

2015 ACCESSORIES & BODY, CAB

Active Park Assist System - MKS

SPECIFICATIONS

SPECIFICATIONS

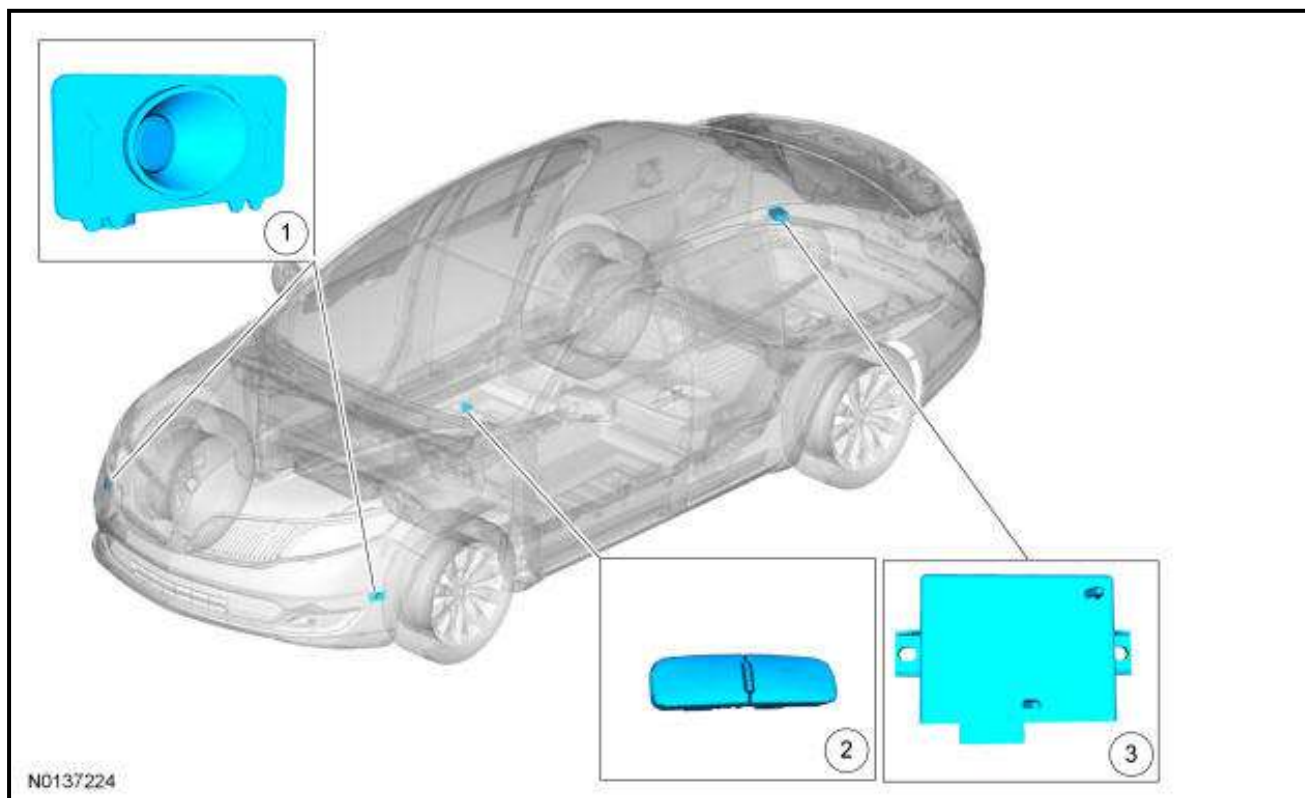
General Specifications

Item	Specification
Azimuth system check object position 1 (P1) distance from sensor	50 cm $\hat{A}\pm$ 10 cm (20 in $\hat{A}\pm$ 4 in) ⁽¹⁾
Azimuth system check object position 2 (P2) and position 3 (P3), distance from sensor	390 cm $\hat{A}\pm$ 20 cm (154 in $\hat{A}\pm$ 8 in) ⁽¹⁾
(1) Refer to the Azimuth System Check for object position information.	

DESCRIPTION AND OPERATION

ACTIVE PARK ASSIST

Component Location



Item	Description	Comments
1	Active park assist sensor	-
2	Active park assist switch	-
3	PAM	-

Overview

The active park assist system is a supplementary parking aid that assists the operator in detecting an available parallel parking space and automatically steering the vehicle into the space while the operator controls the accelerator, gearshift and brakes.

2015: ACCESSORIES & BODY, CAB

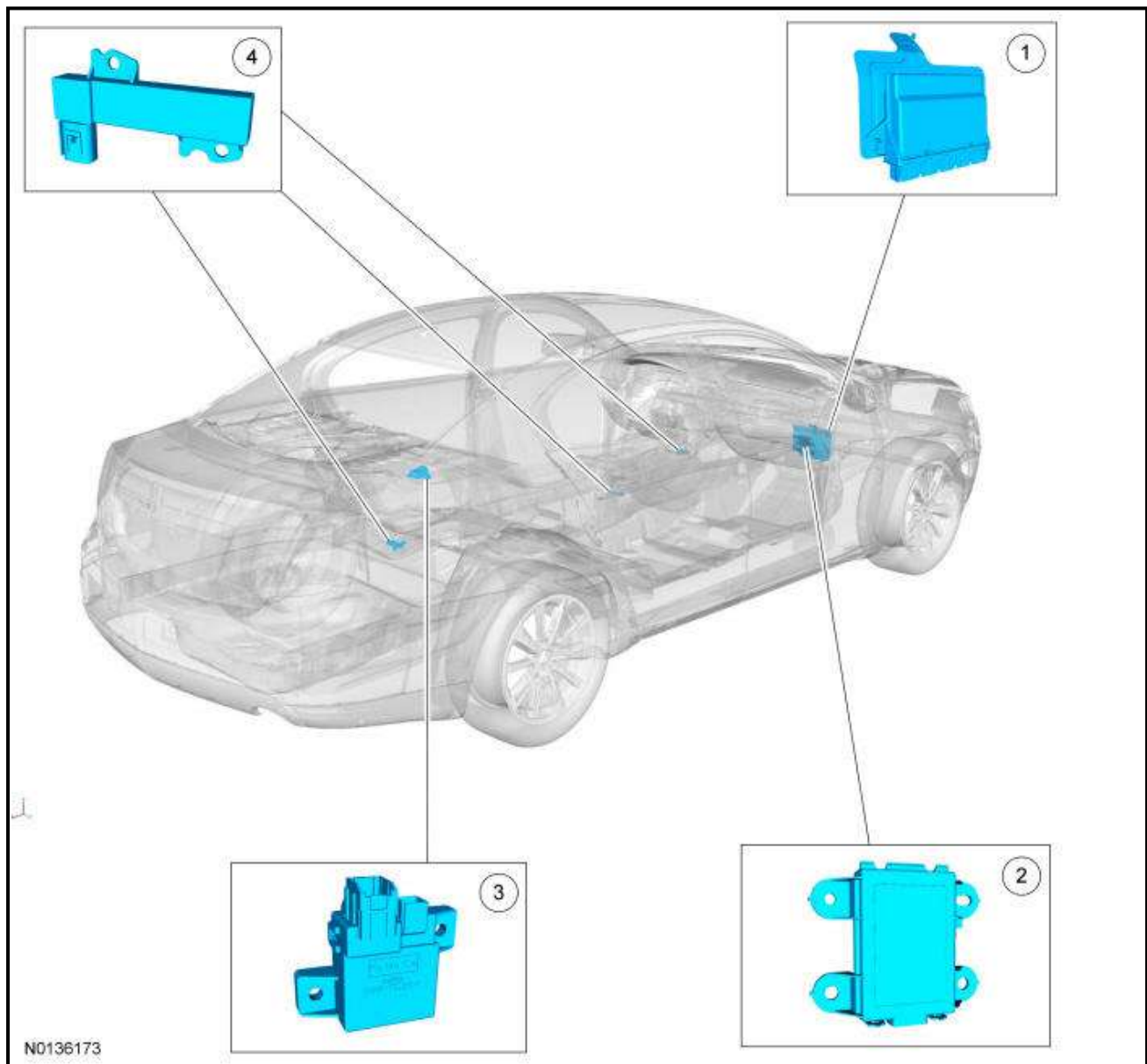
Anti-Theft - Passive Anti-Theft System (PATS) - MKS

DESCRIPTION AND OPERATION

ANTI-THEFT

Component Location

NOTE: The Tire Pressure Monitor (TPM) module may also be known as the Radio Transceiver Module (RTM).



N0136173

Item	Description
1	RFA module
2	Backup transceiver
3	TPM module
4	Passive start antenna (3 required)

Overview

PATS deters the vehicle from theft by preventing the ignition from turning on and the engine from starting unless a programmed IA key is detected in the vehicle. PATS does not disable an already running engine.

- Reconnect all previously disconnected electrical components and system electrical connectors.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new HVAC module. REFER to Climate Control .
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST I : THE DEFROST SYSTEM WILL NOT SHUT OFF AUTOMATICALLY

Diagnostic Overview

Diagnostics in this service information assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in [Service Information](#) for information about these practices.

Refer to [HEATED WINDOW](#) for schematic and connector information.

Normal Operation and Fault Conditions

For a complete description of normal operation, refer to Rear Window Defrost in [Glass, Frames and Mechanisms](#).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1C83:11	Rear Defog Relay: Circuit Short to Ground	This DTC sets when the HVAC module detects a short to ground is present on the rear window defrost relay control circuit.

Possible Sources:

- Wiring, terminals or connectors
- Rear window defrost relay
- HVAC module

PINPOINT TEST I : THE DEFROST SYSTEM WILL NOT SHUT OFF AUTOMATICALLY

NOTE: Use the correct probe adapter(s) from the Flex Probe Kit when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

I1 CHECK THE REAR WINDOW DEFROST GRID POWER CIRCUIT FOR A SHORT TO VOLTAGE

- Disconnect: Rear Window Defrost Relay.
- Disconnect: Rear Window Defrost Grid Power.
- Ignition ON.
- Measure the voltage between rear window defrost grid power circuit (BK), harness side and ground.



- Wiring, terminals or connectors
- Ambient lighting LED harness
- HVAC module

PINPOINT TEST L : ONE OR MORE OF THE AMBIENT LIGHTING LEDs ARE INOPERATIVE

L1 CHECK AMBIENT LIGHTING OPERATION

- Ignition ON.
- Place the headlamp switch in the parking lamps ON position.
- Observe each of the ambient lamps.

Are all the ambient lamps inoperative?

Yes	GO to L2 .
No	GO to L7 .

L2 CHECK FOR COMMUNICATION TO THE HVAC MODULE

- Ignition ON.
- Using a scan tool, perform the network test.

Does the HVAC module pass the network test?

Yes	GO to L3 .
No	REFER to Module Communications Network .

L3 CHECK THE CLIMATE CONTROL OPERATION

- Check the operation of the climate control system and verify that all of the climate controls operate correctly.

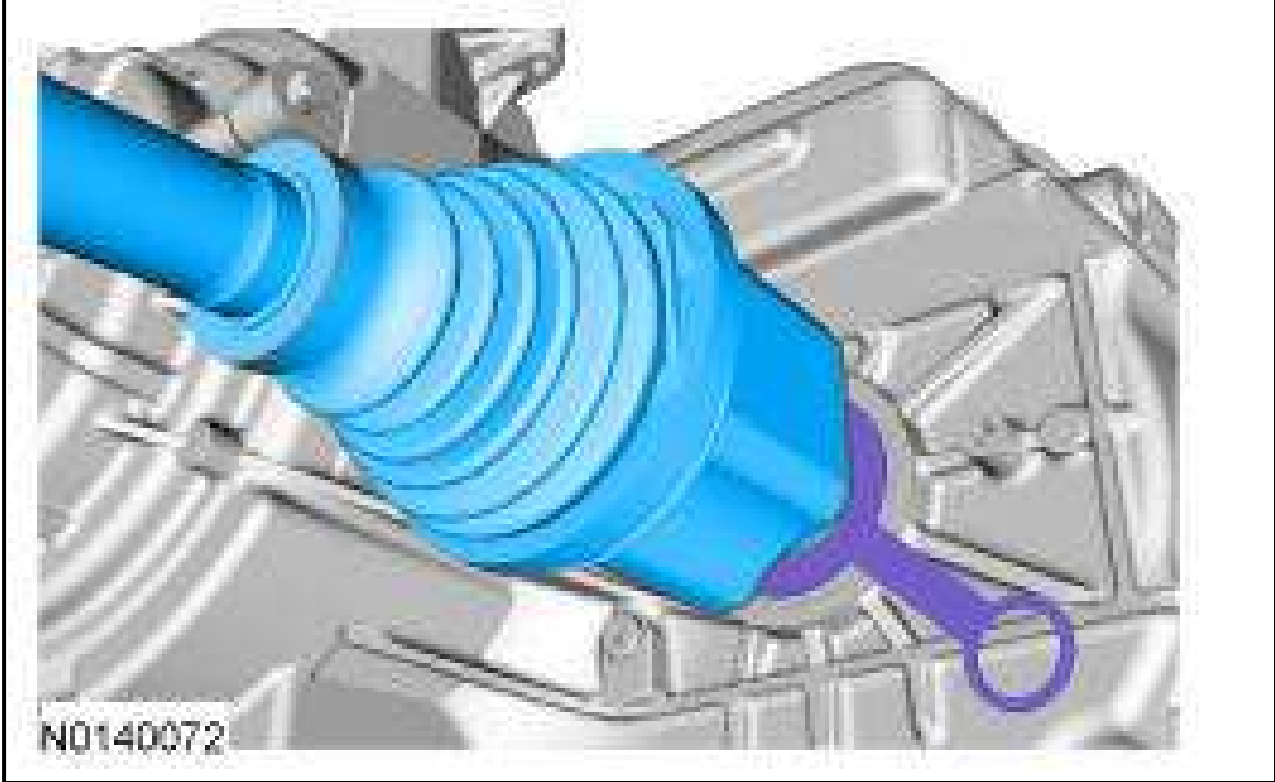
Does the climate control system operate correctly?

Yes	GO to L4 .
No	REFER to Climate Control System General Information and Diagnostics .

L4 CHECK THE AMBIENT LIGHTING GROUND CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect: HVAC Module [C228C](#) .
- Disconnect: Negative Battery Cable.
- Measure the **resistance** between:

Positive Lead		Negative Lead	
Pin	Circuit	Pin	Circuit
C228C-8	GD374 (BK/WH)	-	Ground



5.

Rotate the wheel knuckle into position and insert the halfshaft into the wheel hub.

6.

Position the lower ball joint into the wheel knuckle and install the new nut.

- Tighten the new nut to 200 Nm (148 lb-ft).

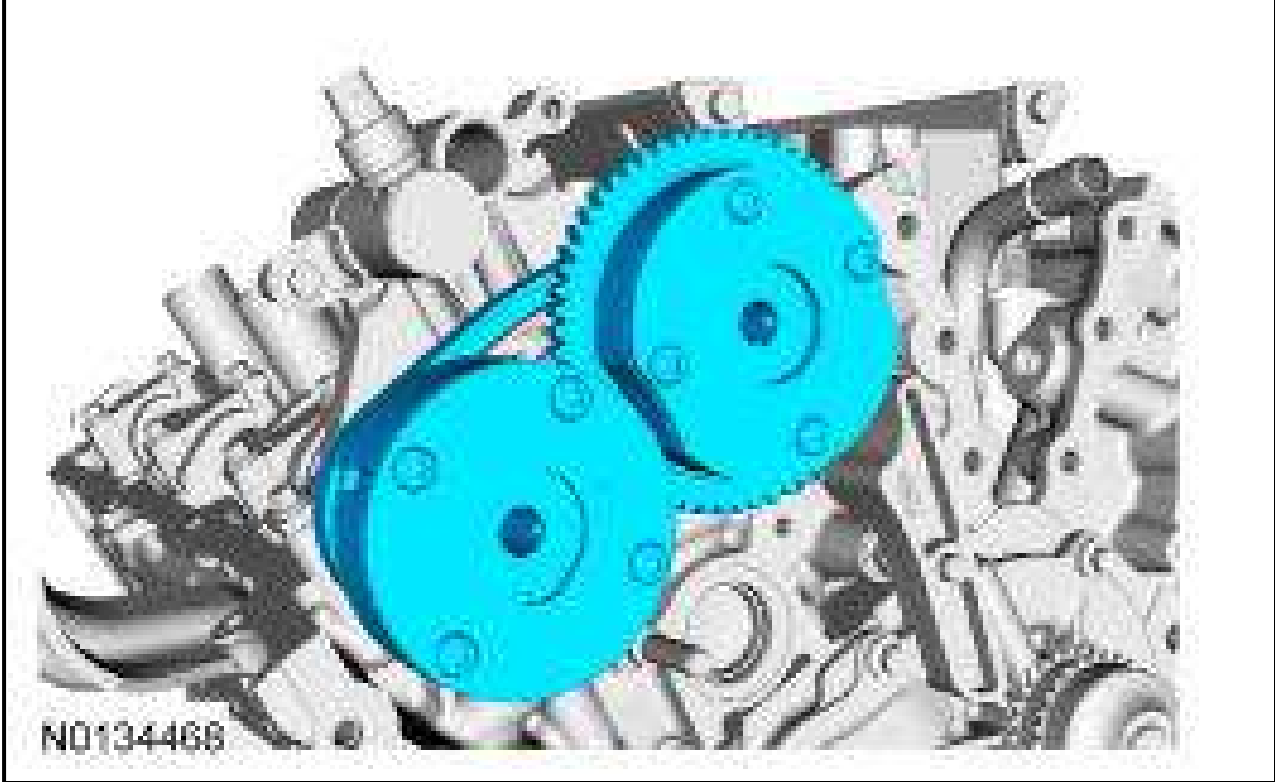
7.

NOTE: The hex-holding feature can be used to prevent turning of the stud while installing the nut.

Connect the outer tie-rod end(s) to the wheel knuckle(s) and install the nut(s).

- Tighten the new nut to 150 Nm (111 lb-ft).

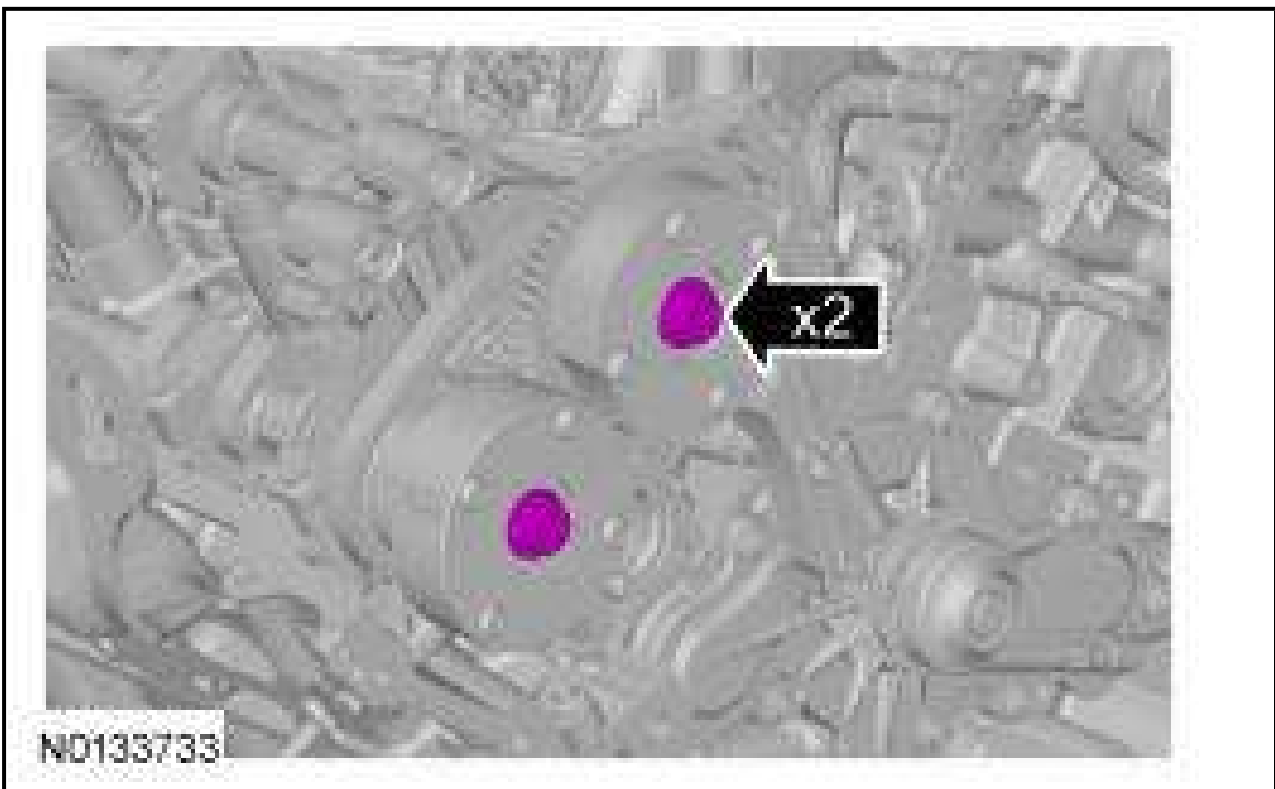




7.

Install the 2 new RH VCT bolts and tighten in 4 stages.

- Stage 1: Tighten to 40 Nm (30 lb-ft).
- Stage 2: Loosen one full turn.
- Stage 3: Tighten to 25 Nm (18 lb-ft).
- Stage 4: Tighten an additional 180 degrees.



8.

Activate the RH secondary timing chain tensioner by pressing down on the secondary tensioner top shoe until it bottoms out, let go of the tensioner and it will spring up putting tension on the chain.

Condition	Possible Sources	Action
Engine drumming noise - accompanied by vibration	Powertrain mount(s)	CARRY OUT the Powertrain/Drivetrain Mount Neutralizing procedure. TEST the system for normal operation after the repair.
Rattle - occurs at idle or at light acceleration from a stop	Powertrain mount(s)	CHECK the powertrain mounts for damage. INSTALL new mounts as necessary. For engine, Refer to the appropriate Engine article for the procedure. For transaxle, Refer to the appropriate Automatic Transmission article for the procedure. TEST the system for normal operation after the repair.
Whine/moan type noise - pitch increases or changes with vehicle speed	Powertrain mount(s)	CHECK the powertrain mounts for damage. INSTALL new mounts as necessary. For engine, Refer to the appropriate Engine article for the procedure. For transaxle, Refer to the appropriate Automatic Transmission article for the procedure. TEST the system for normal operation after the repair.
Clunk - occurs when shifting from PARK or between REVERSE and DRIVE	Powertrain mount(s)	CHECK the powertrain/drivetrain mounts for damage. INSTALL new mounts as necessary. For engine, Refer to the appropriate Engine article for the procedure. For transaxle, Refer to the appropriate Automatic Transmission article for the procedure. TEST the system for normal operation after the repair.
Idle speed is too high		CHECK for the correct idle speed.
Accessory drive bearing hoot - occurs at idle or high idle in cold temperatures of approximately 4 Â°C (40 Â°F) or colder at the first start of the day	Accessory drive idler or tensioner pulley bearing is experiencing stick/slip between ball bearings and the bearing race	CARRY OUT the engine cold soak procedure. REFER to Noise, Vibration and Harshness . PLACE the EngineEAR probe directly on the idler/tensioner center post or bolt to verify which bearing is making the noise. INSTALL new parts as necessary. REFER to Accessory Drive . TEST the system for normal operation after the repair.
Accessory drive belt noise, squeal or chirping	Defective/worn or incorrect accessory drive belt Misaligned pulley(s) Pulley runout Damaged or worn accessory drive component or idler Fluid contamination of the accessory drive belt or pulleys Damaged or worn accessory drive belt tensioner Damaged pulley grooves	CARRY OUT the Engine Accessory Test. REFER to Noise, Vibration and Harshness . INSPECT components and INSTALL new parts as necessary. REFER to Accessory Drive . TEST the system for normal operation after the repair.

FUEL INJECTORS

NOTE: For information on Ford Color Coded Illustrations refer to [COLOR-CODING - FORD](#).

REMOVAL AND INSTALLATION

1.

The fuel injectors are serviced with the fuel rail. For additional information, refer to [Fuel Rail - 3.5L GTDI](#).

FUEL PUMP CONTROL MODULE

NOTE: For information on Ford Color Coded Illustrations refer to [COLOR-CODING - FORD](#).

REMOVAL AND INSTALLATION

NOTE: Removal steps in this procedure may contain installation details.

NOTE: The fuel pump control module is located behind the rear seat backrest on the right side.

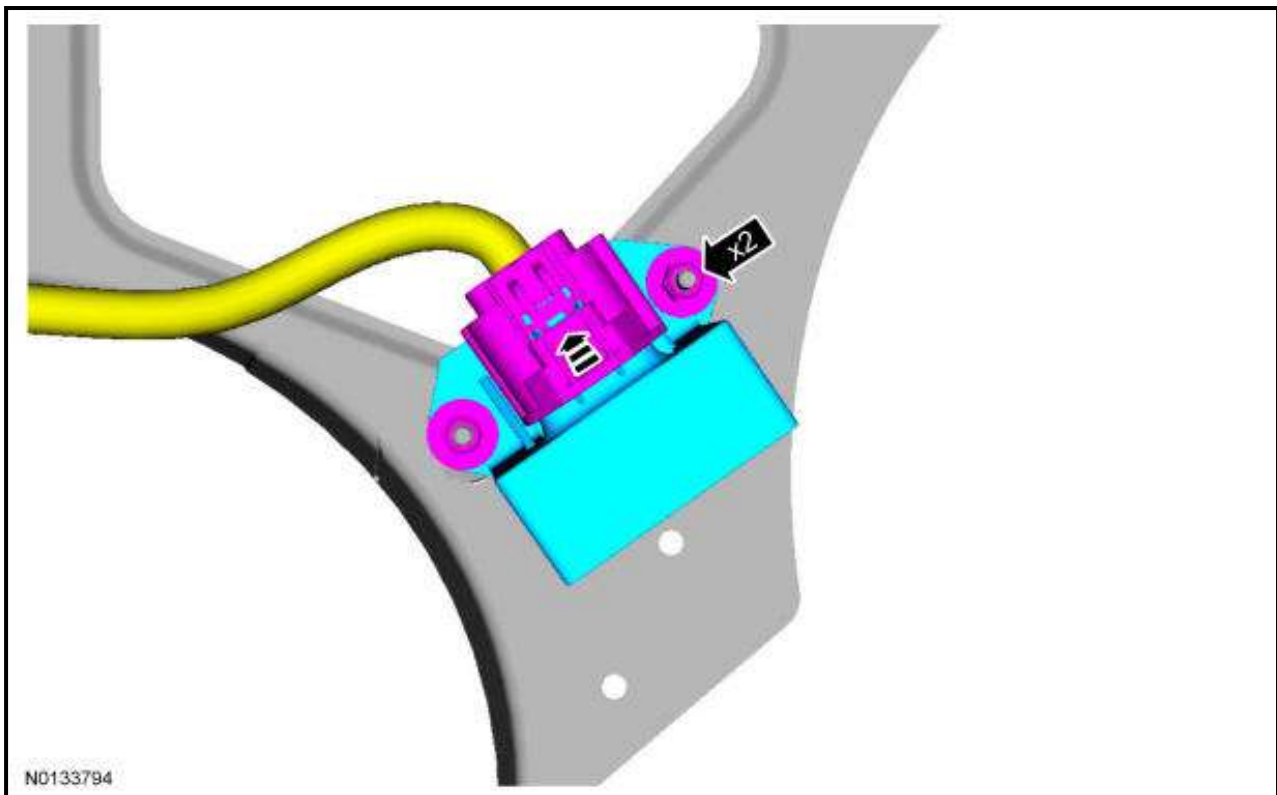
1.

Remove the rear seat backrest. [Seating](#)

2.

NOTE: Do not overtighten the fasteners or damage to the module will occur.

Tighten to 5 Nm (44 lb-in).



3.

To install, reverse the removal procedure.

2015 ENGINE PERFORMANCE

Engine Emission Control System - MKS

SPECIFICATIONS

SPECIFICATIONS

Material

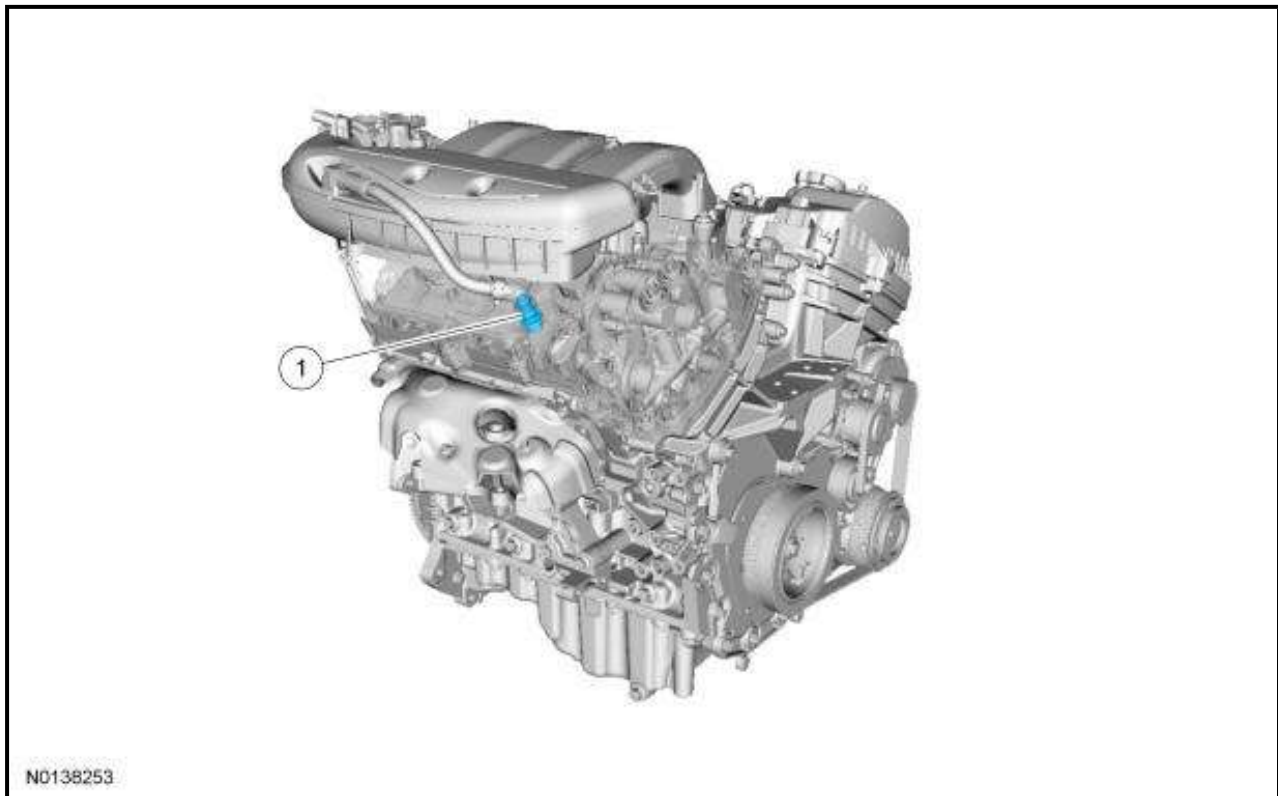
Item	Specification	Fill Capacity
Motorcraft [®] SAE 5W-20 Premium Synthetic Blend Motor Oil (US); Motorcraft [®] SAE 5W-20 Super Premium Motor Oil (Canada) XO-5W20-QSP (US); CXO-5W20-LSP12 (Canada)	WSS-M2C945-A	-
Motorcraft [®] SAE 5W-30 Premium Synthetic Blend Motor Oil (US); Motorcraft [®] SAE 5W-30 Super Premium Motor Oil (Canada) XO-5W30-QSP (US); CXO-5W30-LSP12 (Canada)	WSS-M2C946-A	-

DESCRIPTION AND OPERATION

ENGINE EMISSION CONTROL

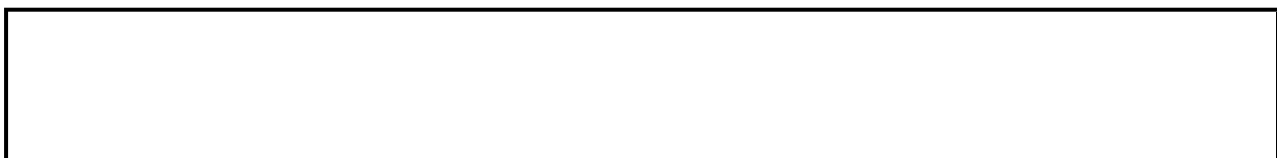
Component Locations

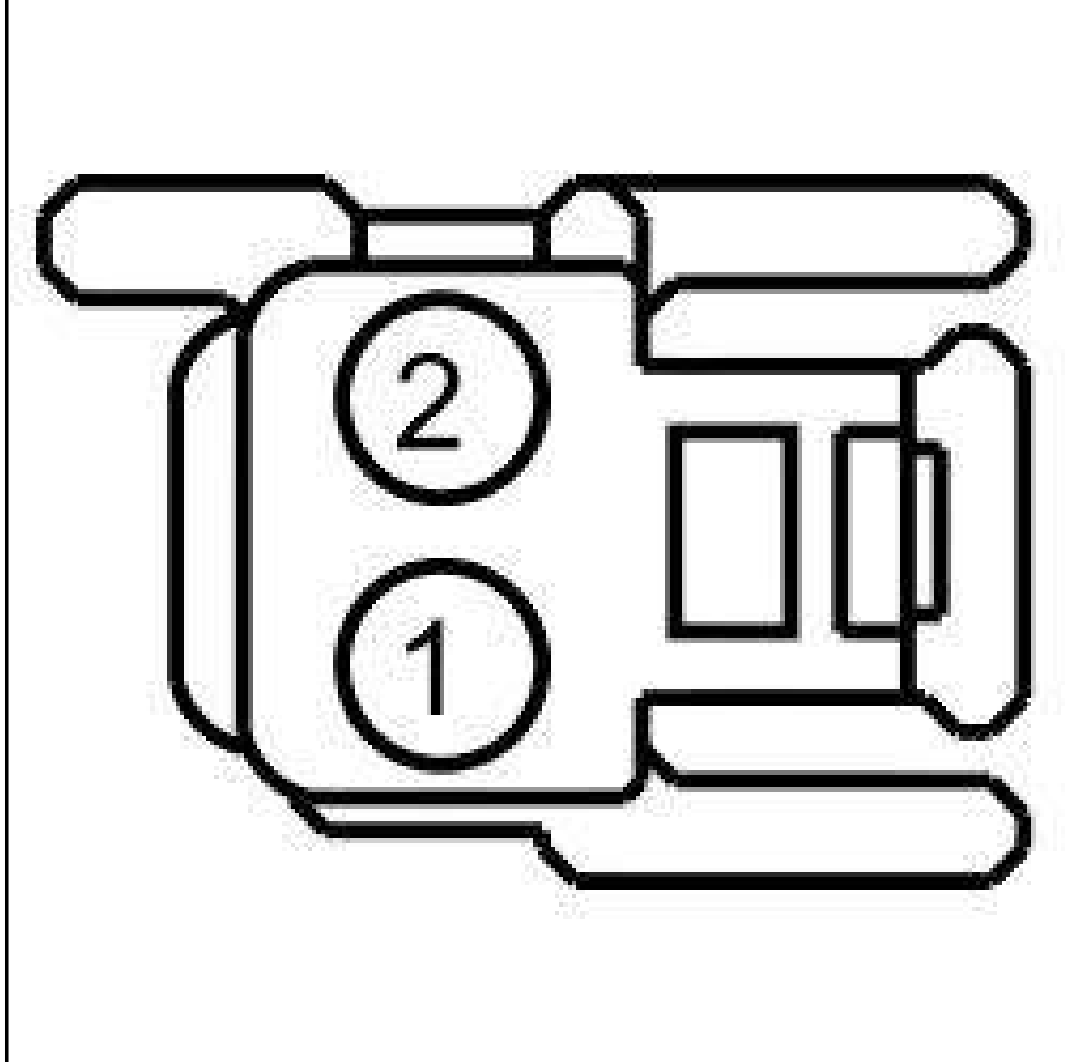
3.7L Ti-VCT



Item	Description	Comments
1	PCV valve	-

3.5L GTDI





Is the resistance greater than 10, 000 ohms?

Yes	GO to F8 .
No	REPAIR the circuit.

F8 CHECK FOR CORRECT HVAC MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect all HVAC module connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Connect all HVAC module 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 TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSB addresses this concern, INSTALL a new HVAC module. REFER to Climate Control .
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST G : DTCs U3003:16 OR 17

Diagnostic Overview

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices. Refer to Diagnostic Methods in [Service Information](#) for information about these practices.

Refer to [Automatic Climate Control System](#) , for schematic and connector information.

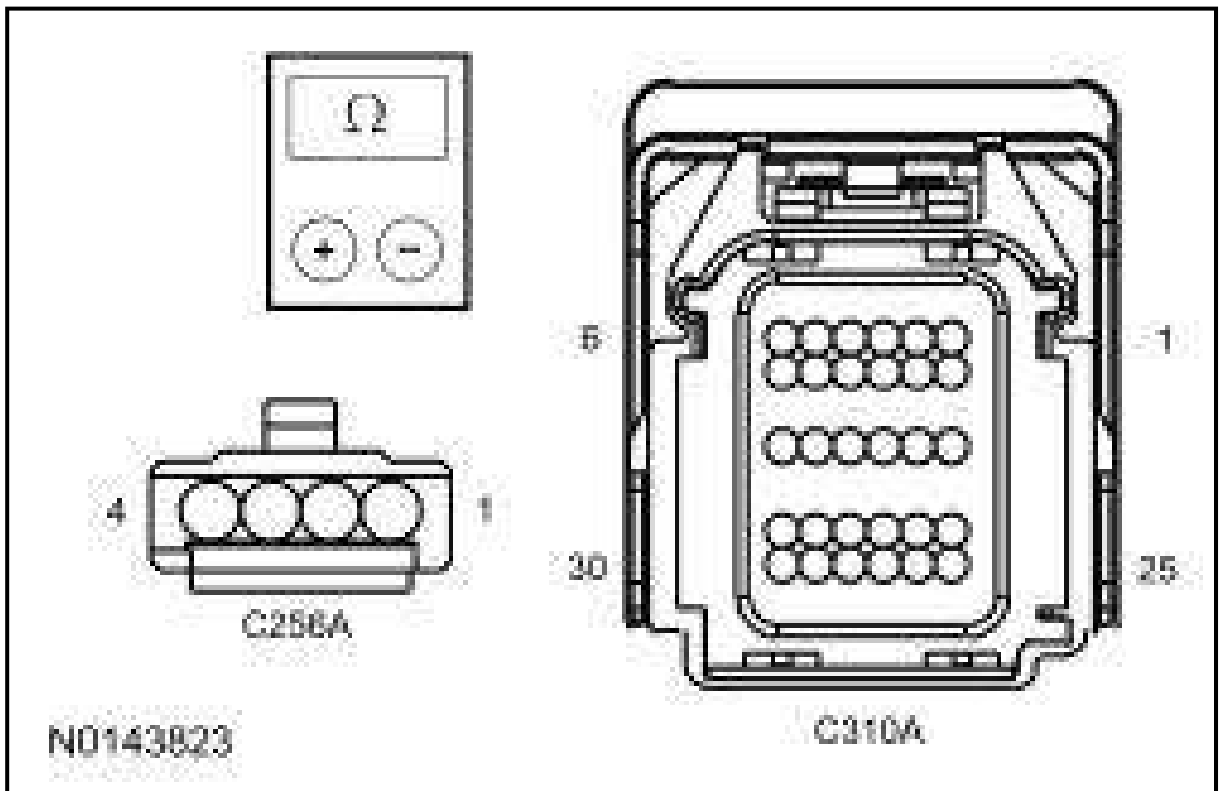
NOTE: DTC U3003 can be set if the vehicle has been recently jump started, the battery has been

Yes	GO to Q12 .
No	REPAIR the circuits. Refer to OEM CONNECTOR REPAIR PROCEDURES for schematic and connector information. GO to Q17 .

O6 CHECK THE PASSENGER AIR BAG MODULE CANISTER VENT CIRCUITS FOR AN OPEN

- Ignition OFF.
- Depower the SRS. Refer to [Supplemental Restraint System \(SRS\) Depowering and Repowering](#).
- Disconnect: RCM [C310A](#) and [C310B](#) .
- Disconnect: Passenger Air Bag Module [C256A](#) .
 - Open and lower the glove compartment door and detach the glove compartment door dampener.
 - Unhook the glove compartment door from the instrument panel.
- Disconnect: Passenger Air Bag Module [C256B](#) .
- Measure the **resistance** between:

Positive	Lead	Negative	Lead
Pin	Circuit	Pin	Circuit
C256A-3	CR144 (GY/OG)	C310A-10	CR144 (GY/OG)
C256A-4	RR144 (VT/GN)	C310A-9	RR144 (VT/GN)

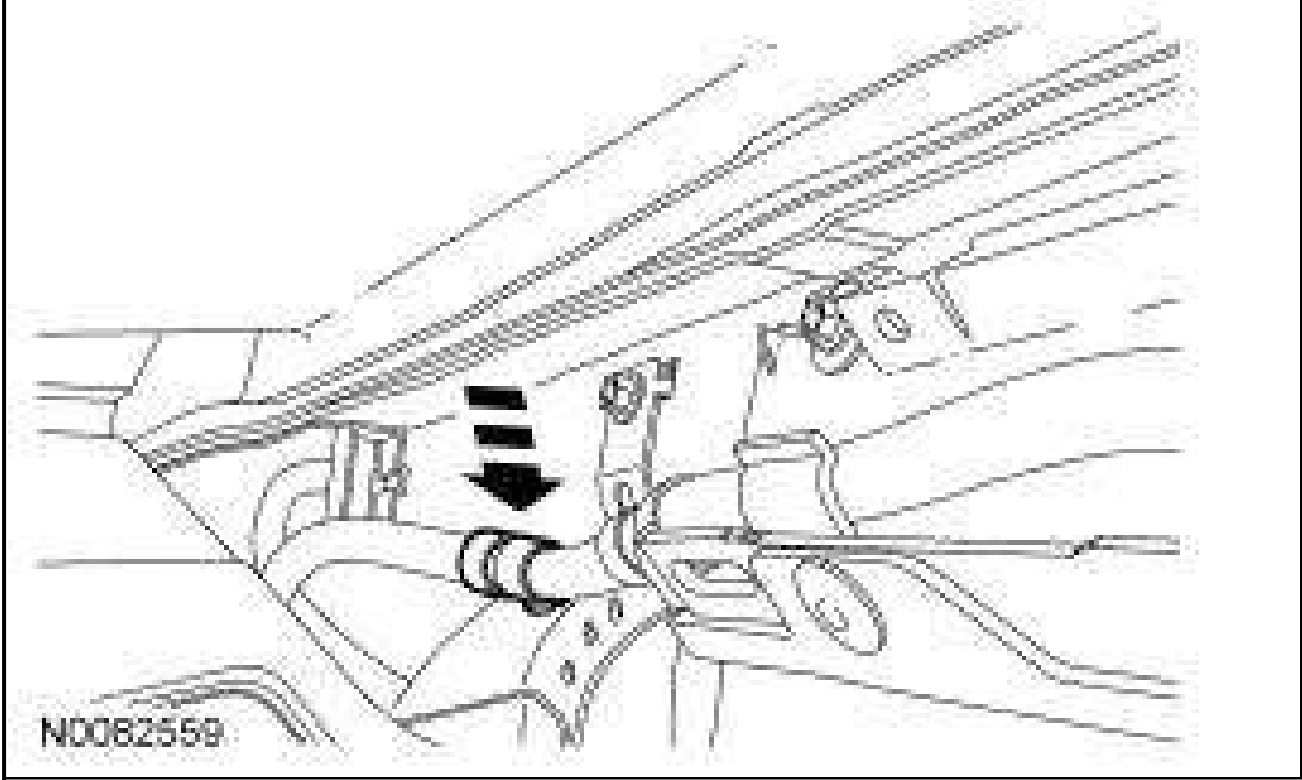


Are the resistances less than 0.5 ohm?

Yes	GO to Q7 .
No	REPAIR the affected circuit. Refer to OEM CONNECTOR REPAIR PROCEDURES for schematic and connector information. GO to Q17 .

O7 CHECK THE PASSENGER AIR BAG CANISTER VENT DEPLOYMENT CONTROL DTC FOR A FAULT STATUS CHANGE (OPEN INDICATED)

NOTE: This pinpoint test step attempts to change the fault reported by the RCM by inducing a different fault condition. If the fault reported



6.

Install the Safety Canopy® module bolt at the A-pillar.

- Tighten to 7 Nm (62 lb-in).

7.

Install the pin-type retainers to the A-pillar trim bracket and Safety Canopy® module front tether bracket bolt.

- Tighten to 7 Nm (62 lb-in).

8.

Install the headliner. For additional information. Refer to [Interior Trim and Ornamentation](#) .

9.

Install the parcel shelf. For additional information. Refer to [Interior Trim and Ornamentation](#) .

10.

Repower the SRS. For additional information. Refer to [Supplemental Restraint System \(SRS\) Depowering and Repowering](#) .

SEAT POSITION SENSOR


NOTE: For information on Ford Color Coded Illustrations refer to [COLOR-CODING - FORD](#) .



procedure. REFER to [Solenoid Body Strategy Download](#). PERFORM the Solenoid Body Strategy Drive Cycle, REFER to [Solenoid Body Strategy Drive Cycle](#).

C4 CHECK THE SSC CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness [C168](#) .
- Disconnect: PCM [C175E](#) .
- Inspect the connectors for damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals.
- Measure:

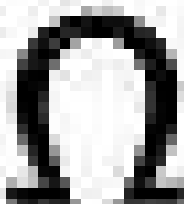
Positive Lead	Measurement / Action	Negative Lead
C168-17		Ground

Is the resistance greater than 10, 000 ohms?

Yes	GO to C5 .
No	REPAIR the circuit.

C5 CHECK SSC FOR A SHORT TO GROUND

- Measure:

Positive Lead	Measurement / Action	Negative Lead
Component side, pin 17		Ground

Is the resistance less than 3 ohms?

Yes	REMOVE the main control cover. REFER to Main Control Cover - 3.7L Ti-VCT . INSPECT the solenoid body for foreign material such as metal shavings on the exposed metal contacts or other components. CLEAN the solenoid body and RECHECK the resistance value. If the resistance value is out of specification and a short to ground is not found, INSTALL a new solenoid body assembly. REFER to Solenoid Body Assembly . PERFORM the Solenoid Body Strategy Data Download procedure. REFER to Solenoid Body Strategy Download . PERFORM the Solenoid Body Strategy Drive Cycle, REFER to Solenoid Body Strategy Drive Cycle .
No	INSTALL a new PCM. REFER to Electronic Engine Controls . PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to Solenoid Body Strategy Download . PERFORM the Solenoid Body Strategy Drive Cycle, REFER to Solenoid Body Strategy Drive Cycle .

C6 CHECK THE SSC CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness [C168](#) .
- Disconnect: PCM [C175E](#) .
- Inspect the connectors for damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.
- Measure:

Positive Lead	Measurement / Action	Negative Lead



N0134322

119.

Remove and discard the direct clutch piston seals.



N0137513

120.

Remove the direct clutch snap ring.

Condition	Code	Procedure
Insulation damaged, conductors not exposed	1	Suggest repair or replacement
Open	A	Require repair or replacement
Protective shield (conduit) melted	2	Suggest repair or replacement
NOTE: Determine cause and correct prior to repair or replacement of part.		
Resistance (voltage drop) out of specification	A	Require repair or replacement
Routed incorrectly	B	Require repair
Secured incorrectly	B	Require repair
Shorted	A	Require repair or replacement
Terminal broken	A	Require repair or replacement
Terminal burned, affecting performance	A	Require repair or replacement
Terminal burned, not affecting performance	2	Suggest repair or replacement
Terminal corroded, affecting performance	A	Require repair or replacement
Terminal corroded, not affecting performance	2	Suggest repair or replacement
Terminal loose, affecting performance	B	Require repair or replacement
Terminal loose, not affecting performance	1	Suggest repair or replacement
Voltage drop out of specification	A	Require repair or replacement

REASON CODE EXPLANATION

Code	Reason
Required	
A	Part No Longer Performs Intended Purpose
B	Part Does Not Meet A Design Specification (Regardless Of Performance)
C	Part Is Missing
Suggested/Optional	
1	Part Is Close To The End Of Its Useful Life
2	To Address A Customer Need, Convenience Or Request
3	To Comply With Maintenance Recommended By The Vehicle's Original Equipment Manufacturer
4	Technician's Recommendation Based On Substantial And Informed Experience
5	To Comply With Maintenance Recommended By AMRA/MAP

AUTOMOTIVE TERMINOLOGY & DEFINITIONS

ACTUATOR

a control device that delivers mechanical action in response to a vacuum or electrical signal; anything that the engine control computer uses to do something, such as trigger fuel injection or fire a spark plug. Most actuators on a computercontrolled engine system are activated by grounding their circuits rather than by actively powering them, since that protects the computer from short circuits.

AEMD (AUTOMOTIVE ELECTRIC DRIVE MOTOR)

a U.S. Department of Energy program to develop low-cost traction drive motors for automotive applications.

AIR BAGS

air bags are fabric bags that are filled quickly with a gas to provide supplemental protection for vehicle passengers during some collisions. Side-impact air bags are becoming increasingly