

SPECIFICATIONS

Material

Item	Specification	Fill Capacity
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A	—

General Specifications

Item	Specification
Fuel tank capacity	60.56L (16 gal)
Key ON Engine OFF (KOEO)	240-485 kPa (35-70 psi)
Key ON Engine Running (KOER)	152-255 kPa (27-37 psi)

DESCRIPTION AND OPERATION

Fuel System

The fuel system consists of the:

- fuel filter.
- fuel injectors.
- Fuel Pump (FP) module.
- fuel level sensor.
- fuel rail.
- fuel rail pressure and temperature sensor.
- saddle-type fuel tank.
- fuel tank filler cap.
- fuel tank filler pipe.
- Fuel Tank Pressure (FTP) sensor (part of the fuel vapor tube assembly).
- fuel tubes (liquid and vapor).
- Inertia Fuel Shutoff (IFS) switch.

The vehicle:

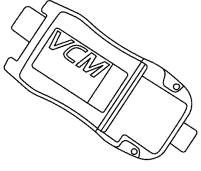
- utilizes an Electronic Returnless Fuel System (ERFS).
- has a saddle-type fuel tank.
- has a FP module in the LH saddle of the fuel tank that supplies fuel under pressure to the fuel rail.
- has a serviceable fuel level sender mounted on the FP module.

- has a fuel level sensor in the RH saddle of the fuel tank.
 - is equipped with a sequential Multi-Port Fuel Injection (MFI) system.
 - has fuel tubes (liquid and vapor) mounted on the underside of the vehicle in a bundle.
 - has a Fuel Tank Pressure (FTP) sensor (part of the fuel vapor tube assembly).
 - uses separately controlled fuel injectors for each cylinder. The fuel injectors are mounted to the intake manifold.
 - fuel injectors are supplied with pressurized fuel from the FP module to the fuel rail.
 - has a fuel rail which is equipped with a fuel rail pressure and temperature sensor.
 - fuel injection rail pressure is controlled by the electronic FP module which is enabled by the PCM.
 - has a one-fourth turn vented type fuel tank filler cap.
 - has a fuel tank filler pipe assembly, which cannot be modified in any way and is serviced only by installation of a new fuel tank filler pipe assembly.
 - has an IFS switch located in the driver side footwell that shuts off fuel in the event of a collision.
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DIAGNOSIS AND TESTING

Fuel System

Special Tool(s)

 <p>ST2834-A</p>	<p>Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool</p>
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Principles of Operation

NOTE: The following procedure diagnoses a slow-to-fill concern only. For all other concerns, refer to the [Powertrain Control/Emissions Diagnosis \(PC/ED\) manual](#).

The fuel tank filler pipe assembly is used to refuel the vehicle. The fuel tank inlet check valve prevents spitback of fuel during and after refueling. The fuel tank stores the fuel. The fuel tank contains a Fuel Pump (FP) module. The FP module consists of a fuel level sender and a FP. The fuel level sender sends a signal to the fuel gauge informing the driver of how much fuel is in the fuel tank. The FP provides fuel to the fuel tubes which supply the fuel rail.

During refueling, the fuel tank vents to the atmosphere through the vent and filler pipes, on vehicles without On-Board Refueling Vapor Recovery (ORVR) systems. In vehicles equipped with ORVR the fuel tank and filler pipe are designed so that when the vehicle is being refueled, fuel vapors in the fuel tank travel to the Evaporative Emission (EVAP) canister, which absorbs the fuel vapors and vents the pressure from the fuel tank during refueling.

Inspection and Verification

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

NOTE: Do not use incandescent lights when inspecting the fuel system. Use only fluorescent or LED lighting.

1. Verify the customer concern by refueling the vehicle and observe the fuel fill rate.
2. Inspect to determine if any of the following mechanical concerns apply.

DIAGNOSIS AND TESTING (Continued)**Visual Inspection Chart**

Mechanical
<ul style="list-style-type: none"> • Bent, kinked or damaged fuel tank filler pipe • Bent, kinked or damaged fuel tank filler pipe vent tube (if equipped) • Incorrect routing of the fuel tank filler pipe • Incorrect routing of the fuel tank filler pipe vent tube (if equipped) • Incorrect position of fuel tank filler pipe clamps • Incorrect position of fuel tank filler pipe vent tube clamps (if equipped) • Fuel tank mounted vapor tubes bent or damaged • Evaporative Emission (EVAP) system tubes or hoses bent or damaged • Accident damage to the fuel tank • Accident damage to the vehicle effecting the fuel tank filler pipe-to-body connection • Unauthorized modifications and/or alterations to the vehicle • EVAP system fresh air hose plugged (dirt, spider webbing)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
 4. **NOTE:** Make sure to use the latest scan tool software release.
If the cause is not visually evident, connect the scan tool to the Data Link Connector (DLC).
 5. **NOTE:** The Vehicle Communication Module (VCM) LED prove out confirms power and ground from the DLC are provided to the VCM.
If the scan tool does not communicate with the VCM:
 - check the VCM connection to the vehicle.
6. If the scan tool does not communicate with the vehicle:
 - check the scan tool connection to the VCM.
 - refer to Section 418-00, No Power To The Scan Tool, to diagnose no power to the scan tool.
 7. Carry out the network test.
 - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
 - If the network test passes, retrieve and record continuous memory DTCs.
 8. Clear the continuous DTCs and carry out the self-test diagnostics for the EVAP system using the scan tool.
 9. If the DTCs retrieved are related to the concern, go to Evaporative Emission (EVAP) System DTC Chart. For PCM-related DTCs, refer to the [Powertrain Control/Emissions Diagnosis \(PC/ED\) manual](#). For all other DTCs, refer to Section 419-10.
 10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Chart**Evaporative Emission (EVAP) System DTC Chart**

DTC	Description	Action
P0446	Evaporative Emission System Vent Control Circuit	GO to Pinpoint Test A.
P0451	Evaporative Emission System Pressure Sensor/Switch Range/Performance	GO to Pinpoint Test A.
P0452	Evaporative Emission System Pressure Sensor/Switch Low	GO to Pinpoint Test A.
P0453	Evaporative Emission System Pressure Sensor/Switch High	GO to Pinpoint Test A.

DIAGNOSIS AND TESTING (Continued)

Evaporative Emission (EVAP) System DTC Chart (Continued)

DTC	Description	Action
P0454	Evaporative Emission System Pressure Sensor/Switch Intermittent	GO to Pinpoint Test A.
P1450	Unable to Bleed up Fuel Tank Vacuum	GO to Pinpoint Test A.
P1451	Evaporative Emission System Vent Control Circuit	GO to Pinpoint Test A.
P260F	Emission System Monitoring Processor Performance	GO to Pinpoint Test A.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
<ul style="list-style-type: none"> Slow to fill 	<ul style="list-style-type: none"> Fuel tank filler pipe Fuel tank filler pipe vent tube, if equipped Evaporative Emission (EVAP) system Fuel tank inlet check valve (part of the fuel tank) Fuel level vent valve, if equipped (part of the Fuel Pump (FP) module) 	<ul style="list-style-type: none"> GO to Pinpoint Test A.
<ul style="list-style-type: none"> All other fuel system concerns 	<ul style="list-style-type: none"> Fuel system components 	<ul style="list-style-type: none"> REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

Pinpoint Test

Pinpoint Test A: Slow to Fill

Normal Operation

Under normal operation, fuel should flow at a steady rate through the fuel tank filler pipe into the fuel tank. As fuel enters the fuel tank air is vented through the filler pipe or the On-Board Refueling Vapor Recovery (ORVR) system.

This pinpoint test is intended to diagnose

the following:

- Fuel tank filler pipe vent tube, if equipped
- Fuel tank filler pipe
- Evaporative Emission (EVAP) system
- Fuel tank inlet check valve (part of the fuel tank)
- Fuel level vent valve, if equipped (part of the Fuel Pump (FP) module)

PINPOINT TEST A: SLOW TO FILL

Test Step		Result / Action to Take
A1	CARRY OUT INSPECTION AND VERIFICATION	Yes REPAIR or INSTALL new components to correct the concern. No GO to A2 .
	<ul style="list-style-type: none"> Carry out Inspection and Verification. Was the cause of the concern found? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: SLOW TO FILL (Continued)

Test Step		Result / Action to Take
A2	CHECK THE SYSTEM FOR ANY EVAP DTCs	Yes REFER to Powertrain Control/Emissions Diagnosis (PC/ED) manual to diagnosis the EVAP system. No GO to A3 .
	<ul style="list-style-type: none"> Connect the scan tool. Check the system for any of the following EVAP DTCs: P0446, P0451, P0452, P0453, P0454, P1450, P1451 and P260F. Are any of these DTCs present? 	
A3	MONITOR THE FTP WHILE FILLING THE FUEL TANK	Yes GO to A5 . No GO to A4 .
	<ul style="list-style-type: none"> Monitor the Fuel Tank Pressure (FTP) reference value while filling the fuel tank. Refer to the Reference Values in the Powertrain Control/Emissions Diagnosis (PC/ED) manual. Is FTP within specification? 	
A4	MONITOR THE FTP WHILE FILLING THE FUEL TANK WITH THE EVAP SYSTEM DISCONNECTED	Yes INSPECT the EVAP system for blockage or restrictions. REPAIR the blockage or restriction. If the blockage or restriction cannot be repaired, INSTALL new EVAP system components. No GO to A5 .
	<ul style="list-style-type: none"> Disconnect the fuel tank-to-EVAP canister quick connect coupling at the EVAP canister. Monitor the FTP reference value while filling the fuel tank. Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. Is FTP within specification? 	
A5	CHECK THE FUEL TANK FILLER PIPE ASSEMBLY FOR BLOCKAGE OR RESTRICTION	Yes If possible, REPAIR the blockage or restriction. If the blockage or restriction cannot be repaired, INSTALL a new fuel tank filler pipe or fuel tank filler pipe vent tube. No GO to A6 .
	<ul style="list-style-type: none"> Remove the fuel tank filler pipe assembly. Refer to Section 310-01. Inspect the fuel tank filler pipe and fuel tank filler pipe vent tube (if equipped) for a blockage or restriction. Is the fuel tank filler pipe or fuel tank filler pipe vent tube (if equipped) blocked or restricted? 	
A6	CHECK THE FUEL TANK INLET CHECK VALVE	Yes If possible, REPAIR the restrictions. If the restriction cannot be repaired, INSTALL a new fuel tank. REFER to Section 310-01. No GO to A7 .
	<ul style="list-style-type: none"> Inspect the fuel tank inlet check valve for restriction or sticking. Is the fuel tank inlet check valve restricted or sticking? 	
A7	CHECK TO MAKE SURE THAT THE FUEL LEVEL VENT VALVE IS FUNCTIONING CORRECTLY	Yes Fuel level vent valve is OK. RETEST the system for normal operation. No INSTALL a new FP module. REFER to Section 310-01.
	<ul style="list-style-type: none"> NOTE: The fuel level vent valve, if equipped, is part of the FP module. Remove the FP module. Refer to Section 310-01. Inspect the fuel level vent valve for foreign material at the bottom drain hole. Invert the FP. Watch for a movement and a click noise. Was a movement/click noise witnessed? 	

GENERAL PROCEDURES

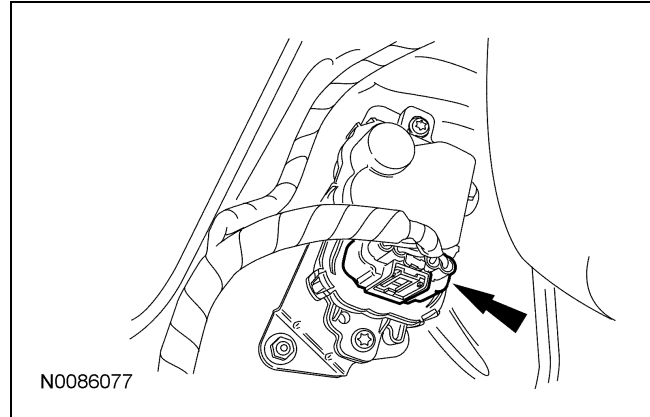
Fuel System Pressure Release

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

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⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

- NOTE:** The Fuel Pump Driver Module (FPDM) is located in the spare tire stowage compartment.
Disconnect the FPDM electrical connector(s).

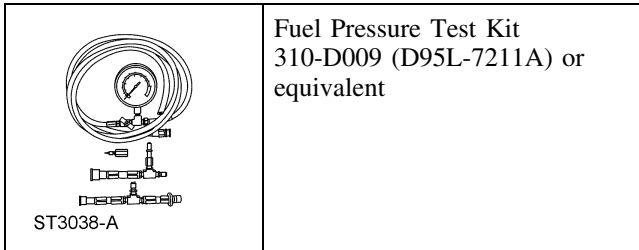


- Start the engine and allow it to idle until it stalls.
- After the engine stalls, crank the engine for approximately 10 seconds to make sure the fuel injection supply manifold pressure has been released.
- Turn the ignition switch to the OFF position.
- When the fuel system service is complete, connect the FPDM electrical connector(s).
- NOTE:** It may take more than one key cycle to pressurize the fuel system.
Cycle the ignition key and wait 3 seconds to pressurize the fuel system. Check for leaks before starting the engine.
- Start the vehicle and check the fuel system for leaks.

GENERAL PROCEDURES

Fuel System Pressure Test

Special Tool(s)



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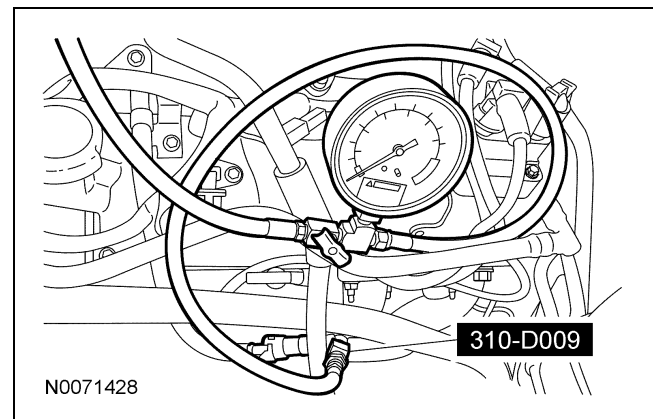
⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

All vehicles

1. Release the fuel system pressure. For additional information, refer to Fuel System Pressure Release in this section.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.

4.0L SOHC vehicles

3. Disconnect the fuel jumper tube-to-fuel tube quick connect coupling. For additional information, refer to Quick Connect Coupling in this section.
4. Install the Fuel Pressure Test Kit between the fuel jumper tube and the fuel tube.

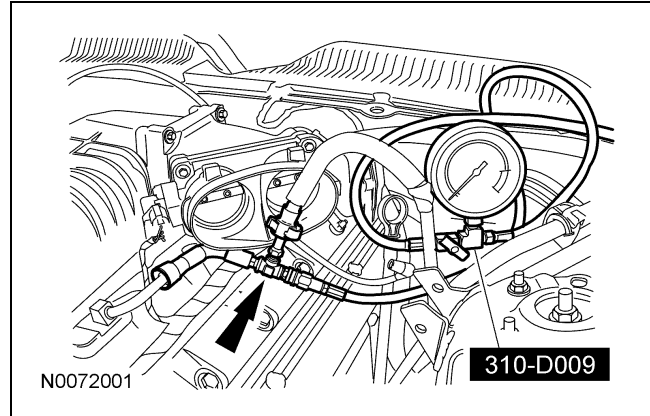
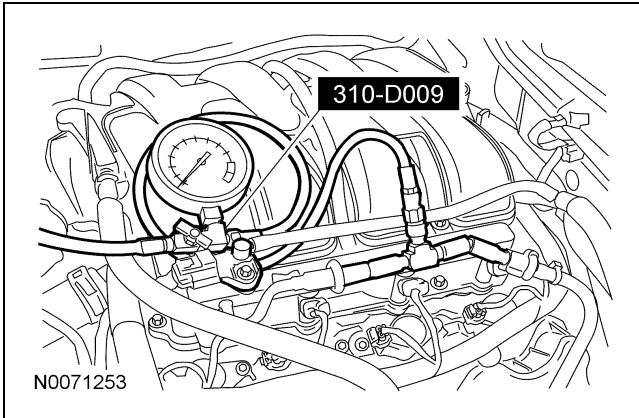


4.6L (3V) vehicles

5. Disconnect the fuel jumper tube-to-fuel rail spring lock coupling. For additional information, refer to Spring Lock Couplings in this section.

GENERAL PROCEDURES (Continued)

6. Install the Fuel Pressure Test Kit between the fuel jumper tube and the fuel rail.

**5.4L (4V) vehicles**

7. Remove the Air Cleaner (ACL) outlet pipe. For additional information, refer to Section 303-12.
8. Disconnect the fuel jumper tube-to-fuel rail quick connect coupling. For additional information, refer to Quick Connect Coupling in this section.
9. **NOTE:** Use a commercially available fuel test adapter (such as OTC® 18527).
Install the Fuel Pressure Test Kit and the fuel test adapter between the fuel jumper tube and the fuel rail.

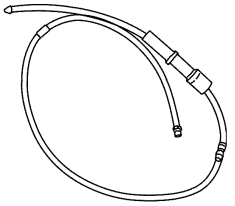
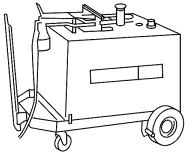
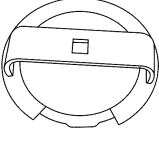
All vehicles

10. **NOTE:** The Fuel Pump Driver Module (FPDM) was previously disconnected in the Fuel System Pressure Release and must be reconnected to complete the Fuel System Pressure Test.
Connect the FPDM electrical connector(s).
11. Connect the battery ground cable. For additional information, refer to Section 414-01.
12. **NOTE:** It may take more than one key cycle to pressurize the fuel system.
Cycle the ignition key and wait 3 seconds to pressurize the fuel system. Check for leaks before starting the engine.
13. **NOTE:** After completing the fuel system pressure test, open the drain valve on the Fuel Pressure Test Kit and release any residual fuel into a suitable container prior to removing the tool.
Test the fuel system pressure to make sure it is within the specified range. For additional information, refer to Specifications in this section.

GENERAL PROCEDURES

Fuel Tank Draining

Special Tool(s)

 <p>ST2134-A</p>	<p>Fuel Draining Hose 310-102</p>
 <p>ST1134A</p>	<p>Fuel Storage Tanker 164-R3202 or equivalent</p>
 <p>ST1839-A</p>	<p>Socket, Fuel Tank Sender Unit 310-D006 (D90P-9275-A) or equivalent</p>

Material

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<p>Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent</p>	<p>WSS-M2C930-A</p>

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⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: Remove the fuel filler cap slowly. The fuel system may be under pressure. If the fuel filler cap is venting vapor or if you hear a hissing sound, wait until it stops before completely removing the fuel filler cap. Otherwise, fuel may spray out. Failure to follow these instructions may result in serious personal injury.

1. Release the fuel system pressure. For additional information, refer to Fuel System Pressure Release in this section.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
3. Carefully turn the fuel tank filler cap counterclockwise approximately one-fourth turn until the thread disengages and position aside.

GENERAL PROCEDURES (Continued)

4. **NOTICE:** When removing the Fuel Draining Hose, the fitting on the end of the hose can become detained by the safety valve. Carefully remove the hose using a gentle agitating motion to avoid detaching the hose from the fitting.

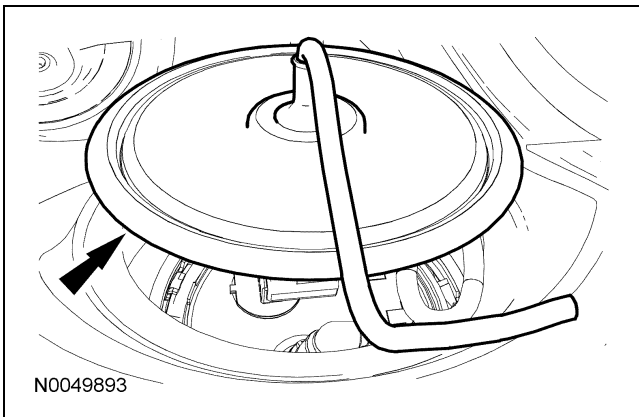
NOTE: The Fuel Draining Hose must be inserted into the fuel tank filler pipe until the fitting on the end of the hose enters into the fuel tank, opening the safety valve.

Insert the Fuel Draining Hose into the fuel tank filler pipe.

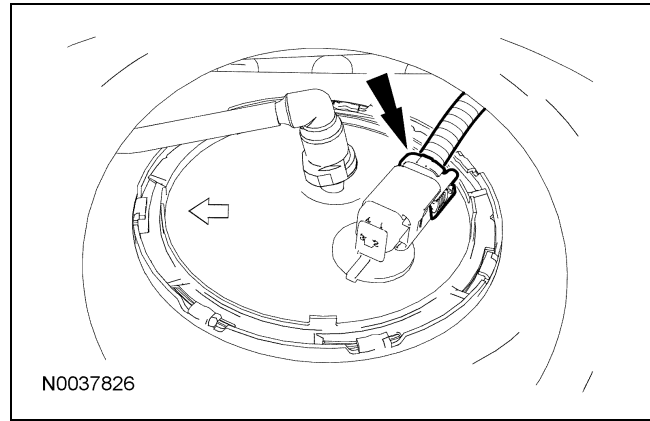
5. **NOTE:** This step will remove approximately one-eighth tank of fuel from a completely full fuel tank and the majority of any residual fuel from the fuel tank filler pipe. Also the fuel in the fuel tank will be below the Fuel Pump (FP) module mounting flange for FP module removal without fuel spillage.

Attach the Fuel Storage Tanker to the Fuel Draining Hose and remove approximately one-eighth tank of fuel (from a completely full tank), lowering the fuel level below the FP module mounting flange.

6. Remove the rear seat cushion. For additional information, refer to Section 501-10.
7. Remove the FP module and fuel level sensor access covers and position aside.

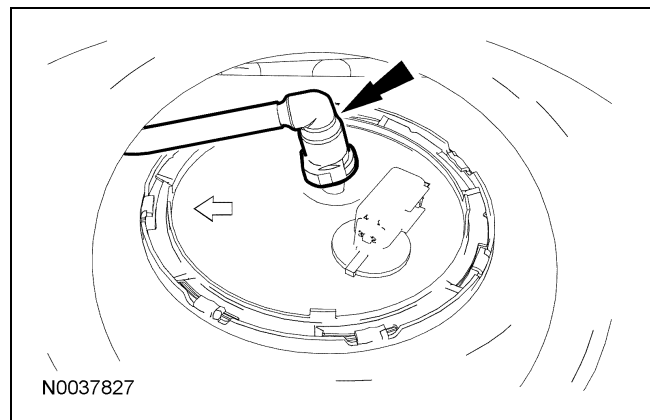


8. **NOTE:** Clean the FP module connections, couplings, flange surfaces and the immediate surrounding area of any dirt or foreign material. Disconnect the FP module electrical connector.



9. **NOTE:** Place absorbent pads in the general work area in case of fuel spillage.

Disconnect the rear fuel tube-to-FP module quick connect coupling. For additional information, refer to Section 310-00.

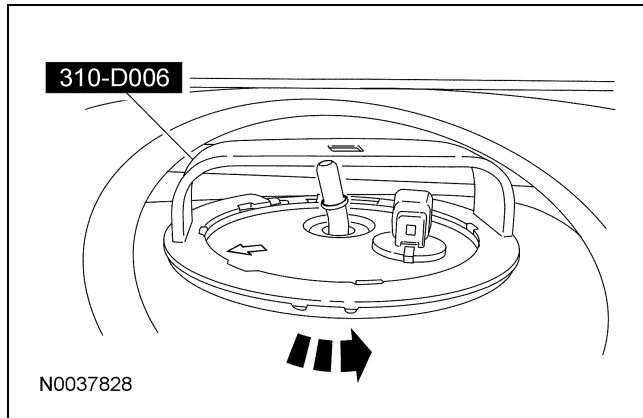


GENERAL PROCEDURES (Continued)

10. **NOTICE:** Carefully install the Fuel Tank Sender Unit Socket to avoid damage to the Fuel Pump (FP) module when removing the lock ring.

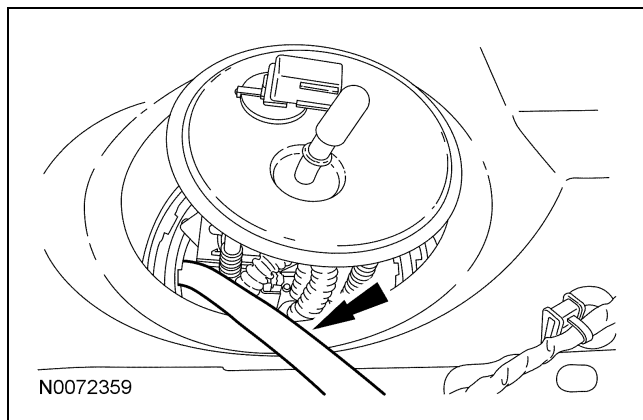
NOTE: When installing the FP module, install a new lock ring and O-ring seal.

Install the Fuel Tank Sender Unit Socket and remove the FP module lock ring.



11. **NOTICE:** The Fuel Pump (FP) module must be handled carefully to avoid damage to the float arm.

Position the FP module aside. Using the Fuel Storage Tanker, completely drain the remaining fuel from the LH saddle of the fuel tank.



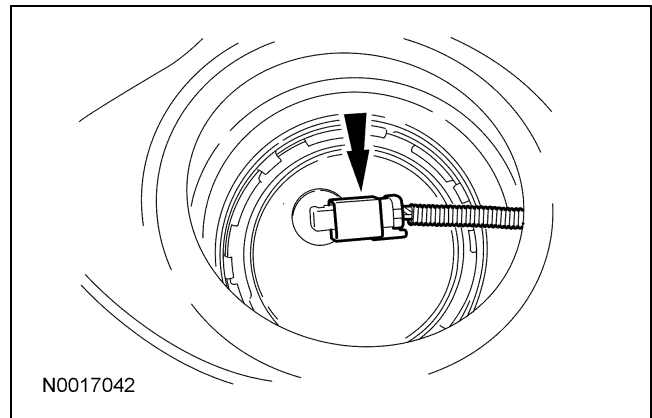
12. **NOTE:** Inspect the surfaces of the FP module flange and fuel tank O-ring seal contact surfaces. Do not polish or adjust the O-ring seal contact area of the fuel tank flange or the fuel tank. Install a new FP module or fuel tank if the O-ring seal contact area is bent, scratched or corroded.

NOTE: To install, apply clean engine oil to the O-ring seal.

Remove and discard the FP module O-ring seal.

13. **NOTE:** Clean the fuel level sensor connections, flange surfaces and the immediate surrounding area of any dirt or foreign material.

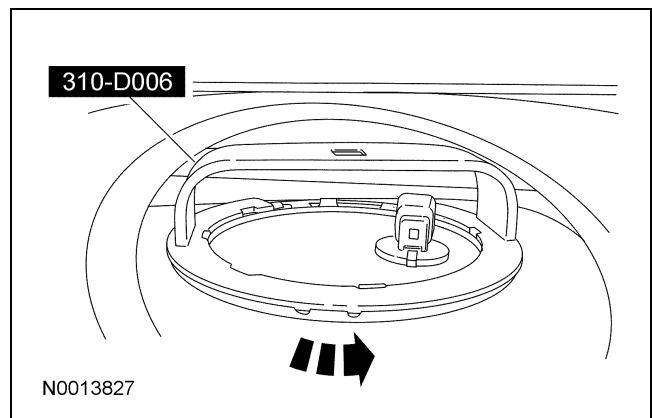
Disconnect the fuel level sensor electrical connector.



14. **NOTICE:** Carefully install the Fuel Tank Sender Unit Socket to avoid damage to the fuel level sensor when removing the lock ring.

NOTE: When installing the fuel level sensor, install a new lock ring and O-ring seal.

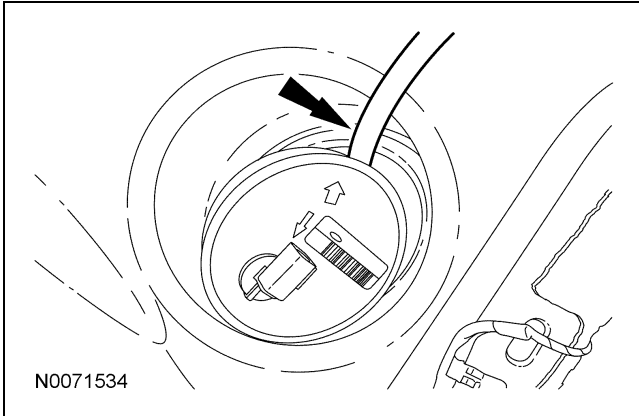
Install the Fuel Tank Sender Unit Socket and remove the fuel level sensor lock ring.



GENERAL PROCEDURES (Continued)

15. **NOTICE:** The fuel level sensor must be handled carefully to avoid damage to the float arm.

Position the fuel level sensor aside. Using the Fuel Storage Tanker, completely drain the RH saddle of the fuel tank.



16. **NOTE:** Inspect the surfaces of the fuel level sensor flange and fuel tank O-ring seal contact surfaces. Do not polish or adjust the O-ring seal contact area of the fuel tank flange or the fuel tank. Install a new fuel level sensor or fuel tank if the O-ring seal contact area is bent, scratched or corroded.

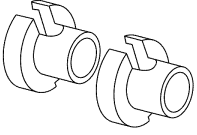
NOTE: To install, apply clean engine oil to the O-ring seal.

Remove and discard the fuel level sensor O-ring seal.

GENERAL PROCEDURES

Spring Lock Couplings

Special Tool(s)

 <p>ST1399-A</p>	<p>Spring Lock Coupling Disconnect Tool 310-S039 (T90T-9550-S) or equivalent</p>
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Material

Item	Specification
<p>Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent</p>	<p>WSS-M2C930-A</p>

Disconnect

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⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

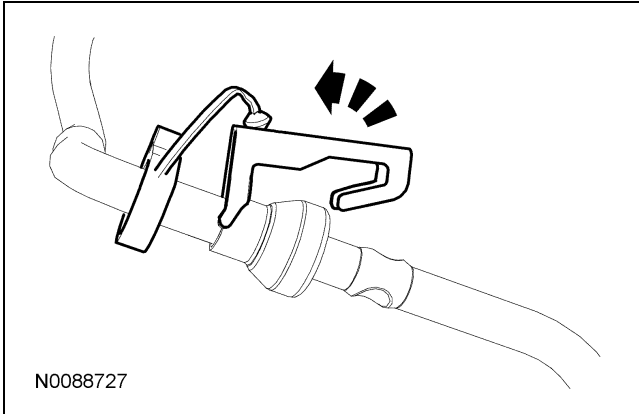
NOTICE: When reusing liquid or vapor tube connectors, make sure to use compressed air to remove any foreign material from the connector retaining clip area before separating from the tube or damage to the tube or connector retaining clip can occur. Apply clean engine oil to the end of the tube before inserting the tube into the connector.

NOTICE: Fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is essential that absolute cleanliness is observed when working with these components or component damage can occur. Always install plugs to any open orifices to tubes.

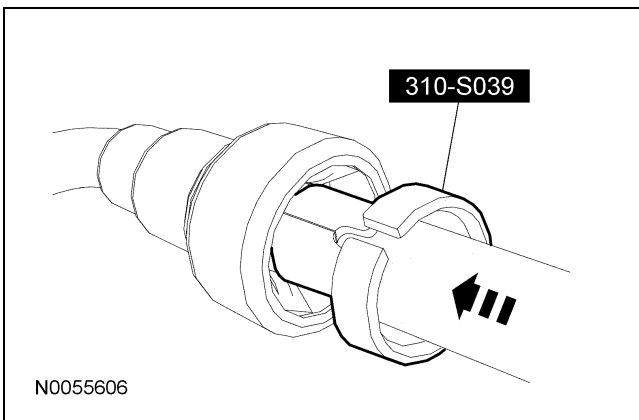
1. If servicing a liquid fuel tube spring lock coupling, release the fuel system pressure. For additional information, refer to Fuel System Pressure Release in this section.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.

GENERAL PROCEDURES (Continued)

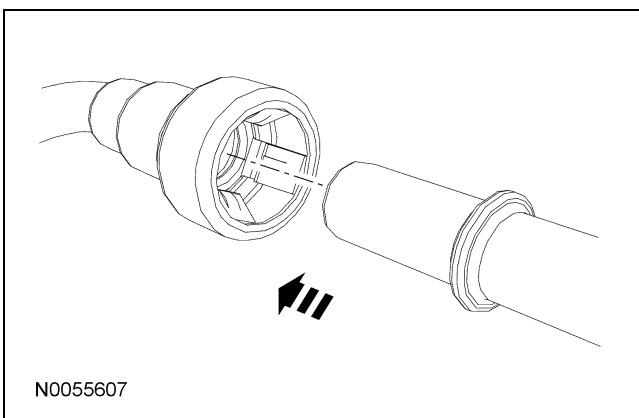
3. If equipped, remove the fuel tube safety clip.



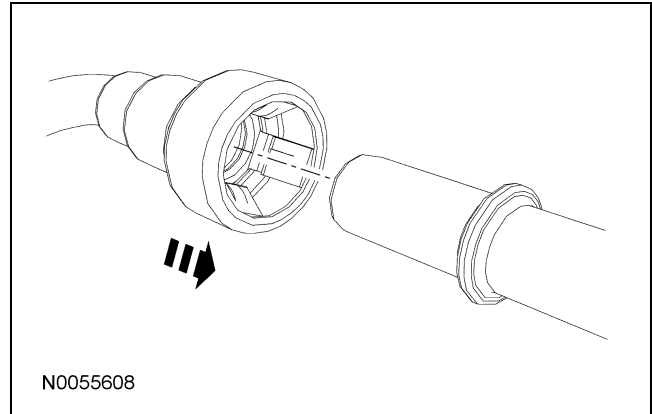
4. Install the Spring Lock Coupling Disconnect Tool on the tube and push into the spring lock coupling to release.



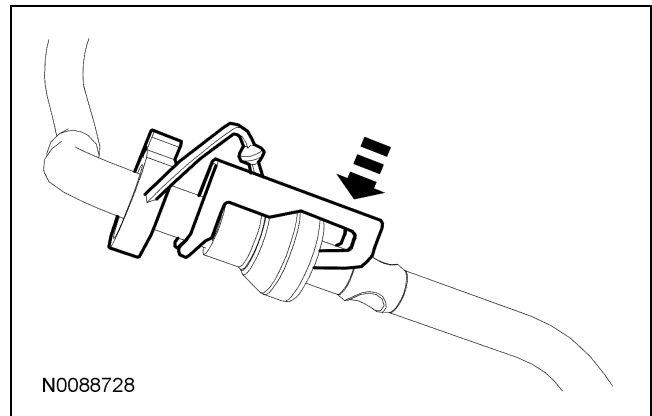
5. Separate the spring lock coupling from the tube fitting.

**Connect**

1. **NOTE:** Lubricate the tube fitting with clean engine oil.
Align and push the spring lock coupling onto the tube fitting until fully seated.



2. Pull on the coupling to make sure it is fully engaged.
3. If equipped, install the fuel tube safety clip.



4. Connect the battery ground cable. For additional information, refer to Section 414-01.

GENERAL PROCEDURES

Quick Connect Coupling

Material

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

Disconnect — Type I

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

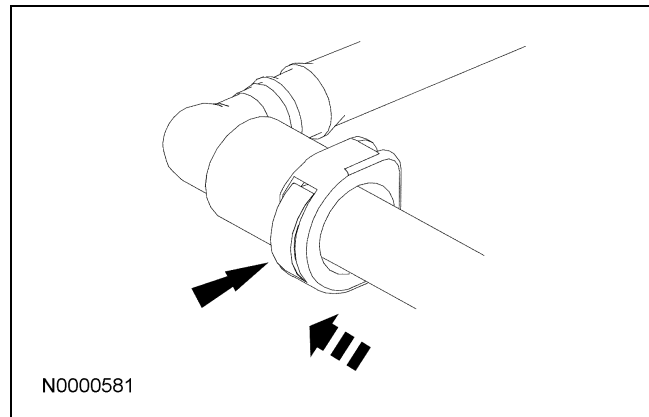
⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

NOTICE: When reusing liquid or vapor tube connectors, make sure to use compressed air to remove any foreign material from the connector retaining clip area before separating from the tube or damage to the tube or connector retaining clip can occur. Apply clean engine oil to the end of the tube before inserting the tube into the connector.

NOTICE: Fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is essential that absolute cleanliness is observed when working with these components or component damage can occur. Always install blanking plugs to any open orifices or tubes.

NOTICE: Do not use any tools. The use of tools may cause a deformity in the clip components which may cause fuel leaks.

1. If servicing a liquid fuel tube, release the fuel system pressure. For additional information, refer to Fuel System Pressure Release in this section.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
3. Depress the retainer clip and disconnect the quick connect coupling from the tube.



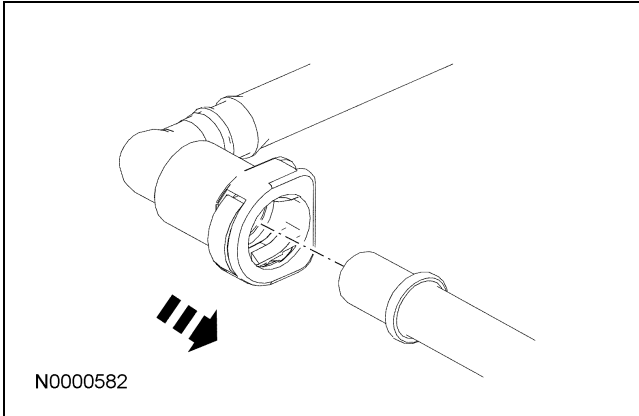
GENERAL PROCEDURES (Continued)

Connect — Type I

- NOTE:** Apply clean engine oil to O-ring seals.

NOTE: Make sure the retainer clip is fully seated and locked onto the tube by pulling on the quick connect coupling.

Install the quick connect coupling onto the tube until it is fully seated.



- Connect the battery ground cable. For additional information, refer to Section 414-01.

Disconnect — Type II

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

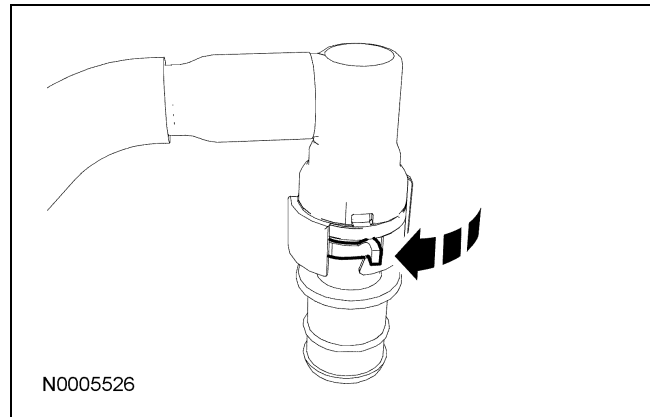
⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

NOTICE: When reusing liquid or vapor tube connectors, make sure to use compressed air to remove any foreign material from the connector retaining clip area before separating from the tube or damage to the tube or connector retaining clip can occur. Apply clean engine oil to the end of the tube before inserting the tube into the connector.

NOTICE: Fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is essential that absolute cleanliness is observed when working with these components or component damage can occur. Always install blanking plugs to any open orifices or tubes.

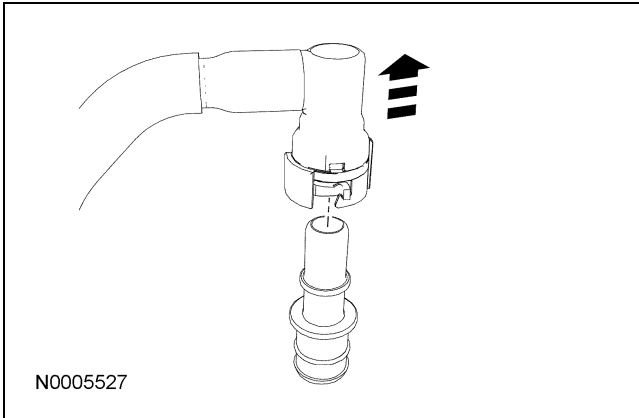
NOTICE: Do not use any tools. The use of tools may cause a deformity in the clip components which may cause fuel leaks.

- Disconnect the battery ground cable. For additional information, refer to Section 414-01.
- Release the retainer clip on the quick connect coupling.

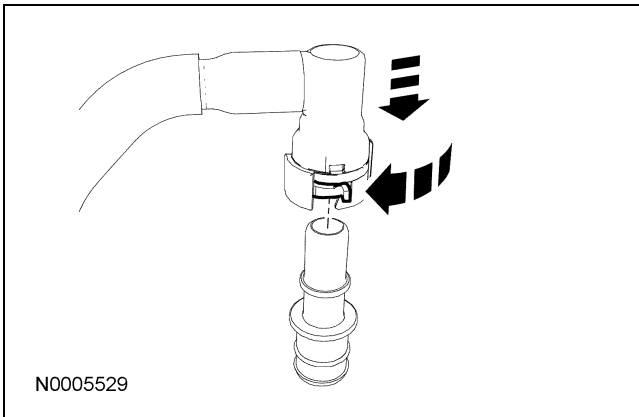


GENERAL PROCEDURES (Continued)

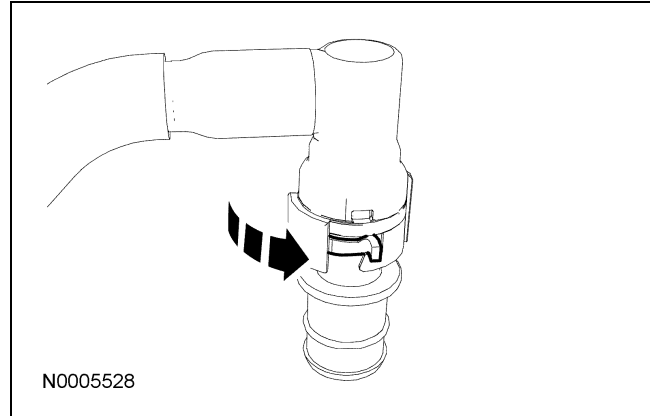
3. Disconnect the quick connect coupling from the fitting.

**Connect — Type II**

1. **NOTE:** Apply clean engine oil to O-ring seals. Release the retainer clip and install the quick connect coupling onto the fitting until fully seated.



2. **NOTE:** Make sure the retainer clip is fully seated and locked onto the tube by pulling on the quick connect coupling. Apply retainer clip into the latched position.



3. Connect the battery ground cable. For additional information, refer to Section 414-01.

Disconnect — Type III

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

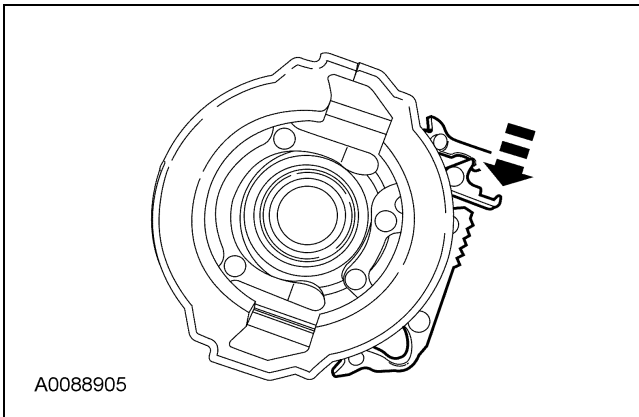
GENERAL PROCEDURES (Continued)

NOTICE: When reusing liquid or vapor tube connectors, make sure to use compressed air to remove any foreign material from the connector retaining clip area before separating from the tube or damage to the tube or connector retaining clip can occur. Apply clean engine oil to the end of the tube before inserting the tube into the connector.

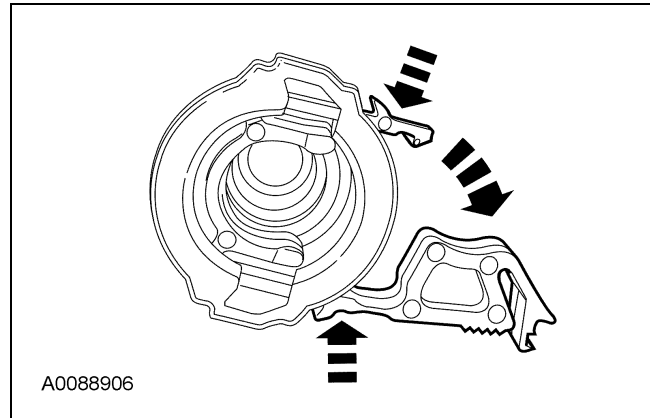
NOTICE: Fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is essential that absolute cleanliness is observed when working with these components or component damage can occur. Always install blanking plugs to any open orifices or tubes.

NOTICE: Do not use any tools. The use of tools may cause a deformity in the clip components which may cause fuel leaks.

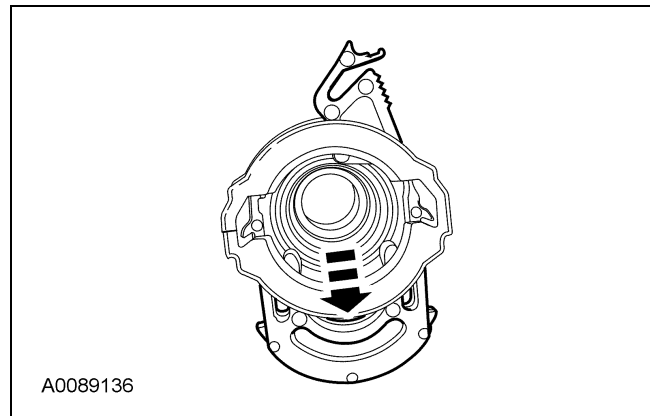
1. If servicing a liquid fuel tube, release the fuel system pressure. For additional information, refer to Fuel System Pressure Release in this section.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
3. Release the quick connect coupling primary retainer clip.



4. Rotate the primary retainer clip to the fully opened position and squeeze the secondary locking tabs to release the retainer clip.



5. Position the retainer clip to the outward position and disconnect the quick connect coupling from the tube.



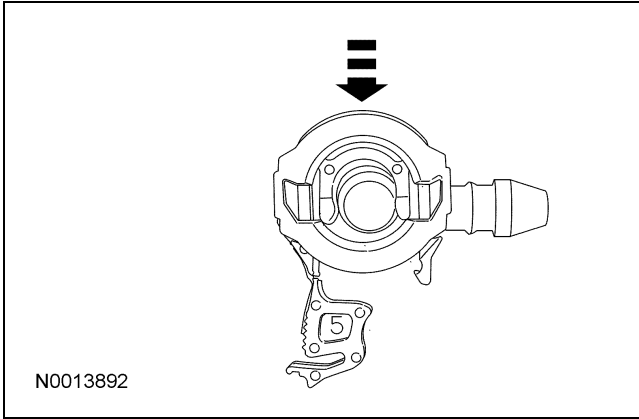
Connect — Type III

1. **NOTE:** Apply clean engine oil to O-ring seals. Install the quick connect coupling onto the tube until fully seated.

GENERAL PROCEDURES (Continued)

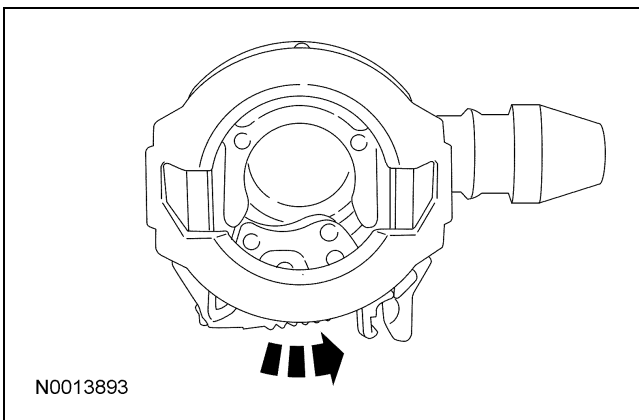
2. **NOTE:** Make sure the retainer clip clicks into place when installing.

Depress the retainer clip until it is flush with the quick connect coupling housing.



3. **NOTE:** Make sure the retainer clip is fully seated and locked onto the tube by pulling on the quick connect coupling.

Rotate the primary locking tab on the retainer clip to the closed position.



4. Connect the battery ground cable. For additional information, refer to Section 414-01.

Disconnect — Type IV

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

NOTICE: When reusing liquid or vapor tube connectors, make sure to use compressed air to remove any foreign material from the connector retaining clip area before separating from the tube or damage to the tube or connector retaining clip can occur. Apply clean engine oil to the end of the tube before inserting the tube into the connector.

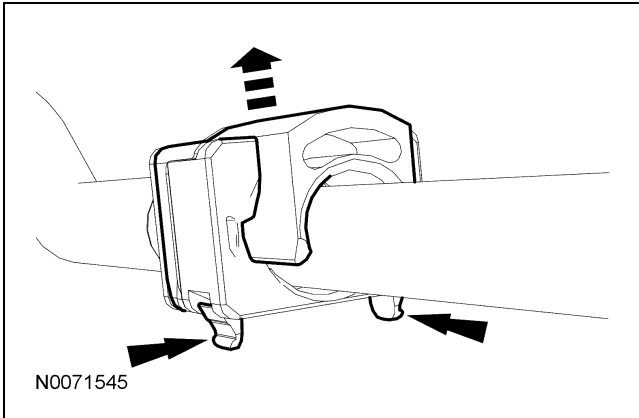
NOTICE: Fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is essential that absolute cleanliness is observed when working with these components or component damage can occur. Always install blanking plugs to any open orifices or tubes.

NOTICE: Do not use any tools. The use of tools may cause a deformity in the clip components which may cause fuel leaks.

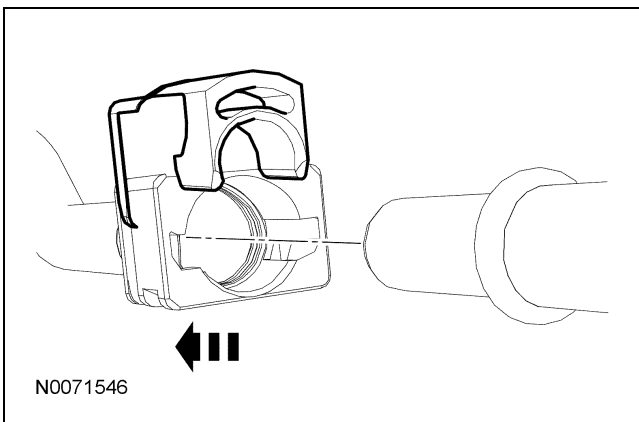
1. If servicing a liquid fuel tube quick connect coupling, release the fuel system pressure. For additional information, refer to Fuel System Pressure Release in this section.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.

GENERAL PROCEDURES (Continued)

3. Depress the legs of the retainer clip and position the clip in an outward position.

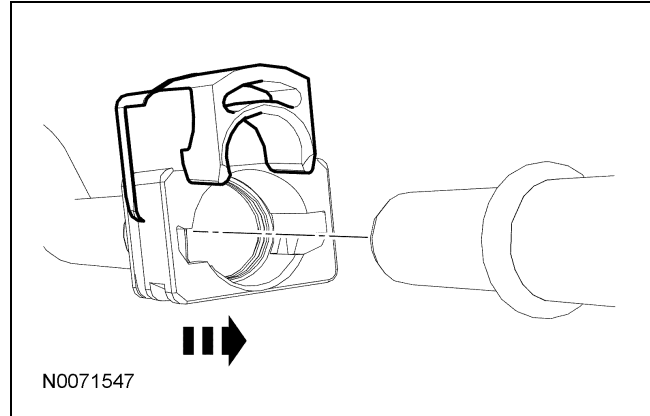


4. Disconnect the quick connect coupling from the tube.

**Connect — Type IV**

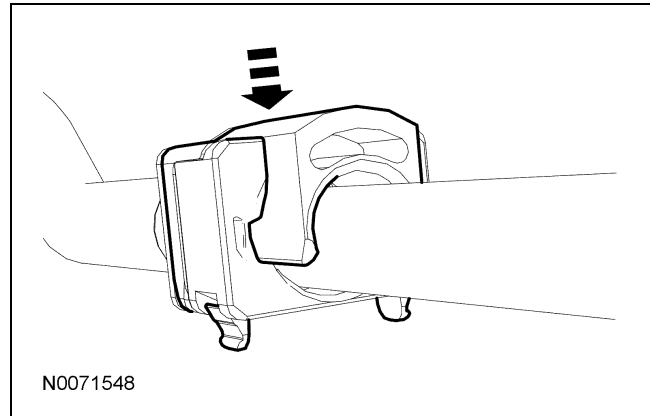
1. **NOTE:** Apply clean engine oil to the end of the tube and quick connect coupling O-ring seals.

Install the quick connect coupling onto the tube until fully seated.



2. **NOTE:** Make sure the retainer clip is fully seated and locked onto the tube by pulling on the quick connect coupling.

Press the retainer clip into the quick connect coupling body until flush and the legs are locked in place.



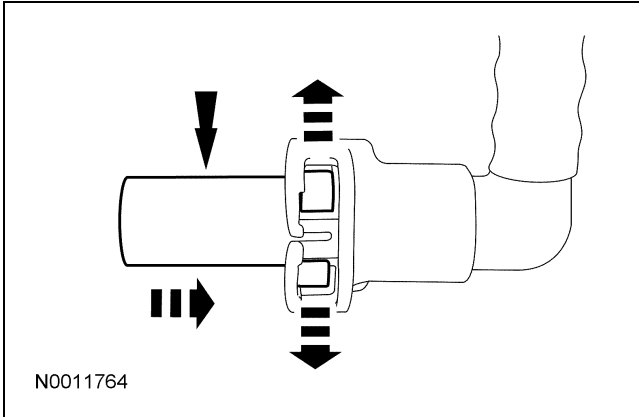
3. Connect the battery ground cable. For additional information, refer to Section 414-01.

GENERAL PROCEDURES

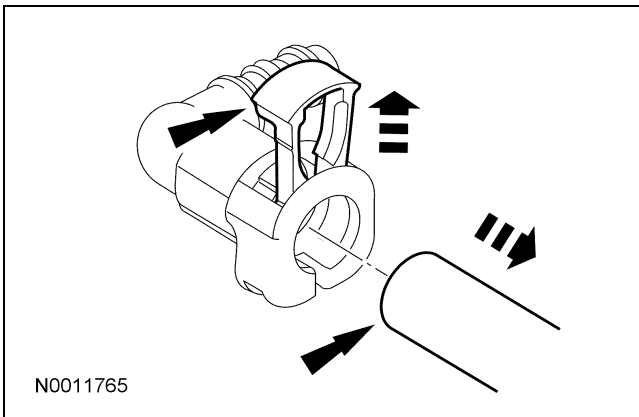
Quick Connect Coupling Retainer Clip

Removal

1. Insert the tool that is supplied with the new replacement retainer clip into the quick connect coupling body until it engages and spreads the retainer legs.



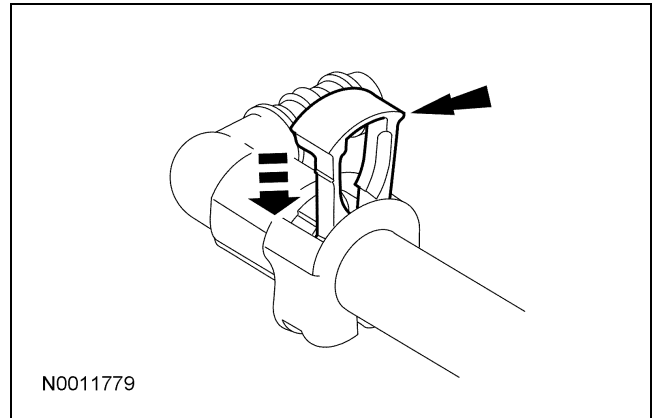
2. Grasp the retainer clip under the lip on each side, pull outward and remove while simultaneously removing the tool from the quick connect coupling body.
 - The legs of the retainer clip may catch on the quick connect coupling body just prior to removal. To complete removal, slightly open the legs of the retainer clip.



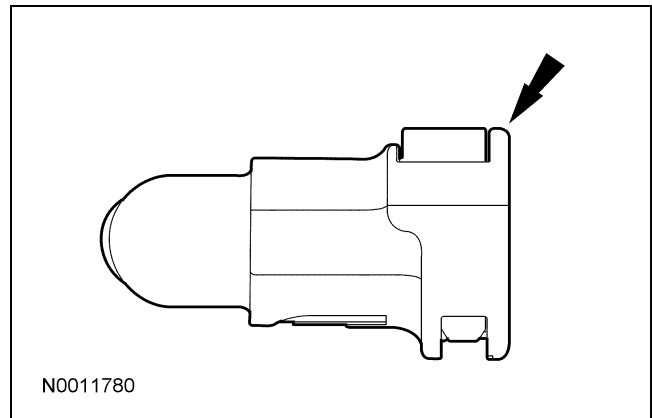
3. Discard the quick connect coupling retainer clip.

Installation

1. Install the tool into the quick connect coupling body.
2. Insert the legs of the new retainer clip into the windows on the body of the quick connect coupling body.



3. Push the retainer clip straight into the quick connect coupling body until it is flush with the top lip and the side of the connector body.



4. **NOTE:** If the retainer clip is properly installed, the tool should be locked into the quick connect coupling body and can only be removed when the center of the retaining clip is depressed.

Push down the center of the retainer clip and remove the tool. During release, the retainer clip should remain in the quick connect coupler body.

SPECIFICATIONS

Material

Item	Specification	Fill Capacity
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A	—

General Specifications

Item	Specification
Fuel tank capacity	60.56L (16 gal)

Torque Specifications

Description	Nm	lb-ft	lb-in
Fuel tank deflector bolt	25	18	—
Fuel tank deflector nuts	25	18	—

Torque Specifications (Continued)

Description	Nm	lb-ft	lb-in
Fuel tank filler pipe bracket bolt	25	18	—
Fuel tank filler pipe hose clamp	6	—	53
Fuel tank strap bolts	52	38	—
Fuel tube bundle bracket bolt	8	—	71
Fuel tube bundle retainer nuts	5	—	44
Fuel tube bundle shield bolts	5	—	44
Fuel tube bundle shield nuts	5	—	44
Inertia Fuel Shutoff (IFS) switch bolts	2	—	18
Lateral stiffener bar-to-body bolts	62	46	—
Lateral stiffener bar-to-body mount nut	115	85	—

DESCRIPTION AND OPERATION

Fuel Tank and Lines

The fuel tank and lines consists of the:

- saddle-type fuel tank.
- fuel tank filler pipe.
- fuel tank filler cap.
- Fuel Pump (FP) module.
- fuel level sensor.
- fuel tubes.
- Fuel Tank Pressure (FTP) sensor.
- Inertia Fuel Shutoff (IFS) switch.

The vehicle:

- utilizes an Electronic Returnless Fuel System (ERFS).
- has a dual-container (saddle-type) stamped steel fuel tank, each half equipped with a fuel level sender.
- has a FP module that supplies fuel under pressure to the fuel rail.
- has a fuel tank filler pipe which contains a restrictor plate to permit only unleaded fuel to be pumped into the fuel tank.

- has a fuel tank filler pipe assembly that cannot be modified in any way. The fuel tank filler pipe is serviced only by installing a new filler pipe assembly.
- has a one-fourth turn fuel tank filler cap.
- has a fuel filter that is mounted in front of the fuel tank on the left hand side of the vehicle providing filtration to protect the fuel injectors.
- has fuel tubes (liquid and vapor) combined in a bundle along with the brake tubes mounted on the underside of the floorpan and covered with a protective cover shield.
- has a FTP sensor (part of the fuel vapor tube assembly).
- has quick connect and spring lock fuel tube couplings.

The FP module is controlled by the PCM. Electrical power to the FP is provided through the IFS switch located in the passenger footwell area.

DIAGNOSIS AND TESTING

Fuel Tank and Lines

Refer to the [Powertrain Control/Emissions Diagnosis \(PC/ED\) manual](#).

REMOVAL AND INSTALLATION

Fuel Tank and Filler Pipe — Exploded View

Fuel Tank and Filler Pipe



N0086193

Item	Part Number	Description
1	9C335	Fuel level sensor access cover
2	—	Fuel vapor tube assembly-to-fuel tank quick connect coupling (part of 9E325)

(Continued)

Item	Part Number	Description
3	9E325	Fuel vapor tube assembly
4	W520214	Lateral stiffener bar-to-body mount nut

(Continued)

REMOVAL AND INSTALLATION (Continued)

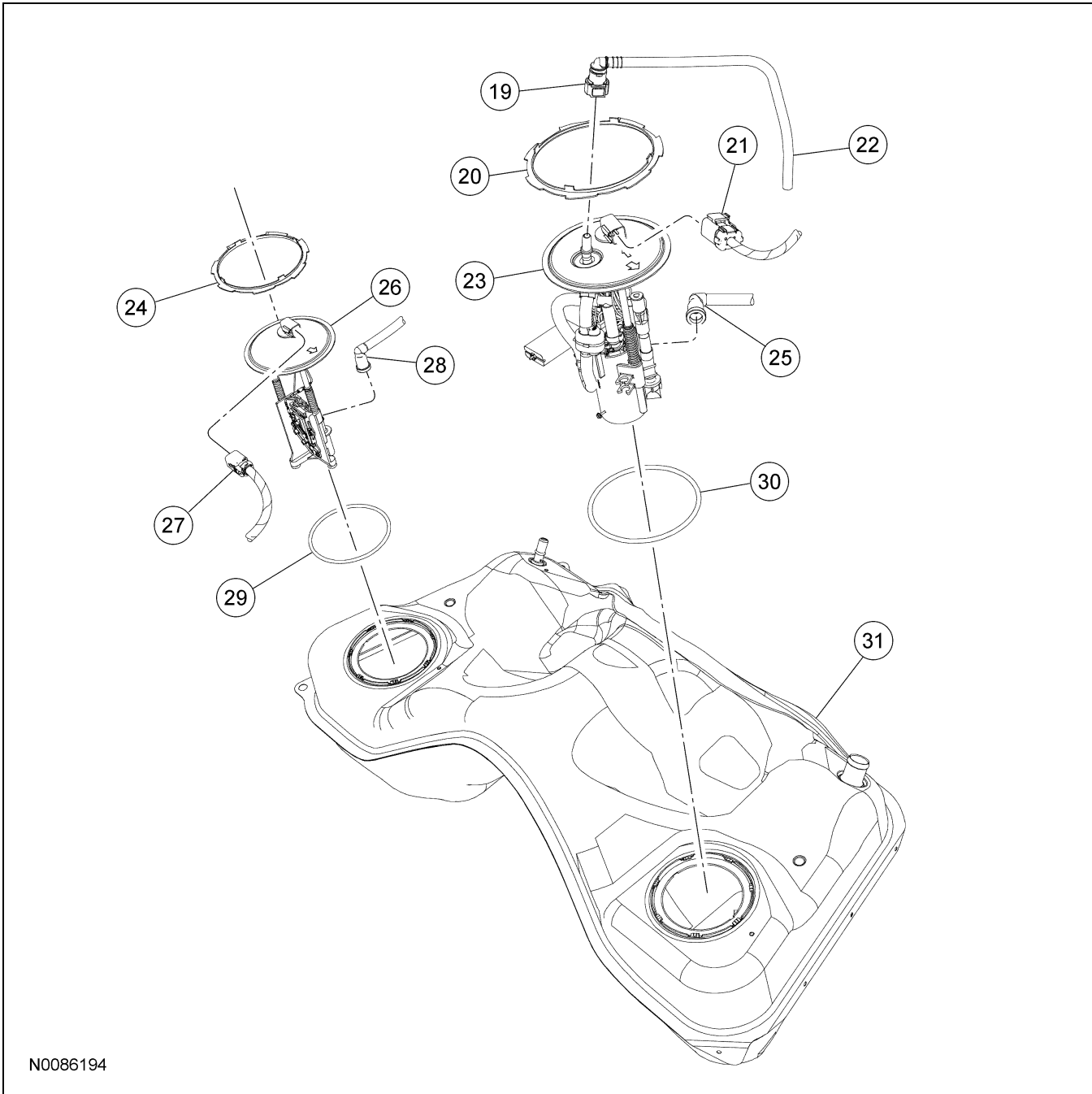
Item	Part Number	Description
5	—	Fuel vapor tube assembly-to-fuel tank filler pipe recirculation tube spring lock coupling (part of 9E325)
6	—	Fuel tank filler pipe recirculation tube (part of 9034)
7	9034	Fuel tank filler pipe
8	9A212	Fuel tank filler pipe upper retainer
9	9030	Fuel tank filler cap
10	9C335	Fuel Pump (FP) module access cover
11	W713388	Fuel tank filler pipe bracket bolt

(Continued)

Item	Part Number	Description
12	W711331	Lateral stiffener bar-to-body bolt (2 required)
13	9002	Fuel tank
14	W525937	Fuel tank filler pipe hose clamp
15	W710947	Fuel tank strap bolt (2 required)
16	2A635	Rear parking brake cable (RH)
17	9055	Fuel tank strap (2 required)
18	2A823	Rear parking brake cable (LH)

REMOVAL AND INSTALLATION (Continued)

Fuel Pump Module, Fuel Level Sensor and Fuel Tank



N0086194

Item	Part Number	Description
19	—	Rear fuel tube-to-FP module quick connect coupling (part of 9J279)
20	9C385	FP module lock ring
21	14A464	FP module electrical connector
22	9J279	Rear fuel tube
23	9H307	FP module
24	9C385	Fuel level sensor lock ring

(Continued)

Item	Part Number	Description
25	—	Internal fuel tube-to-FP module quick connect coupling (part of 9002)
26	9275	Fuel level sensor
27	14A464	Fuel level sensor electrical connector
28	—	Internal fuel tube-to-fuel level sensor quick connect coupling (part of 9002)
29	9E275	Fuel level sensor O-ring seal

(Continued)

REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
30	9E275	FP module O-ring seal
31	9002	Fuel tank

1. For additional information, refer to the procedures in this section.

REMOVAL AND INSTALLATION

Fuel Tank

Removal and Installation

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

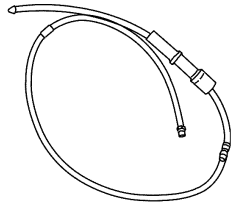
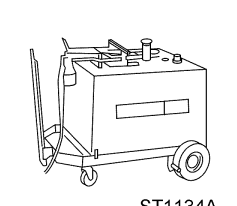
⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
3. Drain the fuel tank. For additional information, refer to Section 310-00.
4. If equipped, remove the rear support braces. For additional information, refer to Section 502-00.
5. Remove the exhaust intermediate pipe(s). For additional information, refer to Section 309-00.
6. Remove the driveshaft. For additional information, refer to Section 205-01.
7. Disconnect the fuel vapor tube assembly-to-fuel tank quick connect coupling. For additional information, refer to Section 310-00.
8. **NOTE:** Some residual fuel may remain in the fuel tank filler pipe after draining the fuel tank. Carefully drain any residual fuel into a suitable container.
Release the clamp and disconnect the fuel tank filler pipe-to-fuel tank hose.
 - To install, tighten clamp to 6 Nm (53 lb-in).
9. Position a suitable lifting device under the fuel tank.
10. Position the emergency brake cables away from the fuel tank.
11. Remove the 2 bolts and the fuel tank straps.
 - To install, tighten to 52 Nm (38 lb-ft).
12. Completely lower and remove the fuel tank from the vehicle.
13. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Fuel Tank Filler Pipe

Special Tool(s)

 <p>ST2134-A</p>	<p>Fuel Draining Hose 310-102</p>
 <p>ST1134A</p>	<p>Fuel Storage Tanker 164-R3202 or equivalent</p>

Removal and Installation

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Remove the fuel filler cap slowly. The fuel system may be under pressure. If the fuel filler cap is venting vapor or if you hear a hissing sound, wait until it stops before completely removing the fuel filler cap. Otherwise, fuel may spray out. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

All vehicles

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
3. Remove the LH rear wheel and tire. For additional information, refer to Section 204-04.
4. Carefully turn the fuel tank filler cap counterclockwise approximately one-fourth turn until the thread disengages and position aside.
5. **NOTICE:** When removing the Fuel Draining Hose, the fitting on the end of the hose can become detained by the safety valve. Carefully remove the hose using a gentle agitating motion to avoid detaching the hose from the fitting.

NOTE: The Fuel Draining Hose must be inserted into the fuel tank filler pipe until the fitting on the end of the hose enters into the fuel tank, opening the safety valve.

Insert the Fuel Draining Hose into the fuel tank filler pipe.

REMOVAL AND INSTALLATION (Continued)

6. **NOTE:** This step will remove approximately one-eighth tank of fuel from a completely full fuel tank and the majority of any residual fuel from the fuel tank filler pipe. Also the fuel in the fuel tank will be below the fuel tank inlet or fuel tank filler pipe removal without fuel spillage.

Attach the Fuel Storage Tanker to the Fuel Draining Hose and remove approximately one-eighth tank of fuel (from a completely full tank), lowering the fuel below the fuel tank inlet.

7. Release the 4 clips and remove the fuel tank filler pipe upper retainer.
8. **NOTE:** Some fuel may remain in the fuel tank filler pipe after draining. Carefully disconnect the fuel tank filler pipe hose from the fuel tank and drain any residual fuel into a suitable container.
- Release the clamp and disconnect the fuel tank filler pipe-to-fuel tank hose.
- To install, tighten to 6 Nm (53 lb-in).
9. Disconnect the fuel vapor tube assembly-to-fuel tank filler pipe recirculation tube spring lock coupling. For additional information, refer to Section 310-00.
10. Remove the fuel tank filler pipe bracket bolt.
- To install, tighten to 25 Nm (18 lb-ft).

11. Loosen the lateral stiffener bar-to-body mount nut.

- To install, tighten to 115 Nm (85 lb-ft).

12. **NOTICE: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure may result in major service expense. New parts must be installed with the same part numbers or equivalent part, if replacement is necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.**

NOTE: Make sure to install new lateral stiffener bar-to-body bolts.

Remove and discard the 2 lateral stiffener bar-to-body bolts and position the bar aside.

- To install, tighten to 62 Nm (46 lb-ft).

4.6L and 5.4L vehicles

13. Remove the LH exhaust intermediate pipe. For additional information, refer to Section 309-00.

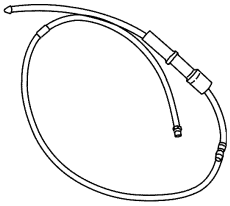
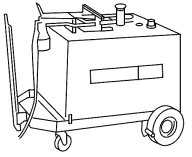
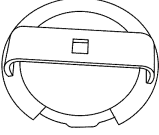
All vehicles

14. Remove the fuel tank filler pipe.
15. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Fuel Pump Module

Special Tool(s)

 <p>ST2134-A</p>	<p>Fuel Draining Hose 310-102</p>
 <p>ST1134A</p>	<p>Fuel Storage Tanker 164-R3202 or equivalent</p>
 <p>ST1839-A</p>	<p>Socket, Fuel Tank Sender Unit 310-D006 (D90P-9275-A) or equivalent</p>

Material

Item	Specification
<p>Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent</p>	<p>WSS-M2C930-A</p>

Removal and Installation

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. Release the fuel system pressure. For additional information, refer to Section 310-00.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.

REMOVAL AND INSTALLATION (Continued)

3. Carefully turn the fuel tank filler cap counterclockwise approximately one-fourth turn until the thread disengages and position aside.

4. **NOTICE:** When removing the Fuel Draining Hose, the fitting on the end of the hose can become detained by the safety valve. Carefully remove the hose using a gentle agitating motion to avoid detaching the hose from the fitting.

NOTE: The Fuel Draining Hose must be inserted into the fuel tank filler pipe until the fitting on the end of the hose enters into the fuel tank, opening the safety valve.

Insert the Fuel Draining Hose into the fuel tank filler pipe.

5. **NOTE:** This step will remove approximately one-eighth tank of fuel from a completely full fuel tank and the majority of any residual fuel from the fuel tank filler pipe. Also the fuel in the fuel tank will be below the Fuel Pump (FP) module mounting flange for FP module removal without fuel spillage.

Attach the Fuel Storage Tanker to the Fuel Draining Hose and remove approximately one-eighth tank of fuel (from a completely full tank), lowering the fuel below the FP module mounting flange.

6. Remove the rear seat cushion. For additional information, refer to Section 501-10.

7. Remove the FP module access cover and position aside.

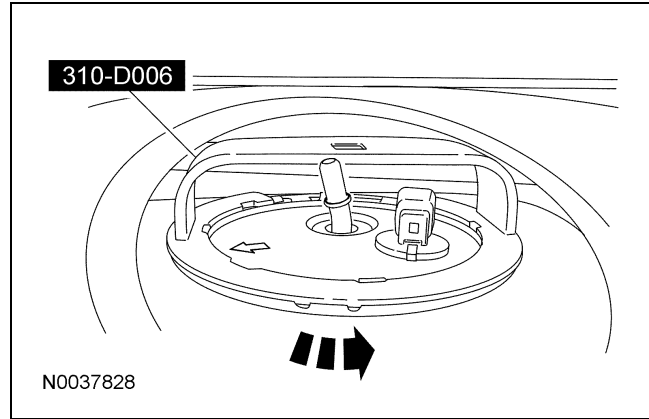
8. **NOTE:** Clean the FP module connections, couplings, flange surfaces and the immediate surrounding area of any dirt or foreign material. Disconnect the FP module electrical connector.

9. **NOTE:** Place absorbent pads in the general work area in case of fuel spillage.

Disconnect the rear fuel tube-to-FP module quick connect coupling. For additional information, refer to Section 310-00.

10. **NOTE:** Carefully install the Fuel Tank Sender Unit Socket to avoid damaging the FP module when removing the lock ring.

Using the Fuel Tank Sender Unit Socket, remove and discard the FP module lock ring.



11. **NOTICE:** The Fuel Pump (FP) module must be handled carefully to avoid damage to the float arm.

Carefully lift the FP module out of the fuel tank allowing access and disconnect the internal fuel tube-to-FP module quick connect coupling. For additional information, refer to Section 310-00.

12. **NOTE:** Drain any residual fuel in the FP module into a suitable container.

Completely remove the FP module from the fuel tank.

13. **NOTE:** Inspect the surfaces of the FP module flange and fuel tank O-ring seal contact surfaces. Do not polish or adjust the O-ring seal contact area of the fuel tank flange or the fuel tank. Install a new FP module or fuel tank if the O-ring seal contact area is bent, scratched or corroded.

NOTE: To install, apply clean engine oil to the O-ring seal.

Remove and discard the FP module O-ring seal.

REMOVAL AND INSTALLATION (Continued)

14. **NOTE:** Make sure to install a new FP module lock ring and O-ring seal.

NOTE: Make sure the alignment arrows on the FP module and the fuel tank meet before tightening the FP module lock ring.

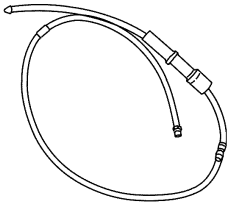
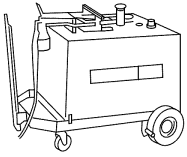
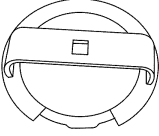
To install, reverse the removal procedure.

- Tighten the FP module lock ring until it meets the stop tabs on the fuel tank.
-

REMOVAL AND INSTALLATION

Fuel Level Sensor

Special Tool(s)

 <p>ST2134-A</p>	<p>Fuel Draining Hose 310-102</p>
 <p>ST1134A</p>	<p>Fuel Storage Tanker 164-R3202 or equivalent</p>
 <p>ST1839-A</p>	<p>Socket, Fuel Tank Sender Unit 310-D006 (D90P-9275-A) or equivalent</p>

Material

Item	Specification
<p>Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent</p>	<p>WSS-M2C930-A</p>

Removal and Installation

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. Release the fuel system pressure. For additional information, refer to Section 310-00.
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01.

REMOVAL AND INSTALLATION (Continued)

- Carefully turn the fuel tank filler cap counterclockwise approximately one-fourth turn until the thread disengages and position aside.

- NOTICE:** When removing the Fuel Draining Hose, the fitting on the end of the hose can become detained by the safety valve. Carefully remove the hose using a gentle agitating motion to avoid detaching the hose from the fitting.

NOTE: The Fuel Draining Hose must be inserted into the fuel tank filler pipe until the fitting on the end of the hose enters into the fuel tank, opening the safety valve.

Insert the Fuel Draining Hose into the fuel tank filler pipe.

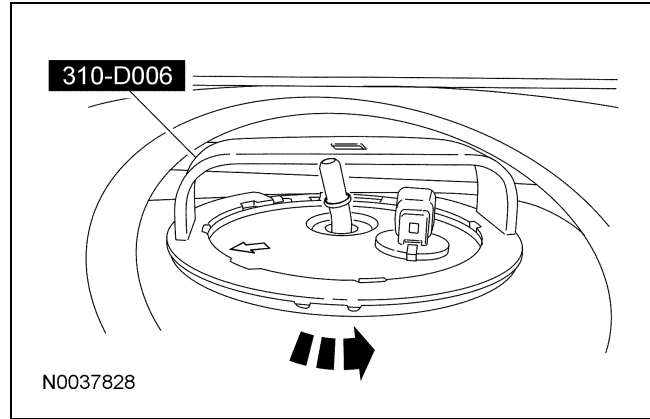
- NOTE:** This step will remove approximately one-eighth tank of fuel from a completely full fuel tank and the majority of any residual fuel from the fuel tank filler pipe. Also the fuel in the fuel tank will be below the Fuel Pump (FP) module mounting flange for FP module removal without fuel spillage.

Attach the Fuel Storage Tanker to the Fuel Draining Hose and remove approximately one-eighth tank of fuel (from a completely full tank), lowering the fuel below the FP module mounting flange.

- Remove the rear seat cushion. For additional information, refer to Section 501-10.
- Remove the FP module and fuel level sensor access covers and position aside.
- NOTE:** Clean the FP module connections, couplings, flange surfaces and the immediate surrounding area of any dirt or foreign material. Disconnect the FP module electrical connector.
- NOTE:** Place absorbent pads in the general work area in case of fuel spillage. Disconnect the rear fuel tube-to-FP module quick connect coupling. For additional information, refer to Section 310-00.

- NOTE:** Carefully install the Fuel Tank Sender Unit Socket to avoid damaging the FP module when removing the lock ring.

Using the Fuel Tank Sender Unit Socket, remove and discard the FP module lock ring.



- NOTE:** The Fuel Pump (FP) module must be handled carefully to avoid damage to the float arm.

Position the FP module aside. Using the Fuel Storage Tanker, completely drain the remaining fuel from the LH saddle of the fuel tank.

- NOTE:** Inspect the surfaces of the FP module flange and fuel tank O-ring seal contact surfaces. Do not polish or adjust the O-ring seal contact area of the fuel tank flange or the fuel tank. Install a new FP module or fuel tank if the O-ring seal contact area is bent, scratched or corroded.

NOTE: To install, apply clean engine oil to the O-ring seal.

Remove and discard the FP module O-ring seal.

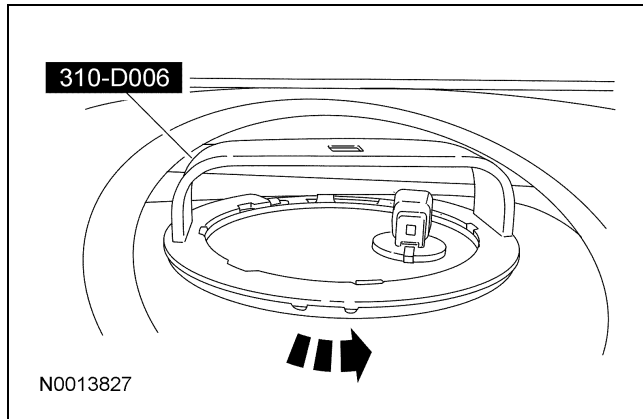
- NOTE:** Clean the fuel level sensor connections, flange surfaces and the immediate surrounding area of any dirt or foreign material.

Disconnect the fuel level sensor electrical connector.

REMOVAL AND INSTALLATION (Continued)

14. **NOTE:** Carefully install the Fuel Tank Sender Unit Socket to avoid damaging the fuel level sensor when removing the lock ring.

Using the Fuel Tank Sender Unit Socket, remove and discard the fuel level sensor lock ring.



15. **NOTICE:** The fuel level sensor must be handled carefully to avoid damage to the float arm.

Carefully lift the fuel level sensor out of the fuel tank allowing access and disconnect the internal fuel tube-to-fuel level sensor quick connect coupling. For additional information, refer to Section 310-00.

16. **NOTE:** Drain any residual fuel in the fuel level sensor into a suitable container.

Completely remove the fuel level sensor from the fuel tank.

17. **NOTE:** Inspect the surfaces of the fuel level sensor flange and fuel tank O-ring seal contact surfaces. Do not polish or adjust the O-ring seal contact area of the fuel tank flange or the fuel tank. Install a new fuel level sensor or fuel tank if the O-ring seal contact area is bent, scratched or corroded.

NOTE: To install, apply clean engine oil to the O-ring seal.

Remove and discard the fuel level sensor O-ring seal.

18. **NOTE:** Make sure to install a new FP module and fuel level sensor lock ring and O-ring seal.

NOTE: Make sure the alignment arrows on the FP module and the fuel level sensor meet with the fuel tank before tightening the lock rings.

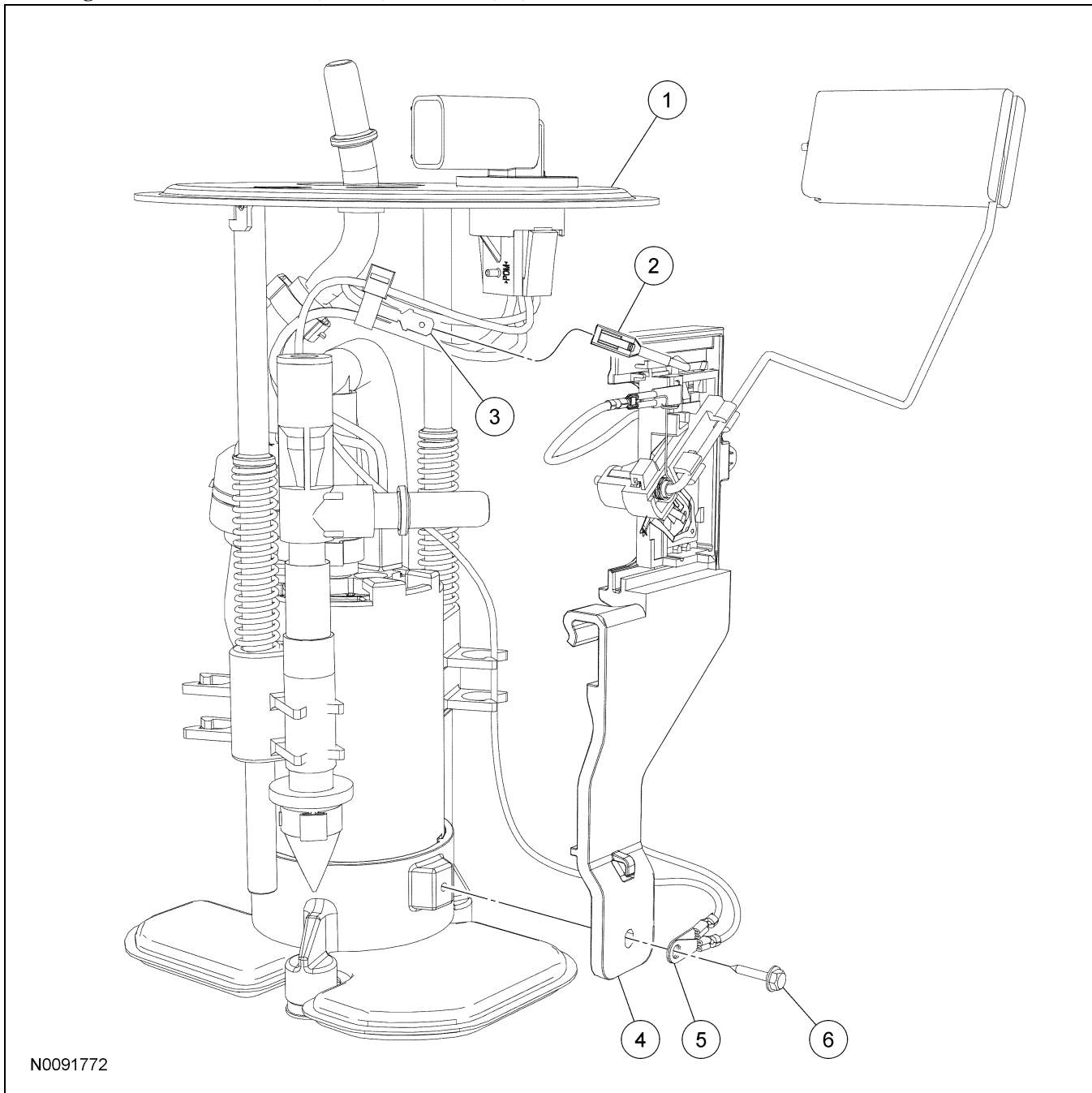
To install, reverse the removal procedure.

- Tighten the lock rings until they meet the stop tabs on the fuel tank.

REMOVAL AND INSTALLATION

Fuel Level Sender

4.0L Single Overhead Camshaft (SOHC) and 4.6L (3V) Vehicles



N0091772

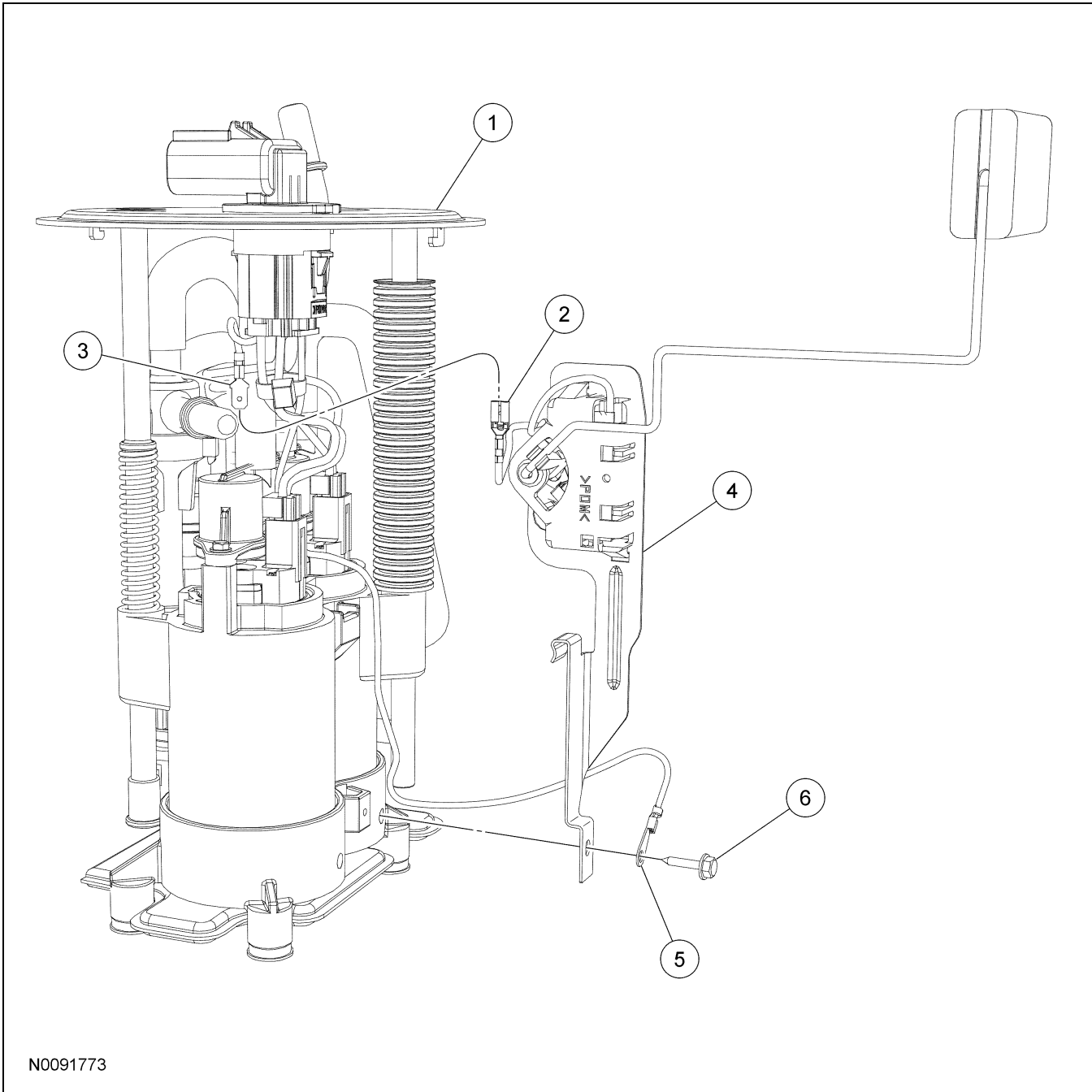
Item	Part Number	Description
1	9H307	Fuel Pump (FP) module
2	—	Fuel level sender electrical connector (part of 9A299)
3	—	Fuel level sender electrical connector (part of 9H307)
4	9A299	Fuel level sender

(Continued)

Item	Part Number	Description
5	—	Fuel level sender electrical connector eyelets (part of 9A299 and 9H307)
6	—	Fuel level sender screw (part of 9H307)

REMOVAL AND INSTALLATION (Continued)

5.4L (4V) Vehicles



N0091773

Item	Part Number	Description
1	9H307	Fuel Pump (FP) module
2	—	Fuel level sender electrical connector (part of 9A299)
3	—	Fuel level sender electrical connector (part of 9H307)

(Continued)

Item	Part Number	Description
4	9A299	Fuel level sender
5	—	Fuel level sender electrical connector eyelets (part of 9H307)
6	—	Fuel level sender screw (part of 9H307)

REMOVAL AND INSTALLATION (Continued)**Removal and Installation**

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

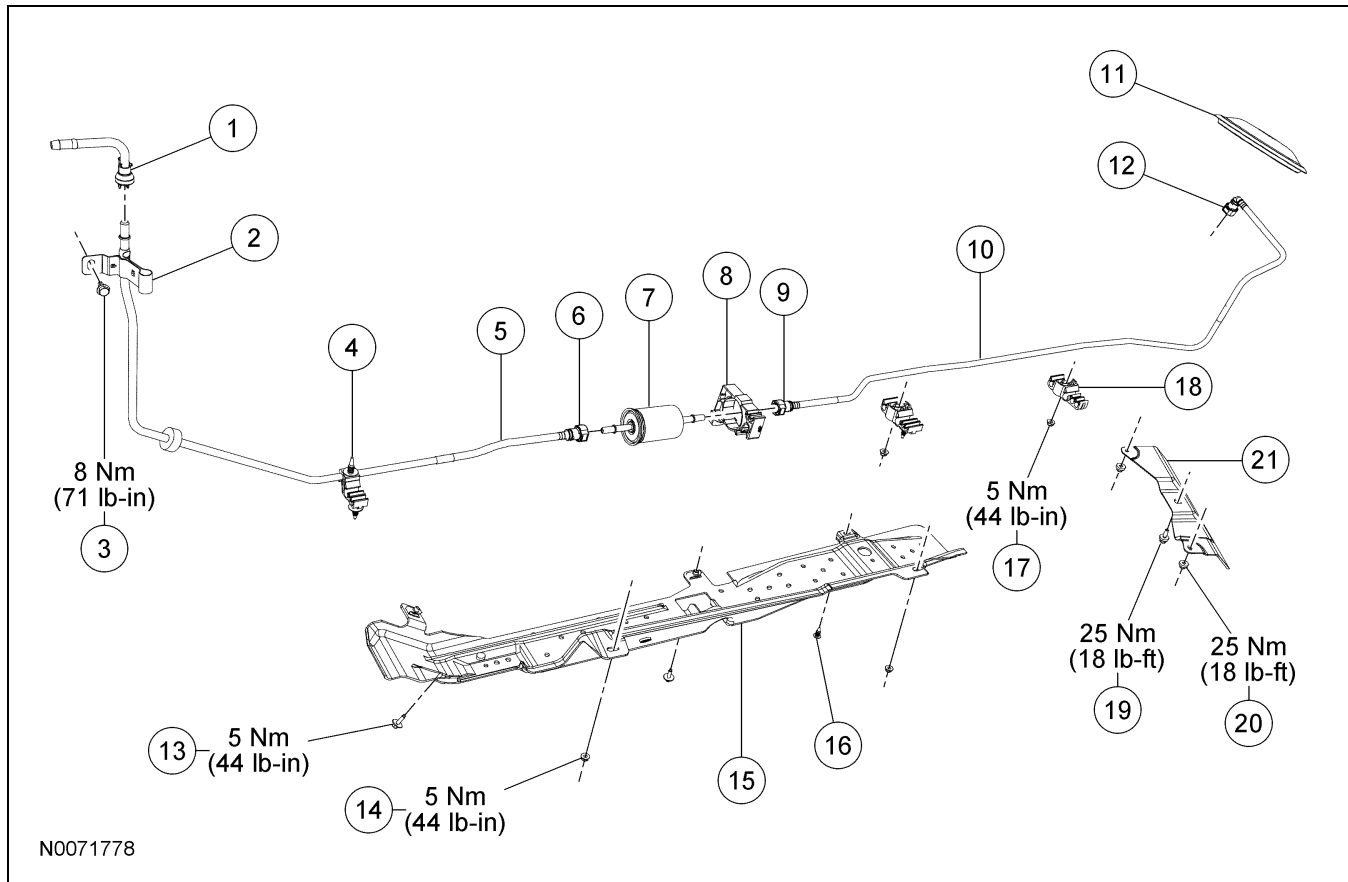
⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. Remove the Fuel Pump (FP) module. For additional information, refer to Fuel Pump Module in this section.
2. Disconnect the fuel level sender electrical connectors.
3. Remove the screw and the electrical connector eyelet(s), and remove the fuel level sender from the FP module.
4. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Fuel Lines and Fuel Filter — Exploded View



Item	Part Number	Description
1	—	Fuel jumper tube-to-front fuel tube spring lock coupling (part of 9J280)
2	—	Fuel tube bundle bracket (part of 9J279)
3	W712583	Fuel tube bundle bracket bolt
4	—	Fuel tube bundle pin-type retainer (part of 9J279)
5	9J279	Front fuel tube
6	—	Front fuel tube-to-fuel filter quick connect coupling (part of 9J279)
7	9155	Fuel filter
8	9180	Fuel filter bracket
9	—	Rear fuel tube-to-fuel filter quick connect coupling (part of 9J279)
10	9J279	Rear fuel tube

(Continued)

Item	Part Number	Description
11	9C335	Fuel Pump (FP) module access cover
12	—	Rear fuel tube-to-FP module quick connect coupling (part of 9J279)
13	W704652	Fuel tube bundle shield bolt (2 required)
14	W520101	Fuel tube bundle shield nut (2 required)
15	9E313	Fuel tube bundle shield
16	—	Fuel tube bundle shield pin-type retainer (part of 9E313)
17	W520101	Fuel tube bundle retainer nut (2 required)
18	—	Fuel tube bundle retainer (2 required) (part of 9J279)
19	W703617	Fuel tank deflector bolt

(Continued)

REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
20	W804620	Fuel tank deflector nut (2 required)
21	9N226	Fuel tank deflector

1. For additional information, refer to the procedures in this section.

REMOVAL AND INSTALLATION

Fuel Lines

Removal and Installation

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
2. Release the fuel system pressure. For additional information, refer to Section 310-00.
3. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
4. Remove the LH front tire and wheel. For additional information, refer to Section 204-04.
5. Remove the LH front splash shield. For additional information, refer to Section 501-02.
6. Disconnect the fuel jumper tube-to-front fuel tube spring lock coupling. For additional information, refer to Section 310-00.
7. Remove the bolt and the fuel tube bundle bracket.
 - To install, tighten to 8 Nm (71 lb-in).
8. Remove the 2 fuel tube bundle shield bolts.
 - To install, tighten to 5 Nm (44 lb-in).
9. Remove the 2 fuel tube bundle shield nuts.
 - To install, tighten to 5 Nm (44 lb-in).
10. Remove the pin-type retainer and the fuel tube bundle shield.
11. Remove the fuel tube bundle pin-type retainer.
12. Disconnect the front fuel tube-to-fuel filter quick connect coupling. For additional information, refer to Section 310-00.
13. **NOTE:** Some residual fuel may remain in the fuel tubes. Upon removal, carefully drain into a suitable container.
Remove the front fuel tube.
14. Disconnect the rear fuel tube-to-fuel filter quick connect coupling. For additional information, refer to Section 310-00.
15. Remove the nuts and the 2 fuel tube bundle retainers.
 - To install, tighten to 5 Nm (44 lb-in).
16. Remove 2 nuts, 1 bolt and the LH fuel tank deflector.
 - To install, tighten to 25 Nm (18 lb-ft).

REMOVAL AND INSTALLATION (Continued)

17. Remove the rear seat cushion. For additional information, refer to Section 501-10.
18. Remove the Fuel Pump (FP) module access cover.
19. Disconnect the rear fuel tube-to-FP module quick connect coupling. For additional information, refer to Section 310-00.
20. **NOTE:** Some residual fuel may remain in the fuel tubes. Upon removal, carefully drain into a suitable container.
Remove the rear fuel supply tube.

21. **NOTE:** Make sure the fuel tubes are completely seated and that the quick connect couplings are locked correctly in place. Pull on the tube to make sure it is fully seated. Upon completion, pressurize the system and check for leaks.

To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Fuel Filter

Removal and Installation

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Do not carry personal electronic devices such as cell phones, pagers or audio equipment of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

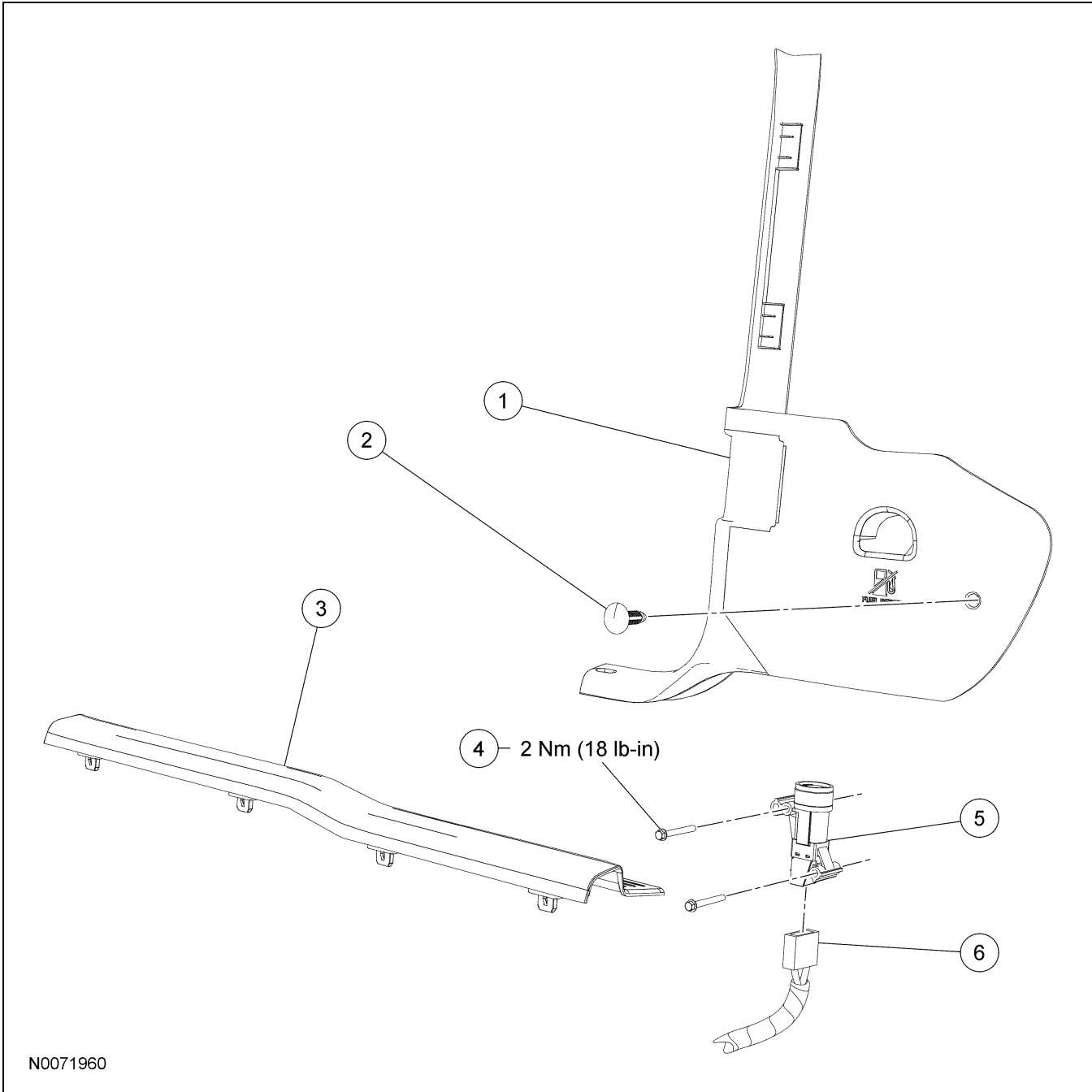
⚠ WARNING: When handling fuel, always observe fuel handling precautions and be prepared in the event of fuel spillage. Spilled fuel may be ignited by hot vehicle components or other ignition sources. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
2. Release the fuel system pressure. For additional information, refer to Section 310-00.
3. Disconnect the battery ground cable. For additional information, refer to Section 414-01.
4. Remove the 2 fuel tube bundle shield bolts.
 - To install, tighten to 5 Nm (44 lb-in).
5. Remove the 2 fuel tube bundle shield nuts.
 - To install, tighten to 5 Nm (44 lb-in).
6. Remove the pin-type retainer and the fuel tube bundle shield.
7. Disconnect the front fuel tube-to-fuel filter quick connect coupling. For additional information, refer to Section 310-00.
8. Disconnect the rear fuel tube-to-fuel filter quick connect coupling. For additional information, refer to Section 310-00.
9. **NOTE:** Some residual fuel may remain in the fuel filter. Upon removal, carefully drain into a suitable container.
Remove the fuel filter from the fuel filter bracket.
10. **NOTE:** Make sure the fuel tubes are completely seated and that the quick connect couplings are locked correctly in place. Pull on the tube to make sure it is fully seated. Pressurize the system and check for leaks. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Inertia Fuel Shutoff (IFS) Switch



N0071960

Item	Part Number	Description
1	02345	LH A-pillar lower trim panel
2	390018	A-pillar lower trim panel pin-type retainer
3	13209	LH door scuff plate

(Continued)

Item	Part Number	Description
4	W504148	Inertia Fuel Shutoff (IFS) mounting bolts (2 required)
5	9341	IFS switch
6	14A464	IFS switch electrical connector

REMOVAL AND INSTALLATION (Continued)**Removal and Installation**

1. Remove the LH door scuff plate.
 2. Remove the LH A-pillar lower trim panel.
 - Remove the pin-type retainer and the trim panel.
 3. Disconnect the Inertia Fuel Shutoff (IFS) switch electrical connector.
 4. **NOTICE: Do not overtighten the fasteners or damage to the switch will occur.**
Remove the 2 bolts and the IFS switch.
 - To install, tighten to 2 Nm (18 lb-in).
 5. To install, reverse the removal procedure.
 - If necessary, reset the IFS switch after the installation has been completed.
-

SPECIFICATIONS

Torque Specifications

Description	Nm	lb-in
Accelerator pedal nuts	9	80

DESCRIPTION AND OPERATION

Acceleration Control

The acceleration control consists of an accelerator pedal and sensor assembly.

The engine management system electronically operates the throttle of the engine in response to throttle pedal movements initiated by the driver. In the event of a system failure, the engine management system provides a “limp home” mode which allows the car to be driven with limited performance.

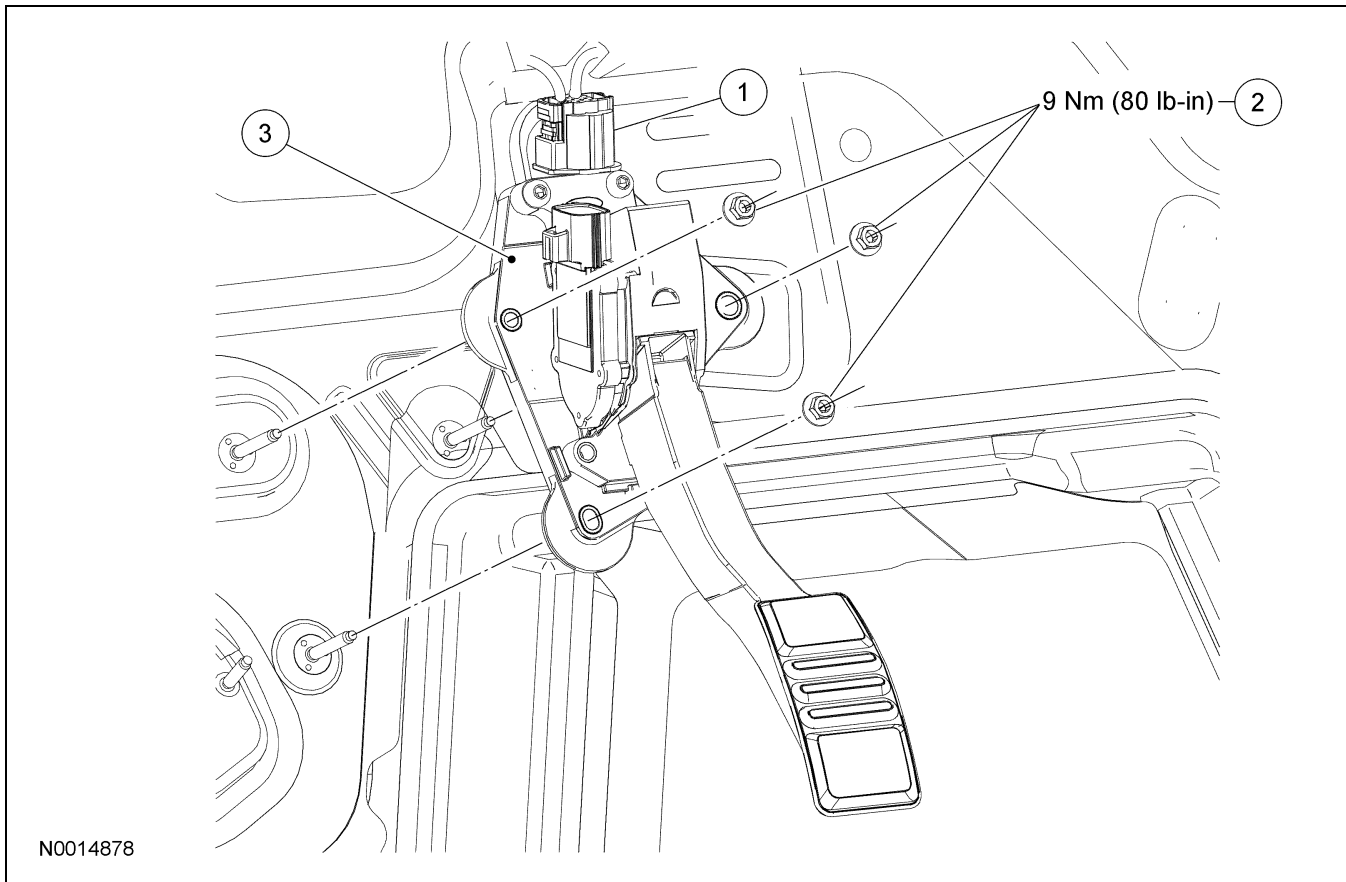
DIAGNOSIS AND TESTING

Acceleration Control

Refer to the [Powertrain Control/Emissions Diagnosis \(PC/ED\) manual](#).

REMOVAL AND INSTALLATION

Accelerator Pedal



Item	Part Number	Description
1	14A464	Accelerator pedal sensor electrical connector
2	W711330	Accelerator pedal and sensor nuts (3 required)
3	9F836	Accelerator pedal and sensor assembly

Removal and Installation

1. Disconnect the accelerator pedal sensor electrical connector.
 - Upon installation, make sure that the red lock tab on the electrical connector is fully engaged to make sure of a complete connection.
2. Remove the 3 nuts and the accelerator pedal and sensor.
 - To install, tighten to 9 Nm (80 lb-in).
3. To install, reverse the removal procedure.

DESCRIPTION AND OPERATION

Speed Control

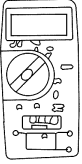
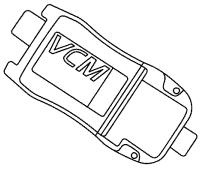
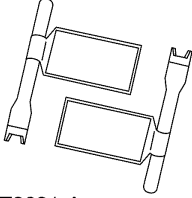
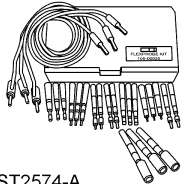
The speed control system consists of the following components:

- Speed control switches
 - Speed control deactivator switch
 - Clutch pedal speed control deactivator switch (manual transmission)
 - Speed control indicator
 - PCM
-

DIAGNOSIS AND TESTING

Speed Control

Special Tool(s)

 <p>ST1137-A</p>	73III Automotive Meter 105-R0057 or equivalent
 <p>ST2834-A</p>	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 <p>ST2621-A</p>	Diagnostic Tool, Restraint System (2 required) 418-F395
 <p>ST2574-A</p>	Flex Probe Kit 105-R025C or equivalent

Principles of Operation

The speed control system is controlled by the PCM. The speed control system is designed to maintain a selected vehicle speed between 48 and 200 km/h (30 and 124 mph). The speed control system is controlled by the steering wheel mounted switches (ON, OFF, SET+, SET-, and RESUME), the stoplamp switch, the clutch pedal speed control deactivator switch (manual transmission), and the speed control deactivator switch. The steering wheel mounted switches are hardwired to the PCM through the clockspring.

The speed control functions include:

- Turning the speed control system on
- Setting and maintaining the desired vehicle speed
- Accelerating the vehicle speed

- Decelerating the vehicle speed
- Turning the vehicle speed control system off
- Cancelling the speed control

Pressing and releasing the ON switch turns the speed control system on. Pressing and releasing the SET+ or SET- switch while the vehicle is traveling at the desired speed activates the speed control system.

Tapping the SET+ or the SET- switch while in the set mode increases or decreases the maintained vehicle speed by 1.6 km/h (1 mph) per tap, respectively. If either button is pressed and held, the vehicle speed continues to accelerate (SET+) or decelerate (SET-) until the button is released.

Pressing and releasing the OFF switch, or switching the ignition switch to the OFF position, turns the speed control system off. Applying the brake pedal puts the speed control system into the standby mode. Pressing the RESUME button when the speed control system is in the standby mode causes the vehicle to accelerate to the last set speed. RESUME does not function if the OFF button is pressed or if the current vehicle speed is below the minimum operational speed.

The clutch pedal speed control deactivator switch is used on vehicles equipped with a manual transmission. When the clutch pedal is applied with the vehicle speed control system engaged, the normally closed switch opens and signals the PCM to deactivate the speed control.

The speed control deactivator switch is provided as an additional safety feature. When the brake pedal is applied, an electrical signal from the stoplamp switch is sent to the smart junction box (SJB), which then sends a message to the PCM to deactivate the speed control system. Under increased brake pedal effort, the speed control deactivator switch opens and removes the voltage signal from the PCM input circuit, deactivating the speed control system.

Whenever the speed control system is engaged and active, a speed control icon on the instrument cluster (IC) is illuminated.

The inputs to the PCM are:

- Output shaft speed (OSS) sensor
- Transmission range (TR) sensor
- Speed control switch

DIAGNOSIS AND TESTING (Continued)

- Clutch pedal speed control deactivator switch (manual transmission)
- Speed control deactivator switch
- Accelerator pedal position sensor
- SJB
- Parking brake

The outputs of the PCM for the speed control system are:

- Speed control indicator lamp
- Throttle command

The speed control system throttle position is completely controlled by the PCM through the electronically controlled throttle body. Speed control electronics are contained entirely within the PCM.

When the speed control system is active, the PCM corrects for deviations in the actual vehicle speed by proportionally moving the throttle plate. The PCM modulates the throttle to minimize error between actual, and desired vehicle speed.

The PCM strategy uses the throttle control for smooth accelerations.

The PCM sends a message over the controller area network (CAN) to the IC whenever the speed control telltale should be turned on or off.

In the event of an OFF command or a deactivation request from any source, the speed control system carries out a deactivation and immediately returns the throttle to the idle position.

The speed control system provides self-diagnostics. The speed control is disabled anytime an error is detected in the system. No cluster telltale or message center messages are displayed when faults occur. Fault codes are logged by the PCM.

An electronically controlled throttle system fault also causes the speed control system to be disabled and a warning telltale (wrench light) or a message center message is displayed.

Additionally, the following conditions cause the speed control system to deactivate:

- Transmission gear selector in a position other than D or OD (automatic transmission)
- Vehicle clutch pedal is applied (manual transmission)
- Speed control set speed is over-ridden with the accelerator pedal for a period longer than 5 minutes

- Vehicle speed loss from set speed of greater than 16 km/h (10 mph) occurs
- Vehicle speed falls below the minimum allowable limit of 48 km/h (30 mph)
- Parking brake is applied
- Speed control switch is pressed or stuck for longer than 2 minutes

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Throttle body 	<ul style="list-style-type: none"> • Smart junction box (SJB) fuse 18 (10A) • Wiring, terminals or connectors • Speed control switch • Clutch pedal speed control deactivator switch (manual transmission) • Speed control deactivator switch • Stoplamp switch • PCM

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. Verify the speedometer operates correctly without speed control by test driving the vehicle. If the speedometer does not operate correctly, refer to Section 413-01.
5. Verify the stoplamps operate correctly with the ignition switch in the ON position. If the stoplamps do not operate correctly, refer to Section 417-01.
6. Verify the parking brake warning indicator is operating correctly. If the parking brake warning indicator does not operate correctly, refer to Section 413-01.
7. **NOTE:** Make sure to use the latest scan tool software release.

If the cause is not visually evident, connect the scan tool to the data link connector (DLC).

DIAGNOSIS AND TESTING (Continued)

8. **NOTE:** The vehicle communication module (VCM) LED prove-out confirms power and ground from the DLC are provided to the VCM.

If the scan tool does not communicate with the VCM:

- Check the VCM connection to the vehicle.
 - Check the scan tool connection to the VCM.
 - Refer to Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.
9. If the scan tool does not communicate with the vehicle:
- Verify the ignition key is in the ON position.
 - Verify the scan tool operation with a known good vehicle.

- Refer to Section 418-00 to diagnose no response from the PCM.

10. Carry out the network test.

- If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
- If the network test passes, retrieve and record the continuous memory DTCs.

11. Clear the continuous DTCs and carry out the self-test diagnostics for the PCM.

12. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.

13. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**PCM DTC Chart**

DTCs	Description	Action
P0579	Cruise Control Multifunction Input A Circuit Range/Performance	GO to Pinpoint Test C.
P0581	Cruise Control Multifunction Circuit High	GO to Pinpoint Test C.
P1703	Brake Switch Out of Self-Test Range	GO to Pinpoint Test B.
All other DTCs	—	REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual .

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • The speed control is inoperative 	<ul style="list-style-type: none"> • PCM not configured for speed control • Speed control switch • Digital transmission range (TR) sensor alignment (automatic transmission) • Clutch pedal speed control deactivator switch (manual transmission) • PCM 	<ul style="list-style-type: none"> • GO to Pinpoint Test A.
<ul style="list-style-type: none"> • The speed control does not disengage when the clutch is applied 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Clutch pedal speed control deactivator switch • PCM 	<ul style="list-style-type: none"> • GO to Pinpoint Test A.

DIAGNOSIS AND TESTING (Continued)

Symptom Chart (Continued)

Condition	Possible Sources	Action
<ul style="list-style-type: none"> The speed control indicator lamp is inoperative/always on 	<ul style="list-style-type: none"> Wiring, terminals or connectors Instrument cluster (IC) PCM 	<ul style="list-style-type: none"> REFER to Section 413-01.

Pinpoint Tests

Pinpoint Test A: The Speed Control Is Inoperative

Normal Operation

The PCM sends a signal through circuit 248 (TN/OG) to the speed control switches, which passes through the clockspring. The return signal is sent to the PCM through circuit 133 (BK) and the clockspring. When the brake pedal is applied, the smart junction box (SJB) sends a message to the PCM to deactivate the speed control, if engaged.

The speed control deactivator switch interrupts circuit 535 (LB/RD), removing the voltage signal to the PCM, when the brake pedal is applied firmly and passes the stoplamp switch trip point. This is a redundant signal to the PCM.

Vehicles equipped with a manual transmission have an additional clutch pedal speed control deactivator switch. The clutch pedal speed control deactivator switch, normally closed, supplies a ground signal to the PCM through circuit 1899 (WH). When the clutch pedal is pressed, the clutch pedal speed control deactivator switch moves to the open position, removing the ground signal from the PCM, which deactivates the speed control. Circuit 1205 (BK) supplies ground to the clutch pedal speed control deactivator switch.

This pinpoint test is intended to diagnose the following:

- PCM not configured for speed control
- Speed control switch
- Digital transmission range (TR) sensor alignment (automatic transmission)
- Clutch pedal speed control deactivator switch (manual transmission)
- PCM

PINPOINT TEST A: THE SPEED CONTROL IS INOPERATIVE

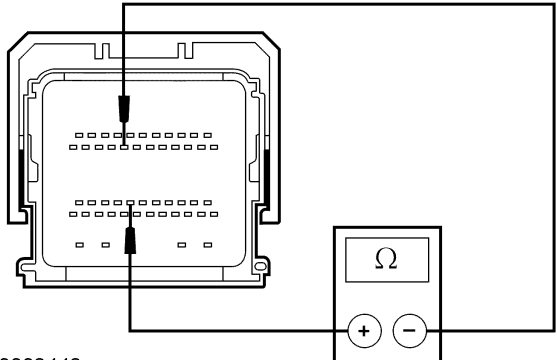
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
A1	VERIFY PCM CONFIGURATION	<p>Yes GO to A2.</p> <p>No Enable the speed control in the PCM using the scan tool programmable parameters menu. If no parameter exists, REFER to Section 418-01 to carry out PCM programmable module installation (PMI). TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: Programmable Parameters. Verify that the speed control is enabled in the PCM. Is the speed control enabled? 	
A2	CHECK FOR DTCs	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. REPAIR all PCM DTCs and RETEST the speed control.</p> <p>No GO to A3.</p>
	<ul style="list-style-type: none"> Review the recorded DTCs from the PCM self-test. Are any non-speed control DTCs recorded? 	
A3	CHECK THE SPEED CONTROL COMMAND SWITCH (SCCS) PID	
	<ul style="list-style-type: none"> Start the engine. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

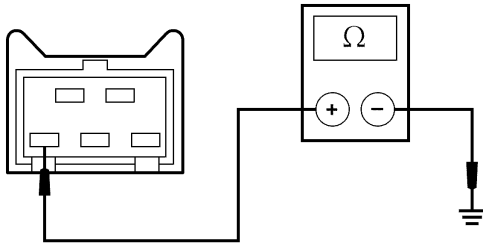
PINPOINT TEST A: THE SPEED CONTROL IS INOPERATIVE (Continued)

Test Step		Result / Action to Take																					
A3	CHECK THE SPEED CONTROL COMMAND SWITCH (SCCS) PID (Continued)																						
<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: PCM DataLogger. With the engine running, monitor the PCM SCCS PID while pressing the speed control switches as follows: 																							
<table border="1"> <thead> <tr> <th>Speed Control Switch</th> <th>PID Minimum Value</th> <th>PID Maximum Value</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>0.00 volts</td> <td>1.089 volts</td> </tr> <tr> <td>SET -</td> <td>2.192 volts</td> <td>3.057 volts</td> </tr> <tr> <td>SET +</td> <td>3.057 volts</td> <td>3.721 volts</td> </tr> <tr> <td>RESUME</td> <td>3.721 volts</td> <td>4.209 volts</td> </tr> <tr> <td>ON</td> <td>4.209 volts</td> <td>4.556 volts</td> </tr> <tr> <td>No switch pressed</td> <td>4.556 volts</td> <td>4.839 volts</td> </tr> </tbody> </table>		Speed Control Switch	PID Minimum Value	PID Maximum Value	OFF	0.00 volts	1.089 volts	SET -	2.192 volts	3.057 volts	SET +	3.057 volts	3.721 volts	RESUME	3.721 volts	4.209 volts	ON	4.209 volts	4.556 volts	No switch pressed	4.556 volts	4.839 volts	
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<ul style="list-style-type: none"> Are the PCM SCCS PID values OK? 		<p>Yes TURN the engine off. GO to A5.</p> <p>No TURN the engine off. GO to A4.</p>																					
A4	CHECK THE SPEED CONTROL SWITCH																						
<ul style="list-style-type: none"> Key in OFF position. Disconnect: PCM C175b. Measure the resistance between the PCM C175b-19, circuit 248 (TN/OG), harness side and the PCM C175b-30, circuit 133 (BK), harness side, while pressing the speed control switches as follows: 																							
<table border="1"> <thead> <tr> <th>Speed Control Switch</th> <th>Resistance Value</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>Less than 5 ohms</td> </tr> <tr> <td>SET -</td> <td>285 - 315 ohms</td> </tr> <tr> <td>SET +</td> <td>570 - 630 ohms</td> </tr> <tr> <td>RESUME</td> <td>1,054 - 1,165 ohms</td> </tr> <tr> <td>ON</td> <td>2,004 - 2,215 ohms</td> </tr> <tr> <td>No switch pressed</td> <td>4,094 - 4,525 ohms</td> </tr> </tbody> </table>		Speed Control Switch	Resistance Value	OFF	Less than 5 ohms	SET -	285 - 315 ohms	SET +	570 - 630 ohms	RESUME	1,054 - 1,165 ohms	ON	2,004 - 2,215 ohms	No switch pressed	4,094 - 4,525 ohms								
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 <p>N0002442</p>																							
<ul style="list-style-type: none"> Are the speed control switch resistance values OK? 		<p>Yes GO to A11.</p> <p>No INSTALL a new speed control switch. REFER to Speed Control Switch in this section. TEST the system for normal operation.</p>																					
A5	CHECK THE STOPLAMP SWITCH (BOO) PID																						
<ul style="list-style-type: none"> Key in ON position. 																							

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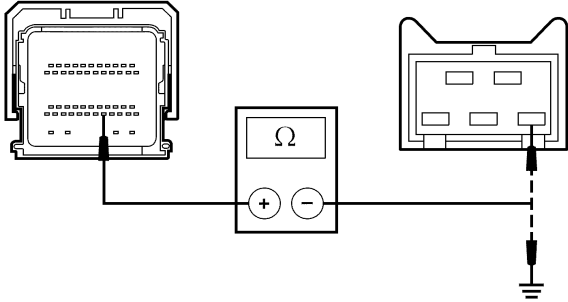
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: THE SPEED CONTROL IS INOPERATIVE (Continued)

Test Step		Result / Action to Take
A5	CHECK THE STOPLAMP SWITCH (BOO) PID (Continued)	<p>Yes GO to A6.</p> <p>No GO to Pinpoint Test B.</p>
	<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: PCM DataLogger. Monitor the PCM BOO PID. Apply and release the brake pedal. Does the PID value agree with the brake pedal position? 	
A6	CHECK THE VEHICLE SPEED	<p>Yes If equipped with an automatic transmission, GO to A7. If equipped with a manual transmission, GO to A8.</p> <p>No REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual to diagnose the output shaft speed (OSS) sensor signal.</p>
	<p>NOTE: This step may require an assistant.</p> <ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: ABS Module DataLogger. Monitor and record the ABS module LF_WSPD (left front wheel speed) PID while driving the vehicle at 48 km/h (30 mph) as indicated on the speedometer. Enter the following diagnostic mode on the scan tool: PCM DataLogger. Monitor and record the PCM VSS (vehicle speed) PID while driving the vehicle at 48 km/h (30 mph). Does the speed indicated by the ABS module LF_WSPD PID match the PCM VSS PID? 	
A7	CHECK THE DIGITAL TRANSMISSION RANGE (TR) SENSOR PID	<p>Yes GO to A11.</p> <p>No REFER to Section 307-01.</p>
	<ul style="list-style-type: none"> Apply the parking brake. Key in ON position. Enter the following diagnostic mode on the scan tool: PCM DataLogger. Monitor the PCM TR PID. Select DRIVE. Does the PID value agree with the transmission range selector lever position? 	
A8	CHECK THE CLUTCH PEDAL SPEED CONTROL DEACTIVATOR SWITCH (CPP_TOP) PID	<p>Yes GO to A11.</p> <p>No GO to A9.</p>
	<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: PCM DataLogger. Monitor the PCM CPP_TOP PID while pressing and releasing the clutch pedal. Does the clutch pedal speed control deactivator switch PID agree with the clutch pedal position? 	
A9	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	<p>Yes GO to A10.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Clutch Pedal Speed Control Deactivator Switch C277. Measure the resistance between the clutch pedal speed control deactivator switch C277-3, circuit 1205 (BK), harness side and ground. <div style="text-align: center;">  <p>N0012707</p> </div> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	
A10	CHECK CIRCUIT 1899 (WH) FOR AN OPEN OR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Disconnect: PCM C175b. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST A: THE SPEED CONTROL IS INOPERATIVE (Continued)**

Test Step		Result / Action to Take
A10	CHECK CIRCUIT 1899 (WH) FOR AN OPEN OR A SHORT TO GROUND (Continued)	
	<ul style="list-style-type: none"> Measure the resistance between the PCM C175b-39, circuit 1899 (WH), harness side and the clutch pedal speed control deactivator switch C277-1, circuit 1899 (WH), harness side; and between the PCM C175b-39, circuit 1899 (WH), harness side and ground.  <p>N0058835</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms between the PCM and the clutch pedal speed control deactivator switch, and greater than 10,000 ohms between the PCM and ground? 	<p>Yes INSTALL a new clutch pedal speed control deactivator switch. REFER to Speed Control Deactivator Switch in this section. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
A11	CHECK FOR CORRECT PCM OPERATION	
	<ul style="list-style-type: none"> Disconnect all the PCM connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the PCM connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	<p>Yes INSTALL a new PCM. REFER to Section 303-14. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. TEST the system for normal operation.</p>

Pinpoint Test B: DTC P1703 — Brake On/Off Circuit Failure

Refer to [Wiring Diagrams Cell 31, Speed Control](#) for schematic and connector information.

Normal Operation

When the brake pedal is applied, the smart junction box (SJB) sends a message to the PCM to deactivate the speed control if engaged.

The speed control deactivator switch receives voltage through circuit 391 (RD/YE). The switch removes voltage from circuit 535 (LB/RD) to the PCM when the brake pedal is applied firmly and passes the stoplamp switch trip point. This is a redundant signal to the PCM.

- DTC P1703 (Brake On/Off Circuit Failure) — sets when there is an open or short in the deactivator switch circuits or when there is an open or short in the stoplamp circuits.

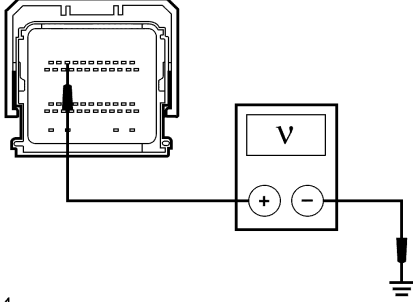
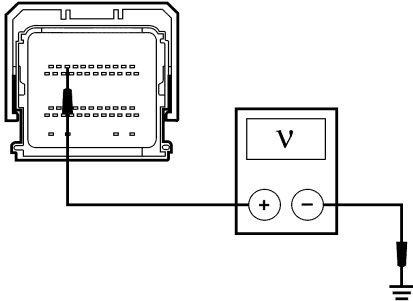
This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Speed control deactivator switch
- ABS module
- Bussed electrical center (BEC)
- SJB
- PCM

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST B: DTC P1703 — BRAKE ON/OFF CIRCUIT FAILURE

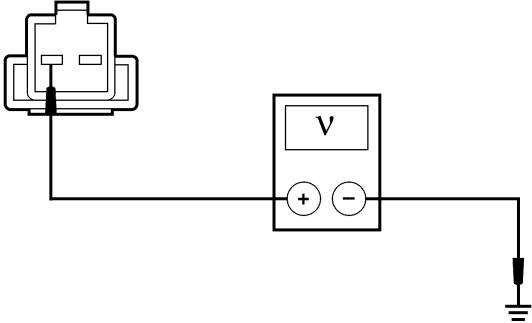
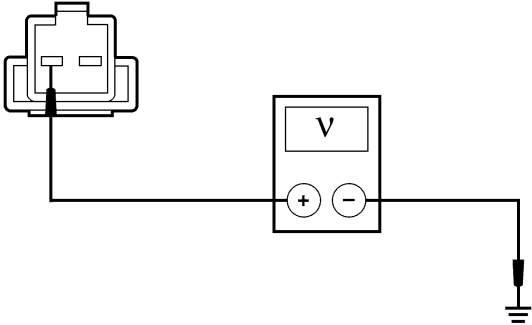
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
B1	CHECK THE OPERATION OF THE STOPLAMPS	Yes GO to B2 . No REFER to Section 417-01.
	<ul style="list-style-type: none"> Key in ON position. Operate the stoplamps. Do the stoplamps operate correctly? 	
B2	CHECK CIRCUIT 535 (LB/RD) FOR VOLTAGE	Yes GO to B3 . No GO to B6 .
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: PCM C175b. Key in ON position. Measure the voltage between the PCM C175b-9, circuit 535 (LB/RD), harness side and ground. <div style="text-align: center;">  <p>N0058834</p> </div> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	
B3	CHECK THE SPEED CONTROL DEACTIVATOR SWITCH FOR CORRECT OPERATION	Yes GO to B10 . No GO to B4 .
	<ul style="list-style-type: none"> While firmly applying and releasing the brake pedal, measure the voltage between the PCM C175b-9, circuit 535 (LB/RD), harness side and ground. <div style="text-align: center;">  <p>N0058834</p> </div> <ul style="list-style-type: none"> Is the voltage greater than 10 volts with the brake pedal released and 0 volts with the brake pedal firmly applied? 	
B4	CHECK CIRCUIT 535 (LB/RD) FOR A SHORT TO VOLTAGE	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Speed Control Deactivator Switch C278. Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

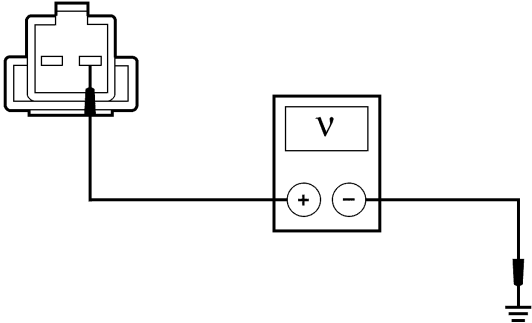
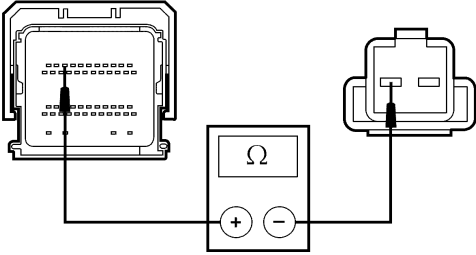
PINPOINT TEST B: DTC P1703 — BRAKE ON/OFF CIRCUIT FAILURE (Continued)

	Test Step	Result / Action to Take
<p>B4</p>	<p>CHECK CIRCUIT 535 (LB/RD) FOR A SHORT TO VOLTAGE (Continued)</p>	
	<ul style="list-style-type: none"> Measure the voltage between the speed control deactivator switch C278-1, circuit 535 (LB/RD), harness side and ground.  <p>N0002250</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes GO to B5.</p> <p>No INSTALL a new speed control deactivator switch. REFER to Speed Control Deactivator Switch in this section. CLEAR the DTCs. REPEAT the self-test.</p>
<p>B5</p>	<p>CHECK THE ABS MODULE FOR A SHORT TO VOLTAGE</p>	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: ABS Module C135. Key in ON position. Measure the voltage between the speed control deactivator switch C278-1, circuit 535 (LB/RD), harness side and ground.  <p>N0002250</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to B9.</p>
<p>B6</p>	<p>CHECK CIRCUIT 391 (RD/YE) FOR AN OPEN</p>	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Speed Control Deactivator Switch C278. Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

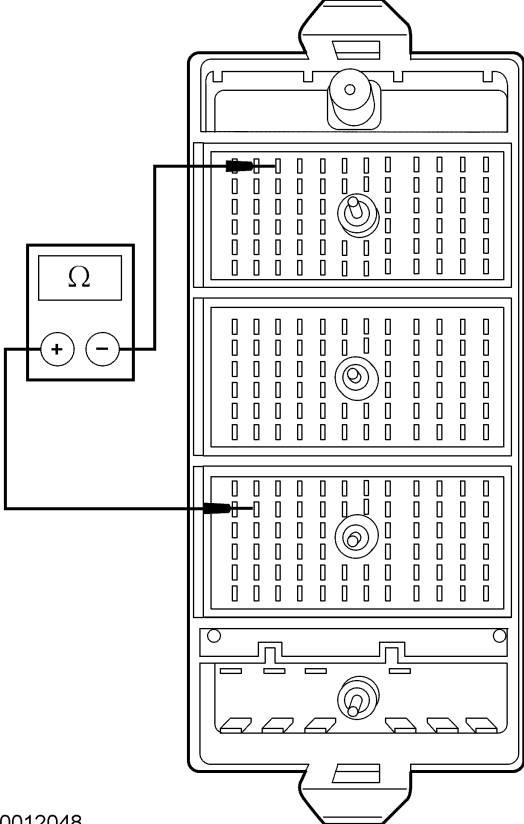
PINPOINT TEST B: DTC P1703 — BRAKE ON/OFF CIRCUIT FAILURE (Continued)

Test Step		Result / Action to Take
B6	<p>CHECK CIRCUIT 391 (RD/YE) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the speed control deactivator switch C278-2, circuit 391 (RD/YE), harness side and ground.  <p>N0002251</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to B7.</p> <p>No VERIFY the SJB fuse 18 (10A) is OK. If OK, REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
B7	<p>CHECK CIRCUIT 535 (LB/RD) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Measure the resistance between the PCM C175b-9, circuit 535 (LB/RD), harness side and the speed control deactivator switch C278-1, circuit 535 (LB/RD), harness side.  <p>N0058836</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new speed control deactivator switch. REFER to Speed Control Deactivator Switch in this section. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to B8.</p>
B8	<p>CHECK THE BEC FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: BEC C1035a. Disconnect: BEC C1035b. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST B: DTC P1703 — BRAKE ON/OFF CIRCUIT FAILURE (Continued)

Test Step	Result / Action to Take
<p>B8 CHECK THE BEC FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the BEC C1035a pin E2, component side and the BEC C1035b pin F3, component side.  <p>N0012048</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes REPAIR circuit 535 (LB/RD). CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>
<p>B9 CHECK FOR CORRECT ABS MODULE OPERATION</p> <ul style="list-style-type: none"> Disconnect the ABS module connector. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect the ABS module connector and make sure it is seated correctly. Operate the system and verify the concern is still present. Is the concern still present? 	<p>Yes INSTALL a new ABS module. REFER to Section 206-09. CLEAR the PCM DTCs. REPEAT the self test.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the PCM DTCs. REPEAT the self-test.</p>
<p>B10 CHECK FOR CORRECT PCM OPERATION</p> <ul style="list-style-type: none"> Disconnect all the PCM connectors. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect all the PCM connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	<p>Yes INSTALL a new PCM. REFER to Section 303-14. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test C: DTC P0579 or DTC P0581 — Speed Control Switch Circuit Failure

Refer to Wiring Diagrams Cell 31, Speed Control for schematic and connector information.

DIAGNOSIS AND TESTING (Continued)

Normal Operation

The PCM sends a signal through circuit 248 (TN/OG) to the speed control switches. The return signal is sent through circuit 133 (BK). Both circuits pass through the clockspring.

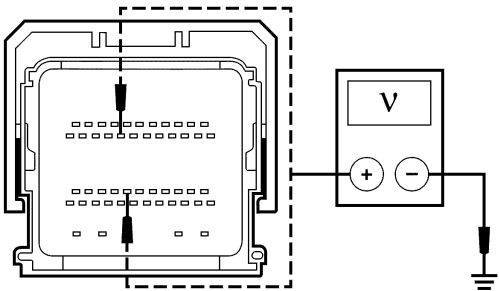
- DTC P0579 (Speed Control Switch Circuit Failure) — sets when the speed control switch circuits are open, shorted to voltage or shorted to ground.
- DTC P0581 (Speed Control Switch Circuit Failure) — sets when the speed control switch circuits are shorted to voltage or open.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Clockspring
- Speed control switch
- PCM

PINPOINT TEST C: DTC P0579 OR DTC P0581 — SPEED CONTROL SWITCH CIRCUIT FAILURE

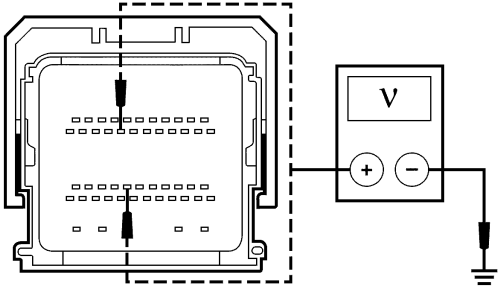

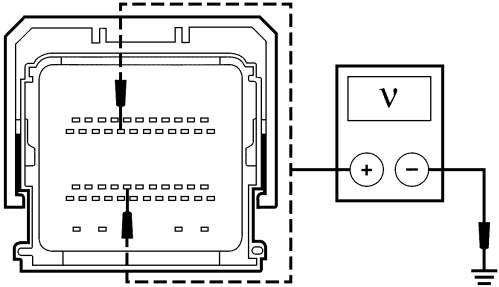
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

	Test Step	Result / Action to Take
C1	<p>CHECK THE SPEED CONTROL SWITCH CIRCUITRY FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> • Key in OFF position. • Disconnect: PCM C175b. • Key in ON position. • Turn the parking lamps on. • Measure the voltage between the PCM C175b-19, circuit 248 (TN/OG), harness side and ground; and between the PCM C175b-30, circuit 133 (BK), harness side and ground.  <p>A0082239</p> <ul style="list-style-type: none"> • Is any voltage present? 	<p>Yes TURN the parking lamps off. GO to C2.</p> <p>No TURN the parking lamps off. GO to C4.</p>
C2	<p>CHECK CIRCUITS 248 (TN/OG) AND 133 (BK) FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Clockspring C2274. • Key in ON position. • Turn the parking lamps on. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

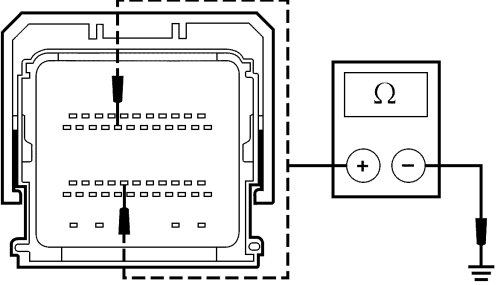
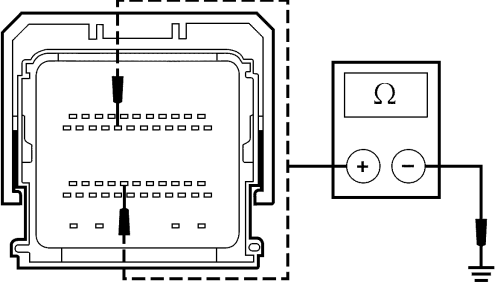
PINPOINT TEST C: DTC P0579 OR DTC P0581 — SPEED CONTROL SWITCH CIRCUIT FAILURE (Continued)

Test Step		Result / Action to Take
C2	<p>CHECK CIRCUITS 248 (TN/OG) AND 133 (BK) FOR A SHORT TO VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the PCM C175b-19, circuit 248 (TN/OG), harness side and ground; and between the PCM C175b-30, circuit 133 (BK), harness side and ground.  <p>A0082239</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No TURN the parking lamps off. GO to C3.</p>
C3	<p>CHECK THE CLOCKSPRING FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> Key in OFF position. Connect: Clockspring C2274. Remove the driver air bag module. Refer to Section 501-20B. Connect the restraint system diagnostic tools (418-F395) to the upper clockspring air bag connector. Disconnect: Upper Clockspring.  WARNING: Make sure no one is in the vehicle and there is nothing blocking or placed in front of any air bag module when the battery is connected. Failure to follow these instructions may result in serious personal injury in the event of an accidental deployment. Connect the battery. Key in ON position. Turn the parking lamps on. Measure the voltage between the PCM C175b-19, circuit 248 (TN/OG), harness side and ground; and between the PCM C175b-30, circuit 133 (BK), harness side and ground.  <p>A0082239</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes INSTALL a new clockspring. REFER to Section 501-20B. DISCONNECT the battery. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new speed control switch. REFER to Speed Control Switch in this section. DISCONNECT the battery. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p>
C4	<p>CHECK THE SPEED CONTROL SWITCH CIRCUITRY FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Key in OFF position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

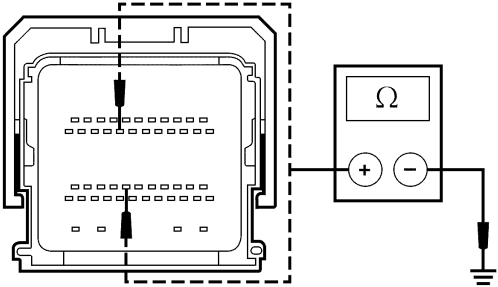
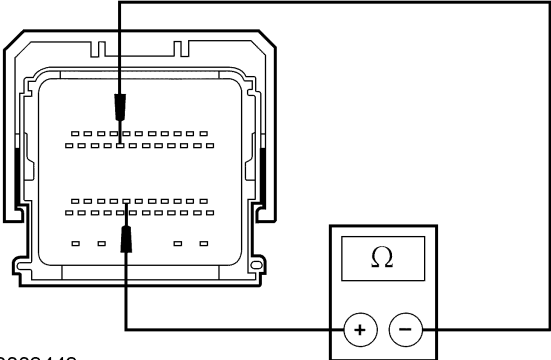
PINPOINT TEST C: DTC P0579 OR DTC P0581 — SPEED CONTROL SWITCH CIRCUIT FAILURE (Continued)

Test Step	Result / Action to Take
<p>C4 CHECK THE SPEED CONTROL SWITCH CIRCUITRY FOR A SHORT TO GROUND (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the PCM C175b-19, circuit 248 (TN/OG), harness side and ground; and between the PCM C175b-30, circuit 133 (BK), harness side and ground.  <p>A0082240</p> <ul style="list-style-type: none"> Are the resistances greater than 10,000 ohms? 	<p>Yes GO to C7.</p> <p>No GO to C5.</p>
<p>C5 CHECK THE CLOCKSPRING FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Remove the driver air bag module. Refer to Section 501-20B. Disconnect: Upper Clockspring. Measure the resistance between the PCM C175b-19, circuit 248 (TN/OG), harness side and ground; and between the PCM C175b-30, circuit 133 (BK), harness side and ground.  <p>A0082240</p> <ul style="list-style-type: none"> Are the resistances greater than 10,000 ohms? 	<p>Yes INSTALL a new speed control switch. REFER to Speed Control Switch in this section. DISCONNECT the battery. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to C6.</p>
<p>C6 CHECK CIRCUITS 248 (TN/OG) AND 133 (BK) FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Disconnect: Clockspring C2274. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

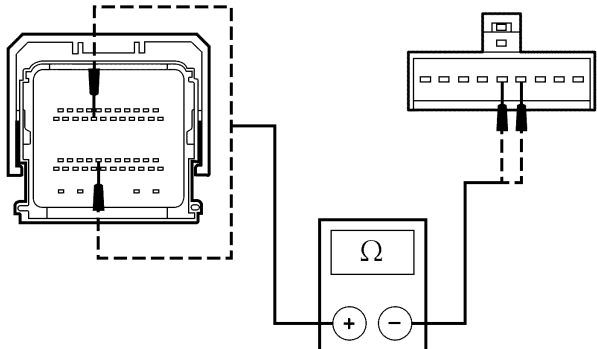
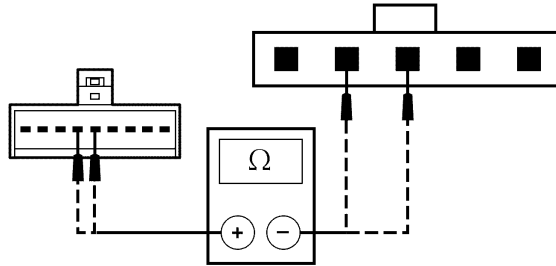
PINPOINT TEST C: DTC P0579 OR DTC P0581 — SPEED CONTROL SWITCH CIRCUIT FAILURE (Continued)

Test Step		Result / Action to Take
C6	<p>CHECK CIRCUITS 248 (TN/OG) AND 133 (BK) FOR A SHORT TO GROUND (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the PCM C175b-19, circuit 248 (TN/OG), harness side and ground; and between the PCM C175b-30, circuit 133 (BK), harness side and ground.  <p>A0082240</p> <ul style="list-style-type: none"> Are the resistances greater than 10,000 ohms? 	<p>Yes INSTALL a new clockspring. REFER to Section 501-20B. DISCONNECT the battery. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p>
C7	<p>CHECK THE SPEED CONTROL SWITCH CIRCUITRY FOR AN OPEN</p> <ul style="list-style-type: none"> Measure the resistance between the PCM C175b-19, circuit 248 (TN/OG), harness side and the PCM C175b-30, circuit 133 (BK), harness side.  <p>N0002442</p> <ul style="list-style-type: none"> Is the resistance between 4,100 and 4,500 ohms? 	<p>Yes GO to C10.</p> <p>No GO to C8.</p>
C8	<p>CHECK CIRCUITS 248 (TN/OG) AND 133 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: Clockspring C2274. 	

(Continued)

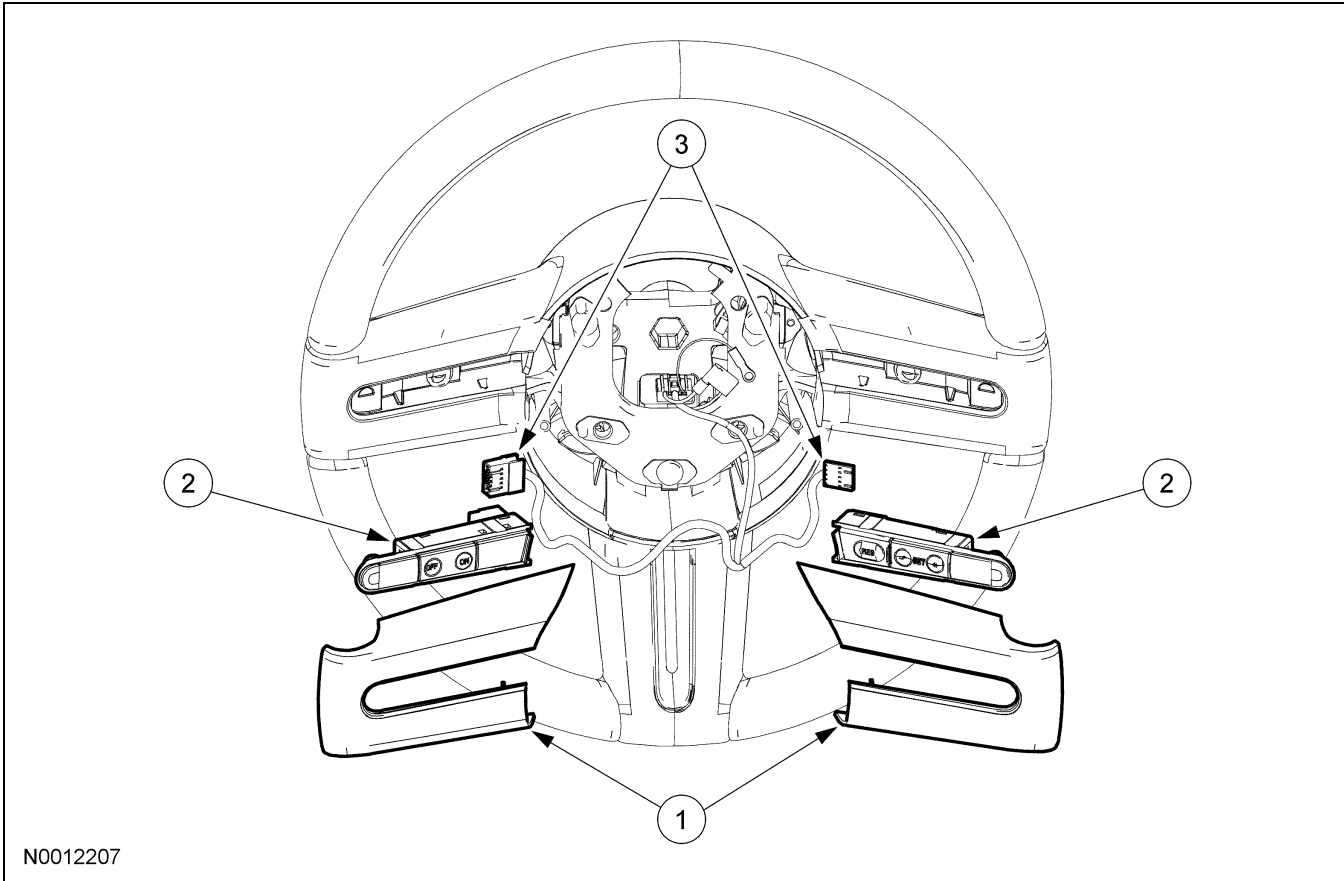
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST C: DTC P0579 OR DTC P0581 — SPEED CONTROL SWITCH CIRCUIT FAILURE (Continued)

Test Step	Result / Action to Take
<p>C8 CHECK CIRCUITS 248 (TN/OG) AND 133 (BK) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the PCM C175b-19, circuit 248 (TN/OG), harness side and the clockspring C2274-4, circuit 248 (TN/OG), harness side; and between the PCM C175b-30, circuit 133 (BK), harness side and the clockspring C2274-5, circuit 133 (BK), harness side.  <p>N0002809</p> <ul style="list-style-type: none"> Are the resistances less than 5 ohms? 	<p>Yes GO to C9.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
<p>C9 CHECK THE CLOCKSPRING</p> <ul style="list-style-type: none"> Remove the driver air bag module. Refer to Section 501-20B. Disconnect: Upper Clockspring. Measure the resistance between the clockspring C2274 pin 4, component side and the upper clockspring connector pin 2, component side; and between the clockspring C2274 pin 5, component side and the upper clockspring connector pin 3, component side.  <p>N0012049</p> <ul style="list-style-type: none"> Are the resistances less than 5 ohms? 	<p>Yes INSTALL a new speed control switch. REFER to Speed Control Switch in this section. DISCONNECT the battery. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new clockspring. REFER to Section 501-20B. DISCONNECT the battery. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p>
<p>C10 CHECK FOR CORRECT PCM OPERATION</p> <ul style="list-style-type: none"> Disconnect all the PCM connectors. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect all the PCM connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	<p>Yes INSTALL a new PCM. REFER to Section 303-14. INSTALL the driver air bag module. REFER to Section 501-20B. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. INSTALL the driver air bag module. REFER to Section 501-20B. CLEAR the DTCs. REPEAT the self-test.</p>

REMOVAL AND INSTALLATION

Speed Control Switch



Item	Part Number	Description
1	3F830	Steering wheel spoke finish panels (if equipped)
2	9E740	Speed control switches
3	—	Speed control switch electrical connectors

Removal and Installation

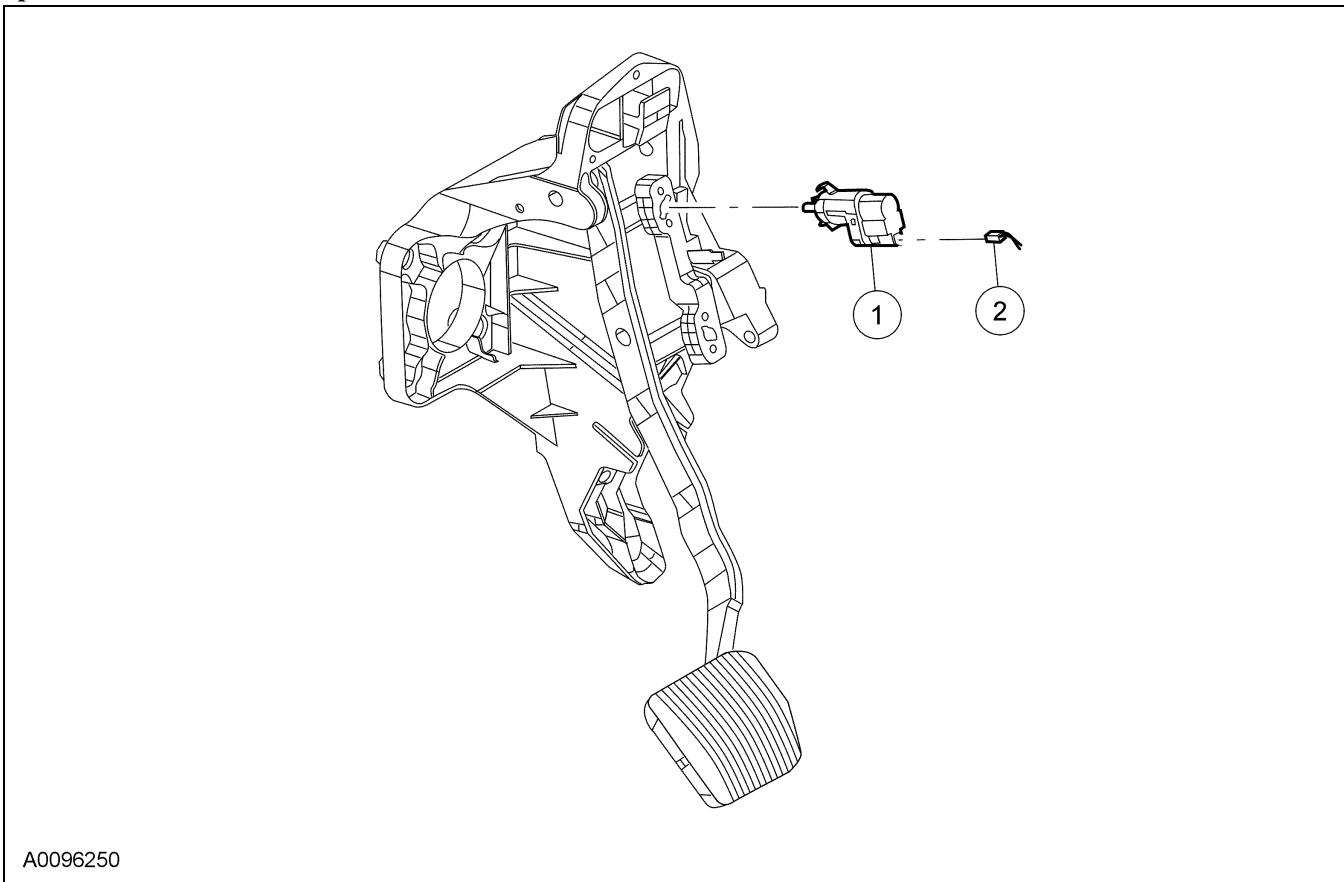
1. Remove the driver air bag module. For additional information, refer to Section 501-20B.

2. **NOTE:** Carefully grasp and pull the edges to remove the steering wheel spoke finish panels. If equipped, remove the steering wheel spoke finish panels.
3. **NOTE:** Using a small, flat-bladed screwdriver, gently pry up the speed control switches from the steering wheel, beginning at the outer edge. Use care not to damage the steering wheel. Remove the speed control switches.
 - Disconnect the electrical connectors.
4. To install, reverse the removal procedure.

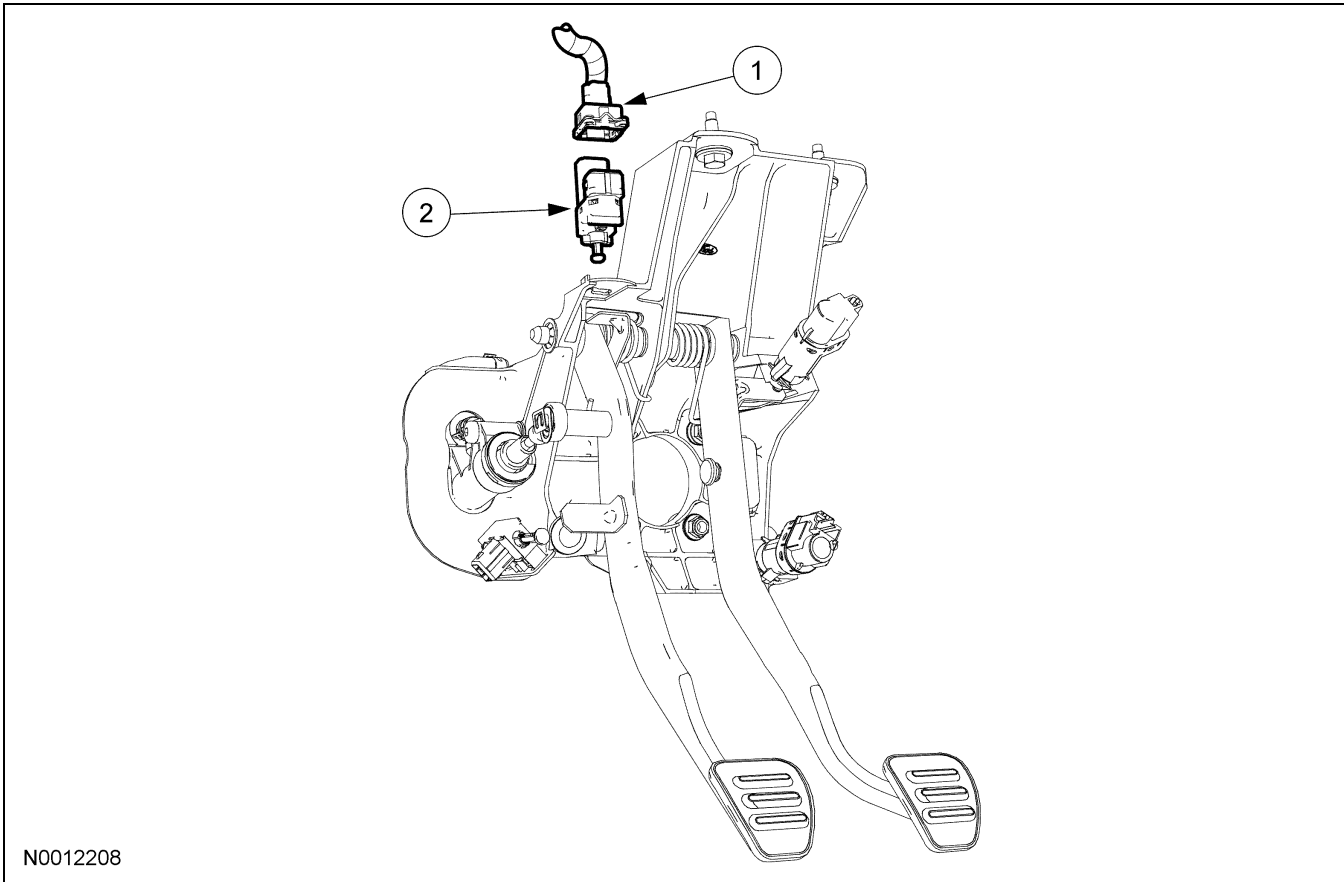
REMOVAL AND INSTALLATION

Speed Control Deactivator Switch

Speed Control Deactivator Switch — Brake Pedal



Item	Part Number	Description
1	9C872	Speed control deactivator switch
2	—	Speed control deactivator switch electrical connector

REMOVAL AND INSTALLATION (Continued)**Speed Control Deactivator Switch — Clutch Pedal**

Item	Part Number	Description
1	—	Speed control deactivator switch electrical connector
2	7C534	Speed control deactivator switch

Removal and Installation

⚠ CAUTION: Do not press, pull or otherwise move the brake pedal while removing or installing the speed control deactivator switch. The switch must be installed with the booster push rod attached to the brake pedal and with the brake pedal in the at-rest position. Installing the switch with the brake pedal in any other position results in incorrect adjustment and damage to the switch.

NOTE: This procedure is for both speed control deactivator switches.

- ⚠ CAUTION:** The switch plunger must be compressed for the switch to rotate in the bracket. Attempting to remove the switch with the plunger extended (during brake pedal apply) results in damage to the switch.

Remove the speed control deactivator switch.

- Disconnect the electrical connector.
- Rotate the speed control deactivator switch counterclockwise 45 degrees and remove the deactivator switch.

- NOTE:** When installing the speed control deactivator switch, it is automatically self-adjusting to the proper position. Do not pull up or push down on the pedal during installation. Initial installation of the speed control deactivator switch allows for one adjustment. If additional adjustments are necessary, install a new switch.

To install, reverse the removal procedure.