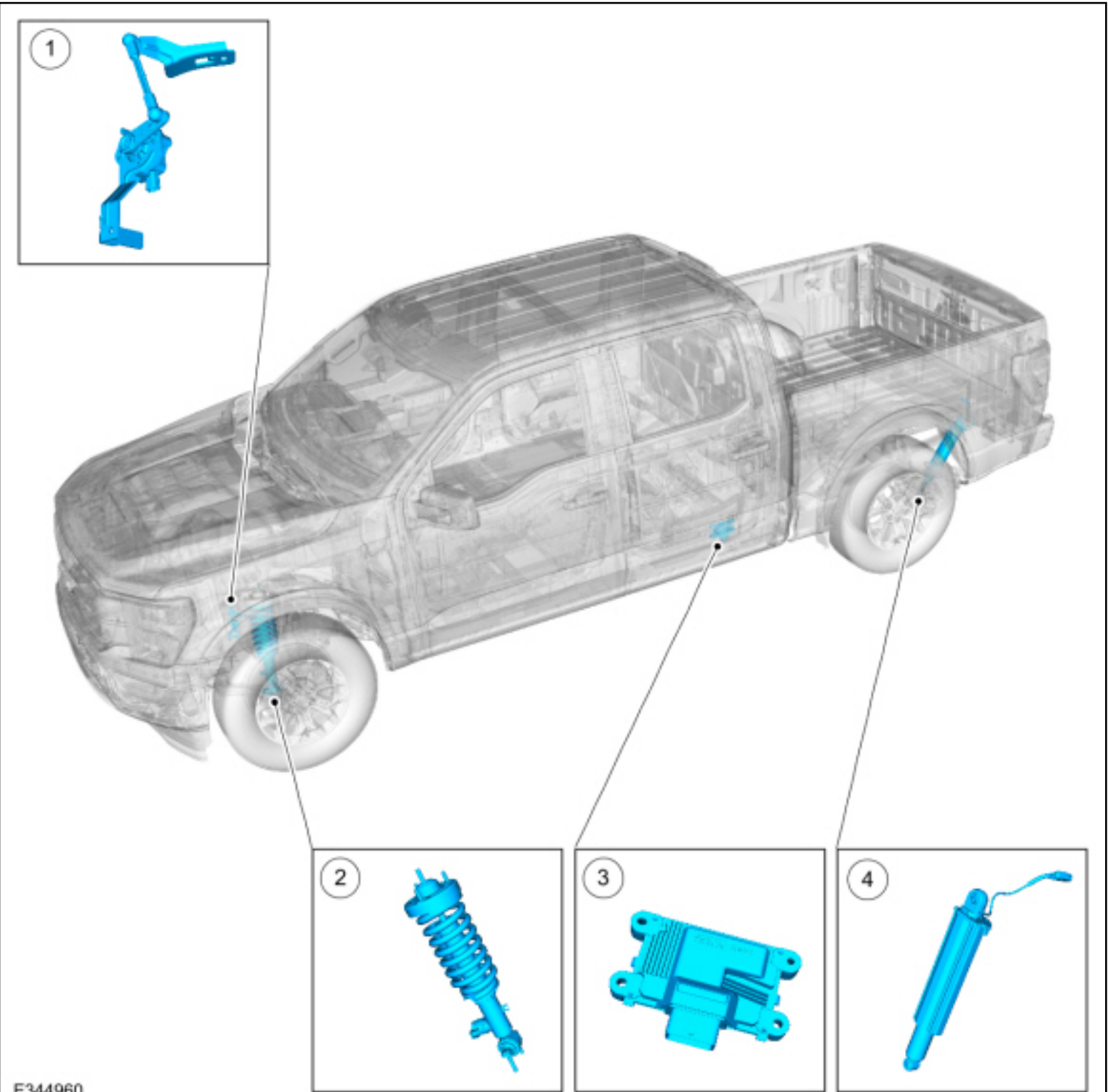
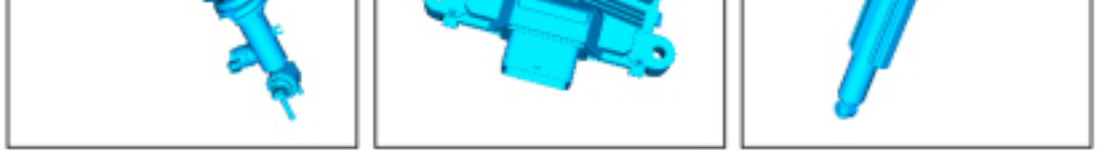


Vehicle Dynamic Suspension - Component Location



E344960



Item	Description
1	Front height sensor (2 required)
2	Front strut assembly (2 required)
3	VDM
4	Rear shock absorber (2 required)

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Vehicle Dynamic Suspension - Overview



Overview

The semi-active suspension dampening provides improved handling, comfort and stability by continuously adjusting the adaptive shock absorber force to the current road and driving conditions.

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Vehicle Dynamic Suspension - System Operation and Component Description



System Operation

System Diagram

E344999 1 VDM 2 RH Front Valve Solenoid 3 LH Rear Valve Solenoid 4 RH Rear Valve Solenoid 5 LH Front Height Sensor 6 PSCM 7 PCM 8 ABS 9 IPC 10 GWM 11 RCM 12 BCM 13 LH Front Valve Solenoid 14 RH Front Height Sensor 15 LH Rear Height Sensor 16 RH Rear Height Sensor 17 HVAC

Item	Description
1	VDM
2	RH Front Valve Solenoid
3	LH Rear Valve Solenoid
4	RH Rear Valve Solenoid
5	LH Front Height Sensor
6	PSCM
7	PCM
8	ABS
9	IPC
10	GWM
11	RCM
12	BCM
13	LH Front Valve Solenoid
14	RH Front Height Sensor

15	LH Rear Height Sensor
16	RH Rear Height Sensor
17	HVAC

Network Message Chart

Module Network Input Messages - VDM

Broadcast Message	Originating Module	Message Purpose
ABS active	ABS module	Indicates the current ABS activity, on or off.
Accelerator pedal position	PCM	Indicates the current accelerator pedal position in percentage of travel with 0% at rest and 100% at full throttle.
Ambient air temperature	HVAC module	Indicates the current ambient air temperature in degrees Celsius.
Brake torque request	ABS module	This message indicates the total amount of braking, in newton meters, requested by the driver (via the brake pedal), the adaptive cruise control system or the collision avoidance system. The VDM adjusts the valve solenoids to help stabilize the vehicle during the operation of those systems.
Driven wheel torque request	PCM	Torque at the wheels (sum of all wheels) desired from the propulsion system. This includes the effects of the driver's accelerator pedal input and the effects of the virtual driver functions, cruise control, adaptive cruise control.

Fuel level	IPC	This message is sent to the GWM and then to the VDM . Indicates the fuel level at time of ride height calibration in fractions of the fuel tank. The VDM uses fuel level when calculating suspension settings and uses a default setting when the information is not available.
Gear lever position	PCM	Indicates the current transmission gear status.
Gross train weight estimate	PCM	Rough estimate of the combined mass of a road vehicle, the passengers and cargo in the tow vehicle, plus the mass of the trailer and cargo in the trailer.
Ignition status	BCM	This message is sent to the GWM and then to the VDM . Indicates the current ignition status; off, accessory, run, start, invalid or unknown.
Life cycle mode	BCM	This message is sent to the GWM and then to the VDM . Indicates the current vehicle life cycle; normal, factory, not used or transport.
Odometer master value	IPC	This message is sent to the GWM and then to the VDM . Indicates the current odometer value in kilometers and whether the data is fresh or unchanged.
Power pack status	PCM	Indicates the current status of the engine and powertrain; Off - torque not available, On - torque not available, start in progress - torque not available or On - torque available.
Selectable Drive Modes mode request	ABS	Indicates the current SDM mode.
Stability control event in progress	ABS module	Indicates a stability control system (traction control or ESC) is currently active.

Stability control indicator request	ABS module	Indicates the current stability control warning indicator status; on, off, slow flash or fast flash.
Stability control	ABS module	Indicates if ESC is available, yes or no, and active, yes or no.
Start stop status	PCM	Indicates the current start/stop status of the engine.
Steering angle data	PSCM	Indicates the current steering wheel angle relative to the straight ahead position.
Traction control	ABS module	Indicates the current traction control state, active or inactive and if it is active, yes or no.
Vehicle configuration data	BCM	This message is sent to the GWM and then to the VDM . Indicates the current vehicle configuration and optional equipment.
Vehicle lateral acceleration	ABS module	Indicates the current lateral acceleration of the vehicle in meters per second squared as measured by the sensors in the RCM and relayed by the ABS module.
Vehicle lateral acceleration	RCM	Indicates the current lateral acceleration of the vehicle in meters per second squared as measured by the sensors in the RCM .
Vehicle longitudinal acceleration	ABS module	Indicates the current longitudinal acceleration of the vehicle in meters per second squared as measured by the sensors in the RCM and relayed by the ABS module.
Vehicle longitudinal acceleration	RCM	Indicates the current longitudinal acceleration of the vehicle in meters per second squared as measured by the sensors in the RCM .

Vehicle roll rate	ABS module	Indicates the current roll rate of the vehicle in radians per second squared as measured by the sensors in the RCM and relayed by the ABS module.
Vehicle roll rate	RCM	Indicates the current roll rate of the vehicle in radians per second squared as measured by the sensors in the RCM .
Vehicle speed	PCM	Indicates the current vehicle speed in kilometers per hour.
Vehicle yaw stability index	ABS module	Indicates the current stability (oversteer or understeer) of the vehicle.
Vehicle yaw rate	ABS module	Indicates the current yaw rate of the vehicle in radians per second squared as measured by the sensors in the RCM .
Vehicle vertical acceleration	ABS module	Indicates the current vertical acceleration of the vehicle in meters per second squared as measured by the sensors in the RCM and relayed by the ABS module.
Vehicle vertical acceleration	RCM	Indicates the current vertical acceleration of the vehicle in meters per second squared as measured by the sensors in the RCM and relayed by the ABS module.
Vehicle yaw rate	RCM	Indicates the current yaw rate of the vehicle in radians per second squared as measured by the sensors in the RCM .

Vehicle Dynamic Suspension

The VDM is connected to the FD-CAN to communicate with other modules. The VDM also gathers suspension height information from the height sensors. With the information received, the VDM monitors the heave, roll, pitch, cornering, braking and acceleration of the vehicle. Based on this information the VDM calculates the best action for each valve solenoid.

Once the valve solenoid is energized, the damping increases with the PWM duty cycle. At maximum current the damping is less than when minimum current is applied. The damper and valve solenoid have been designed so failure leads to a firm ride. The fail-safe level of damping is at a level equivalent to

what is produced at the minimum current.

When the VDM is initialized (ignition ON), the module carries out a preliminary electrical check of the height sensors, height sensor circuits, valve solenoids and valve solenoid circuits. It also checks for battery voltage above or below acceptable thresholds. Any malfunction detected in the above hardware of the system causes the VDM to set a DTC and send a message over the CAN to the IPC . The IPC responds by displaying a message in the message center and the VDM will deactivate the dynamic suspension system resulting in a firm suspension feel.

Component Description

Selectable Drive Modes (SDM)

The driver can select system modes using the (SDM) rotary dial. F-150 Raptor customers can also set the suspension mode independent of the drive mode via the suspension button on the steering wheel. When a mode is selected, the VDM regulates the PWM signal to the valve solenoids to keep the suspension "feel" realtional to the selected mode.

Height Sensor

The height sensor sends a variable amount of voltage back to the VDM based on suspension height. 2021 model year F150 with Continous Control Damping (CCD) suspension have an integrated height sensor and damper assembly on the rear of the vehicle. In this case, the height sensor is built into the dust boot of the rear dampers and is commonly known as a "linear sensor". The sensor has 3 circuits, one circuit is for the 5 volt sensor supply, one circuit is for sensor ground and one circuit is for the sensor output.

Valve Solenoid

The VDM uses a PWM output to control the valve solenoid. The solenoid opens or closes the valve depending on the amount of current supplied by the VDM . **For the base F-150** the higher the current, the more the valve is closed, resulting in a higher level of damping. **For the Raptor** the higher the current, the more the valve is opened, resulting in a lower level of damping.

Vehicle Dynamics Control Module (VDM)

The VDM monitors all sensor inputs and all HS-CAN messages that relate to the vehicle dynamic suspension and then directly controls the valve solenoids. The VDM sends an individual electrical current to each valve solenoid to control the amount of damping required.

The VDM requires calibration when any of the following components is installed new, disassembled, disconnected or removed.

- VDM
- Suspension height sensor
- Front upper control arm
- Front coil over shock assembly
- Rear upper control arm (Raptor)
- Rear leaf spring (Base F-150)
- Rear shock (Base F-150)

The calibration procedure is carried out using the diagnostic scan tool and required for the system to learn the zero-position of the vehicle.

Before performing the calibration procedure:

- Be sure the vehicle is on a level surface.
- The vehicle must not be moving.
- No occupants in the vehicle.
- Make sure the suspension is in a neutral position if it was recently lowered. To neutralize the suspension, drive the vehicle a short distance, such as around a parking lot.

For the Raptor only (Activate the **Engineering Test** mode for dynamic suspension which will power the shocks and allow the vehicle to settle by following the procedure below:

- Put the vehicle into Neutral
- Turn the vehicle ON with engine OFF
- Depress the gas pedal fully 3 times within 10 seconds, letting it fully return between each depression
- If the above sequence is correctly executed, a small **ET** for **Engineering Test** will display in the bottom right of the cluster and the shocks will power on (truck may also drop slightly).

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Vehicle Dynamic Suspension



Diagnostic Trouble Code (DTC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation) .

Module	DTC	Description	Action
VDM	C110C:11	Left Front Damper Solenoid: Circuit Short To Ground	GO to Pinpoint Test D
VDM	C110C:12	Left Front Damper Solenoid: Circuit Short To Battery	GO to Pinpoint Test D
VDM	C110C:13	Left Front Damper Solenoid: Circuit Open	GO to Pinpoint Test D
VDM	C110C:64	Left Front Damper Solenoid: Signal Plausibility Failure	GO to Pinpoint Test D
VDM	C110D:11	Right Front Damper Solenoid: Circuit Short To Ground	GO to Pinpoint Test E
VDM	C110D:12	Right Front Damper Solenoid: Circuit Short To Battery	GO to Pinpoint Test E
VDM	C110D:13	Right Front Damper Solenoid: Circuit Open	GO to Pinpoint Test E
VDM	C110D:64	Right Front Damper Solenoid: Signal Plausibility Failure	GO to Pinpoint Test E
VDM	C110E:11	Left Rear Damper Solenoid: Circuit Short To Ground	GO to Pinpoint Test F
VDM	C110E:12	Left Rear Damper Solenoid: Circuit Short To Battery	GO to Pinpoint Test F
VDM	C110E:13	Left Rear Damper Solenoid: Circuit Open	GO to Pinpoint Test F
VDM	C110E:64	Left Rear Damper Solenoid: Signal Plausibility Failure	GO to Pinpoint Test F
VDM	C110F:11	Right Rear Damper Solenoid: Circuit Short To Ground	GO to Pinpoint Test G
VDM	C110F:12	Right Rear Damper Solenoid: Circuit Short To Battery	GO to Pinpoint Test G
VDM	C110F:13	Right Rear Damper Solenoid: Circuit Open	GO to Pinpoint Test G

VDM	C110F:64	Right Rear Damper Solenoid: Signal Plausibility Failure	GO to Pinpoint Test G
VDM	C1124:55	Height Sensor(s): Not Configured	GO to Pinpoint Test V
VDM	C1124:56	Height Sensor(s): Invalid/Incompatible Configuration	GO to Pinpoint Test V
VDM	C1A03:11	Left Front Height Sensor: Circuit Short To Ground	GO to Pinpoint Test H
VDM	C1A03:12	Left Front Height Sensor: Circuit Short To Battery	GO to Pinpoint Test H
VDM	C1A03:64	Left Front Height Sensor: Signal Plausibility Failure	GO to Pinpoint Test U
VDM	C1A04:11	Right Front Height Sensor: Circuit Short To Ground	GO to Pinpoint Test I
VDM	C1A04:12	Right Front Height Sensor: Circuit Short To Battery	GO to Pinpoint Test I
VDM	C1A04:64	Right Front Height Sensor: Signal Plausibility Failure	GO to Pinpoint Test U
VDM	C1A05:11	Left Rear Height Sensor: Circuit Short To Ground	GO to Pinpoint Test J
VDM	C1A05:12	Left Rear Height Sensor: Circuit Short To Battery	GO to Pinpoint Test J
VDM	C1A05:64	Left Rear Height Sensor: Signal Plausibility Failure	GO to Pinpoint Test U
VDM	C1A06:11	Right Rear Height Sensor: Circuit Short To Ground	GO to Pinpoint Test K
VDM	C1A06:12	Right Rear Height Sensor: Circuit Short To Battery	GO to Pinpoint Test K
VDM	C1A06:64	Right Rear Height Sensor: Signal Plausibility Failure	GO to Pinpoint Test U
VDM	P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	GO to Pinpoint Test D
VDM	P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	GO to Pinpoint Test E
VDM	P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	GO to Pinpoint Test F
VDM	P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	GO to Pinpoint Test G
VDM	P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	GO to Pinpoint Test D
VDM	P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	GO to Pinpoint Test E
VDM	P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	GO to Pinpoint Test F
VDM	P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	GO to Pinpoint Test G
VDM	P0608:13	Control Module VSS Output 'A': Circuit Open	GO to Pinpoint Test D

VDM	P0608:13	Control Module VSS Output 'A': Circuit Open	GO to Pinpoint Test E
VDM	P0608:13	Control Module VSS Output 'A': Circuit Open	GO to Pinpoint Test F
VDM	P0608:13	Control Module VSS Output 'A': Circuit Open	GO to Pinpoint Test G
VDM	P1758:19	Pressure Solenoid Control System Incorrect Current: Circuit Current Above Threshold	GO to Pinpoint Test C
VDM	U0100:08	Lost Communication With ECM/PCM 'A': Bus Signal/Message Failures	GO to Pinpoint Test L
VDM	U0100:87	Lost Communication With ECM/PCM 'A': Missing Message	GO to Pinpoint Test M
VDM	U0121:08	Lost Communication With Anti-Lock Brake System (ABS) Control Module 'A': Bus Signal/Message Failures	GO to Pinpoint Test N
VDM	U0121:08	Lost Communication With Anti-Lock Brake System (ABS) Control Module 'A': Bus Signal/Message Failures	GO to Pinpoint Test Q
VDM	U0121:87	Lost Communication With Anti-Lock Brake System (ABS) Control Module 'A': Missing Message	GO to Pinpoint Test O
VDM	U0131:87	Lost Communication With Power Steering Control Module 'A': Missing Message	GO to Pinpoint Test P
VDM	U0140:87	Lost Communication With Body Control Module: Missing Message	GO to Pinpoint Test R
VDM	U0151:87	Lost Communication With Restraints Control Module: Missing Message	GO to Pinpoint Test S
VDM	U0401:00	Invalid Data Received from ECM/PCM A: No Sub Type Information	GO to Pinpoint Test W
VDM	U0415:00	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module 'A': No Sub Type Information	GO to Pinpoint Test X
VDM	U0415:08	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module 'A': Bus Signal/Message Failures	GO to Pinpoint Test Y
VDM	U0420:00	Invalid Data Received from Power Steering Control Module 'A': No Sub Type Information	GO to Pinpoint Test Z
VDM	U0422:00	Invalid Data Received From Body Control Module: No Sub Type Information	GO to Pinpoint Test AA
VDM	U0452:00	Invalid Data Received From Restraints Control Module: No Sub Type Information	GO to Pinpoint Test AB

VDM	U1000:00	Solid State Driver Protection Active -Driver Disabled: No Sub Type Information	GO to Pinpoint Test AD
VDM	U200D:11	Control Module Output Power A: Circuit Short To Ground	GO to Pinpoint Test H
VDM	U200D:11	Control Module Output Power A: Circuit Short To Ground	GO to Pinpoint Test I
VDM	U200D:12	Control Module Output Power A: Circuit Short To Battery	GO to Pinpoint Test H
VDM	U200D:12	Control Module Output Power A: Circuit Short To Battery	GO to Pinpoint Test I
VDM	U200E:11	Control Module Output Power B: Circuit Short To Ground	GO to Pinpoint Test J
VDM	U200E:11	Control Module Output Power B: Circuit Short To Ground	GO to Pinpoint Test K
VDM	U200E:12	Control Module Output Power B: Circuit Short To Battery	GO to Pinpoint Test J
VDM	U200E:12	Control Module Output Power B: Circuit Short To Battery	GO to Pinpoint Test K
VDM	U2012:56	Car Configuration Parameter(s): Invalid/Incompatible Configuration	GO to Pinpoint Test T
VDM	U2016:61	Control Module Main Software: Signal Calculation Failure	GO to Pinpoint Test T
VDM	U2024:4A	Control Module Cal-Config Data: Incorrect Component Installed	GO to Pinpoint Test T
VDM	U2024:51	Control Module Cal-Config Data: Not Programmed	GO to Pinpoint Test T
VDM	U2024:57	Control Module Cal-Config Data: Invalid/Incompatible Software Component	GO to Pinpoint Test T
VDM	U2100:00	Initial Configuration Not Complete: No Sub Type Information	GO to Pinpoint Test T
VDM	U3000:04	Control Module: System Internal Failures	GO to Pinpoint Test T
VDM	U3000:49	Control Module: Internal Electronic Failure	GO to Pinpoint Test AD
VDM	U3000:54	Control Module: Missing Calibration	GO to Pinpoint Test AC
VDM	U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test A

VDM	U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test B
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Global Customer Symptom Code (GCSC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation) .

Symptom	Action
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test D
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test E
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test H
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test I
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test T
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test U
Stop/Steer/Ride > Ride Quality > Harsh > Front	GO to Pinpoint Test V
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test D
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test E
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test F
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test G
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test H
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test I
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test J
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test K
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test T
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test U
Stop/Steer/Ride > Ride Quality > Harsh > Over Bump	GO to Pinpoint Test V
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test D
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test E
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test F

Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test G
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test J
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test K
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test T
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test U
Stop/Steer/Ride > Ride Quality > Harsh > Rear	GO to Pinpoint Test V
Stop/Steer/Ride > Ride Quality > Soft/Float > Front	GO to Pinpoint Test D
Stop/Steer/Ride > Ride Quality > Soft/Float > Front	GO to Pinpoint Test E
Stop/Steer/Ride > Ride Quality > Soft/Float > Front	GO to Pinpoint Test H
Stop/Steer/Ride > Ride Quality > Soft/Float > Front	GO to Pinpoint Test I
Stop/Steer/Ride > Ride Quality > Soft/Float > Over Bump	GO to Pinpoint Test D
Stop/Steer/Ride > Ride Quality > Soft/Float > Over Bump	GO to Pinpoint Test E
Stop/Steer/Ride > Ride Quality > Soft/Float > Over Bump	GO to Pinpoint Test AC
Stop/Steer/Ride > Ride Quality > Soft/Float > Rear	GO to Pinpoint Test F
Stop/Steer/Ride > Ride Quality > Soft/Float > Rear	GO to Pinpoint Test G
Stop/Steer/Ride > Ride Quality > Soft/Float > Rear	GO to Pinpoint Test J
Stop/Steer/Ride > Ride Quality > Soft/Float > Rear	GO to Pinpoint Test K

Symptom Chart

Symptom Chart: Vehicle Dynamic Suspension

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation) .

Condition	Actions
Message center displays, DRIVE CONTROL MALFUNCTION SERVICE REQUIRED	RETRIEVE all VDM Diagnostic Trouble Codes (DTCs).

Rough or harsh ride	● RETRIEVE all VDM Diagnostic Trouble Codes (DTCs). ● If no Diagnostic Trouble Codes (DTCs) are present, REFER to: Suspension System (204-00 Suspension System - General Information, Diagnosis and Testing) .
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Pinpoint Tests

[PINPOINT TEST A: U3003:16](#)

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM requires an operating voltage that is between 9 and 16 volts. The VDM receives this voltage from the BCMC which has an internal FET that is switched ON and OFF. The VDM has a single ground circuit. Excessive resistance or an open in one or more of these circuits, a discharged battery or an inoperative charging system results in the VDM setting a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U3003:16	Battery Voltage: Circuit Voltage Below Threshold	This DTC sets in continuous memory and on-demand if the voltage supplied to the VDM falls below 9 volts for more than 500 milliseconds.

Possible Sources

- Wiring, terminals or connectors
- Charging system concern
- VDM

- BCMC

Visual Inspection and Pre-checks

- Make sure the vehicle battery terminals and cables are free of any corrosion and other contaminants.
- Make sure the vehicle battery terminals are tightened to their correct torque specifications.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

A1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC U3003:16 still present?

Yes	GO to A2
No	The system is operating correctly at this time. The DTC may have set due to a previous low battery voltage.

A2 CHECK FOR CHARGING SYSTEM DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve all Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Charging System Diagnostic Trouble Codes (DTCs) present in more than one module?

Yes	DIAGNOSE the vehicle charging concern. REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (BM) (414-00 Charging System - General Information, Diagnosis and Testing) . REFER to: Charging System - 3.3L Duratec-V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing) . REFER to: Charging System (414-00 Charging System - General Information, Diagnosis and Testing) .
No	GO to A3

A3 CHECK THE BATTERY CONDITION AND STATE OF CHARGE

- Carry out the Battery Condition Test.
REFER to: [Battery](#) (414-01 Battery, Mounting and Cables, Diagnosis and Testing) .

Did the battery pass the condition test?

Yes	GO to A4
No	INSTALL a new battery. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation) .

A4 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) VOLTAGE (IGN_VOLTS_SW (V) PID (PARAMETER IDENTIFICATION)

- Ignition ON.
- Measure and record the voltage at the battery.
- Using a diagnostic scan tool,

Access the VDM and monitor the IGN_VOLTS_SW (V) PID

Is the PID display within 0.2 volts of the recorded voltage?

Yes	GO to A7
No	GO to A5

A5 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) VOLTAGE SUPPLY CIRCUIT FOR HIGH RESISTANCE

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Ignition ON.
- Measure and record the battery voltage.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-M1	$\overline{\text{V}}$	Ground

Is the voltage reading within 0.2 volts of the recorded battery voltage?

Yes	GO to A7
No	GO to A6

A6 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) GROUND CIRCUIT FOR HIGH RESISTANCE

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-M4	Ω	C1035C-29

Is the resistance less than 3 ohms?

Yes	GO to A7
No	REPAIR the circuit.

A7 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to A8
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

A8 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect VDM [C4396](#) . Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no Technical Service Bulletins (TSBs) exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST B: U3003:17

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM requires an operating voltage that is between 9 and 16 volts. The VDM receives this voltage from the BCMC . The VDM has a single ground circuit. Excessive resistance or an open in one or more of these circuits, a discharged battery or a inoperative charging system results in the VDM setting a DTC .

An overcharging condition in the charging system results in the VDM setting a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U3003:17	Battery Voltage: Circuit Voltage Above Threshold	This DTC sets in continuous memory and on-demand if the voltage supplied to the VDM is above 16 volts for more than 500 milliseconds.

Possible Sources

- Charging system concern
- VDM
- BCMC

B1 CHECK FOR HIGH VOLTAGE DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve all Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Charging System Diagnostic Trouble Codes (DTCs) present in more than one module?

Yes	DIAGNOSE the vehicle charging concern. REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (BM) (414-00 Charging System - General Information, Diagnosis and Testing) . REFER to: Charging System - 3.3L Duratec-V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing) . REFER to: Charging System (414-00 Charging System - General Information, Diagnosis and Testing) .
No	GO to B2

B2 CHECK THE BATTERY VOLTAGE

- Turn off all interior lights, exterior lights and accessories.
- **NOTE:** *Do not allow the engine speed to increase above 2,000 RPM while performing this step or the generator may self-excite and result in default charging system output voltage. If engine speed goes above 2,000 RPM , turn the engine off and restart the engine before performing this step.*

Start and run the engine at approximately 1,500 RPM for 3 minutes while monitoring the battery voltage.

Is the battery voltage between 13 and 15.2 volts?

Yes	GO to B3
No	DIAGNOSE the overcharging condition. REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (BM) (414-00 Charging System - General Information, Diagnosis and Testing) . REFER to: Charging System - 3.3L Duratec-V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing) . REFER to: Charging System (414-00 Charging System - General Information, Diagnosis and Testing) .

B3 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) FOR DTC (DIAGNOSTIC TROUBLE CODE) U3003:17

- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC U3003:17 still present?

Yes	GO to B4
No	The system is operating normally at this time. The DTC may have been set previously during battery charging or while jump starting the vehicle.

B4 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect BJB [C1035C](#).
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to B5
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

B5 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect BJB [C1035C](#) . Make sure it seats and latches correctly.
- Connect VDM [C4396](#) . Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no Technical Service Bulletins (TSBs) exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

☐☐ [PINPOINT TEST C: P1758:19](#)

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

Using input from the height sensors and FD-CAN messages, the VDM provides a varying current to the damper solenoid valves. The VDM is programmed with an upper limit for this current. One or more of the height sensors failing internally and damage or modifications to the vehicle suspension may cause this DTC to set. After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM P1758:19	Pressure Solenoid Control System Incorrect Current: Circuit Current Above Threshold	This DTC sets in continuous memory if one or more of the damper solenoids requests a current greater than or equal to a preset maximum current for a given duration, 3 or more times during the same ignition cycle. For base F-150 with CCD suspension, the maximum current threshold and duration is 1.9 amps for 2 minutes. For the Raptor F-150 the maximum current threshold and duration is 2.0 amps for 2 minutes.
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Possible Sources

- Height sensor(s) incorrectly installed
- Height sensor(s) faulted
- Height sensor(s) damaged
- VDM calibration

C1 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.

Is P1758:19 the only DTC present in the VDM ?

Yes	GO to C2
No	DIAGNOSE and REPAIR all other VDM Diagnostic Trouble Codes (DTCs) before diagnosing P1758:19. GO to the DTC Chart: Vehicle Dynamics Control Module (VDM).

C2 INSPECT THE SUSPENSION HEIGHT SENSORS

- With the transmission in NEUTRAL, position the vehicle on a hoist.
REFER to: [Jacking and Lifting - Overview](#) (100-02 Jacking and Lifting, Description and Operation) .
- Inspect height sensors, make sure they are undamaged and correctly installed.
REFER to: [Rear Suspension Height Sensor](#) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
REFER to: [Front Suspension Height Sensor](#) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .

Are height sensors undamaged and installed correctly?

Yes	GO to C3
No	INSTALL new height sensor(s) as necessary. REFER to: Rear Suspension Height Sensor (204-05 Vehicle Dynamic Suspension, Removal and Installation) . REFER to: Front Suspension Height Sensor (204-05 Vehicle Dynamic Suspension, Removal and Installation) . TEST DRIVE the vehicle above 8 km/h (5 mph) on a smooth surface for at least 3 minutes. CARRY OUT the VDM self-test. If the DTC returns, GO to C3

C3 RECALIBRATE THE VDM (VEHICLE DYNAMICS CONTROL MODULE) AND CHECK THE DAMPER SOLENOID CURRENT DRAWS

- Using a diagnostic scan tool, carry out the Ride Height Calibration routine without passengers or cargo in the vehicle.
- Test drive the vehicle above 8 km/h (5 mph) on a smooth surface for at least 4 minutes and use a diagnostic scan tool to record the following Parameter Identifications (PIDs):
 - Access the VDM and monitor the LF_DAMP_CUR (Amp) PID
 - Access the VDM and monitor the RF_DAMP_CUR (Amp) PID
 - Access the VDM and monitor the LR_DAMP_CUR (Amp) PID
 - Access the VDM and monitor the RR_DAMP_CUR (Amp) PID

Does any solenoid damper request a current greater than or equal to 1.9 amps continually for longer than 2 minutes?

Yes	GO to C4
No	The system is operating correctly at this time. The concern may have been caused by an incomplete or incorrectly calibrated VDM .

C4 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no Technical Service Bulletins (TSBs) exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

☐☐ **PINPOINT TEST D: LEFT FRONT DAMPER SOLENOID ELECTRICAL FAULTS**

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM sends a variable voltage to the damper solenoids based on sensor input and FD-CAN messages. The VDM continually monitors the damper solenoid circuits and sets a DTC when a circuit fault is detected. A shorted or open damper solenoid also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C110C:11	Left Front Damper Solenoid: Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110C:12	Left Front Damper Solenoid: Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110C:13	Left Front Damper Solenoid: Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110C:64	Left Front Damper Solenoid: Signal Plausibility Failure	This DTC sets in continuous memory when the VDM detects an error set due to current matching and initial test being triggered 10 times in 1 minute.

VDM P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoid for longer than 200 milliseconds.
VDM P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoid for longer than 200 milliseconds.
VDM P0608:13	Control Module VSS Output 'A': Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoid for longer than 200 milliseconds.

Possible Sources

- Wiring, terminals or connectors
- Shock (valve solenoid is serviced as an assembly with the shock) for base F-150
- Shock (valve solenoid is serviced separately as part of repair kits) for Raptor
- VDM

Visual Inspection and Pre-checks

- Make sure the valve solenoid harness is routed correctly and is undamaged.
- Make sure the valve solenoid electrical connector is free from any corrosion or other contaminants.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

D1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C110C:11 present?

Yes	GO to D2
No	GO to D3

D2 CHECK THE LH (LEFT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH front damper solenoid [C1668](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-A1	Ω	Ground
C4396-B1	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to D5
No	REPAIR the affected circuit.

D3 CHECK THE LH (LEFT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH front damper solenoid [C1668](#).
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-A1	$\overline{\overline{V}}$	Ground
C4396-B1	$\overline{\overline{V}}$	Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	GO to D4

D4 CHECK THE LH (LEFT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR AN OPEN

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-A1	Ω	C1668-1
C4396-B1	Ω	C1668-2

Are the resistances less than 3 ohms?

Yes	GO to D5
No	REPAIR the affected circuit.

D5 CHECK THE LH (LEFT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR A SHORT TOGETHER

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1668-1	Ω	C1668-2

Are the resistances greater than 10,000 ohms?

Yes	GO to D6
No	REPAIR the affected circuit.

D6 CHECK THE LH (LEFT-HAND) FRONT DAMPER SOLENOID RESISTANCE

- Measure the **component side** resistance:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1668-1 component side	Ω	C1668-2 component side

Is the resistance between 2.8 and 4.5 ohms?

Yes	GO to D7
No	INSTALL a new LH front damper. REFER to: Shock Absorber Solenoid - Raptor (204-01B Front Suspension - LHD 4WD, Removal and Installation) . REFER to: Shock Absorber and Spring Assembly - Vehicles With: Dynamic Suspension (204-01B Front Suspension - LHD 4WD, Removal and Installation) .

D7 VERIFY ALL WIRING CONNECTIONS

- Disconnect VDM [C4396](#) (if not previously disconnected).
- Disconnect damper solenoid valve electrical connector [C1668](#) (if not previously disconnected).
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to D8
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

D8 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect damper solenoid valve electrical connector [C1668](#). Make sure it seats and latches correctly.
- Connect VDM [C4396](#). Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST E: RIGHT FRONT DAMPER SOLENOID ELECTRICAL FAULTS

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM sends a variable voltage to the damper solenoids based on sensor input and FD-CAN messages. The VDM continually monitors the damper solenoid circuits and sets a DTC when a circuit fault is detected. A shorted or open damper solenoid also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C110D:11	Right Front Damper Solenoid: Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoid circuits for longer than 200 milliseconds.

VDM C110D:12	Right Front Damper Solenoid: Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110D:13	Right Front Damper Solenoid: Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110D:64	Right Front Damper Solenoid: Signal Plausibility Failure	This DTC sets in continuous memory when the VDM detects an error set due to current matching and initial test being triggered 10 times in 1 minute.
VDM P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoids for longer than 200 milliseconds.
VDM P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoids for longer than 200 milliseconds.
VDM P0608:13	Control Module VSS Output 'A': Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoids for longer than 200 milliseconds.

Possible Sources

- Wiring, terminals or connectors
- Shock (valve solenoid is serviced as an assembly with the shock) for base F-150
- Shock (valve solenoid is serviced separately as part of repair kits) for Raptor
- VDM

Visual Inspection and Pre-checks

- Make sure the valve solenoid harness is routed correctly and is undamaged.
- Make sure the valve solenoid electrical connector is free from any corrosion or other

contaminants.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

E1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C110D:11 present?

Yes	GO to E2
No	GO to E3

E2 CHECK THE RH (RIGHT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH front damper solenoid [C1669](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-C1	Ω	Ground
C4396-D1	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to E5
No	REPAIR the affected circuit.

E3 CHECK THE RH (RIGHT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH front damper solenoid [C1669](#).
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-C1	$\overline{\overline{\overline{V}}}$	Ground
C4396-D1	$\overline{\overline{\overline{V}}}$	Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	GO to E4

E4 CHECK THE RH (RIGHT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR AN OPEN

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-C1	Ω	C1669-1
C4396-D1	Ω	C1669-2

Are the resistances less than 3 ohms?

Yes	GO to E5
No	REPAIR the affected circuit.

E5 CHECK THE RH (RIGHT-HAND) FRONT DAMPER SOLENOID CIRCUITS FOR A SHORT TOGETHER

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1669-1	Ω	C1669-2

Are the resistances greater than 10,000 ohms?

Yes	GO to E6
No	REPAIR the affected circuit.

E6 CHECK THE RH (RIGHT-HAND) FRONT DAMPER SOLENOID RESISTANCE

- Measure the **component side** resistance:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1669-1 component side	Ω	C1669-2 component side

Is the resistance between 2.8 and 4.5 ohms?

Yes	GO to E7
No	INSTALL a new RH front damper. REFER to: Shock Absorber Solenoid - Raptor (204-01B Front Suspension - LHD 4WD, Removal and Installation) . REFER to: Shock Absorber and Spring Assembly - Vehicles With: Dynamic Suspension (204-01B Front Suspension - LHD 4WD, Removal and Installation) .

E7 VERIFY ALL WIRING CONNECTIONS

- Disconnect VDM [C4396](#) (if not previously disconnected).
- Disconnect damper solenoid valve electrical connector [C1669](#) (if not previously disconnected).
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to E8
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

E8 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect damper solenoid valve electrical connector [C1669](#) . Make sure it seats and latches correctly.
- Connect VDM [C4396](#) . Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

[PINPOINT TEST F: LEFT REAR DAMPER SOLENOID ELECTRICAL FAULTS](#)

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM sends a variable voltage to the damper solenoids based on sensor input and FD-CAN messages. The VDM continually monitors the damper solenoid circuits and sets a DTC when a circuit fault is detected. A shorted or open damper solenoid also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/ harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C110E:11	Left Rear Damper Solenoid: Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110E:12	Left Rear Damper Solenoid: Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110E:13	Left Rear Damper Solenoid: Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110E:64	Left Rear Damper Solenoid: Signal Plausibility Failure	This DTC sets in continuous memory when the VDM detects an error set due to current matching and initial test being triggered 10 times in 1 minute.
VDM P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoids for longer than 200 milliseconds.
VDM P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoids for longer than 200 milliseconds.
VDM P0608:13	Control Module VSS Output 'A': Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoids for longer than 200 milliseconds.

Possible Sources

- Wiring, terminals or connectors
- Shock (valve solenoid is serviced as an assembly with the shock) for base F-150
- Shock (valve solenoid is serviced separately as part of repair kits) for Raptor
- VDM

Visual Inspection and Pre-checks

- Make sure the valve solenoid harness is routed correctly and is undamaged.
- Make sure the valve solenoid electrical connector is free from any corrosion or other contaminants.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

F1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C110E:11 present?

Yes	GO to F2
No	GO to F3

F2 CHECK THE LH (LEFT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH rear damper solenoid [C3655](#).
- Disconnect LH rear damper solenoid [C373](#) Raptor .
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-E1	Ω	Ground
C4396-F1	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to F5
No	REPAIR the affected circuit.

F3 CHECK THE LH (LEFT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH rear damper solenoid [C3655](#).
- Disconnect LH rear damper solenoid [C373](#) Raptor .
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-E1	$\overline{\overline{V}}$	Ground
C4396-F1	$\overline{\overline{V}}$	Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	GO to F4

F4 CHECK THE LH (LEFT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR AN OPEN

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-E1	Ω	C3655-1
C4396-F1	Ω	C3655-2

[Click to display connectors](#)

Raptor

Positive Lead	Measurement / Action	Negative Lead
C4396-E1	Ω	C373-1
C4396-F1	Ω	C373-2

Are the resistances less than 3 ohms?

Yes	GO to F5
No	REPAIR the affected circuit.

F5 CHECK THE LH (LEFT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR A SHORT TOGETHER

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C3655-1	Ω	C3655-2

[Click to display connectors](#)

Raptor

Positive Lead	Measurement / Action	Negative Lead
C373-1	Ω	C373-2

Are the resistances greater than 10,000 ohms?

Yes	GO to F6
No	REPAIR the affected circuit.

F6 CHECK THE LH (LEFT-HAND) REAR DAMPER SOLENOID RESISTANCE

- Measure the **component side** resistance:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C3655-1 component side	Ω	C3655-2 component side

[Click to display connectors](#)

Raptor

Positive Lead	Measurement / Action	Negative Lead
C373-1 component side	Ω	C373-2 component side

Is the resistance between 2.8 and 4.5 ohms?

Yes	GO to F7
No	INSTALL a new LH rear damper. REFER to: Shock Absorber Solenoid - Raptor (204-02 Rear Suspension, Removal and Installation) . REFER to: Shock Absorber and Spring Assembly - Vehicles With: Dynamic Suspension (204-01B Front Suspension - LHD 4WD, Removal and Installation) .

F7 VERIFY ALL WIRING CONNECTIONS

- Disconnect VDM [C4396](#) (if not previously disconnected).
- Disconnect damper solenoid valve electrical connector [C3655](#) (if not previously disconnected).
- Disconnect damper solenoid valve electrical connector [C373](#) Raptor (if not previously disconnected).
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to F8
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

F8 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect damper solenoid valve electrical connector [C3655](#). Make sure it seats and latches correctly.
- Connect damper solenoid valve electrical connector [C373](#) Raptor. Make sure it seats and latches correctly.
- Connect VDM [C4396](#). Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST G: RIGHT REAR DAMPER SOLENOID ELECTRICAL FAULTS

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM sends a variable voltage to the damper solenoids based on sensor input and FD-CAN messages. The VDM continually monitors the damper solenoid circuits and sets a DTC when a circuit fault is detected. A shorted or open damper solenoid also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C110F:11	Right Rear Damper Solenoid: Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoid circuits for longer than 200 milliseconds.

VDM C110F:12	Right Rear Damper Solenoid: Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110F:13	Right Rear Damper Solenoid: Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoid circuits for longer than 200 milliseconds.
VDM C110F:64	Right Rear Damper Solenoid: Signal Plausibility Failure	This DTC sets in continuous memory when the VDM detects an error set due to current matching and initial test being triggered 10 times in 1 minute.
VDM P0608:11	Control Module VSS Output 'A': Circuit Short To Ground	This DTC sets in continuous memory when the VDM detects a short to ground on one or both of the damper solenoids for longer than 200 milliseconds.
VDM P0608:12	Control Module VSS Output 'A': Circuit Short To Battery	This DTC sets in continuous memory when the VDM detects a short to battery voltage on one or both of the damper solenoids for longer than 200 milliseconds.
VDM P0608:13	Control Module VSS Output 'A': Circuit Open	This DTC sets in continuous memory when the VDM detects an open circuit on one or both of the damper solenoids for longer than 200 milliseconds.

Possible Sources

- Wiring, terminals or connectors
- Shock (valve solenoid is serviced as an assembly with the shock) for base F-150
- Shock (valve solenoid is serviced separately as part of repair kits) for Raptor
- VDM

Visual Inspection and Pre-checks

- Make sure the valve solenoid harness is routed correctly and is undamaged.
- Make sure the valve solenoid electrical connector is free from any corrosion or other

contaminants.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

G1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C110F:11 present?

Yes	GO to G2
No	GO to G3

G2 CHECK THE RH (RIGHT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH rear damper solenoid [C3656](#).
- Disconnect RH rear damper solenoid [C372](#) Raptor .
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-G1	Ω	Ground
C4396-H1	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to G5
No	REPAIR the affected circuit.

G3 CHECK THE RH (RIGHT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH rear damper solenoid [C3656](#).
- Disconnect RH rear damper solenoid [C372](#) Raptor .
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-G1	$\overline{\text{V}}$	Ground
C4396-H1	$\overline{\text{V}}$	Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	GO to G4

G4 CHECK THE RH (RIGHT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR AN OPEN

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4396-G1	Ω	C3656-1
C4396-H1	Ω	C3656-2

[Click to display connectors](#)

Raptor

Positive Lead	Measurement / Action	Negative Lead
C4396-G1	Ω	C372-1
C4396-H1	Ω	C372-2

Are the resistances less than 3 ohms?

Yes	GO to G5
No	REPAIR the affected circuit.

G5 CHECK THE RH (RIGHT-HAND) REAR DAMPER SOLENOID CIRCUITS FOR A SHORT TOGETHER

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C3656-1	Ω	C3656-2

[Click to display connectors](#)

Raptor

Positive Lead	Measurement / Action	Negative Lead
C372-1	Ω	C372-2

Are the resistances greater than 10,000 ohms?

Yes	GO to G6
No	REPAIR the affected circuit.

G6 CHECK THE RH (RIGHT-HAND) REAR DAMPER SOLENOID RESISTANCE

- Measure the **component side** resistance:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C3656-1 component side	Ω	C3656-2 component side

[Click to display connectors](#)

Raptor

Positive Lead	Measurement / Action	Negative Lead
C372-1 component side	Ω	C372-2 component side

Is the resistance between 2.8 and 4.5 ohms?

Yes	GO to G7
No	INSTALL a new RH rear damper. REFER to: Shock Absorber Solenoid - Raptor (204-02 Rear Suspension, Removal and Installation) . REFER to: Shock Absorber and Spring Assembly - Vehicles With: Dynamic Suspension (204-01B Front Suspension - LHD 4WD, Removal and Installation) .

G7 VERIFY ALL WIRING CONNECTIONS

- Disconnect VDM [C4396](#) (if not previously disconnected).
- Disconnect damper solenoid valve electrical connector [C3656](#) (if not previously disconnected).
- Disconnect damper solenoid valve electrical connector [C372](#) Raptor (if not previously disconnected).
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to G8
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

G8 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect damper solenoid valve electrical connector [C3656](#) . Make sure it seats and latches correctly.
- Connect damper solenoid valve electrical connector [C372](#) Raptor. Make sure it seats and latches correctly.
- Connect VDM [C4396](#) . Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM continually monitors the height sensor circuits and sets a DTC when a circuit fault is detected. A shorted height sensor also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C1A03:11	Left Front Height Sensor: Circuit Short To Ground	Sets in continuous memory when the VDM detects height sensor voltage less than 4% of supply (nominally 5V) for greater than 250 milliseconds on the left front height sensor signal circuit.
VDM C1A03:12	Left Front Height Sensor: Circuit Short To Battery	Sets in continuous memory when the VDM detects height sensor voltage greater than 96% of supply (nominally 5V) for greater than 250 milliseconds on the left front height sensor signal circuit.
VDM U200D:11	Control Module Output Power A: Circuit Short To Ground	Sets in continuous memory when the VDM detects if front height sensor supply voltage is less than 4.7 volts for 250 milliseconds.
VDM U200D:12	Control Module Output Power A: Circuit Short To Battery	Sets in continuous memory when the VDM detects if front height sensor supply voltage is greater than 5.2 volts for 250 milliseconds.

Possible Sources

- Wiring, terminals or connectors
- Height sensor
- VDM

Visual Inspection and Pre-checks

- Make sure the height sensor harness is routed correctly and is undamaged.
- Make sure the height sensor electrical connector is free from any corrosion or other contaminants.
- Make sure the height sensor brackets are not damaged.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

H1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- **NOTE:** If both types of faults are present (XXXXX:11 and XXXXX:12), diagnose the XXXXX:12 fault first.

Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C1A03:12 present?

Yes	GO to H2
No	GO to H3

H2 CHECK THE LH (LEFT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH front height sensor [C1153](#).
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1153-1	$\overline{\overline{\overline{V}}}$	Ground
C1153-2	$\overline{\overline{\overline{V}}}$	Ground
C1153-3	$\overline{\overline{\overline{V}}}$	Ground

Is any voltage present?

Yes	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.
No	GO to H5

H3 CHECK THE LH (LEFT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH front height sensor [C1153](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1153-1	Ω	Ground
C1153-2	Ω	Ground
C1153-3	Ω	Ground

Are the resistance greater than 10,000 ohms?

Yes	GO to H4
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

H4 CHECK THE LH (LEFT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR AN OPEN

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1153-1	Ω	C4396-G3
C1153-2	Ω	C4396-G2
C1153-3	Ω	C4396-H2

Are the resistance less than 3 ohms?

Yes	GO to H5
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

H5 CHECK THE LH (LEFT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR A SHORT TOGETHER

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1153-1	Ω	C1153-2
C1153-1	Ω	C1153-3
C1153-2	Ω	C1153-3

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new height sensor. REFER to: Front Suspension Height Sensor (204-05 Vehicle Dynamic Suspension, Removal and Installation) . If the concern is still present after height sensor replacement, GO to H6
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

H6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all VDM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to H7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

H7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect LH front height sensor [C1153](#). Make sure they seat and latch correctly.
- Connect all VDM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST I: RIGHT FRONT HEIGHT SENSOR ELECTRICAL FAULTS

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM continually monitors the height sensor circuits and sets a DTC when a circuit fault is detected. A shorted height sensor also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C1A04:11	Right Front Height Sensor: Circuit Short To Ground	Sets in continuous memory when the VDM detects height sensor voltage less than 4% of supply (nominally 5V) for greater than 250 milliseconds on the right front height sensor signal circuit.
VDM C1A04:12	Right Front Height Sensor: Circuit Short To Battery	Sets in continuous memory when the VDM detects height sensor voltage greater than 96% of supply (nominally 5V) for greater than 250 milliseconds on the right front height sensor signal circuit.
VDM U200D:11	Control Module Output Power A: Circuit Short To Ground	Sets in continuous memory when the VDM detects if front height sensor supply voltage is less than 4.7 volts for 250 milliseconds.

VDM U200D:12	Control Module Output Power A: Circuit Short To Battery	Sets in continuous memory when the VDM detects if front height sensor supply voltage is greater than 5.2 volts for 250 milliseconds.
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Possible Sources

- Wiring, terminals or connectors
- Height sensor
- VDM

Visual Inspection and Pre-checks

- Make sure the height sensor harness is routed correctly and is undamaged.
- Make sure the height sensor electrical connector is free from any corrosion or other contaminants.
- Make sure the height sensor brackets are not damaged.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

I1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- **NOTE:** If both types of faults are present (XXXXX:11 and XXXXX:12), diagnose the XXXXX:12 fault first.

Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C1A04:12 present?

Yes	GO to I2
No	GO to I3

I2 CHECK THE RH (RIGHT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH front height sensor [C1151](#).
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1151-1	$\overline{\overline{\overline{V}}}$	Ground
C1151-2	$\overline{\overline{\overline{V}}}$	Ground
C1151-3	$\overline{\overline{\overline{V}}}$	Ground

Is any voltage present?

Yes	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.
No	GO to I5

I3 CHECK THE RH (RIGHT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH front height sensor [C1151](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1151-1	Ω	Ground
C1151-2	Ω	Ground
C1151-3	Ω	Ground

Are the resistance greater than 10,000 ohms?

Yes	GO to I4
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

I4 CHECK THE RH (RIGHT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR AN OPEN

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1151-1	Ω	C4396-J2
C1151-2	Ω	C4396-H3
C1151-3	Ω	C4396-J3

Are the resistance less than 3 ohms?

Yes	GO to I5
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

I5 CHECK THE RH (RIGHT-HAND) FRONT HEIGHT SENSOR CIRCUITS FOR A SHORT TOGETHER

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C1151-1	Ω	C1151-2
C1151-1	Ω	C1151-3
C1151-2	Ω	C1151-3

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new height sensor. REFER to: Front Suspension Height Sensor (204-05 Vehicle Dynamic Suspension, Removal and Installation) . If the concern is still present after height sensor replacement, GO to I6
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

I6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all VDM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to 17
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

I7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect RH front height sensor [C1151](#) . Make sure they seat and latch correctly.
- Connect all VDM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST J: LEFT REAR HEIGHT SENSOR ELECTRICAL FAULTS

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM continually monitors the height sensor circuits and sets a DTC when a circuit fault is detected. A shorted height sensor also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C1A05:11	Left Rear Height Sensor: Circuit Short To Ground	Sets in continuous memory when the VDM detects height sensor voltage less than 4% of supply (nominally 5V) for greater than 250 milliseconds on the left rear height sensor signal circuit.
VDM C1A05:12	Left Rear Height Sensor: Circuit Short To Battery	Sets in continuous memory when the VDM detects height sensor voltage greater than 96% of supply (nominally 5V) for greater than 250 milliseconds on the left rear height sensor signal circuit.
VDM U200E:11	Control Module Output Power B: Circuit Short To Ground	Sets in continuous memory when the VDM detects if rear height sensor supply voltage is less than 4.7 volts for 250 milliseconds.

VDM U200E:12	Control Module Output Power B: Circuit Short To Battery	Sets in continuous memory when the VDM detects if rear height sensor supply voltage is greater than 5.2 volts for 250 milliseconds.
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Possible Sources

- Wiring, terminals or connectors
- Height sensor
- VDM

Visual Inspection and Pre-checks

- Make sure the height sensor harness is routed correctly and is undamaged.
- Make sure the height sensor electrical connector is free from any corrosion or other contaminants.
- Make sure the height sensor brackets are not damaged.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

J1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- **NOTE:** *If both types of faults are present (XXXXX:11 and XXXXX:12), diagnose the XXXXX:12 fault first.*

Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C1A05:12 or U200F:12 present?

Yes	GO to J2
No	GO to J3

J2 CHECK THE LH (LEFT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH rear height sensor [C4092](#).
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4092-1	$\overline{\overline{\overline{V}}}$	Ground
C4092-2	$\overline{\overline{\overline{V}}}$	Ground
C4092-3	$\overline{\overline{\overline{V}}}$	Ground

Is any voltage present?

Yes	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.
No	GO to J5

J3 CHECK THE LH (LEFT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect LH rear height sensor [C4092](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4092-1	Ω	Ground
C4092-2	Ω	Ground
C4092-3	Ω	Ground

Are the resistance greater than 10,000 ohms?

Yes	GO to J4
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

J4 CHECK THE LH (LEFT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR AN OPEN

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4092-1	Ω	C4396-K2
C4092-2	Ω	C4396-J1
C4092-3	Ω	C4396-K1

Are the resistance less than 3 ohms?

Yes	GO to J5
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

J5 CHECK THE LH (LEFT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR A SHORT TOGETHER

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4092-1	Ω	C4092-2
C4092-1	Ω	C4092-3
C4092-2	Ω	C4092-3

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new height sensor. REFER to: Rear Suspension Height Sensor (204-05 Vehicle Dynamic Suspension, Removal and Installation) . If the concern is still present after height sensor replacement, GO to J6
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

J6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all VDM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to J7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

J7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect LH rear height sensor [C4092](#) . Make sure they seat and latch correctly.
- Connect all VDM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST K: RIGHT REAR HEIGHT SENSOR ELECTRICAL FAULTS

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

The VDM continually monitors the height sensor circuits and sets a DTC when a circuit fault is detected. A shorted height sensor also causes the VDM to set a DTC . After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message.

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C1A06:11	Right Rear Height Sensor: Circuit Short To Ground	Sets in continuous memory when the VDM detects height sensor voltage less than 4% of supply (nominally 5V) for greater than 250 milliseconds on the right rear height sensor signal circuit.
VDM C1A06:12	Right Rear Height Sensor: Circuit Short To Battery	Sets in continuous memory when the VDM detects height sensor voltage greater than 96% of supply (nominally 5V) for greater than 250 milliseconds on the right rear height sensor signal circuit.
VDM U200E:11	Control Module Output Power B: Circuit Short To Ground	Sets in continuous memory when the VDM detects if rear height sensor supply voltage is less than 4.7 volts for 250 milliseconds.

VDM U200E:12	Control Module Output Power B: Circuit Short To Battery	Sets in continuous memory when the VDM detects if rear height sensor supply voltage is greater than 5.2 volts for 250 milliseconds.
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Possible Sources

- Wiring, terminals or connectors
- Height sensor
- VDM

Visual Inspection and Pre-checks

- Make sure the height sensor harness is routed correctly and is undamaged.
- Make sure the height sensor electrical connector is free from any corrosion or other contaminants.
- Make sure the height sensor brackets are not damaged.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

K1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- **NOTE:** *If both types of faults are present (XXXXX:11 and XXXXX:12), diagnose the XXXXX:12 fault first.*

Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC C1A06:12 present?

Yes	GO to K2
No	GO to K3

K2 CHECK THE RH (RIGHT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR A SHORT TO BATTERY

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH rear height sensor [C4093](#).
- Ignition ON.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4093-1	$\overline{\overline{\overline{V}}}$	Ground
C4093-2	$\overline{\overline{\overline{V}}}$	Ground
C4093-3	$\overline{\overline{\overline{V}}}$	Ground

Is any voltage present?

Yes	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.
No	GO to K5

K3 CHECK THE RH (RIGHT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect VDM [C4396](#).
- Disconnect RH rear height sensor [C4093](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4093-1	Ω	Ground
C4093-2	Ω	Ground
C4093-3	Ω	Ground

Are the resistance greater than 10,000 ohms?

Yes	GO to K4
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

K4 CHECK THE RH (RIGHT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR AN OPEN

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4093-1	Ω	C4396-K3
C4093-2	Ω	C4396-J4
C4093-3	Ω	C4396-K4

Are the resistance less than 3 ohms?

Yes	GO to K5
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

K5 CHECK THE RH (RIGHT-HAND) REAR HEIGHT SENSOR CIRCUITS FOR A SHORT TOGETHER

- Ignition OFF.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	Negative Lead
C4093-1	Ω	C4093-2
C4093-1	Ω	C4093-3
C4093-2	Ω	C4093-3

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new height sensor. REFER to: Rear Suspension Height Sensor (204-05 Vehicle Dynamic Suspension, Removal and Installation) . If the concern is still present after height sensor replacement, GO to K6
No	INSPECT the height sensor connector for corrosion, pushed out pins, bent pins and spread terminals. REPAIR as necessary. If the connector is OK, REPAIR the affected circuit.

K6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all VDM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to K7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

K7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect RH rear height sensor [C4093](#) . Make sure they seat and latch correctly.
- Connect all VDM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new VDM module. REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST L: U0100:08

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the PCM sends messages over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel but it will not cause the IPC to display a dynamic suspension system warning message. Also the VDM will no longer react to stop-start events.REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U0100:08	Lost Communication With ECM/PCM 'A': Bus Signal/Message Failures	This DTC sets in continuous memory if any one of the following messages is missing: vehicle operating modes. This can be due to a PCM failure, a circuit failure on the FD-CAN or an excessive load on the network

Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- PCM

L1 CHECK THE COMMUNICATION NETWORK

- Ignition OFF.
- Using a diagnostic scan tool, carry out the Network Test.

Does the PCM pass the Network Test?

Yes	GO to L2
No	DIAGNOSE the PCM does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

L2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open then Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0100:87 retrieved again?

Yes	GO to L3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

L3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to L4

L4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE PCM (POWERTRAIN CONTROL MODULE)

- Using a diagnostic scan tool, carry out the PCM KOEO self-test.

Is DTC P0562 or P0563 present in the PCM ?

Yes	DIAGNOSE the PCM Diagnostic Trouble Codes (DTCs).
No	GO to L5

L5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the PCM or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.

- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to L6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

L6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all PCM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to L7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

L7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all PCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new PCM module. Refer to section 303-14.
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST M: U0100:87

Refer to Wiring Diagrams Cell [41](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the PCM sends messages over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/ harsh suspension feel but it will not cause the IPC to display a dynamic suspension system warning message.REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0100:87	Lost Communication With ECM/PCM 'A': Missing Message	This DTC sets in continuous memory if any one of the following messages is missing: accelerator pedal position, driven wheel torque. This can be due to a PCM failure, a circuit failure on the FD-CAN or an excessive load on the network
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Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- PCM

M1 CHECK THE COMMUNICATION NETWORK

- Ignition OFF.
- Using a diagnostic scan tool, carry out the Network Test.

Does the PCM pass the Network Test?

Yes	GO to M2
No	DIAGNOSE the PCM does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

M2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open then Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0100:87 retrieved again?

Yes	GO to M3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

M3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to M4

M4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE PCM (POWERTRAIN CONTROL MODULE)

- Using a diagnostic scan tool, carry out the PCM KOEO self-test.

Is DTC P0562 or P0563 present in the PCM ?

Yes	DIAGNOSE the PCM Diagnostic Trouble Codes (DTCs).
No	GO to M5

M5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the PCM or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to M6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

M6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all PCM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to M7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

M7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all PCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new PCM module. Refer to section 303-14.
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

Refer to Wiring Diagrams Cell [42](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the ABS module sends messages to the VDM over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM will NOT deactivate the dynamic suspension system or cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U0121:08	Lost Communication With Anti-Lock Brake System (ABS) Control Module 'A': Bus Signal/Message Failures	This DTC sets in continuous memory if any one of the following messages is missing: SDM mode request. This can be due to a ABS module failure, a circuit failure on the FD-CAN module or an excessive load on the network.

Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- ABS

N1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Does the ABS module pass the Network Test?

Yes	GO to N2
No	DIAGNOSE the ABS module does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

N2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0121:08 retrieved again?

Yes	GO to N3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

N3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to N4

N4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE

- Using a diagnostic scan tool, carry out the ABS module self-test.

Is DTC U3003:16 or U3003:17 present in the ABS module?

Yes	DIAGNOSE the ABS module Diagnostic Trouble Codes (DTCs). REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing) .
No	GO to N5

N5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the ABS module or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.

- return the swapped module to source vehicle and obtain new replacement module.

- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to N6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

N6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all ABS connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to N7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

N7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all ABS connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new ABS module. REFER to: Electric Brake Booster (EBB) (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST O: U0121:87

Refer to Wiring Diagrams Cell [42](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the ABS module sends messages to the VDM over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system but will not cause the IPC to display a dynamic suspension system warning message.
REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0121:87	Lost Communication With Anti-Lock Brake System (ABS) Control Module 'A': Missing Message	This DTC sets in continuous memory if any one of the following messages is missing: ABS active, brake torque request, stability control, stability control event in progress, stability control indicator request, traction control, vehicle lateral acceleration, vehicle longitudinal acceleration, vehicle vertical acceleration, vehicle roll rate, vehicle yaw rate, vehicle yaw stability index or vehicle vertical acceleration. This can be due to a ABS module failure, a circuit failure on the FD-CAN module or an excessive load on the network.
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Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- ABS

01 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Does the ABS module pass the Network Test?

Yes	GO to O2
No	DIAGNOSE the ABS module does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

O2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0121:87 retrieved again?

Yes	GO to O3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

O3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to O4

O4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs) IN THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE

- Using a diagnostic scan tool, carry out the ABS module self-test.

Is DTC U3003:16 or U3003:17 present in the ABS module?

Yes	DIAGNOSE the ABS module Diagnostic Trouble Codes (DTCs). REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing) .
No	GO to O5

O5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the ABS module or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to O6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

O6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all ABS connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to O7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

O7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all ABS connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new ABS module. REFER to: Electric Brake Booster (EBB) (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST P: U0131:87

Refer to Wiring Diagrams Cell [43](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the EPAS sends messages to the VDM over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm suspension feel but will not cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0131:87	Lost Communication With Power Steering Control Module 'A': Missing Message	This DTC sets in continuous memory if any one of the following messages is missing: Steering wheel angle. This can be due to an EPAS module failure, a circuit failure on the FD-CAN or an excessive load on the network.
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Possible Sources

- Fuse(s)
- Wiring, terminals or connectors
- PSCM

P1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Does the PSCM pass the Network Test?

Yes	GO to P2
No	DIAGNOSE the PSCM does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

P2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0131:87 retrieved again?

Yes	GO to P3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

P3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE PSCM (POWER STEERING CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the PSCM self-test.

Is DTC U3003:16 or U3003:17 present in the PSCM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to P4

P4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE PSCM (POWER STEERING CONTROL MODULE)

- Using a diagnostic scan tool, carry out the PSCM self-test.

Are any Diagnostic Trouble Codes (DTCs) present in the PSCM ?

Yes	DIAGNOSE the PSCM Diagnostic Trouble Codes (DTCs). ☐ Click here to access Guided Routine (EPAS).
No	GO to P5

P5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the PSCM or VDM .
If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to P6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

P6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all PSCM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to P7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

P7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all PSCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new PSCM module. REFER to: Steering Gear (211-02 Power Steering, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

Refer to Wiring Diagrams Cell [42](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the ABS module sends messages to the VDM over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM will NOT deactivate the dynamic suspension system or cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U0121:08	Lost Communication With Anti-Lock Brake System (ABS) Control Module 'A': Bus Signal/Message Failures	This DTC sets in continuous memory if any one of the following messages is missing: SDM mode request. This can be due to a ABS module failure, a circuit failure on the FD-CAN module or an excessive load on the network.

Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- ABS

Q1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Does the ABS module pass the Network Test?

Yes	GO to Q2
No	DIAGNOSE the ABS module does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

Q2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0121:08 retrieved again?

Yes	GO to Q3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

Q3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCs) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to Q4

Q4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs) IN THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE

- Using a diagnostic scan tool, carry out the ABS module self-test.

Is DTC U3003:16 or U3003:17 present in the ABS module?

Yes	DIAGNOSE the ABS module Diagnostic Trouble Codes (DTCs). REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing) .
No	GO to Q5

Q5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the ABS module or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.

- return the swapped module to source vehicle and obtain new replacement module.

- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to Q6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

Q6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all ABS connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to Q7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

Q7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all ABS connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new ABS module. REFER to: Electric Brake Booster (EBB) (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

[PINPOINT TEST R: U0140:87](#)

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the BCM sends messages to the GWM over the FD-CAN . The GWM sends these messages to the VDM over the FD-CAN . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm suspension feel but will not cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0140:87	Lost Communication With Body Control Module: Missing Message	This DTC sets in continuous memory if any one of the following messages is missing: ignition status or life cycle. This can be due to a BCM failure, a GWM failure, a circuit failure on the HS-CAN or FD-CAN or an excessive load on the network.
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Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- GWM
- BCM

R1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Do both the BCM and the GWM pass the Network Test?

Yes	GO to R2
No	DIAGNOSE the BCM or GWM does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

R2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0140:87 retrieved again?

Yes	GO to R3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

R3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to R4

R4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE GWM (GATEWAY MODULE A)

- Using a diagnostic scan tool, carry out the GWM self-test.

Are any Diagnostic Trouble Codes (DTCs) present in the GWM ?

Yes	DIAGNOSE the GWM Diagnostic Trouble Codes (DTCs). REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .
No	GO to R5

R5 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs) IN THE BCM (BODY CONTROL MODULE)

- Using a diagnostic scan tool, carry out the BCM self-test.

Are any Diagnostic Trouble Codes (DTCs) present in the BCM ?

Yes	DIAGNOSE the BCM Diagnostic Trouble Codes (DTCs). REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing) .
No	GO to R6

R6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the BCM or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.

- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to R7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

R7 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all BCM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to R8
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

R8 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all BCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new BCM module. REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

[PINPOINT TEST S: U0151:87](#)

Refer to Wiring Diagrams Cell [46](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the RCM sends messages to the VDM over the HS-CAN2 . If the VDM does not receive these messages within a 5 second time frame, the module sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm suspension feel but will not cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0151:87	Lost Communication With Restraints Control Module: Missing Message	This DTC sets in continuous memory if any one of the following messages is missing: vehicle lateral acceleration, vehicle longitudinal acceleration, vehicle roll rate or vehicle vertical acceleration. This can be due to a RCM failure, a GWM failure, a circuit failure on the HS-CAN2 or FD-CAN or an excessive load on the network
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Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- RCM
- GWM

S1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Does the RCM pass the Network Test?

Yes	GO to S2
No	DIAGNOSE the RCM does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

S2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0151:87 retrieved again?

Yes	GO to S3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

S3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to S4

S4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE RCM (RESTRAINTS CONTROL MODULE)

- Using a diagnostic scan tool, carry out the RCM self-test.

Are any Diagnostic Trouble Codes (DTCs) present in the RCM ?

Yes	DIAGNOSE the RCM Diagnostic Trouble Codes (DTCs). REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing) .
No	GO to S5

S5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the RCM or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to S6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

S6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all RCM connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to S7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

S7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all RCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new RCM module. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST T: VDM (VEHICLE DYNAMICS CONTROL MODULE) CONFIGURATION CONCERN

Normal Operation and Fault Conditions

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U2012:56	Car Configuration Parameter(s): Invalid/Incompatible Configuration	Sets as a continuous memory DTC on initial VDM power up until initial configuration of data collection is completed with a scan tool.
VDM U2016:61	Control Module Main Software: Signal Calculation Failure	Sets as a continuous memory DTC if internal software fault is detected.
VDM U2024:4A	Control Module Cal-Config Data: Incorrect Component Installed	Sets as a continuous memory DTC due to incomplete or improper VDM programming.
VDM U2024:51	Control Module Cal-Config Data: Not Programmed	Sets as a continuous memory DTC due to incomplete or improper VDM programming.
VDM U2024:57	Control Module Cal-Config Data: Invalid/Incompatible Software Component	Sets as a continuous memory DTC due to incomplete or improper VDM programming.
VDM U2100:00	Initial Configuration Not Complete: No Sub Type Information	Sets as a continuous memory DTC due to incomplete or improper VDM programming.
VDM U3000:04	Control Module: System Internal Failures	Sets as a continuous memory DTC due to incomplete or improper VDM programming.

Possible Sources

- VDM configuration
- VDM

T1 CHECK FOR OTHER VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the VDM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) other than U2012:56, U2016:61, U2024:4A, U2024:51, U2024:57, U2100:00 or U3000:04 present in the VDM ?

Yes	DIAGNOSE all other VDM Diagnostic Trouble Codes (DTCs) before continuing this test. REFER to the VDM DTC Chart in this section.
No	GO to T2

T2 CHECK THE VEHICLE SERVICE HISTORY

- Check the vehicle service history for recent service actions related to the VDM .

Are any recent service actions related to the VDM found?

Yes	Reprogram VDM following the diagnostic scan tool instructions. REFER to: Module Programming (418-01A Module Configuration, General Procedures) .
No	GO to T3

T3 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, carry out the VDM self-test.

Is DTC U2012:56, U2016:61, U2024:4A, U2024:51, U2024:57, U2100:00 or U3000:04 still present?

Yes	INSTALL a new VDM . REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

☐☐ **PINPOINT TEST U: HEIGHT SENSOR PLAUSIBILITY FAILURE CONCERN**

Normal Operation and Fault Conditions

With the Ignition ON, the VDM runs a series of internal checks. If the VDM was not configured or improperly configured Diagnostic Trouble Codes (DTCs) will be set. After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C1A03:64	Left Front Height Sensor: Signal Plausibility Failure	Sets as a continuous memory and on-demand DTC due to incomplete or improper VDM programming.
VDM C1A04:64	Right Front Height Sensor: Signal Plausibility Failure	Sets as a continuous memory and on-demand DTC due to incomplete or improper VDM programming.

VDM C1A05:64	Left Rear Height Sensor: Signal Plausibility Failure	Sets as a continuous memory and on-demand DTC due to incomplete or improper VDM programming.
VDM C1A06:64	Right Rear Height Sensor: Signal Plausibility Failure	Sets as a continuous memory and on-demand DTC due to incomplete or improper VDM programming.

Possible Sources

- VDM configuration
- VDM

U1 CHECK THE VEHICLE SERVICE HISTORY

- Check the vehicle service history for recent service actions related to the VDM .

Are any recent service actions related to the VDM found?

Yes	Reprogram VDM following the diagnostic scan tool instructions. REFER to: Module Programming (418-01A Module Configuration, General Procedures) .
No	GO to U2

U2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Carry out the VDM self-test.

Is DTC C1A03:64, C1A04:64, C1A05:64 or C1A06:64 still present?

Yes	Reprogram VDM following the diagnostic scan tool instructions. REFER to: Module Programming (418-01A Module Configuration, General Procedures) .
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No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.
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PINPOINT TEST V: VDM (VEHICLE DYNAMICS CONTROL MODULE) CALIBRATION CONCERN

Normal Operation and Fault Conditions

With the Ignition ON, the VDM runs a series of internal checks. If the height sensors were not calibrated or height sensor calibration failed the VDM sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel and send a message to the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM C1124:55	Height Sensor(s): Not Configured	This DTC is automatically set in a new VDM and indicates that the system requires height sensor calibration. Once the system is calibrated, the DTC can be cleared.
VDM C1124:56	Height Sensor(s): Invalid/ Incompatible Configuration	This DTC sets when the height sensor voltage is out of range during VDM system height sensor calibration. Once the system is calibrated, the DTC can be cleared.

Possible Sources

- VDM calibration
- Height sensor(s) damaged or improperly installed

Visual Inspection and Pre-checks

- Make sure the height sensor harness is routed correctly and is undamaged
- Make sure the height sensor electrical connector is free from any corrosion or other

contaminates

- Make sure the height sensor brackets are not damaged or bent

V1 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCs)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 30 seconds.
- Using a diagnostic scan tool, carry out the VDM self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) other than C1124:55 or C1124:56 present in the VDM ?

Yes	DIAGNOSE all other non-network VDM Diagnostic Trouble Codes (DTCs) before continuing this test. REFER to the VDM DTC Chart in this section.
No	CALIBRATE the VDM and height sensors using the diagnostic scan tool.

☐ ☐ [PINPOINT TEST W: U0401:00](#)

Normal Operation and Fault Conditions

With the Ignition ON, the PCM sends messages over the FD-CAN . If the VDM does not receive valid data from these messages within a certain time frame, the VDM sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel but will not cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U0401:00	Invalid Data Received from ECM/ PCM A: No Sub Type Information	Sets in continuous memory when the VDM receives invalid network data for any one of the following messages: acceleration pedal or vehicle speed from the PCM for more than 5 seconds.

Possible Sources

- Network communication concern
- PCM concern

W1 CHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the PCM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present in the PCM ?

Yes	DIAGNOSE the Diagnostic Trouble Codes (DTCs). For PCM Diagnostic Trouble Codes (DTCs), Refer to the appropriate section in Group 303 for the procedure.
No	GO to W2

W2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Carry out the VDM self-test.

Is DTC U0401:00 still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new PCM module. Refer to section 303-14.
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

☐☐ PINPOINT TEST X: U0415:00

Normal Operation and Fault Conditions

With the Ignition ON, the ABS sends messages over the FD-CAN . If the VDM does not receive valid data from these messages within a certain time frame, the VDM sets Diagnostic Trouble Codes (DTCs). After setting the DTC the VDM deactivates the dynamic suspension system resulting in a firm/harsh suspension feel but will not cause the IPC to display a dynamic suspension system warning message. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0415:00	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module 'A': No Sub Type Information	Sets in continuous memory when the VDM receives invalid network data for any one of the following messages: brake torque request, vehicle speed, vehicle lateral acceleration, vehicle longitudinal acceleration, vehicle roll rate, vehicle yaw stability index or stability control event in progress from the ABS module for more than 5 seconds.
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Possible Sources

- Network communication concern
- ABS module concern

X1 CHECK THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the ABS module Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present in the ABS module?

Yes	DIAGNOSE the ABS module Diagnostic Trouble Codes (DTCs). REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing) .
No	GO to X2

X2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Carry out the VDM self-test.

Is DTC U0415:00 still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new ABS module. REFER to: Electric Brake Booster (EBB) (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

☐☐ [PINPOINT TEST Y: U0415:08](#)

Refer to Wiring Diagrams Cell [42](#) for schematic and connector information.

Normal Operation and Fault Conditions

With the ignition ON, the ABS module sends messages to the VDM over the FD-CAN . If the VDM does not receive valid data from these messages within a certain time frame, the module sets Diagnostic Trouble Codes (DTCs). The VDM will NOT deactivate the dynamic suspension system.REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0415:08	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module 'A': Bus Signal/Message Failures	This DTC sets in continuous memory if the VDM receives invalid network data for any one of the following messages: vehicle speed and vehicle yaw rate for more than 5 seconds. This can be due to a ABS module failure, a circuit failure on the ABS module or an excessive load on the network.
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Possible Sources

- Wiring, terminals or connectors
- Network communication concern
- Vehicle battery
- Charging system concern
- ABS

Y1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the Network Test.

Does the ABS module pass the Network Test?

Yes	GO to Y2
No	DIAGNOSE the ABS module does not respond to the diagnostic scan tool. REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing) .

Y2 CHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, carry out the VDM self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Open and Close drivers door.
- Wait 2 1/2 minutes.
- Ignition ON.
- Using a diagnostic scan tool, carry out the VDM self-test.
- Record the VDM Diagnostic Trouble Codes (DTCs).

Is DTC U0415:08 retrieved again?

Yes	GO to Y3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

Y3 REVIEW THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE VDM (VEHICLE DYNAMICS CONTROL MODULE) SELF-TEST

- Check the recorded Diagnostic Trouble Codes (DTCs) from the VDM self-test.

Is DTC U3003:16 or U3003:17 present in the VDM ?

Yes	If DTC U3003:16 is present, GO to Pinpoint Test A If DTC U3003:17 is present, GO to Pinpoint Test B
No	GO to Y4

Y4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) IN THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE

- Using a diagnostic scan tool, carry out the ABS module self-test.

Is DTC U3003:16 or U3003:17 present in the ABS module?

Yes	DIAGNOSE the ABS module Diagnostic Trouble Codes (DTCs). REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing) .
No	GO to Y5

Y5 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration can be incorrectly set during the PMI or the PMI may not have been carried out.*

- Check the vehicle service history for recent service actions related to the ABS module or VDM . If recent service history is found:
 - verify the correct replacement module was installed.
 - HVBOM may be used to verify correct part fitment.
 - verify the configuration of replacement module was correct.
 - re-configure the module by reprogramming if prior configuration is suspect.
 - verify the module was not obtained from a like vehicle and installed into customer vehicle.
 - return the swapped module to source vehicle and obtain new replacement module.
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to Y6
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

Y6 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect all ABS connectors.
- Using a good light source, inspect all disconnected electrical connectors for the following:
 - corrosion - install new connector or terminal and clean the module pins
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
 - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to Y7
No	REPAIR the connector or terminals. Refer to Wiring Diagrams Cell 5 for schematic and connector information.

Y7 CHECK FOR CORRECT VDM (VEHICLE DYNAMICS CONTROL MODULE) OPERATION

- Connect all ABS connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new ABS module. REFER to: Electric Brake Booster (EBB) (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST Z: U0420:00

Normal Operation and Fault Conditions

With the ignition ON, the PSCM module sends messages to the VDM over the FD-CAN . If the VDM does not receive valid data from these messages within a certain time frame, the module sets Diagnostic Trouble Codes (DTCs). The VDM will deactivate the dynamic suspension system. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U0420:00	Invalid Data Received from Power Steering Control Module 'A': No Sub Type Information	Sets in continuous memory when the VDM receives invalid network data for any one of the following messages: steering angle data from the PSCM for more than 5 seconds.

Possible Sources

- Network communication concern
- PSCM concern

Z1 CHECK THE PSCM (POWER STEERING CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the PSCM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present in the PSCM ?

Yes	DIAGNOSE the PSCM Diagnostic Trouble Codes (DTCs). REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing) .
No	GO to Z2

Z2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Carry out the VDM self-test.

Is DTC U0420:00 still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new PSCM module. REFER to: Steering Gear (211-02 Power Steering, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

PINPOINT TEST AA: U0422:00

Normal Operation and Fault Conditions

With the ignition ON, the BCM module sends messages to the GWM over the HS-CAN1 . The GWM sends these messages to the VDM over the FD-CAN . If the VDM does not receive valid data from these messages within a certain time frame, the module sets Diagnostic Trouble Codes (DTCs). The VDM will deactivate the dynamic suspension system but will NOT cause the IPC to display a warning message for the dynamic suspension system. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0422:00	Invalid Data Received From Body Control Module: No Sub Type Information	Sets in continuous memory when the VDM receives invalid network data for any one of the following messages: ignition status from the BCM for more than 5 seconds.
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Possible Sources

- Network communication concern
- BCM concern

AA1 CHECK THE BCM (BODY CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the BCM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present in the BCM ?

Yes	DIAGNOSE the BCM Diagnostic Trouble Codes (DTCs). REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing) .
No	GO to AA2

AA2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Carry out the VDM self-test.

Is DTC U0422:00 still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new BCM module. REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

☐☐ [PINPOINT TEST AB: U0452:00](#)

Normal Operation and Fault Conditions

With the ignition ON, the RCM module sends messages to the VDM over the HS-CAN2 . If the VDM does not receive valid data from these messages within a certain time frame, the module sets Diagnostic Trouble Codes (DTCs). The VDM will deactivate the dynamic suspension system but will NOT cause the IPC to display a warning message for the dynamic suspension system. REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition

VDM U0452:00	Invalid Data Received From Restraints Control Module: No Sub Type Information	Sets in continuous memory when the VDM receives invalid network data for any one of the following messages: vehicle lateral acceleration, vehicle longitudinal acceleration, vehicle vertical acceleration or vehicle roll rate from the RCM for more than 5 seconds.
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Possible Sources

- Network communication concern
- RCM concern

AB1 CHECK THE RCM (RESTRAINTS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the RCM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present in the RCM ?

Yes	DIAGNOSE the RCM Diagnostic Trouble Codes (DTCs). REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing) .
No	GO to AB2

AB2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Carry out the VDM self-test.

Is DTC U0452:00 still present?

Yes	CHECK OASIS for any applicable service articles: TSB , GSB , SSM or FSA . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles exist for this concern, INSTALL a new RCM module. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

[PINPOINT TEST AC: U3000:54](#)

Normal Operation and Fault Conditions

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U3000:54	Control Module: Missing Calibration	Sets as a continuous memory DTC on initial VDM power up until initial configuration of On Board Scales are completed using a scan tool.

Possible Sources

- VDM configuration
- VDM
- Suspension Calibration Routine not completed.

AC1 CHECK FOR OTHER VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the VDM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) other than U3000:54 present in the VDM ?

Yes	DIAGNOSE all other VDM Diagnostic Trouble Codes (DTCs) before continuing this test. REFER to the VDM DTC Chart in this section.
No	GO to AC2

AC2 CHECK THE VEHICLE SERVICE HISTORY

- Check the vehicle service history for recent service actions related to the VDM .

Are any recent service actions related to the VDM found?

Yes	Reprogram VDM following the diagnostic scan tool instructions. REFER to: Module Programming (418-01A Module Configuration, General Procedures) .
No	GO to AC3

AC3 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, carry out the VDM Suspension Calibration Routine.

Is DTC U3000:54 still present?

Yes	INSTALL a new VDM . REFER to: Vehicle Dynamics Control Module (VDM) (204-05 Vehicle Dynamic Suspension, Removal and Installation) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.

☐ ☐ [PINPOINT TEST AD: U1000:00 OR U3000:49](#)

Normal Operation and Fault Conditions

REFER to: [Vehicle Dynamic Suspension - System Operation and Component Description](#) (204-05 Vehicle Dynamic Suspension, Description and Operation) .

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
VDM U1000:00	Solid State Driver Protection Active - Driver Disabled: No Sub Type Information	Sets as a continuous memory DTC when the VDM has disabled an output due to an over-load.
VDM U3000:49	Control Module: Internal Electronic Failure	Sets as a continuous memory DTC when the VDM has disabled an output due to an overload.

Possible Sources

- VDM configuration
- VDM

AD1 CHECK FOR OTHER VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the VDM Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) other than U1000:00 or U3000:49 present in the VDM ?

Yes	DIAGNOSE all other VDM Diagnostic Trouble Codes (DTCs) before continuing this test. REFER to the VDM DTC Chart in this section.
No	GO to AD2

AD2 RECHECK THE VDM (VEHICLE DYNAMICS CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the VDM Diagnostic Trouble Codes (DTCs).
- Using the scan tool, carry out the VDM sel-test.

Is DTC U1000:00 or U3000:49 still present?

Yes	REFER to: Body Control Module C (BCMC) (419-10 Multifunction Electronic Modules, Diagnosis and Testing) .
No	The system is operating correctly at this time. The concern may have been caused by an intermittent condition.