensors: ±100 deg/s</td>
<td>Angular Rate</td>
<td>Angular Rate: ≤0.004 deg/s</td>
<td>Angular Rate Sensors: 0.05% of full range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radar Speed Sensor and</td>
<td>Vehicle Speed</td>
<td>0-125 mph</td>
<td>0.009 mph</td>
<td>±0.25% of full scale</td>
<td>A-DAT Corp. Radar Model: DRS-6</td>
<td>1400603</td>
<td>By: B+S Multidata</td>
</tr>
<tr>
<td>Dashboard Display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Display Model: RD-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ultrasonic Distance Measuring</td>
<td>Left and Right Side Vehicle Height</td>
<td>5-24 inches</td>
<td>0.01 inches</td>
<td>±0.25% of maximum distance</td>
<td>Massa Products Corporation Model: M-5000/220</td>
<td>104619 &amp; 104613</td>
<td>By: Consumers Energy Laboratory Services</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Acquisition System</td>
<td>Record Time; Velocity; Distance;</td>
<td>Sufficient</td>
<td>Sufficient to meet or exceed individual sensors</td>
<td>Sufficient to meet or exceed individual sensors</td>
<td>Dewetron Sidehand DAS Model: DA-121-16 Digitizer Model: Dewe-Onion-1616-100 Amplifier/AntiAliasing: MDAQ-FILT-10-S</td>
<td>12060 1105</td>
<td>By: Dewetron</td>
</tr>
<tr>
<td>[Amplify, Anti-alias, and</td>
<td>Lateral, Longitudinal, and Vertical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digitize]</td>
<td>Accelerations; Roll, Yaw, and Pitch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rates; Steering Wheel Angle.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Cell</td>
<td>Vehicle Brake Pedal Force</td>
<td>0-300 lb</td>
<td>1 lb</td>
<td>±0.05% of full scale</td>
<td>DATRON Model: DTM-LPA</td>
<td>4970-1103</td>
<td>By: TRC</td>
</tr>
<tr>
<td>Coordinate Measurement Machine</td>
<td>Inertial Sensing System Location</td>
<td>0-10 feet</td>
<td>0.001 inch</td>
<td>±0.003% of full scale</td>
<td>FARO International Model: Faro Arm N10</td>
<td>U12-05-08-07108</td>
<td>By: FARO</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outriggers</td>
<td>No output. Safety Item.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>NHTSA Titanium Outriggers Model: Docket 2007-27662-11</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Date: 1-12-11, Due: 4-12-11
Date: 2-14-11, Due: 5-14-11
Date: 2-18-11, Due: 2-18-12
Date: 1-10-11, Due: 1-10-12
Date: 2-14-12
Date: 1-20-11, Due: 1-20-12
Date: 12-02-10, Due: 12-02-11
Date: per test
Date: 7-30-10, Due: 7-30-11
5.0 PHOTOGRAPHS

5.1 ¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE
5.2 ¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
5.3 VEHICLE CERTIFICATION LABEL
5.4 TIRE AND LOADING INFORMATION LABEL
5.5 WINDOW STICKER (MONRONEY LABEL)
5.6 ESC MALFUNCTION TELTTALE
5.7 ¾ FRONT VIEW - TEST VEHICLE INSTRUMENTED
5.8 ¾ REAR VIEW – TEST VEHICLE INSTRUMENTED
5.9 STEERING WHEEL CONTROLLER AND DATA ACQUISITION SYSTEM
5.10 STEERING CONTROLLER BATTERY BOX
5.11 INERTIA MEASUREMENT UNIT
5.12 VEHICLE SPEED SENSOR
5.13 BODY ROLL SENSOR (DRIVER SIDE)
5.14 BODY ROLL SENSOR (PASSENGER SIDE)
5.15 BRAKE PEDAL FORCE TRANSDUCER
5.1 ¾ FRONT VIEW FROM LEFT SIDE OF VEHICLE
5.2 ¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
MFD. BY FORD MOTOR CO.

DATE: 11/10  |  GVWR: 2270 KG (5005 LB)
FRONT GAWR: 1130 KG  |  REAR GAWR: 1243 KG
(2491 LB)  |  WITH  (2470 LB)  |  WITH
P205/65R15 95T  |  TIRES  |  P205/65R15 95T  |  TIRES
15X6J  |  RIMS  |  15X6J  |  RIMS

AT 275 kPa / 40 PSI COLD  |  AT 340 kPa / 49 PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

VIN: NM0LS7DN6BT050535
TYPE: TRUCK

EXT PNT: Z2

WB 2912  |  INT TR 8K  |  R AXLE 4  |  TR 2

2011 FORD TRANSIT CONNECT
FMVSS 126
VEHICLE No.: CB0206
MARCH 2011

5.3 VEHICLE CERTIFICATION LABEL
The combined weight of occupants and cargo should never exceed
Le poids total des occupants et du chargement ne doit jamais dépasser:

<table>
<thead>
<tr>
<th>TIRE PNEU</th>
<th>SIZE DIMENSIONS</th>
<th>COLD TIRE PRESSURE</th>
<th>SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT/AVANT</td>
<td>P205/65R15 95T</td>
<td>275KPA, 40PSI</td>
<td>VOIR LE MANUEL DE L'USAGER POUR PLUS DE RENSEIGNEMENTS</td>
</tr>
<tr>
<td>REAR/ARRIERE</td>
<td>P205/65R15 95T</td>
<td>340KPA, 49PSI</td>
<td></td>
</tr>
<tr>
<td>SPARE/DE SECOURS</td>
<td>P205/65R15 95T</td>
<td>340KPA, 49PSI</td>
<td></td>
</tr>
</tbody>
</table>
EPA Fuel Economy Estimates

CITY MPG 21
HIGHWAY MPG 26

Expected range for most drivers
17 to 25 MPG

Estimated Annual Fuel Cost

$1,957
based on 15,000 miles at $3.00 per gallon

2011 FORD TRANSIT CONNECT
FMVSS 126
VEHICLE No.: CB0206
MARCH 2011

TOTAL MSRP $24,470.00

SAFETY RATING

Frontal Driver Not Rated
Crash Passenger Not Rated

Side Front seat Not Rated
Crash Rear seat Nrt Not Rated

Rollover Not Rated

Star ratings based on the risk of rollover in a single vehicle crash.

Star ratings range from 1 to 5 stars, with 5 being the highest.
5.6 ESC MALFUNCTION TELLTALE
5.9 STEERING WHEEL CONTROLLER AND DATA ACQUISITION SYSTEM
5.11 INERTIA MEASUREMENT UNIT
5.12 VEHICLE SPEED SENSOR
5.13 BODY ROLL SENSOR (DRIVER SIDE)
5.14 BODY ROLL SENSOR (PASSENGER SIDE)
5.15 BRAKE PEDAL FORCE TRANSDUCER
6.0 DATA PLOTS

Figure 1. Steering Angle and Yaw Rate Time History, Counter-Clockwise Initial Steer Tests

Figure 2. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Counter-Clockwise Initial Steer Tests

Figure 3. Steering Angle and Yaw Rate Time History, Clockwise Initial Steer Tests

Figure 4. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Clockwise Initial Steer Tests
Figure 1. Steering Angle and Yaw Rate Time History, Counter-Clockwise Initial Steer Tests
Figure 2. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Counter-Clockwise Initial Steer Tests
Figure 3. Steering Angle and Yaw Rate Time History, Clockwise Initial Steer Tests
Figure 4. Steering Angle, Lateral Acceleration, and Lateral Displacement Time History, Clockwise Initial Steer Tests
7.0 OTHER DOCUMENTATION

7.1 OWNER'S MANUAL PAGES
7.2 VEHICLE ARRIVAL CONDITION REPORT
7.3 VEHICLE COMPLETION CONDITION REPORT
7.4 SINE WITH DWELL TEST RESULTS
7.5 SLOWLY INCREASING STEER TEST RESULTS
7.6 INERTIAL SENSING SYSTEM LOCATION COORDINATES
7.1 OWNER’S MANUAL PAGES
ADVANCETRAC® WITH ROLL STABILITY CONTROL™ (RSC®)
STABILITY ENHANCEMENT SYSTEM

WARNING: Vehicle modifications involving braking system, aftermarket roof racks, suspension, steering system, tire construction and/or wheel/tire size may change the handling characteristics of the vehicle and may adversely affect the performance of the AdvanceTrac® with RSC® system. In addition, installing any stereo loudspeakers may interfere with and adversely affect the AdvanceTrac® with RSC® system. Install any aftermarket stereo loudspeaker as far as possible from the front center console, the tunnel, and the front seats in order to minimize the risk of interfering with the AdvanceTrac® with RSC® sensors. Reducing the effectiveness of the AdvanceTrac® with RSC® system could lead to an increased risk of loss of vehicle control, vehicle rollover, personal injury and death.

WARNING: Remember that even advanced technology cannot defy the laws of physics. It's always possible to lose control of a vehicle due to inappropriate driver input for the conditions. Aggressive driving on any road condition can cause you to lose control of your vehicle increasing the risk of personal injury or property damage. Activation of the AdvanceTrac® with RSC® system is an indication that at least some of the tires have exceeded their ability to grip the road; this could reduce the operator's ability to control the vehicle, potentially resulting in a loss of vehicle control, vehicle rollover, personal injury and death. If your AdvanceTrac® with RSC® system activates, SLOW DOWN.

WARNING: If a failure has been detected within the AdvanceTrac® with RSC® system, the "sliding car" icon will illuminate steadily. If the "sliding car" icon illuminates steadily, have the system service by an authorized dealer immediately. Operating your vehicle with the "sliding car" icon illuminated could lead to an increased risk of loss of vehicle control, vehicle rollover, personal injury and death.

The AdvanceTrac® with RSC® system provides the following stability enhancement features for certain driving situations:

- Traction Control (TCS), which functions to help avoid drive-wheel spin and loss of traction.
Driving

- Electronic Stability Control (ESC), which functions to help avoid skids or lateral slides.
- Roll Stability Control™ (RSC®), which functions to help avoid a vehicle roll-over.

The AdvanceTrac® with RSC® system automatically enables each time the engine is started. All features of the AdvanceTrac® with RSC® system (TCS, ESC, and RSC®) are active and monitor the vehicle from start-up. However, the system will only intervene if the driving situation requires it.

The “sliding car” icon 🚗 in the instrument cluster will illuminate temporarily during start-up as part of a normal system self-check, or during driving if a driving situation causes the AdvanceTrac® with RSC® system to operate. If the “sliding car” icon 🚗 remains steadily illuminated, have the system serviced by an authorized dealer immediately.

When AdvanceTrac® with RSC® performs a normal system self-check, some drivers may notice a slight movement of the brake, and/or a rumble, grunting, or grinding noise after startup and when driving off. When an event occurs that activates AdvanceTrac® with RSC®, you may experience the following:

- A slight deceleration of the vehicle.
- The “sliding car” 🚗 indicator light will flash.
- A vibration in the pedal when your foot is on the brake pedal.
- If the driving condition is severe and your foot is not on the brake, the brake pedal may move as the systems applies higher brake forces. You may also hear a whoosh of air from under the instrument panel during this severe condition.
- The brake pedal may feel stiffer than usual.

Traction Control (TCS)

Traction Control is a driver aid feature that helps your vehicle maintain traction of the wheels, typically when driving on slippery and/or hilly road surfaces, by detecting and controlling wheel spin.

Excessive wheel spin is controlled in two ways, which may work separately or in tandem: Engine Traction Control and Brake Traction Control. Engine Traction Control works to limit drive-wheel spin by momentarily reducing engine power. Brake Traction Control works to limit wheel spin by momentarily applying the brakes to the wheel that is...
slipping. Traction Control prevents the driven wheels from loss of traction due to excessive throttle or low road friction level.

During Traction Control events the “sliding car” icon  in the instrument cluster will flash.

If the Traction Control system is activated excessively in a short period of time, the braking portion of the system may become temporarily disabled to allow the brakes to cool down. In this situation, Traction Control will use only engine power reduction or transfer to help control the wheels from over-spinning. When the brakes have cooled down, the system will regain all features. Anti-lock braking, RSC®, and ESC are not affected by this condition and will continue to function during the cool-down period.

**Electronic Stability Control (ESC)**

Electronic Stability Control (ESC) may enhance your vehicle’s directional stability during adverse maneuvers, for example when cornering severely or avoiding objects in the roadway. ESC operates by applying brakes to one or more of the wheels individually and, if necessary, reducing engine power if the system detects that the vehicle is about to skid or slide laterally.

During Electronic Stability Control events the “sliding car” icon  in the instrument cluster will flash.

Certain adverse driving maneuvers may activate the Electronic Stability Control system, which include but are not limited to:

- Taking a turn too fast
- Maneuvering quickly to avoid an accident, pedestrian or obstacle
- Driving over a patch of ice or other slippery surfaces
- Changing lanes on a snow-rutted road
- Entering a snow-free road from a snow-covered side street, or vice versa
- Entering a paved road from a gravel road, or vice versa
- Cornering while towing a heavily loaded trailer (refer to Trailer towing in the Tires, Wheels and Loading chapter).

**Roll Stability Control™ (RSC®)**

Roll Stability Control™ (RSC®) may help to maintain roll stability of the vehicle during adverse maneuvers. RSC® operates by detecting the vehicle’s roll motion and the rate at which it changes and by applying the brakes to one or more wheels individually.
Driving

During an event that activates the Roll Stability Control™ (RSC®) the “sliding car” icon ⚠️ in the instrument cluster will flash.

Certain adverse driving maneuvers may activate the Roll Stability Control system, which include:

- Emergency lane-change
- Taking a turn too fast
- Quick maneuvering to avoid an accident, pedestrian or obstacle

STEERING

To help prevent damage to the power steering system:

- Never hold the steering wheel at its furthest turning points (until it stops) for more than a few seconds when the engine is running.
- Do not operate the vehicle with a low power steering pump fluid level (below the MIN mark on the reservoir).
- Some noise is normal during operation. If the noise is excessive, check for low power steering pump fluid level before seeking service by your authorized dealer.
- Heavy or uneven steering efforts may be caused by low power steering pump fluid level. Check for low power steering pump fluid level before seeking service by your authorized dealer.
- Do not fill the power steering pump reservoir above the MAX mark on the reservoir, as this may result in leaks from the reservoir.

If the power steering system breaks down (or if the engine is turned off), you can steer the vehicle manually, but it takes more effort. If the steering wanders or pulls, check for:

- an improperly inflated tire
- uneven tire wear
- loose or worn suspension components
- loose or worn steering components
- improper steering alignment

A high crown in the road or high crosswinds may also make the steering seem to wander/pull.

If the steering wheel vibrates check for:

- improper wheel balance
Driving

PREPARING TO DRIVE

**WARNING:** Utility vehicles have a significantly higher rollover rate than other types of vehicles.

**WARNING:** In a rollover crash, an unbelted person is significantly more likely to die than a person wearing a seat belt.

Utility vehicles and trucks have larger tires and increased ground clearance, giving the vehicle a higher center of gravity than a passenger car.

**WARNING:** Vehicles with a higher center of gravity such as utility vehicles and trucks handle differently than vehicles with a lower center of gravity. Utility vehicles and trucks are **not** designed for cornering at speeds as high as passenger cars any more than low-slung sports cars are designed to perform satisfactorily under off-road conditions. Avoid sharp turns, excessive speed or abrupt maneuvers in these vehicles. Failure to drive cautiously could result in an increased risk of loss of vehicle control, vehicle rollover, personal injury and death.

**WARNING:** Loaded vehicles, with a higher center of gravity, may handle differently than unloaded vehicles. Do not overload your vehicle and use extra precautions, such as driving at slower speeds, avoiding abrupt steering changes and allowing for increased stopping distance, when driving a heavily loaded vehicle. Over-loading or loading the vehicle improperly can deteriorate handling capability and contribute to loss of vehicle control and vehicle rollover.

**Vehicle stability and handling**

The risk of a rollover crash increases as the number of people and load in the vehicle increases. This increased risk occurs because the passenger weight and load raises the vehicle’s center of gravity and causes it to shift rearward. As a result, the van has less resistance to rollover and handles differently from other commonly driven passenger vehicles, making it more difficult to control in an emergency situation. Placing any load on the roof also raises the center of gravity and increase the potential for rollover.

The van should be operated by an experienced driver. An organization that owns a van should select one or two experienced drivers to drive.
7.2 VEHICLE ARRIVAL CONDITION REPORT

CONTRACT NO. DTNH22-08-D-00097 DATE: 3/03/11

FROM: Automotive Allies

TO: TRC

PURPOSE: (X) Initial ( ) Received ( ) Present 

Model Year/Make/Model/Body Style: 2011 / Ford / Transit Connect / Truck

Manufacture Date: 11/10 NHTSA No.: CB0206

Body Color: White VIN: NM0LS7DN6BT050535

Odometer Reading: 20 miles GVWR: 2,270 KG

Purchase Price: $ rented / leased Dealer's Name: Buckeye Ford, 110 US 42 South, London, OH 43140

X ALL OPTIONS LISTED ON "WINDOW STICKER" ARE PRESENT ON THE TEST VEHICLE
X TIRES AND WHEEL RIMS ARE NEW AND THE SAME AS LISTED
X THERE ARE NO DENTS OR OTHER INTERIOR OR EXTERIOR FLAWS
X THE VEHICLE HAS BEEN PROPERLY PREPARED AND IS IN RUNNING CONDITION
X THE GLOVE BOX CONTAINS AN OWNER'S MANUAL, WARRANTY DOCUMENT, CONSUMER INFORMATION, AND EXTRA SET OF KEYS
X PROPER FUEL FILLER CAP IS SUPPLIED ON THE TEST VEHICLE
X PLACE VEHICLE IN STORAGE AREA
X INSPECT THE VEHICLE'S INTERIOR AND EXTERIOR, INCLUDING ALL WINDOWS, SEATS, DOORS, ETC., TO CONFIRM THAT EACH SYSTEM IS COMPLETE AND FUNCTIONAL PER THE MANUFACTURER'S SPECIFICATIONS. ANY DAMAGE, MISADJUSTMENT, OR OTHER UNUSUAL CONDITION THAT COULD INFLUENCE THE TEST PROGRAM OR TEST RESULTS SHALL BE RECORDED. REPORT ANY ABNORMAL CONDITION TO THE NHTSA COTR BEFORE BEGINNING ANY TEST

Recorded By: Alan Ida DATE: 3-03-11

Approved By: Ken Webster DATE: 3-28-11
7.3 VEHICLE COMPLETION CONDITION REPORT

CONTRACT NO. _DTNH22-08-D-00097_ DATE: _3/23/11_

MODEL YEAR/MAKE/MODEL/ BODY STYLE: _2011 / Ford / Transit Connect / Truck_

MANUFACTURE DATE: _11/10_ NHTSA NO.: _CB0206_

BODY COLOR: _White_ VIN: _NM0LS7DN6BT050535_

ODOMETER READING: _106_ miles GVWR: _2,270_ KG

LIST OF FMVSS TESTS PERFORMED BY THIS LAB: _126, 135_

- [X] THERE ARE NO DENTS OR OTHER INTERIOR OR EXTERIOR FLAWS
- [X] THE VEHICLE HAS BEEN PROPERLY MAINTAINED AND IS IN RUNNING CONDITION
- [X] THE GLOVE BOX CONTAINS AN OWNER'S MANUAL, WARRANTY DOCUMENT, CONSUMER INFORMATION, AND EXTRA SET OF KEYS
- [X] PROPER FUEL FILLER CAP IS SUPPLIED ON THE TEST VEHICLE

REMARKS:

Equipment that is no longer on the test vehicle as noted on Vehicle Arrival Condition Report:

None.

Explanation for equipment removal:

N/A

Test Vehicle Condition:

Like new.

RECORDED BY: _Alan Ida_ DATE: _3-23-11_

APPROVED BY: _Ken Webster_ DATE: _3-28-11_
### 7.4 SINE WITH DWELL TEST RESULTS

**2011 Ford Transit Connect**

**NHTSA No.: CB0206**

Date Created: 18-Mar-11

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<th>COS</th>
<th>Time@COS</th>
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**LEFT-TO-RIGHT (INITIAL COUNTER-CLOCKWISE STEER)**

**RIGHT-TO-LEFT (INITIAL CLOCKWISE STEER)**

The table above lists the test results for the SINE with dwell test on a 2011 Ford Transit Connect, including data for both left-to-right and right-to-left initial steering conditions. Each row provides detailed measurements such as file number, steering condition, and performance metrics. The data is presented in a structured format to facilitate analysis and comparison.
# 7.4 SINE WITH DWELL TEST RESULTS

## 2011 Ford Transit Connect

**NHTSA No.: CB0206**

**Date Created:** 18-Mar-11

### LEFT-TO-RIGHT (INITIAL COUNTER-CLOCKWISE STEER)

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<th>2nd Yaw Peak Ct</th>
<th>Lat Diap (ft)</th>
<th>Lat. Acc. 1.07s (g)</th>
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### RIGHT-TO-LEFT (INITIAL CLOCKWISE STEER)

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<th>Lat Diap (ft)</th>
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### 7.5 SLOWLY INCREASING STEER TEST RESULTS

*2011 Ford Transit Connect*

NHTSA No.: CB0206

Date Created: 18-Mar-11

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**Scalars**

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### 7.6 INERTIA SENSOR MEASUREMENTS

**2011 Ford Transit Connect**

NHTSA No.: CB0206

<table>
<thead>
<tr>
<th>Label</th>
<th>ActualX</th>
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<th>ActualZ</th>
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<td>M_PLANE001</td>
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<td>C_COORDSYS001</td>
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<tr>
<td>M_INERTIA_PACK</td>
<td>1617.075</td>
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<td>M_ROOF</td>
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<td>689.831</td>
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<td>M_GROUND</td>
<td>3123.709</td>
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**Track Width**: 1498.600

**Roof Height (relative to ground)**: 1982.703

- **Motion Pak - x-distance (mm)**: 1617.075
- **Motion Pak - y-distance (mm)**: -16.025
- **Motion Pak - z-distance (mm)**: 1003.808
- **Motion Pak - x-distance (inches)**: 63.664
- **Motion Pak - y-distance (inches)**: -0.631
- **Motion Pak - z-distance (inches)**: 39.520

**x-distance (longitudinal)**: Point of reference is the front axle centerline. (Positive from front axle toward rear of vehicle.)

**y-distance (lateral)**: Point of reference is the vehicle centerline. (Positive from the center toward the right.)

**z-distance (vertical)**: Point of reference is the ground plane. (Positive from the ground up.)