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June 7, 2018

**TO:** All U.S. Ford and Lincoln Dealers

**SUBJECT:** **Safety Recall 17S09 – Supplement #3**  
 Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and 2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine Coolant Level Sensor System Installation

**REF:** **Safety Recall 17S09 – Supplement #2**  
 Dated January 19, 2018

**New! REASON FOR THIS SUPPLEMENT**

- **Service Action Update:** *Parts are now available to complete this safety recall on Fiesta ST vehicles.*

**AFFECTED VEHICLES**

Vehicle	Model Year	Assembly Plant	Build Dates
Escape	2014	Louisville	February 12, 2013 through September 2, 2014
Fiesta ST	2014-2015	Cuautitlan	January 22, 2013 through May 27, 2014
Fusion	2013-2014	Hermosillo	February 15, 2012 through June 6, 2014
Transit Connect	2013-2015	Valencia	June 13, 2013 through December 14, 2014

Affected vehicles are identified in OASIS and FSA VIN Lists.

**REASON FOR THIS SAFETY RECALL**

In the affected vehicles, localized overheating of the engine cylinder head may cause the cylinder head to crack, causing a pressurized oil leak that may result in a fire in the engine compartment.

**New! SERVICE ACTION**

***All Affected Vehicles:***

*Parts ordering information and repair instructions to repair all affected vehicles are now available.*

Dealers are to perform repairs following the technical information that include enhancements to the engine cooling and control systems. This service must be performed on all affected vehicles at no charge to the vehicle owner.

**Important!** A small number of Escape vehicles will require unique PCM programming instructions. A small number of 2015 MY Transit Connect vehicles will require an additional cylinder head inspection. Please refer to Attachment VI prior to carrying out any repairs on Escape or 2015 MY Transit Connect vehicles, as certain VINs will require a contact to the Special Service Support Center (SSSC) for additional repair instructions.

Prepare your dealership to efficiently perform the repair:

- Review the repair instructions, which include 11 modular sub-procedures as identified in the Escape and Transit Connect technical information (Attachment IV).
- Watch the instructional videos and become familiar with the repair instructions and parts.

## **New! OWNER NOTIFICATION MAILING SCHEDULE**

Owners of record were notified of this safety recall via first-class mail the week of April 24, 2017.

Owners of Escape vehicles were notified of the final repair the week of January 1, 2018.

Owners of Fusion and Transit Connect vehicles were notified of the final repair the week of January 29, 2018.

*Owners of Fiesta ST vehicles will be notified of the final repair the week of June 18, 2018.*

Dealers should repair any affected vehicles that arrive at their dealerships, whether or not the customer has received a letter.

### **PLEASE NOTE:**

**Federal law requires dealers to complete this recall service before a new vehicle is delivered to the buyer or lessee. Violation of this requirement by a dealer could result in a civil penalty of up to \$21,000 per vehicle. Correct all vehicles in your new vehicle inventory before delivery.**

### **New! ATTACHMENTS**

*Attachment I: Administrative Information*  
*Attachment II: Labor Allowances and Parts Ordering Information*  
*Attachment III: Technical Information (Fiesta ST)*  
Attachment IV: Technical Information (Escape and Transit Connect)  
Attachment V: Inspection / Check Sheet  
Attachment VI: Unique Vehicle Repairs  
Attachment VII: Instructional Video Links  
Attachment VIII: Technical Information (Fusion)  
Owner Notification Letters  
Recall Reimbursement Plan

### **QUESTIONS & ASSISTANCE**

For questions and assistance, contact the Special Service Support Center (SSSC) via the SSSC Web Contact Site. The SSSC Web Contact Site can be accessed through the Professional Technician Society (PTS) website using the SSSC link listed at the bottom of the OASIS VIN report screen or listed under the SSSC tab.

Sincerely,



David J. Johnson

**Safety Recall 17S09 – Supplement #3**

Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**OASIS ACTIVATION**

OASIS was activated on March 28, 2017.

**New! FSA VIN LISTS ACTIVATION**

FSA VIN Lists were made available through <https://web.fsavinlists.dealerconnection.com> on March 28, 2017. Owner names and addresses were made available by February 9, 2018 for Escape, Fusion, and Transit Connect vehicles. *Owner names and addresses will be available by June 29, 2018 for Fiesta ST vehicles.*

**NOTE:** Your FSA VIN Lists may contain owner names and addresses obtained from motor vehicle registration records. The use of such motor vehicle registration data for any purpose other than in connection with this recall is a violation of law in several states, provinces, and countries. Accordingly, you must limit the use of this listing to the follow-up necessary to complete this recall.

**New! SOLD VEHICLES**

***All Affected Vehicles:***

- Owners of affected vehicles will be directed to dealers for repairs.
- Immediately contact any of your affected customers whose vehicles are not on your VIN list but are identified in OASIS. Give the customer a copy of the Owner Notification Letter (when available) and schedule a service date.
- Correct other affected vehicles identified in OASIS which are brought to your dealership.
- Dealers are to prioritize repairs of customer vehicles over repairs of new and used vehicle inventory.

**New! STOCK VEHICLES**

***All Affected Vehicles:***

Use OASIS to identify any affected vehicles in your used vehicle inventory.

**DEALER-OPERATED RENTAL VEHICLES**

The Fixing America's Surface Transportation (FAST) Act law effective June 2016 prohibits a rental company from selling, renting or leasing vehicles subject to a safety or compliance recall. Please consult your legal counsel for legal advice.

**TITLE BRANDED / SALVAGED VEHICLES**

Affected title branded and salvaged vehicles are eligible for this recall.

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Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**OWNER REFUNDS**

- **This safety recall must still be performed, even if the owner has paid for a previous repair. Claiming a refund will not close the recall on the vehicle.**
- Ford Motor Company is offering a refund for owner-paid repairs covered by this recall if the repair was performed prior to the date indicated in the reimbursement plan, which is posted with this bulletin. Owners are directed to seek reimbursement through authorized dealers or, at their option, directly through Ford Motor Company at P.O. Box 6251, Dearborn, MI 48121-6251.
- Dealers are also pre-approved to refund owner-paid emergency repairs that were performed away from an authorized servicing dealer after the end date specified in the reimbursement plan. Non-covered repairs, or those judged by Ford to be excessive, will not be reimbursed.
- Refunds will only be provided for the cost associated with an engine coolant leak or overheat.

**RENTAL VEHICLES**

Dealers are pre-approved for up to 1 day for a rental vehicle. Follow Extended Service Plan (ESP) guidelines for dollar amounts. Rentals will only be reimbursed for the day(s) the vehicle is at the dealership for part replacement. Prior approval for more than 1 rental day is required from the SSSC via the SSSC Web Contact Site.

**ADDITIONAL REPAIR (LABOR TIME AND/OR PARTS)**

Additional repairs identified as necessary to complete the FSA should be managed as follows:

- For related damage and access time requirements, refer to the Warranty and Policy Manual – Section 6 – Ford/Lincoln Program Policies – Field Service Actions (FSA) – Related Damage.
- For vehicles within new vehicle bumper-to-bumper warranty coverage, no SSSC approval is required.
  - Ford vehicles – 3 years or 36,000 miles
- For vehicles outside new vehicle bumper-to-bumper warranty coverage, dealers are pre-approved to claim up to \$500 in related damage for labor and/or parts.
  - For claims exceeding the pre-approved amount, submit an Approval Request to the SSSC Web Contact Site prior to completing the repair.

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Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**New! CLAIMS PREPARATION AND SUBMISSION**

- Enter claims using One Warranty Solution (OWS).
- When entering claims in DMS software, select claim type 31: Field Service Action. The FSA number 17S09 is the sub code.
- Additional labor and/or parts must be claimed as related damage on a separate repair line from the FSA.
- Dealers are authorized to claim up to \$500 of additional labor and/or parts without contacting the SSSC for approval. Follow the Actual Time Usage Guidelines and Service Management Responsibilities as identified in the Warranty and Policy Manual.
- For rental vehicle claiming, follow Extended Service Plan (ESP) guidelines for dollar amounts. Enter the total amount of the rental expense under Miscellaneous Expense code RENTAL.
- Submit refunds on a separate repair line.
  - Program Code: 17S09
  - Misc. Expense: ADMIN
  - Misc. Expense: REFUND
  - Misc. Expense: 0.2 Hrs.
- Multiple refunds should be submitted on one repair line and the invoice details for each repair should be detailed in the comments section of the claim.
- Claims for Escape interim repairs under labor operation code 17S09XX must have a repair date on or before December 13, 2017 to be eligible for payment.
- Claims for Fusion and Transit Connect interim repairs under labor operation codes 17S09YY and 17S09ZZ must have a repair date on or before January 19, 2018 to be eligible for payment.
- *Claims for Fiesta ST interim repairs under labor operation code 17S09YY must have a repair date on or before June 7, 2018 to be eligible for payment.*
- *Claims for Escape repairs under labor operation code 17S09B must have a repair date on or before June 7, 2018 to be eligible for payment. For Ford internal administrative purposes the Escape labor operation is being changed, however, repair procedures and labor times have not changed.*
- ***Provision for locally obtained Lead-free solder (SAC305 or equivalent) required for Fiesta ST models only:*** *Submit on the same repair line as the repair. Can be claimed with labor operation code 17S09J only.*
  - *Program Code: 17S09*
  - *Misc. Expense: OTHER*
  - *Misc. Expense: Claim Actual Cost up to \$2.00*

**Safety Recall 17S09 – Supplement #3**

Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**New! LABOR ALLOWANCES**

Description	Vehicle	Labor Operation	Labor Time
Install Coolant Level Sensor System	Escape	17S09H	3.8 Hours
Install Coolant Level Sensor System	Fusion	17S09F	4.3 Hours
Install Coolant Level Sensor System	Transit Connect	17S09G	3.5 Hours
<i>Install Coolant Level Sensor System</i>	<i>Fiesta ST</i>	<i>17S09J</i>	<i>5.3 Hours</i>
Powertrain assembly mount neutralizing - Claim as needed - Use in combination with 17S09B/F/G	Escape and Transit Connect	17S09D	0.2 Hours
	Fusion	17S09E	0.3 Hours

*Escape repairs under labor operation code 17S09B must have a repair date on or before June 7, 2018 to be eligible for payment. For Ford internal administrative purposes the Escape labor operation is being changed, however, repair procedures and labor times have not changed.*

**NOTE:** The labor operations below are for interim repairs and will NOT close the safety recall.

Description	Labor Operation	Labor Time
Perform cooling system pressure test and add coolant as needed - Escape (must have a repair date on/before December 13, 2017 to be eligible for payment)	17S09XX	0.6 Hours
Perform cooling system pressure test and add coolant as needed - Fiesta ST <i>(must have a repair date on/before June 7, 2018 to be eligible for payment)</i>	17S09YY	0.3 Hours
Perform cooling system pressure test and add coolant as needed - Fusion (must have a repair date on/before January 19, 2018 to be eligible for payment)		
Perform cooling system pressure test and add coolant as needed - Transit Connect (must have a repair date on/before January 19, 2018 to be eligible for payment)	17S09ZZ	0.4 Hours

**Safety Recall 17S09 – Supplement #3**

Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**New! PARTS REQUIREMENTS / ORDERING INFORMATION****Escape Vehicles Built on or before August 23, 2014:**

**Note:** These vehicles use a 6-Pin Wiring Harness

Part Number	Description	Order Quantity	Claim Quantity
GV6Z-9P449-E	Coolant Level Sensor Kit	1	1
GV6Z-9P449-A	Degas Bottle and Cap Kit	1	1
EV4Z-14A411-F	6-Pin EPAS Connector Coolant Stand-pipe Wire Harness	1	1
VC-3DIL-B (US) CVC-3DIL-B (Canada)	Motorcraft Orange Antifreeze / Coolant Prediluted	1 Gallon	1 Gallon

**Escape Vehicles Built on or after August 24, 2014 and all Transit Connect Vehicles:**

**Note:** These vehicles use a 3-Pin Wiring Harness.

Part Number	Description	Order Quantity	Claim Quantity
GV6Z-9P449-E	Coolant Level Sensor Kit	1	1
GV6Z-9P449-A	Degas Bottle and Cap Kit	1	1
EV4Z-14A411-H	3-Pin EPAS Connector Coolant Stand-pipe Wire Harness	1	1
VC-3DIL-B (US) CVC-3DIL-B (Canada)	Motorcraft Orange Antifreeze / Coolant Prediluted	1 Gallon	1 Gallon

**Fusion Vehicles:**

Part Number	Description	Order Quantity	Claim Quantity
DG9Z-9P449-A	Coolant Level Sensor Kit	1	1
GV6Z-9P449-C	Thermostat Kit	1	1
DG9Z-14A411-J	Coolant Stand-pipe Wire Harness	1	1
VC-3DIL-B (US) CVC-3DIL-B (Canada)	Motorcraft Orange Antifreeze / Coolant Prediluted	1 Gallon	1 Gallon

To place an order for the PCM connector back shell kit submit a VIN-specific Part Order contact via the SSSC Web Contact Site.

Part Number	Description	Order Quantity	Claim Quantity
DG9Z-14A666-L	PCM Connector Back Shell Kit – <b>Fusion Vehicles with Manual Transmission Only</b>	1	1

Dealers will be notified via a DOES II communication if circumstances warrant a change in part supply strategy and when open ordering resumes.

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Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**New! PARTS REQUIREMENTS / ORDERING INFORMATION (Continued)*****Fiesta ST Vehicles:***

<b><i>Part Number</i></b>	<b><i>Description</i></b>	<b><i>Order Quantity</i></b>	<b><i>Claim Quantity</i></b>
<b><i>H1BZ-9P449-F</i></b>	<b><i>Coolant Level Sensor Kit</i></b>	<b><i>1</i></b>	<b><i>1</i></b>
<b><i>GV6Z-9P449-C</i></b>	<b><i>Thermostat Kit</i></b>	<b><i>1</i></b>	<b><i>1</i></b>
<b><i>C1BZ-14A411-L</i></b>	<b><i>Coolant Stand-pipe Wire Harness</i></b>	<b><i>1</i></b>	<b><i>1</i></b>
<b><i>VC-3DIL-B (US)</i></b> <b><i>CVC-3DIL-B (Canada)</i></b>	<b><i>Motorcraft Orange Antifreeze /</i></b> <b><i>Coolant Prediluted</i></b>	<b><i>Up to 1 Gallon</i></b> <b><i>(only as required)</i></b>	<b><i>Up to 1 Gallon</i></b> <b><i>(only as required)</i></b>
<b><i>Obtain Locally</i></b>	<b><i>Lead-free solder (SAC305 or</i></b> <b><i>equivalent)</i></b>	<b><i>Claim as Misc. Expense: OTHER</i></b>	

The DOR/COR number for this recall is 51077.

Order your parts through normal order processing channels. To guarantee the shortest delivery time, an emergency order for parts must be placed.

**DEALER PRICE**

For latest prices, refer to DOES II.

**PARTS RETENTION AND RETURN**

Follow the provisions of the Warranty and Policy Manual, Section 1 - WARRANTY PARTS RETENTION AND RETURN POLICIES.

**EXCESS STOCK RETURN**

Excess stock returned for credit must have been purchased from Ford Customer Service Division in accordance with Policy Procedure Bulletin 4000.

## CERTAIN 2013-2014 FUSION, 2013-2015 TRANSIT CONNECT, 2014 ESCAPE, AND 2014-2015 FIESTA ST VEHICLES EQUIPPED WITH A 1.6L ECOBOOST ENGINE — COOLANT LEVEL SENSOR SYSTEM INSTALLATION

### 2014-2015 FIESTA ST TECHNICAL INFORMATION

#### OVERVIEW

In the affected vehicles, localized overheating of the engine cylinder head may cause the cylinder head to crack, causing a pressurized oil leak that may result in a fire in the engine compartment.

Service parts and repair procedures are now available to address this safety recall. Dealers are to perform repairs following the technical information in this document that include enhancements to the engine cooling and control systems. This service must be performed on all affected vehicles at no charge to the vehicle owner.

Due to the complexity of this repair, the following considerations have been made to help the repair procedure go as smoothly as possible:

- Repair procedures have been divided alphabetically into multiple separate procedures.
- Parts have been packaged into kits.
- Each procedure includes:
  - Overview
  - List and photo of the parts required
  - List of unique tools needed
  - Service tips to help complete the repair

**NOTE:** Please read this procedure in its entirety, prior to performing repairs. Additionally, instructional videos have been developed to assist with the repair. Please refer to Attachment VII: Instructional Video Links to view the videos.



**Recommended Tools:**

<b>General Tools</b>	
1/4" Drive Ratchet (Power and Hand Tool)	Cut-Off Wheel
1/4" Drive 7, 8, and 10 mm Shallow Sockets	Terminal De-Pin Tools
1/4" Drive 10 mm, 12 mm Deep Sockets	Soldering Iron
1/4" Drive 8 mm Swivel Socket	Heat Gun
1/4" Drive E8 Inverted Torx Socket	Wire Strippers
1/4" Drive 6 in (152 mm) and 12 in (304 mm) Extensions	Tape Measure/ Flex Ruler
3/8" Drive Ratchet (Power and Hand Tool)	
3/8" Drive 13 mm, and 15 mm Deep Impact Socket	<b>General Equipment</b>
3/8" Drive 15 mm Shallow Impact Socket	Floor Jack
3/8" Drive 15 mm Swivel Impact Socket	Wood Block
3/8" Drive 6 in (152 mm) Extension	Coolant Pressure Tester
1/2" Drive Ratchet Power Tool and Hand Tool	Drain Pan
1/4" and 1/2" Drive Impact Swivel	Battery Charger
1/2" Drive 15mm Shallow Impact Socket	Tape/Electrical Tape
1/2" Drive 6" (152 mm) Impact Extension	Extension Cord
1/2" Drive Torque Wrench	
1/4" And 3/8" Drive Torque Wrench	<b>Special Tools</b>
13 mm and 15 mm Ratchet Wrench	Hydrometer/Refractometer
17 mm Wrench 15 in (381 mm)	Vacuum Tester/Re-filler
Channel Lock Pliers	IDS and VCM II
Trim Tool 7 in (177 mm) and 12 in (304 mm)	
Inspection Mirror	
Two Jaw Puller	
Phillips Screwdriver 20 in (508 mm)	
Paint Stick/Pen	
Scissors	
Cable Operated Hose Pliers	
5 in (127 mm) and 12 in (304 mm) Pick Tool	
Pocket Screwdriver	
Side Cutters	
Needle Nose Pliers 9 in (228 mm)	
Hose Hook Tool	



## SERVICE PROCEDURE

### Procedure A - Initial Disassembly and Preparation for Inspection

**OVERVIEW:** This procedure details the components to be removed to enable initial vehicle inspection.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Please note the following:

- The Inspection / Check Sheet (Attachment V) must be printed and started during "Procedure A".
- Cover the turbocharger inlet opening to prevent dropping any parts or debris into the turbocharger while the turbocharger inlet pipe is off.

1. Print a copy of the Inspection / Check Sheet (Attachment V), to record vehicle information and inspection/repair information for the vehicle. The Inspection / Check Sheet is to be attached/filed with the recall repair order following completion, it does not need to be provided to Ford at this time.

2. Fill out top of Inspection / Check Sheet including:

- VIN
- Technician ID
- Repair Order Number
- Repair Date
- Vehicle Mileage
- Vehicle Build Date
- Open Recalls

3. Using OASIS, document vehicle build date on the Inspection / Check Sheet.

4. With the vehicle in NEUTRAL, position it on a hoist. Please follow the Workshop Manual (WSM) procedures in Section 100-02.

5. Using IDS/scan tool, retrieve and record DTCs on the Inspection / Check Sheet.

- Any DTCs recorded will be used later in this procedure.

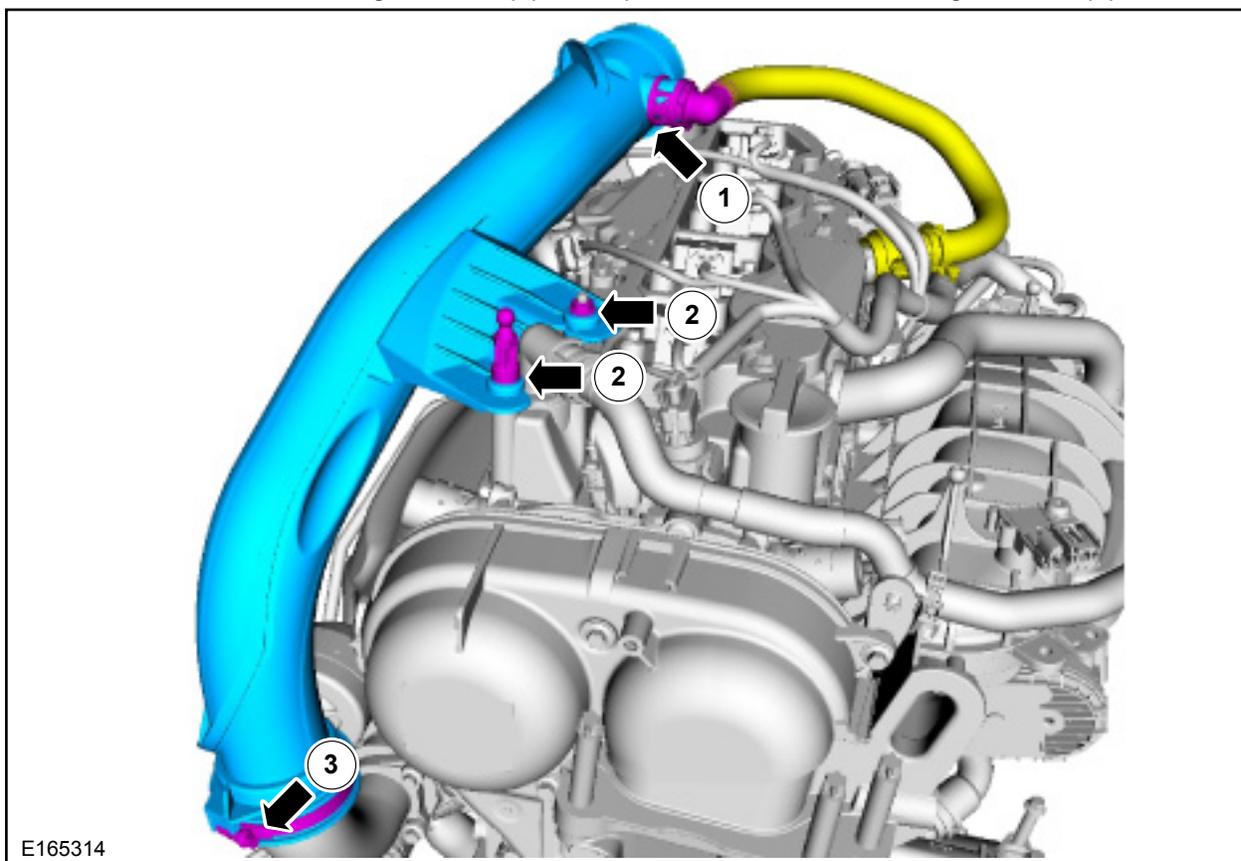
6. Remove the cowl panel grille and cowl panel. Please follow the WSM procedures in Section 501-02.



**NOTICE:** When working with 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:** Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

7. Remove the air cleaner outlet pipe. Please follow the WSM procedures in Section 303-12C.
8. Remove the generator. Please follow the WSM procedures in Section 412-02.
9. Remove the turbocharger air inlet pipe. See Figure A1.
  1. Disconnect the crankcase ventilation tube quick release coupling. Please follow the WSM procedures in Section 310-00C.
  2. Remove the turbocharger air inlet pipe retaining nut, the ball stud.
  3. Loosen the turbocharger air inlet pipe clamp and remove the turbocharger air inlet pipe.



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**FIGURE A1**



10. Detach the three wire harness retainers, disconnect the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve electrical connectors.  
See Figure A2.

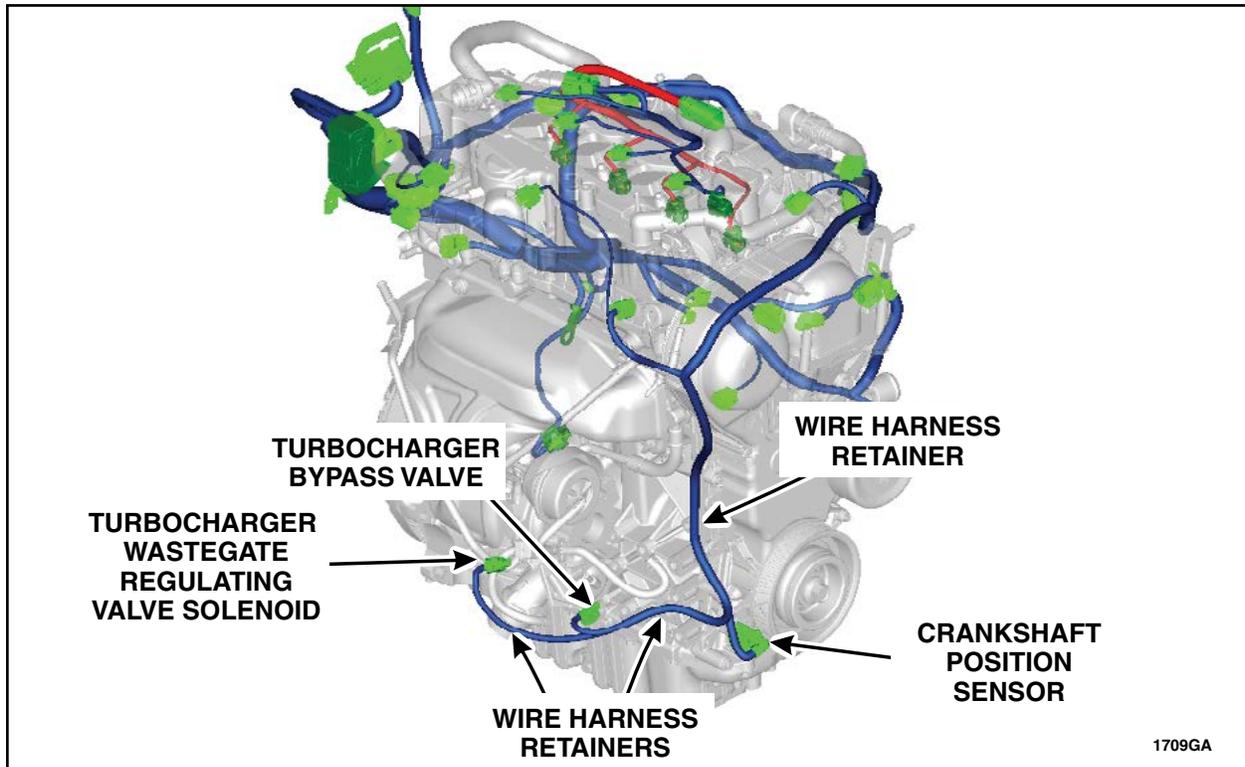


FIGURE A2



## Procedure B - Inspection / Check Sheet Completion

**OVERVIEW:** The Inspection must be completed and documented on the Inspection / Check Sheet. The inspection will check for obvious concerns that require correction with additional focus on cooling system concerns such as:

- Internal coolant leaks
- External coolant leaks
- Any DTC(s) that could indicate a recent engine overheat event or internal engine damage that may have resulted from a previous cooling system concern.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:** Rotunda Cooling System Pressure Tester (STN12270) and adapter (Snap-On TA52, AST ASSFZ-47, Redline RDL95-0750 or equivalent).

**SERVICE TIPS:** Use standard Workshop Manual and PC/ED Diagnostics, if necessary, to diagnose any cooling system or misfire DTC(s) retrieved and for any coolant loss concerns.

**NOTE:** Perform an underhood visual inspection for any obvious coolant, oil, transmission, or fuel leaks.

**NOTE:** If any concerns are identified repair as related damage before proceeding. If the coolant pressure test identifies concerns with the degas bottle, turbocharger return tube, upper section of the degas bottle return hose, or quick connect T-fitting at the coolant shutoff solenoid valve; note the condition. These items will be replaced as part of this recall. Refer to Dealer Bulletin Attachment I, Related Damage, for related damage claiming.

## Vehicle Inspection

1. Visually inspect the coolant level in the degas bottle.

- If the coolant level **is** visible in the degas bottle, proceed to Step 2.
- If the coolant level **is not** visible in the degas bottle, add coolant as necessary, and proceed to Step 2.

**NOTE:** Any gross loss of coolant must be identified and repaired prior to proceeding.

2. Remove the degas bottle cap.

3. Install a coolant pressure tester with adapter onto the degas bottle. Pressurize to 138 kPa (20 psi). Once stabilized, pressure should hold at 138 kPa (20 psi) for a minimum of 2 minutes.

- If cooling system pressure does not hold for a minimum of 2 minutes, the source of pressure loss must be identified and repaired as necessary before proceeding.

4. Visually check for coolant leaks with the system under pressure.



5. Check the engine oil level to ensure it is within normal range, note if it is overfilled. Visually check for engine oil leaks at the rear surface of the cylinder head, above exhaust manifold, that may be the result of a crack in the cylinder head. See Figure B1.

- If an oil leak is detected at the rear surface of the cylinder head, replace the complete cylinder head assembly before proceeding.

**NOTE:** The turbocharger coolant tubes and exhaust manifold heat shield are removed for clarity.

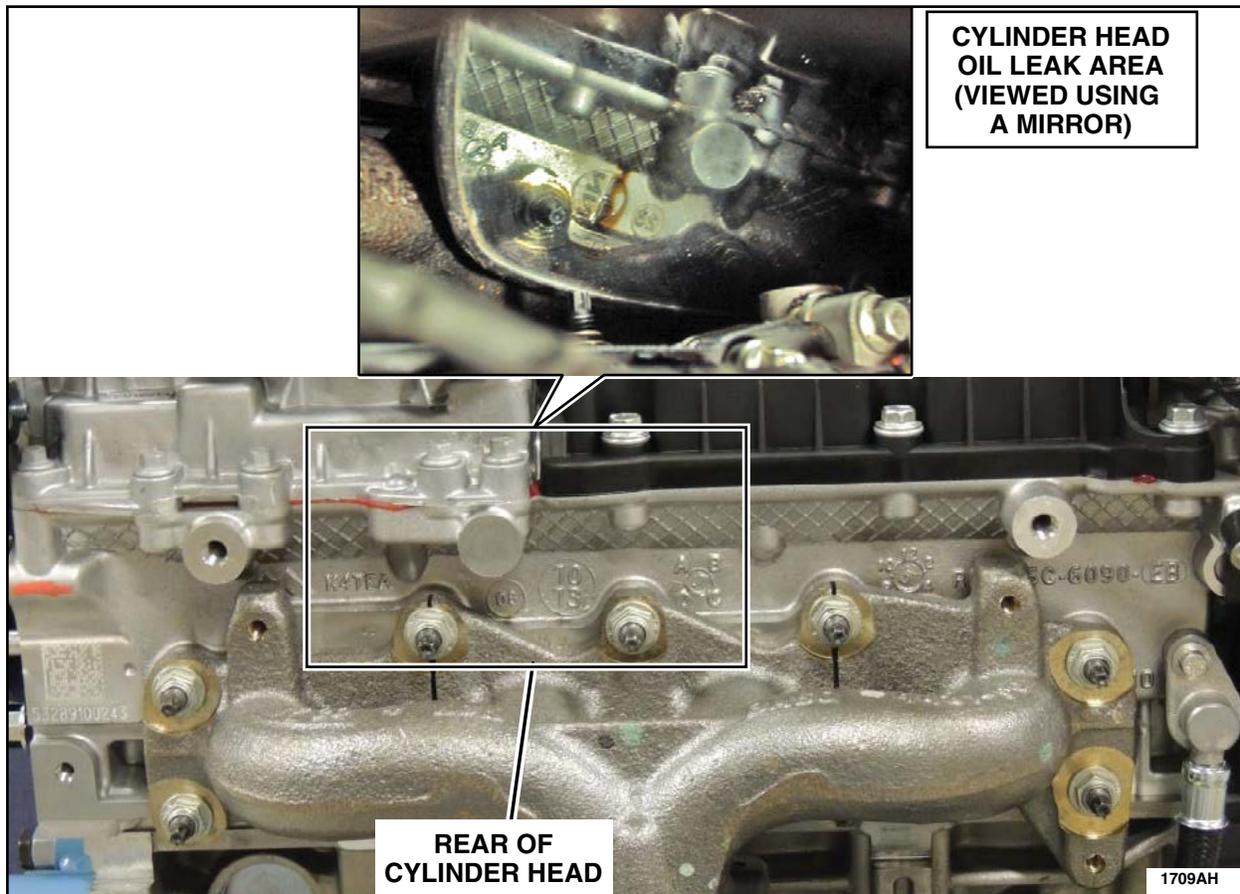


FIGURE B1



6. DTCs - Note and identify the cause of the following DTCs before proceeding:

- If additional DTCs are present, diagnose and repair as required.

**NOTE:** Diagnosis for any of the following DTCs may require reinstallation of the air intake components and battery. Perform diagnosis and repairs as necessary.

<b>Cooling System DTCs</b>	
<b>P0217</b>	Engine Coolant Over Temperature Condition
<b>P0218</b>	Transmission Fluid Over Temperature Condition
<b>P0219</b>	Engine Over Speed Condition
<b>P1299</b>	Cylinder Head Over Temperature Protection Active
<b>Engine Misfire DTCs</b>	
<b>P0300</b>	Random Misfire Detected
<b>P030x</b>	Cylinder X Misfire Detected
<b>P0313</b>	Misfire Detected With Low Fuel
<b>P0316</b>	Misfire Detected On Startup (First 1000 Revolutions)

7. Note any issues and/or repairs made on the Inspection / Check Sheet.

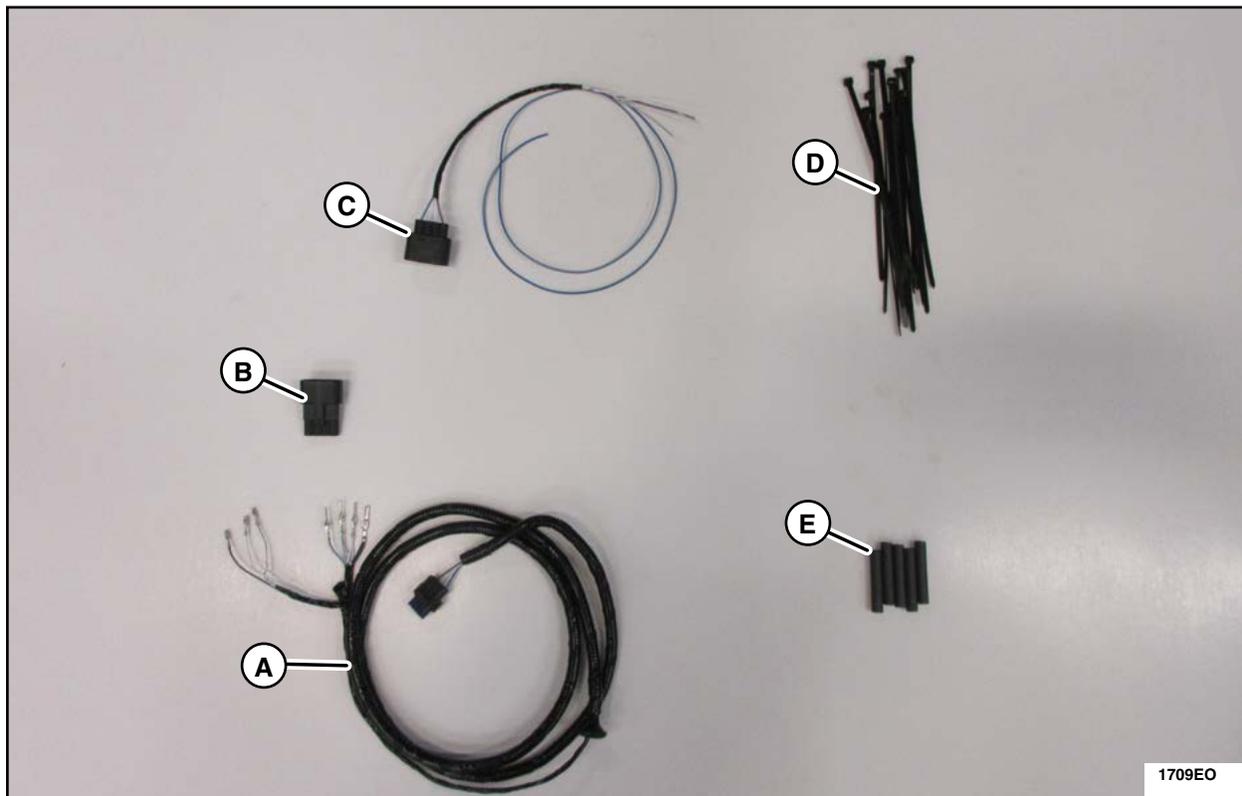


**Procedure C - Not Required for Fiesta ST Vehicles**

**Procedure D - Coolant Stand-pipe Wire Harness Installation**

**OVERVIEW:** The coolant stand-pipe wire harness is installed in this procedure. This is necessary to complete the connections which are a part of the CAN Network. The CAN Network must be complete to allow module programming.

**PARTS / SUPPLIES REQUIRED:**



A	Coolant Stand-pipe Wire Harness
B	Male Connector Shell
C	Female Connector Shell and Wire Harness
D	Tie-Straps
E	Heat Shrink Tubing x5

**UNIQUE TOOL REQUIREMENTS:** Soldering Iron, Heat Gun

**SERVICE TIPS:** None



1. Remove the battery. Please follow the procedures in WSM Section 414-01.
2. Position the LH front door weatherstrip aside, remove the push-pins, the scuff plate and the lower cowl trim panel. See Figure D1.

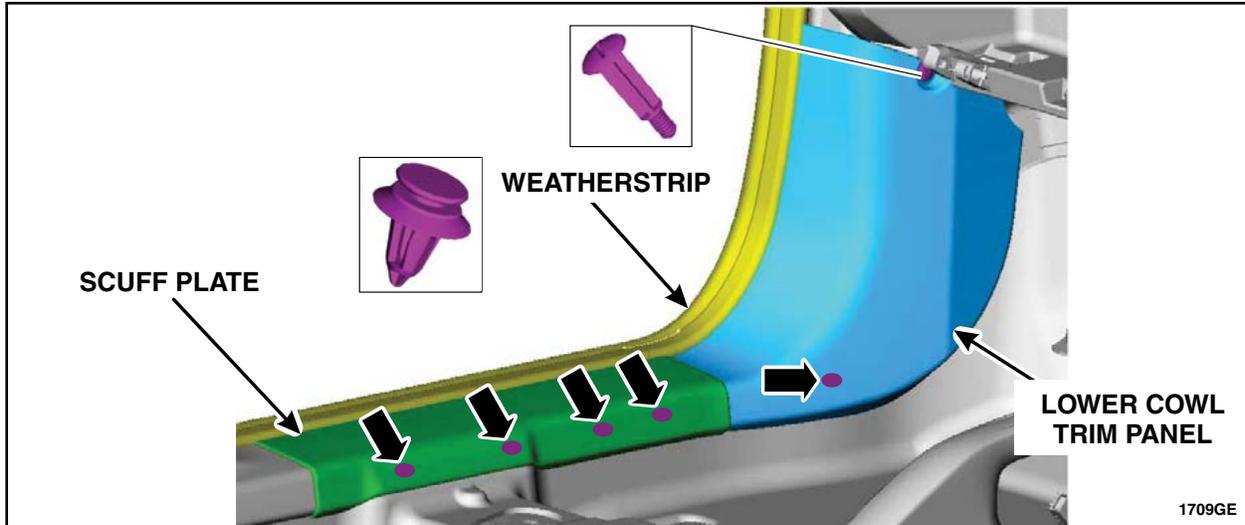


FIGURE D1

3. Loosen the bolt and disconnect connector C211. Remove the two retainers and position aside connector C211. See Figure D2.

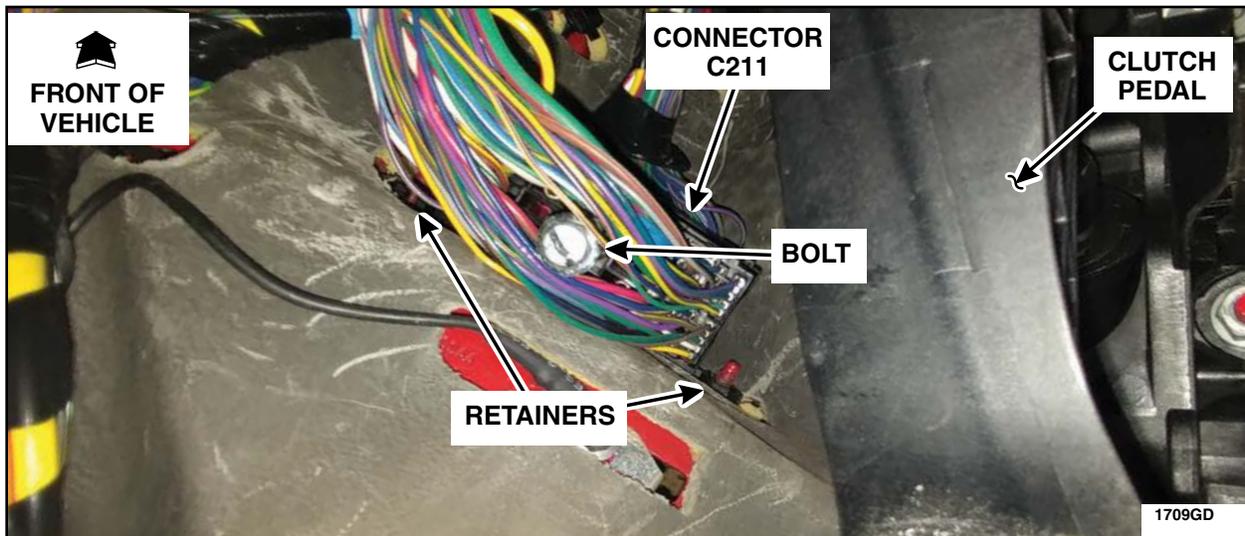


FIGURE D2



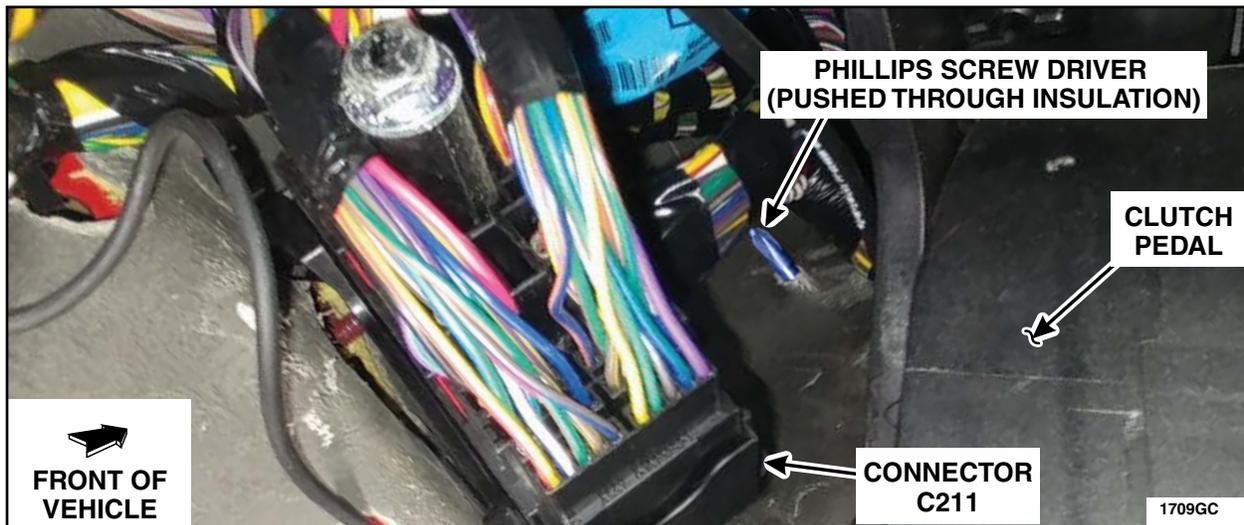
**NOTICE:** Use a blunt tip Phillips screwdriver and do not push far inward through the bulkhead insulation. Use caution to prevent damage to the wire harness on the interior side of the vehicle near the parking brake cable/bulkhead plug. See Figures D3 and D4.

4. Remove the bulkhead plug located on the driver's side of the vehicle near the hood release cable, by inserting a Phillips screw driver and push inward to dis-engage the plug. See Figure D3.



**FIGURE D3**

5. Continue pushing inward on the Phillips screw driver to push through the bulkhead insulation and then remove the Phillips screw driver from the hole. See Figure D4.

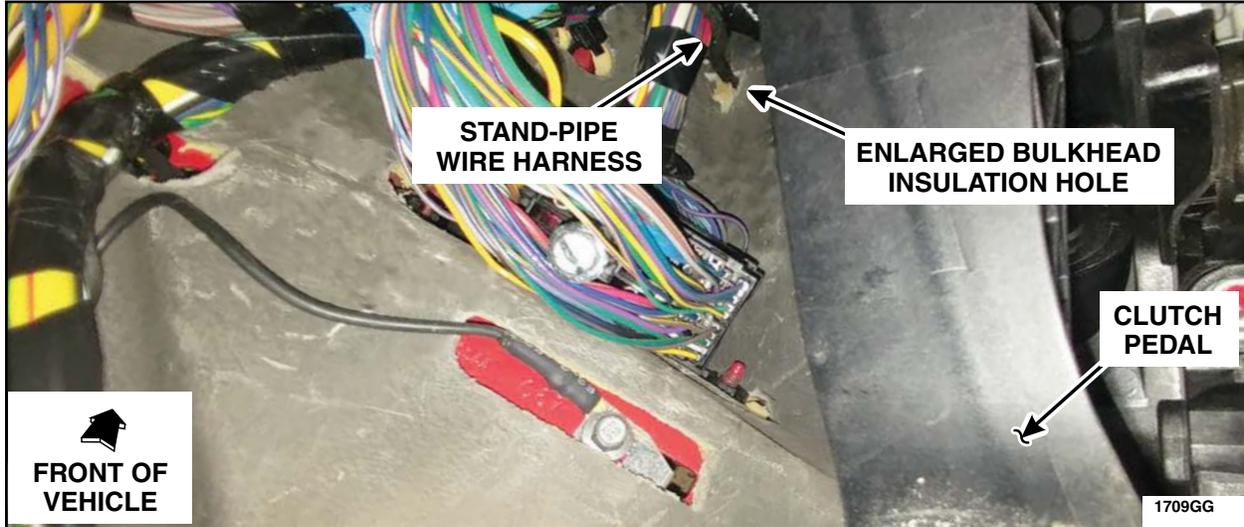


**FIGURE D4**



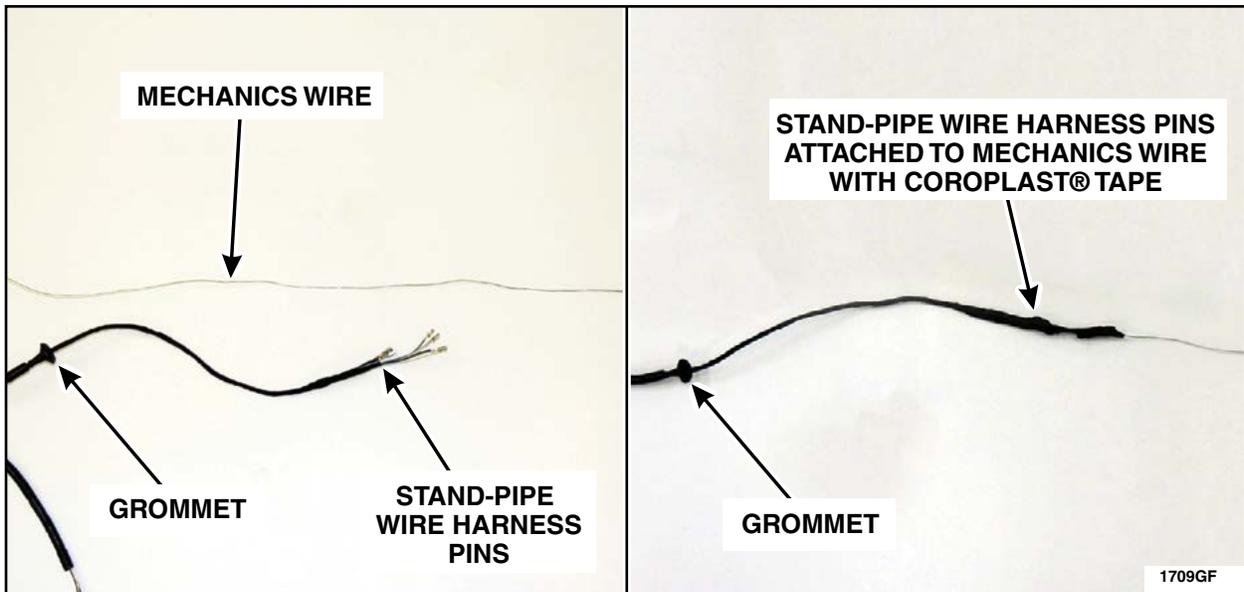
- Widen the hole in the insulation using a utility knife. Use caution not to damage the surrounding wire harnesses or hood release cable. See Figure D5.

**NOTE:** Stand-pipe wire harness shown installed for reference.



**FIGURE D5**

- Using the Coroplast® tape provided in the parts kit secure the stand-pipe wire harness pins and wires to a length of mechanics wire. See Figure D6.



**FIGURE D6**



8. Fish the stand-pipe wire harness through the bulkhead, pull the grommet through the bulkhead and then back out slightly to seat the slot in the grommet in the bulkhead sheet metal. See Figure D7.

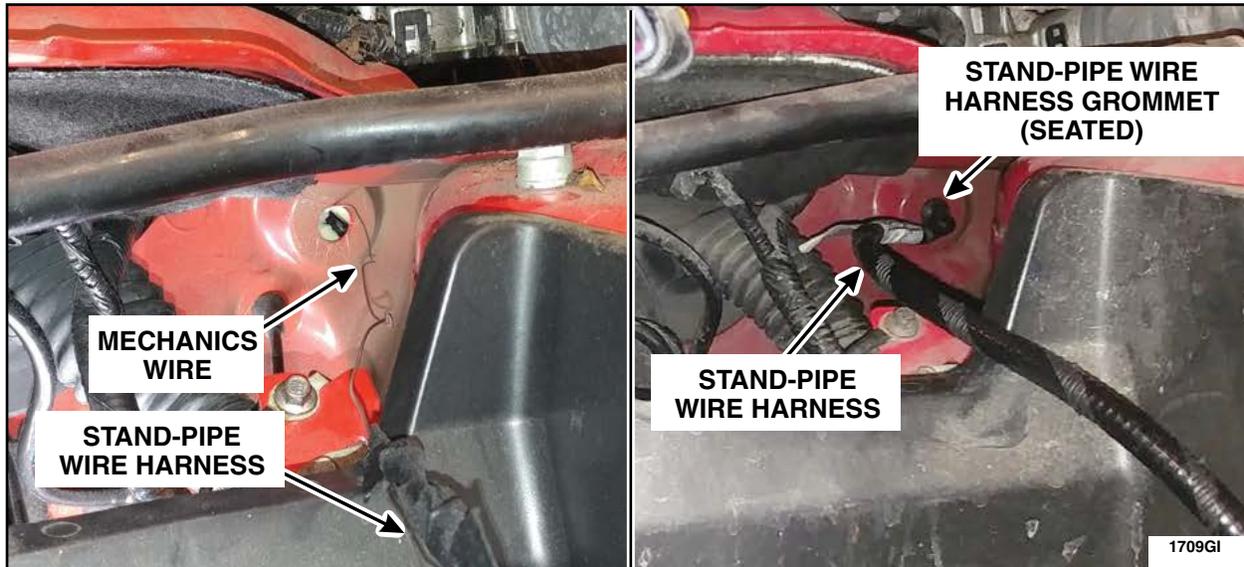


FIGURE D7

9. Route the coolant stand-pipe wiring harness along the engine compartment wire harness, from the left-hand side of the engine compartment to the degas bottle area. Use tie-straps to secure the wiring harness to the engine compartment wiring harness. See Figure D8

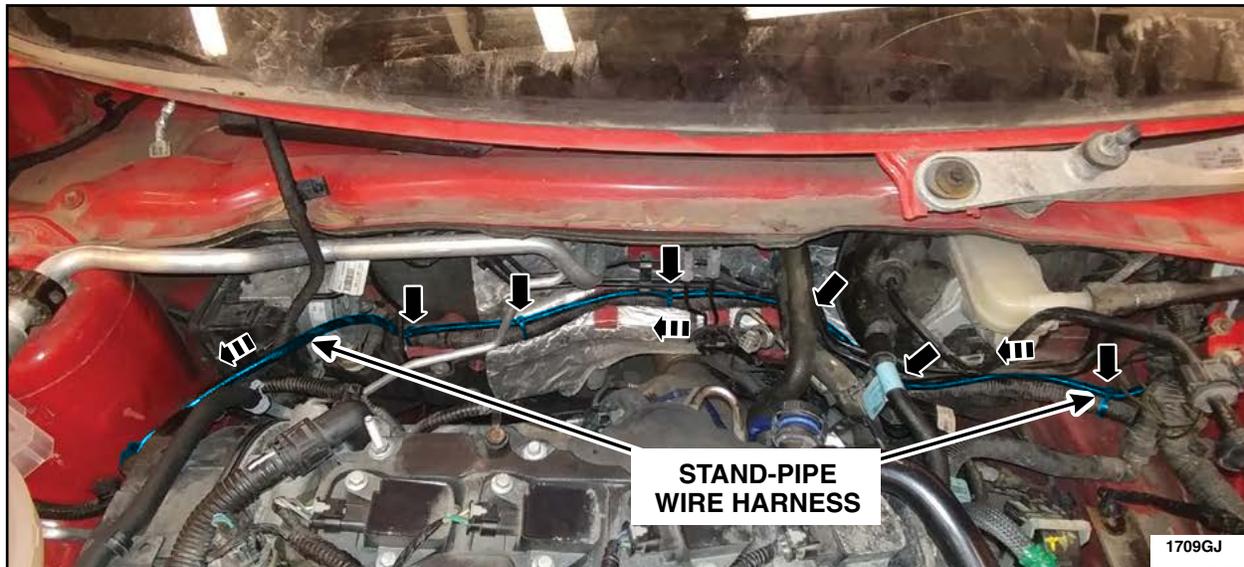
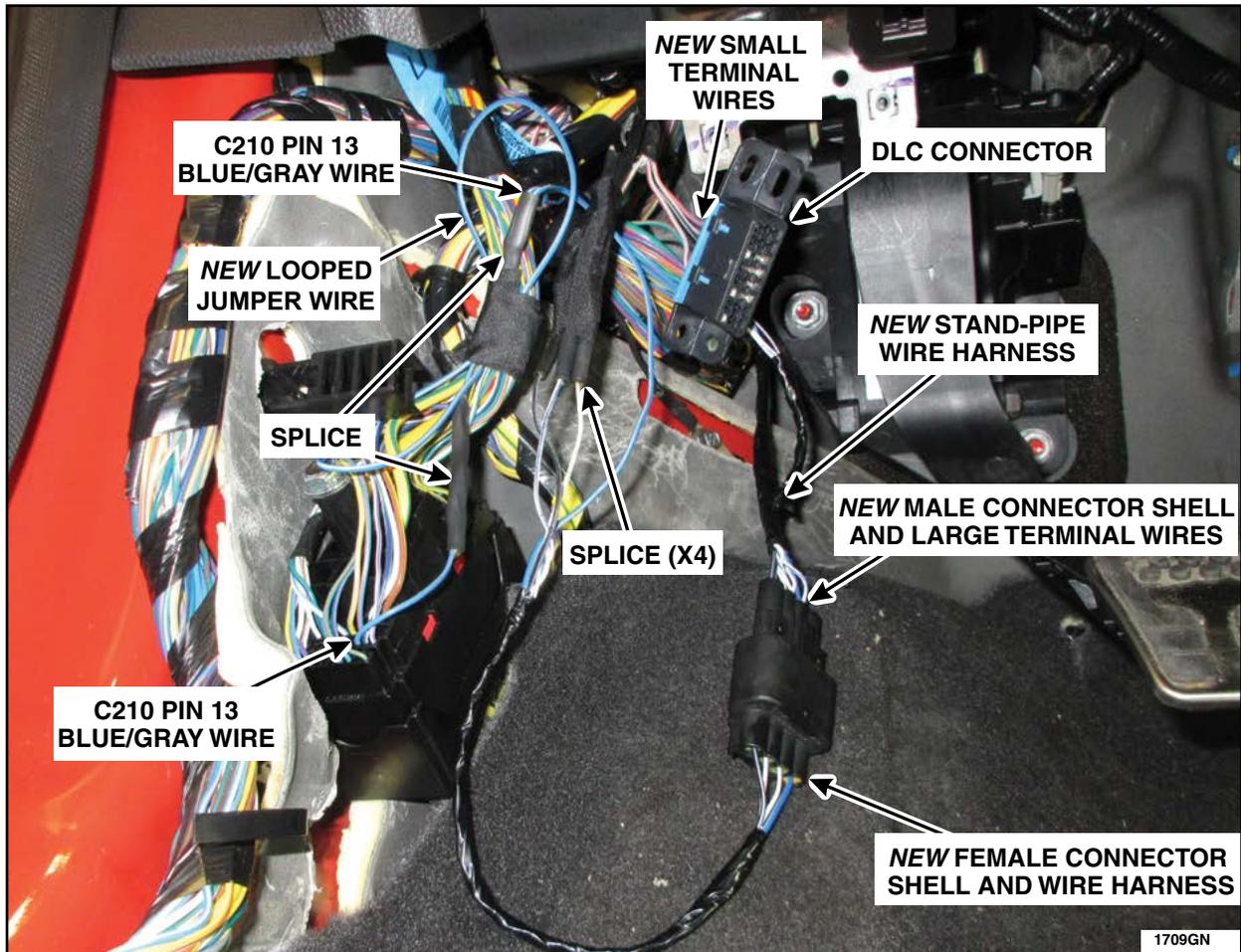


FIGURE D8



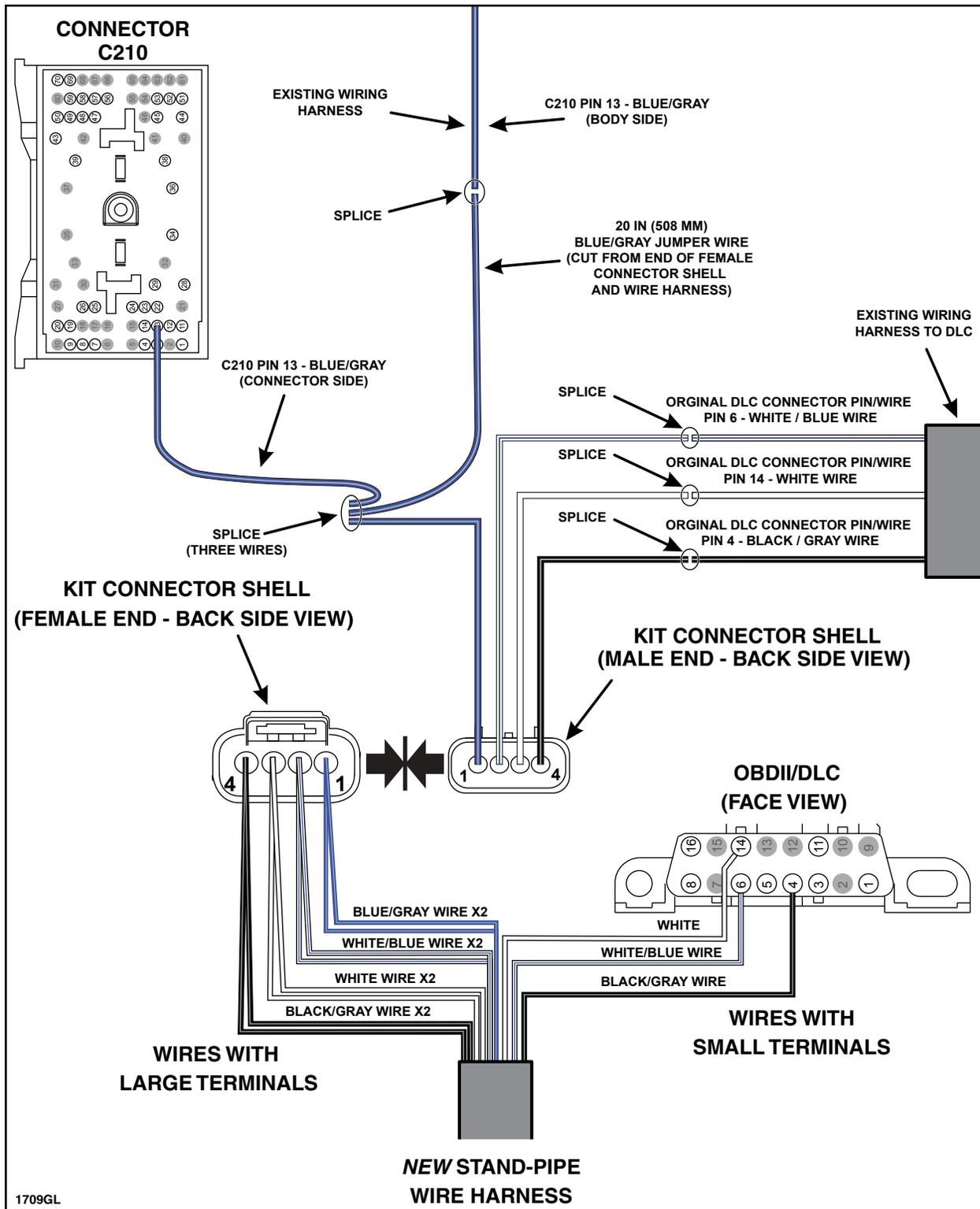
**NOTE:** A completed view of the modified vehicle wiring is provide for reference during this procedure. Review the steps and diagrams below prior to proceeding. See Figure D9.



**FIGURE D9**



**NOTE:** A wire diagram of the modified vehicle wiring is provide for reference during this procedure.  
 Review the steps and diagrams below prior to proceeding. See Figure D10.



**FIGURE D10**



10. Remove the two bolts and position the OBDII/Data Link Connector (DLC) aside.

11. From the DLC connector, remove the following wires/pins from the connector shell (see Figure D11):

- Pin 4 - Black/Gray wire
- Pin 6 - White/Blue wire
- Pin 14 - White wire

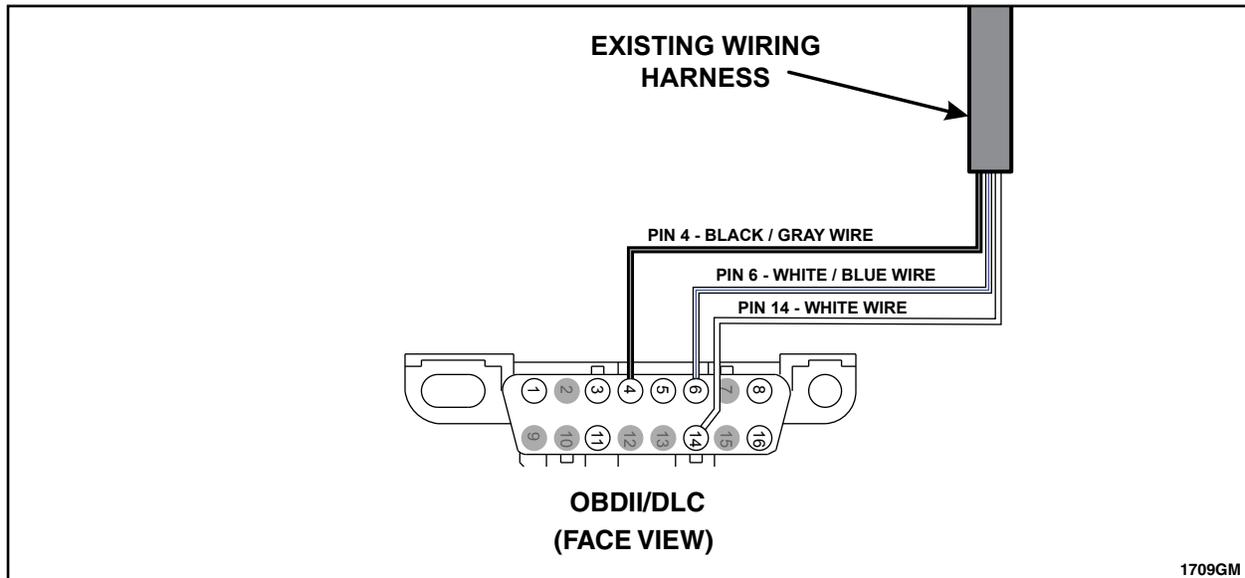


FIGURE D11

12. Cut the metal terminal ends off of the three wires removed from the OBDII/DLC connector shell. The wires will be spliced later in this procedure. See Figure D12.



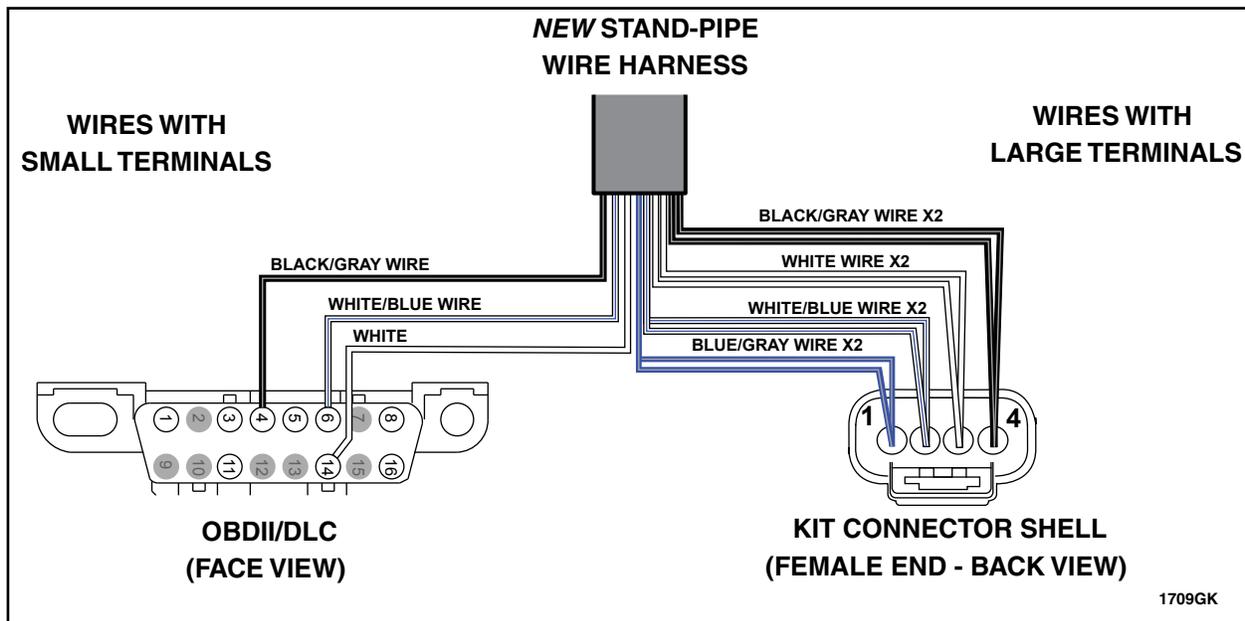
FIGURE D12



**NOTICE:** Review the wire diagrams and splicing locations shown in Figure 10, prior to proceeding. Follow the recommended splicing techniques found in the wire diagrams when splicing wires. Use only ES-1 dual wall heat shrink tubing on each wire to be spliced.

13. Insert the smaller terminal wires from the *new* stand-pipe wire harness into the OBDII/DLC connector as follows (See Figures D9 and D13):

- Pin 4 - *new* Black/Gray wire
- Pin 6 - *new* White/Blue wire
- Pin 14 - *new* White wire



**FIGURE D13**

14. Insert the larger terminal wires from the *new* stand-pipe wire harness into the *new* female connector shell as follows (See Figures D9 and D13):

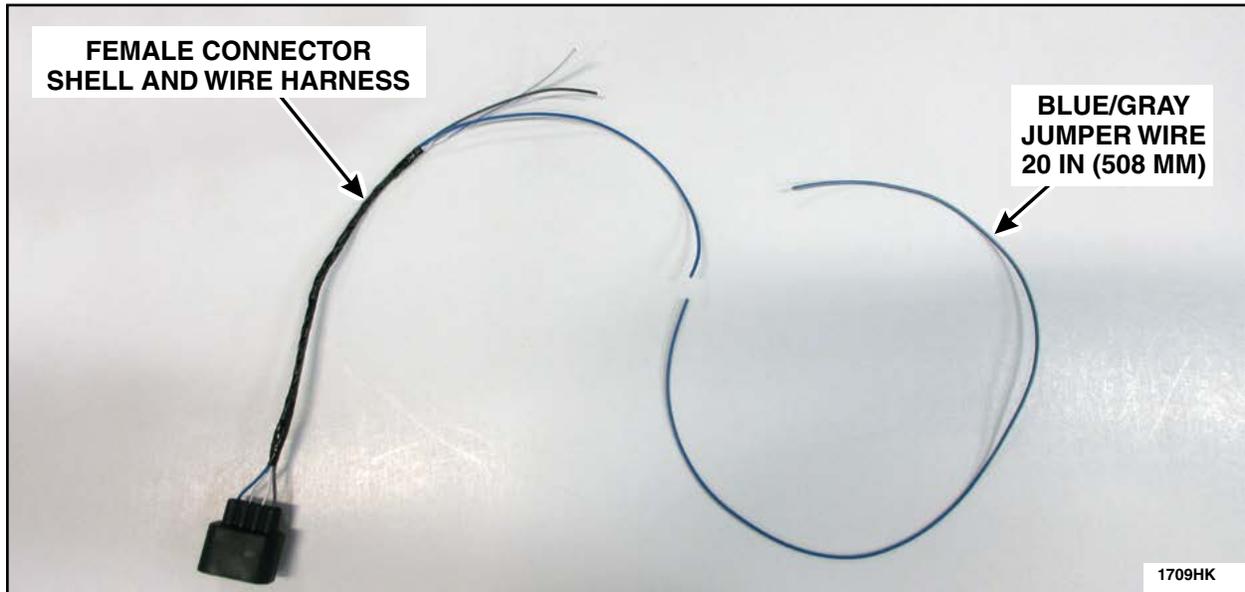
- Pin 1 - *new* Double Blue/Gray wire
- Pin 2 - *new* Double White/Blue wire
- Pin 3 - *new* Double White wire
- Pin 4 - *new* Double Black/Gray wire



15. Locate the C210 Pin 13 Blue/Gray wire and cut the wire so that at least 4 in (101.6 mm) of wire remains on the connector side. See Figure D9, D10 and D16.

- Remove wire harness tape if required.

16. From the Blue/Gray wire on the female connector shell and wire harness, cut 20 in (508 mm) of the wire to create a jumper wire to be spliced in the following steps. See Figure D14.



**FIGURE D14**

17. Prepare the Blue/Gray jumper wire for splicing as follows. See Figure D15.

- Remove 1 in (25.4 mm) of insulation from each end of the wire.
- Position two (2) lengths of ES-1 dual wall heat shrink tubing onto the wire.



**FIGURE D15**



18. Splice the three Blue/Gray Wires together on the body side of the harness:
- C210 Pin 13 body side
  - 20 in (508 mm) Jumper Wire
  - Blue/Gray wire from female connector shell and wire harness

Twist 13 mm (0.5 in.) of the ends of the wires together and bend the splice wire 90 degrees to the harness wire at the end of the twisted area.

Solder the wires together using lead free electrical solder, with the heat being applied opposite of the applied solder. See Figure D16.

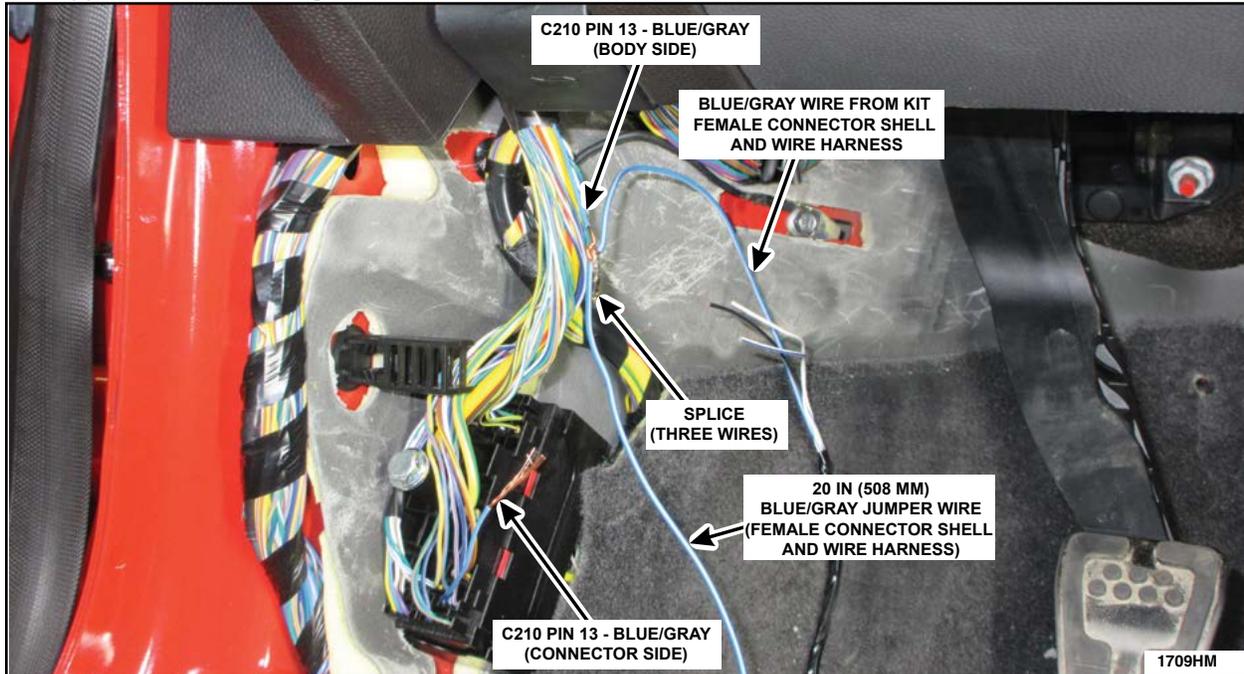


FIGURE D16

19. Splice the other end of the 20 in (508 mm) Jumper Wire to C210 Pin 13 connector side Blue/Gray wire, using the same splicing instructions as the previous step. See Figure D17.

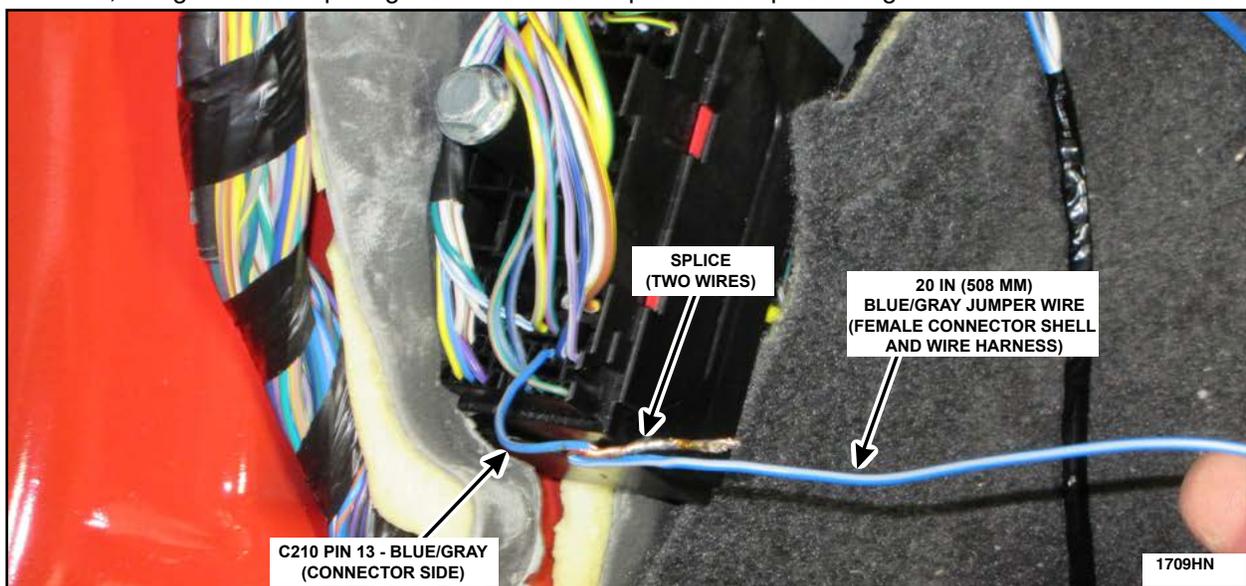
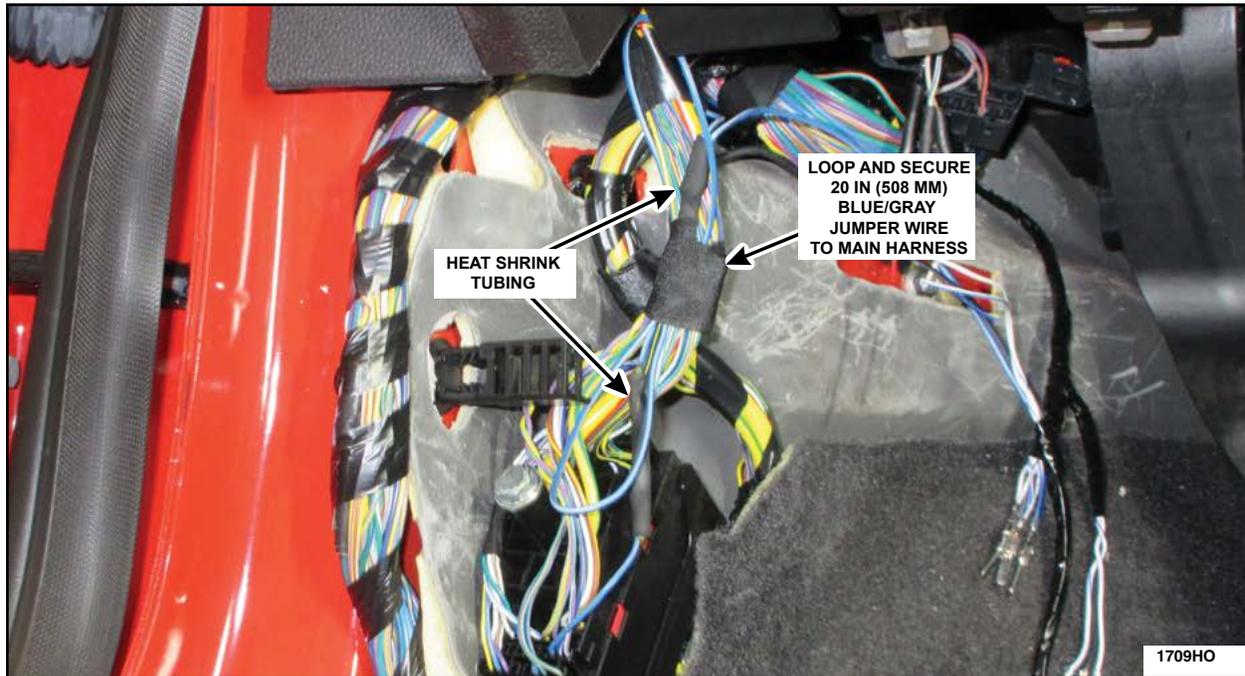


FIGURE D17



20. Position the heat shrink tubing over both ends of the splice wires. Use a suitable heat gun such as Rotunda Shielded Flameless Heat Gun with Heat Deflector, number NAIAT-R5902, that is equipped with a shrink tubing attachment, to heat the heat shrink tubing until the sealant comes out of both ends. See Figure D18.
21. Loop the Blue Gray jumper wire and secure it with Coroplast® Tape along the main harness. See Figure D18.



**FIGURE D18**

22. Splice the three wires removed from the OBDII/DLC connector shell earlier in this procedure to the new female connector shell and wire harness. Position heat shrink tubing onto the remaining wires to be spliced. Make the remaining splices following the splicing technique done for the Blue/Gray Jumper wire previously.

**NOTE:** Refer to Figure D10 for wire schematic.

- Pin 2 - *new* Black/Gray wire to the previously removed OBDII/DLC connector Black/Gray wire.
  - Previously OBDII/DLC connector Pin 4.
- Pin 3 - *new* White/Blue wire to the previously removed OBDII/DLC connector White/Blue wire.
  - Previously OBDII/DLC connector Pin 6.
- Pin 4 - *new* White wire to the previously removed OBDII/DLC connector White wire.
  - Previously OBDII/DLC connector Pin 14.

23. Position the heat shrink tubing over both ends of the three spliced wires. Use a suitable heat gun such as Rotunda Shielded Flameless Heat Gun with Heat Deflector, number NAIAT-R5902, that is equipped with a shrink tubing attachment, to heat the heat shrink tubing until the sealant comes out of both ends.



24. Position connector C211 back onto the retaining studs and install the two retainers. See Figure D2.
25. Connect connector C211.
26. Connect the male and female ends of the new connector shells together. See Figure D9.
27. Position the OBDII/Data Link Connector (DLC) back in its original position and install the two bolts.
28. Bundle the connector C210 harness wires and the *new* C210 Pin 13 spliced wire and wrap the harness with Coroplast® tape.
29. Secure the new wires along the existing vehicle connector C211 wire harness with tie straps.
30. Install the scuff plate and the lower cowl trim panel. Install the push pins. See Figure D1.
31. Position the LH front door weatherstrip back. See Figure D1.

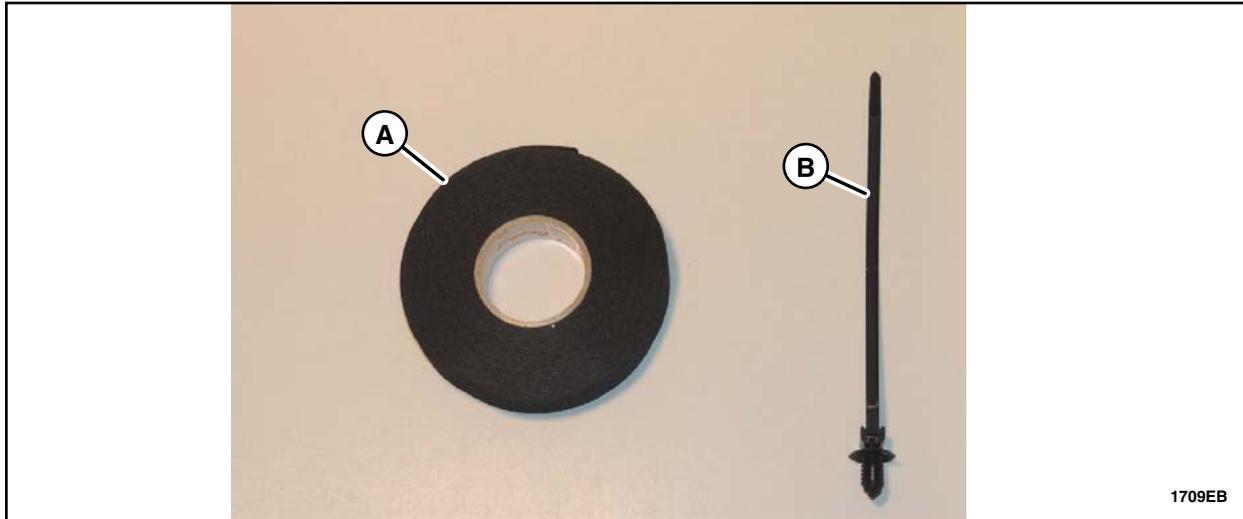


**Procedure E - Instrument Panel Cluster (IPC) Reprogramming  
(Not Required for Fiesta ST Vehicles)**

**Procedure F - Turbocharger Wire Harness Taping**

**OVERVIEW:** This procedure wraps the turbocharger wire harness with Coroplast® tape to prevent the entry/buildup of fluids and debris in the convolute which could ignite from an ignition source.

**PARTS / SUPPLIES REQUIRED:**



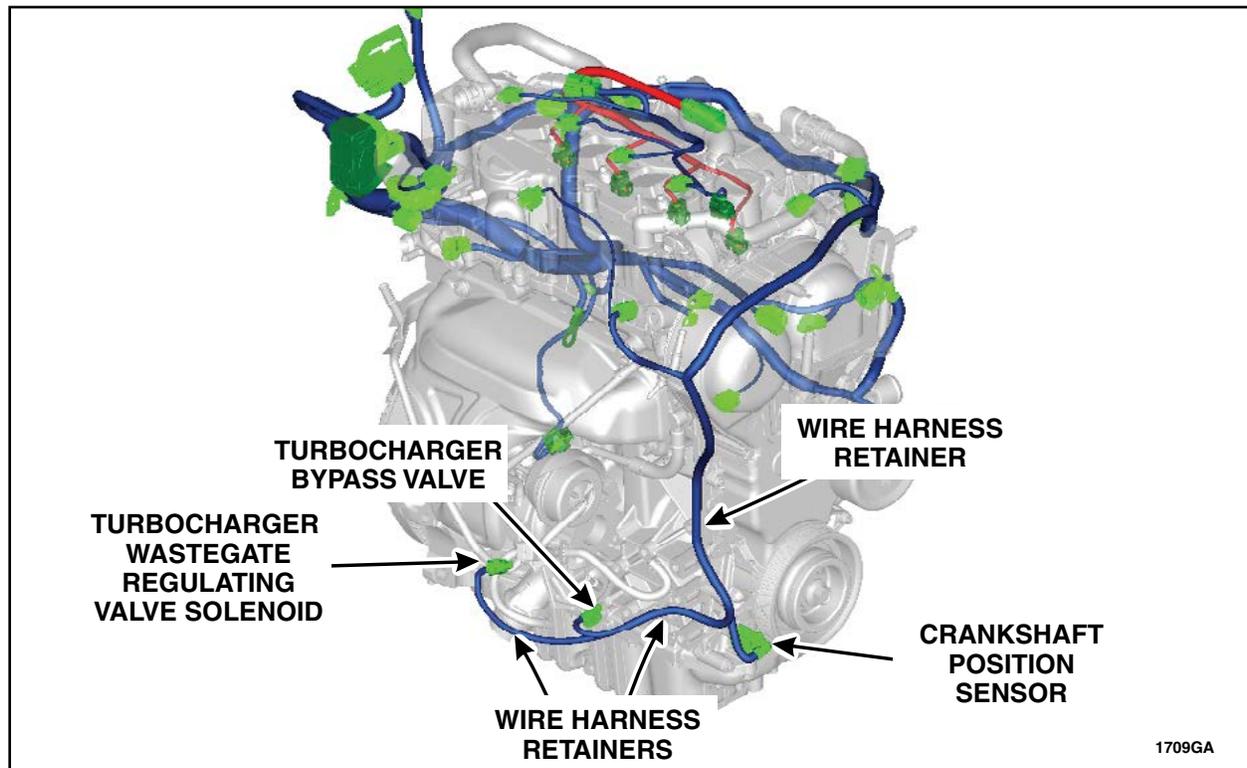
A	Coroplast® Tape
B	Wire Harness Retainer w/Tie-Strap

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Tips for wrapping the harness are included in the procedure.



**NOTE:** Figure F1 is for reference only the harness retainers were previously disconnected in Procedure A.



**FIGURE F1**

1. Route the turbocharger wire harness to the top of the engine compartment. See Figure F2.
2. If broken, replace the wire harness retainer with the *new* one supplied in the vehicle parts kit. See Figures F1 and F2.
  - Mark the wire harness retainer location before removal.



3. Wrap the turbocharger wire harness convolute with the Coroplast® tape provided in the service kit. See Figure F2.

- Start and finish each length of tape applied with three (3) initial and three (3) finishing wraps.
- Apply each wrap of tape with a 50% overwrap.
- First, wrap the takeout for the crankshaft position sensor. Begin the wrap at the connector and end this portion of wrapping by going around the main harness at the takeout. See Figure F2, (A).
- Wrap the turbocharger harness starting at the side of the harness closest to the engine. Proceed down the remaining length of harness to the turbocharger wastegate regulating valve solenoid connector and turbocharger bypass valve electrical connectors. See Figure F2, (B).

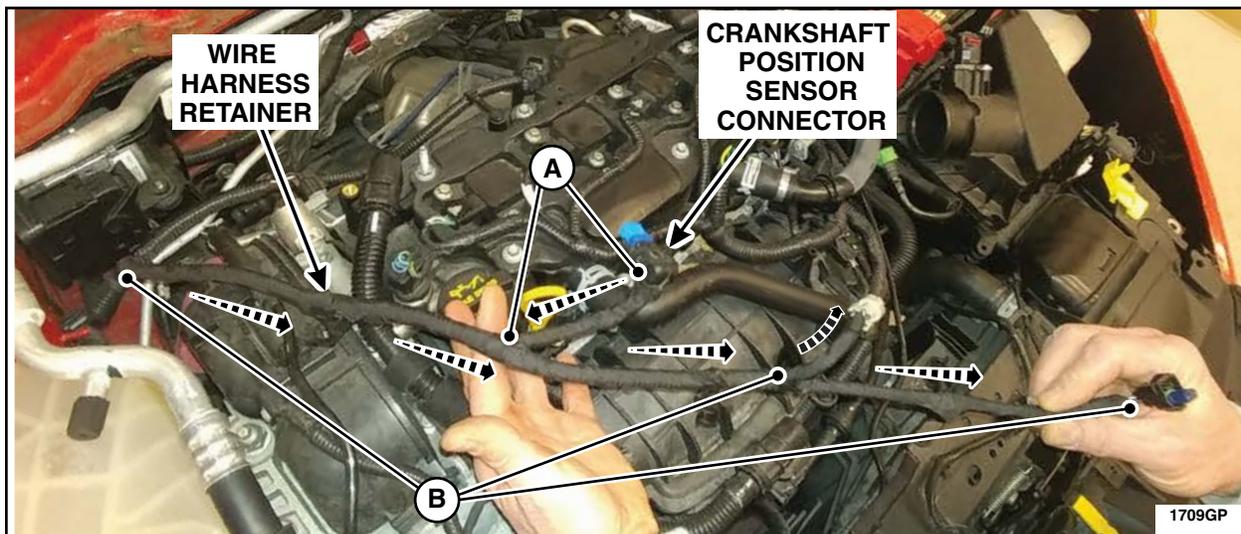


FIGURE F2

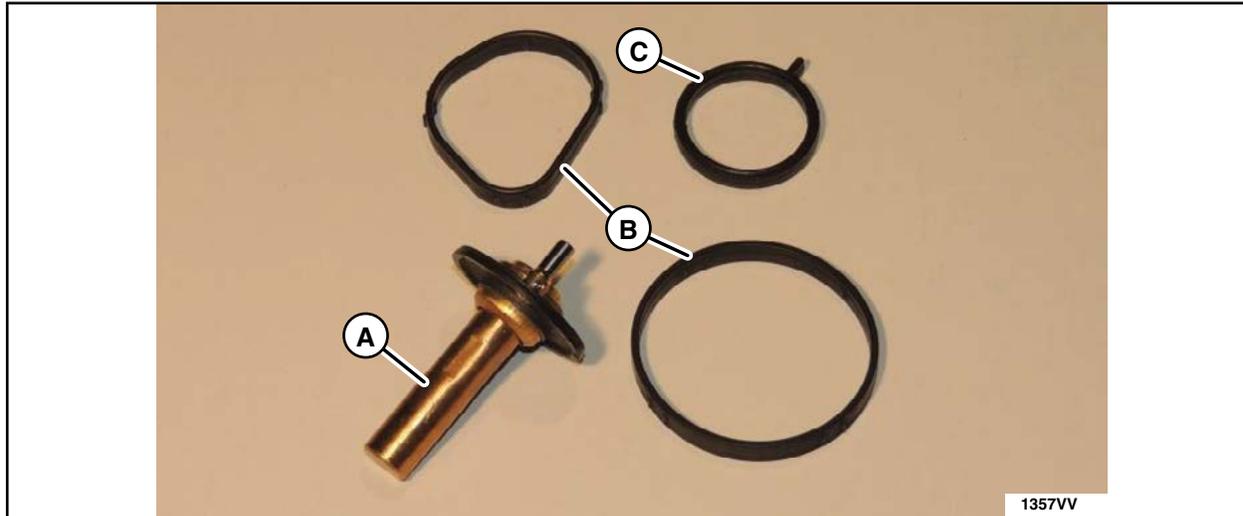
4. Route the wire harness back down to the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve. See Figure F1.
5. Connect the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve electrical connectors. Attach the wire harness retainers to the engine. See Figure F1.



## Procedure G - Thermostat Replacement

**OVERVIEW:** An updated 82° C (179.6° F) thermostat will be installed to improve cooling system performance

### PARTS / SUPPLIES REQUIRED:



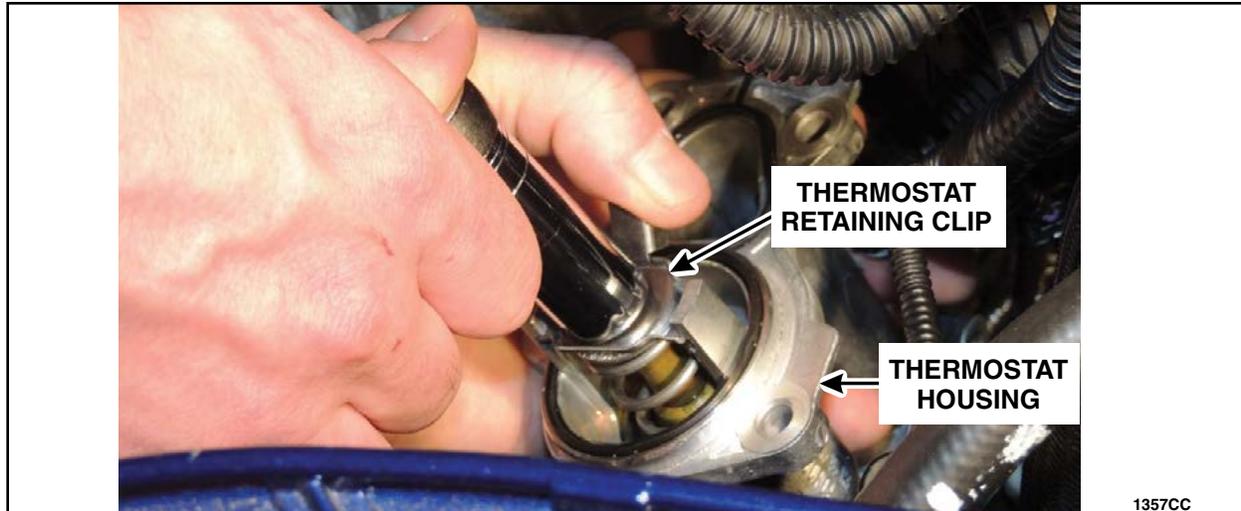
A	Thermostat
B	Thermostat housing to cylinder block O-rings (2 ea.)
C	Thermostat Housing to coolant valve O-Ring (1 ea.)

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Make sure the air bleed hole in the thermostat is in the “UP” position when installed to allow any air trapped in the system to pass.

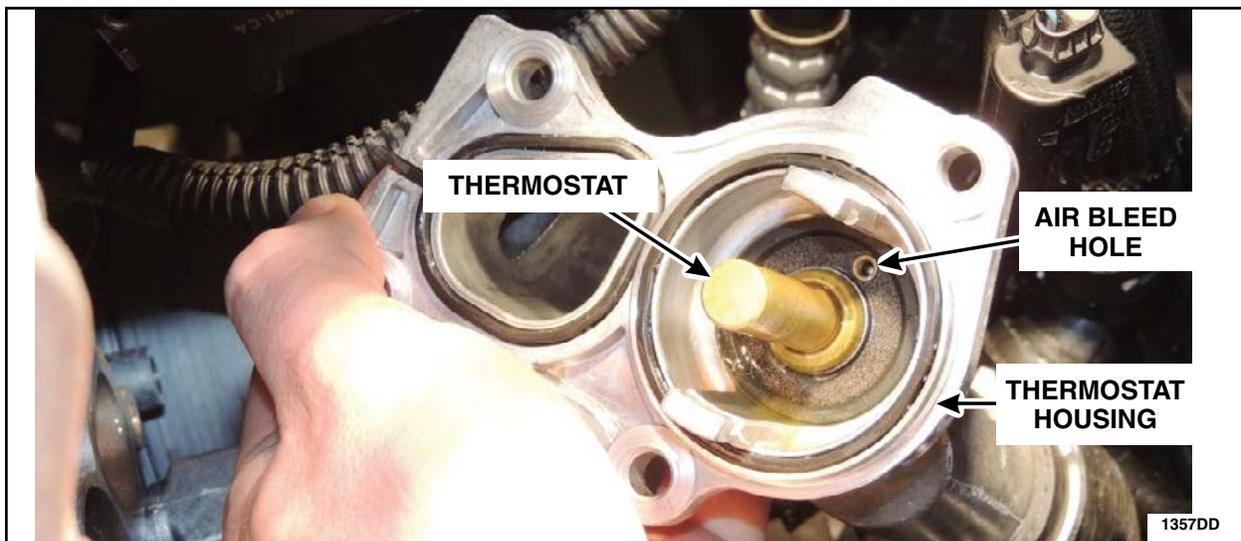


1. Remove the thermostat housing. Please follow the WSM procedures in 303-03.
  - Discard the thermostat housing gaskets.
2. Use a 13 mm (1/2 in) deep well socket to press downward on the thermostat retaining clip and rotate to remove it from the thermostat housing. Remove the thermostat spring. See Figure H2.
  - Note the position of the thermostat retaining clip and thermostat prior to removing. See Figures G1 and G2.



**FIGURE G1**

3. Remove and discard the thermostat. See Figure G2.
4. Position the *new* thermostat into the housing with the air bleed hole positioned upward. Use a 13 mm (1/2 in) deep well socket to install the thermostat spring and clip. The retaining clip must be in the same orientation that it was in prior to removal. See Figures G2 and G3.

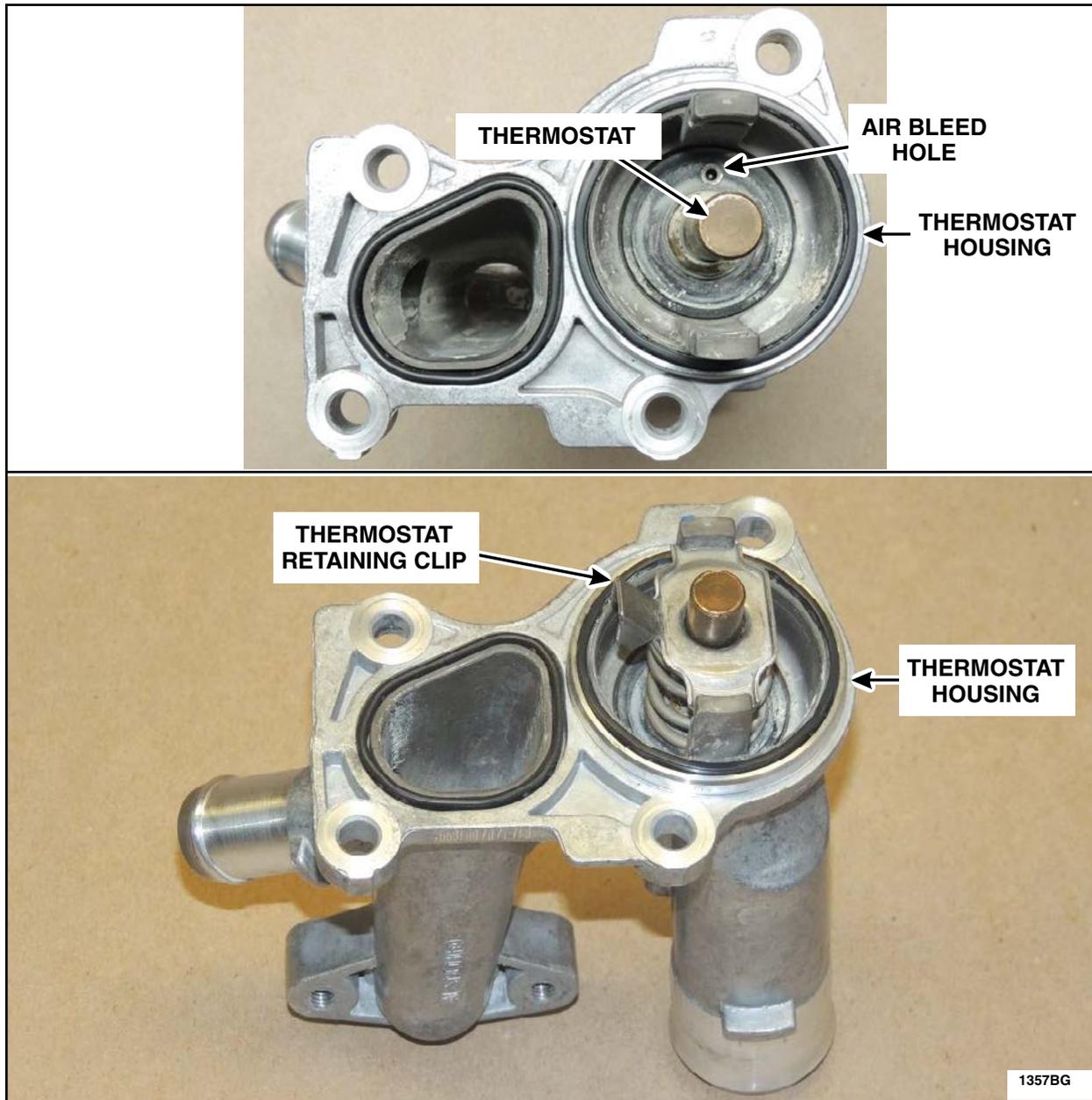


**FIGURE G2**



**NOTICE:** Do not use pliers or other tools to install the thermostat.

**NOTE:** The thermostat retaining clip must be installed in the position as shown. See Figure G3.



**FIGURE G3**

5. Install the *new* thermostat housing gaskets and install the thermostat housing. Please follow the WSM procedures in 303-03.

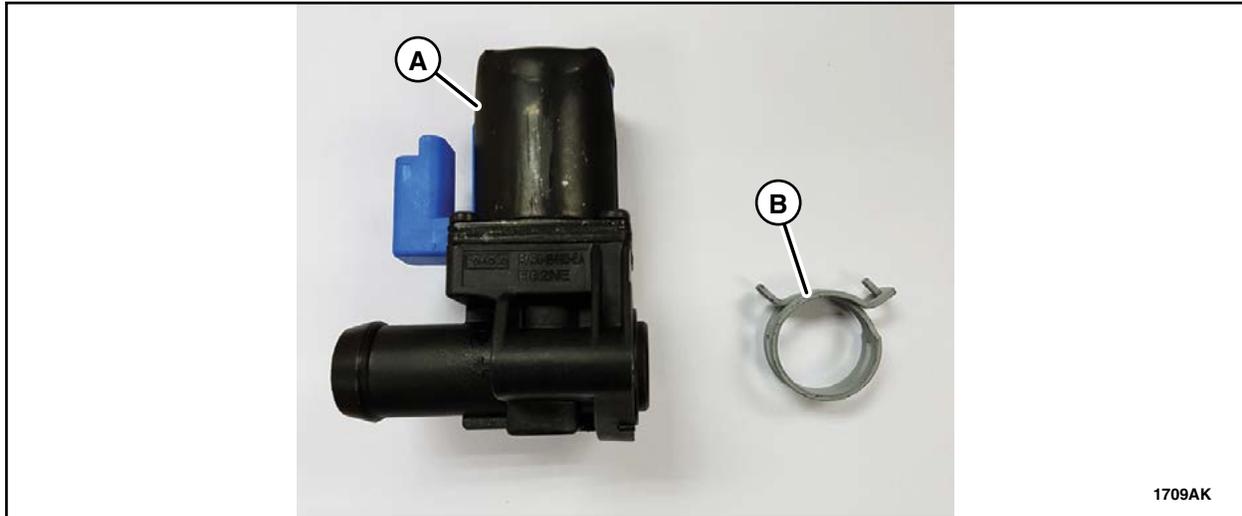
- Do not re-connect the degas bottle to thermostat housing coolant hose at this time.
- Do not re-install the generator at this time.
- Do not refill the engine coolant at this time.



## Procedure H - Engine Coolant Bypass Valve Replacement

**OVERVIEW:** The engine coolant bypass valve is being replaced in this procedure.

### PARTS / SUPPLIES REQUIRED:



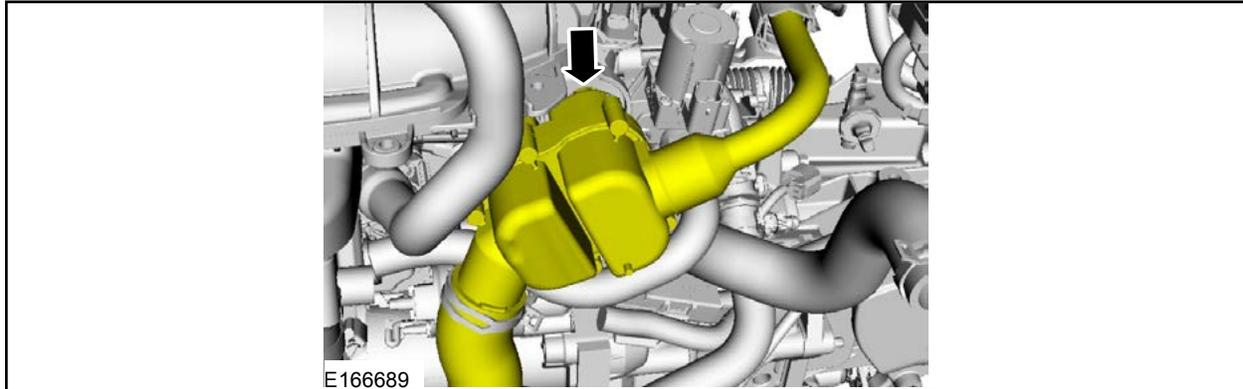
A	Engine Coolant Bypass Valve
B	Hose Clamp

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None



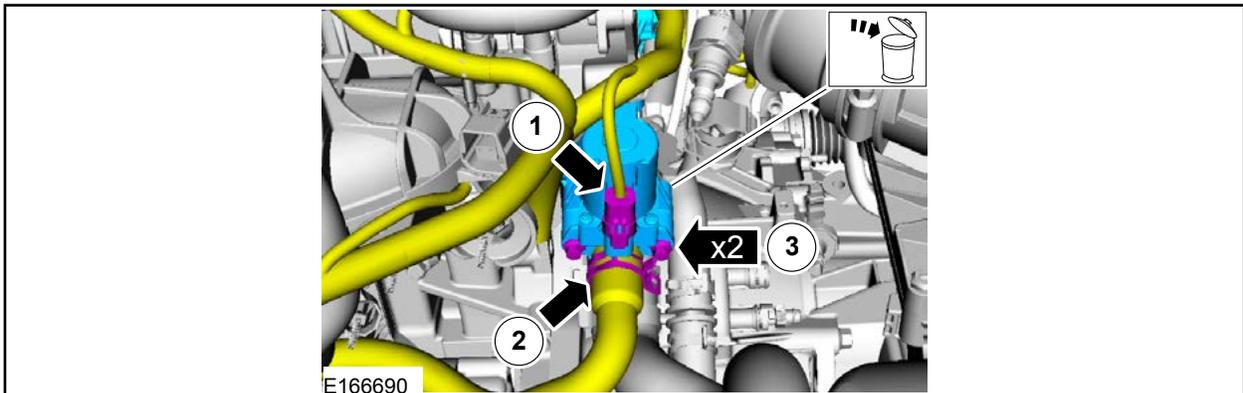
1. Position the resonator assembly aside. See Figure H1.



**FIGURE H1**

2. Remove and discard the engine coolant bypass valve. See Figure H2.

1. Disconnect the electrical connector.
2. Release the clamp and disconnect the coolant hose. Discard the clamp.
3. Remove the bolts and the coolant bypass solenoid valve.
  - Torque: 89 lb.in (10 Nm)



**FIGURE H2**

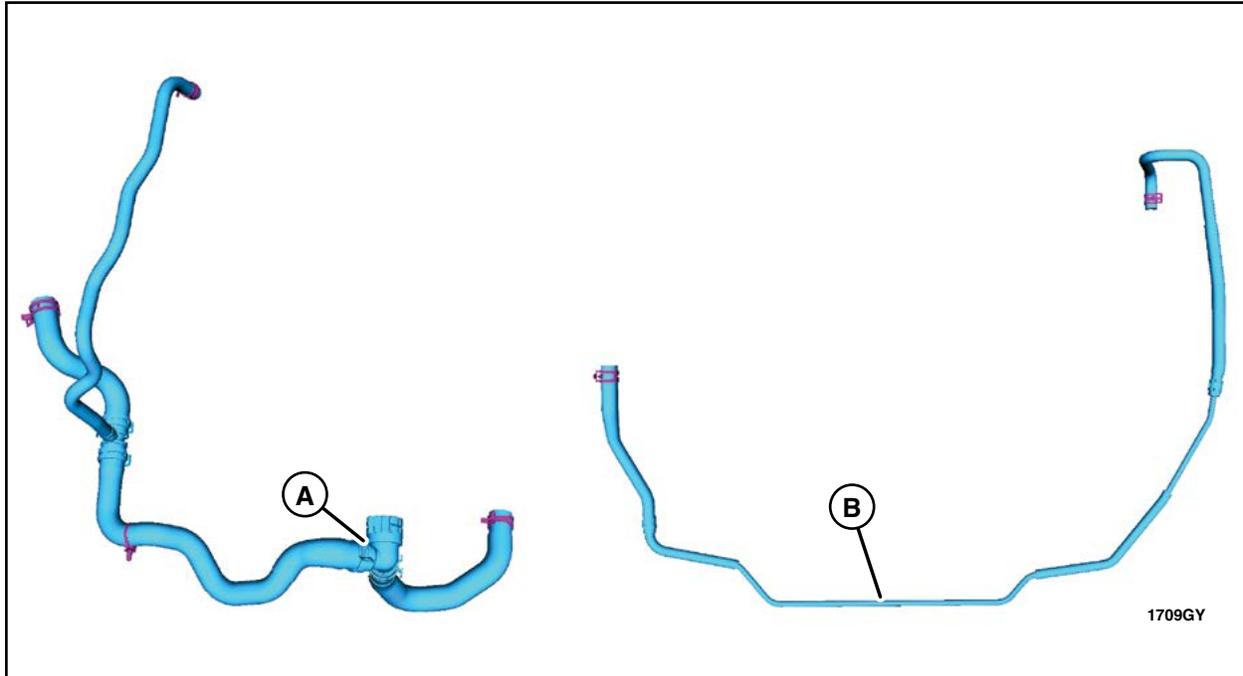
3. Install a *new* engine coolant bypass valve and O-ring seal by reversing the removal procedure.



## Procedure I - Coolant Hose Replacement

**OVERVIEW:** In this procedure, the coolant hose that runs between the degas bottle and thermostat quick connect T-fitting is replaced with an updated hose that allows for connection to the turbocharger coolant return line and the *new* coolant stand-pipe. The engine degas tube is also being replaced with an updated assembly that allows for connection to the radiator degas hose and degas bottle.

### PARTS / SUPPLIES REQUIRED:



A	Coolant Degas Bottle to Thermostat Housing Hose
B	Engine Degas Tube

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None



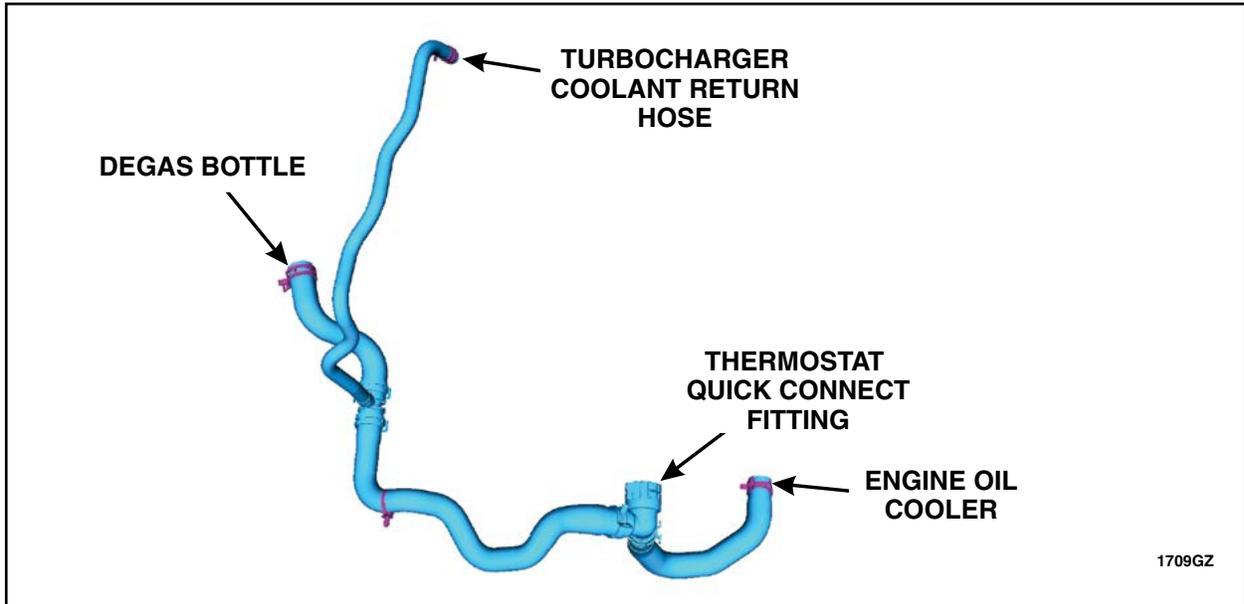


FIGURE I1A

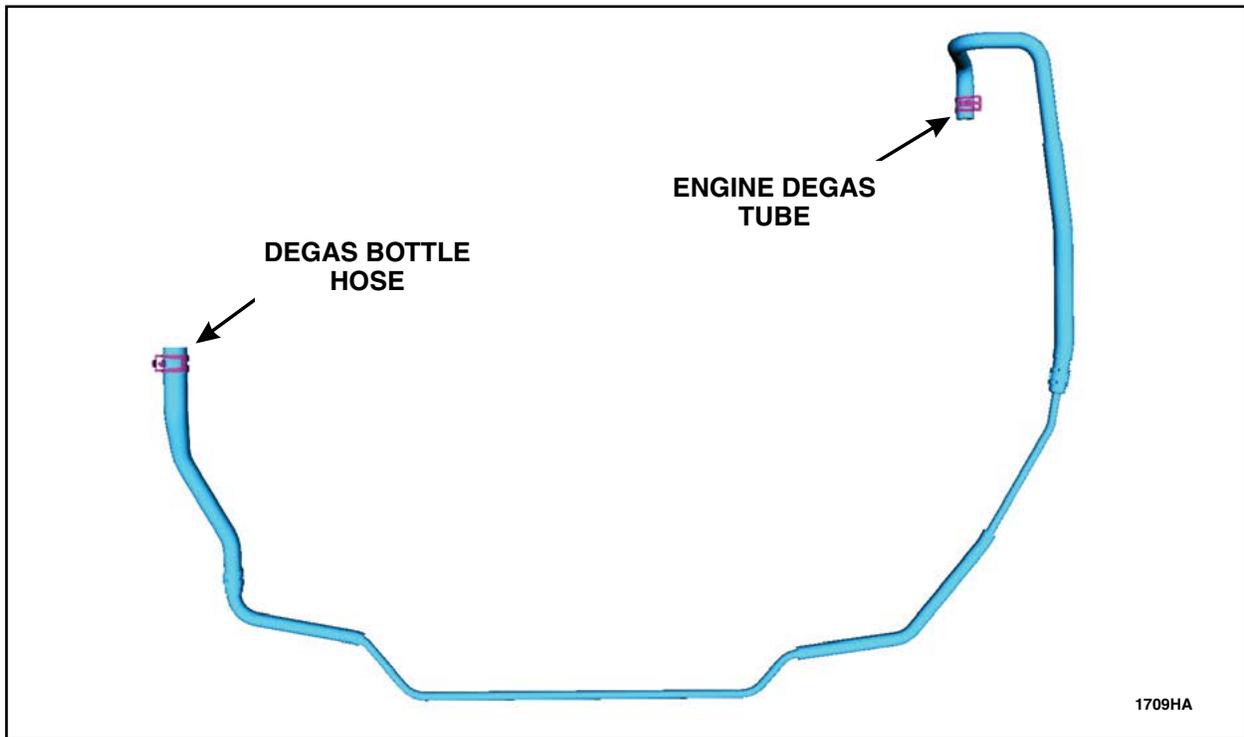


FIGURE I1B



1. Remove the nut and position the A/C compressor inlet line aside. See Figure I2.

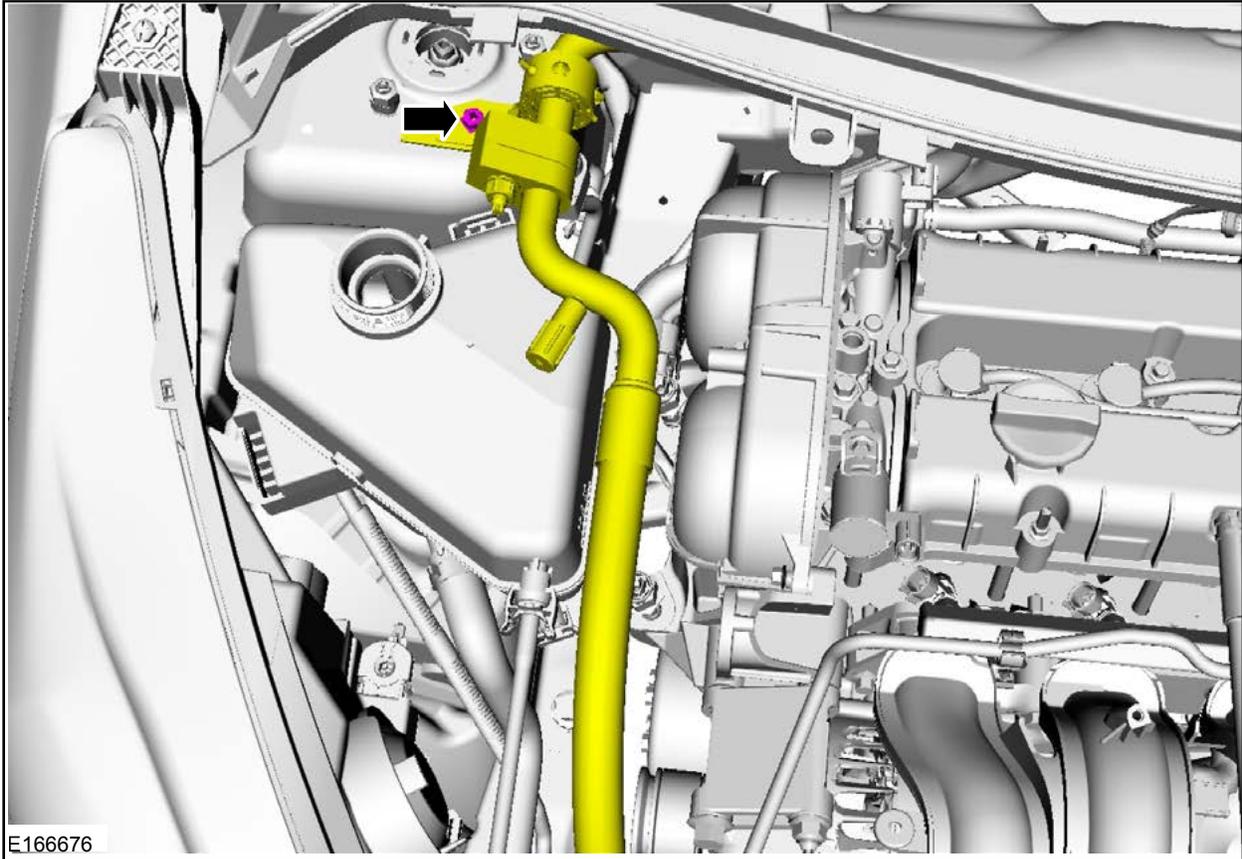


FIGURE I2



2. Remove and discard the degas bottle and cap. See Figure I3.

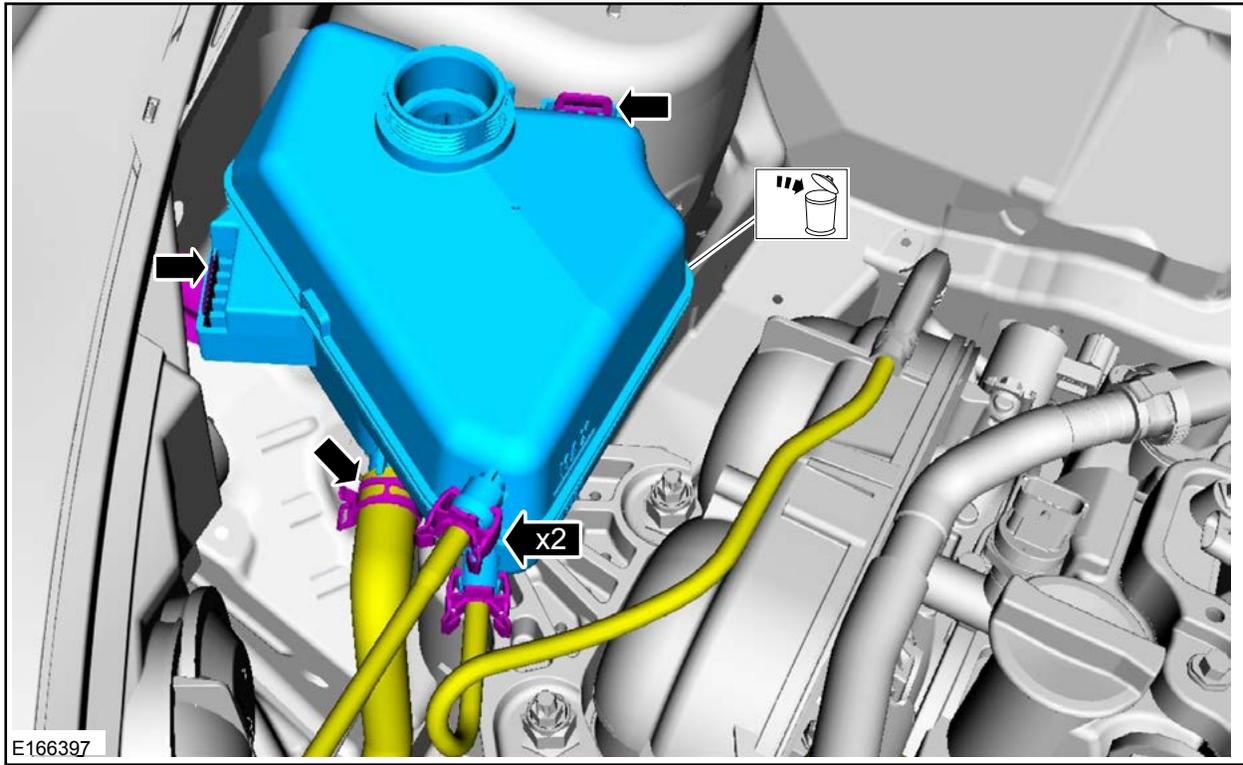


FIGURE I3

3. Remove and discard the turbocharger coolant return hose. See Figure I4.

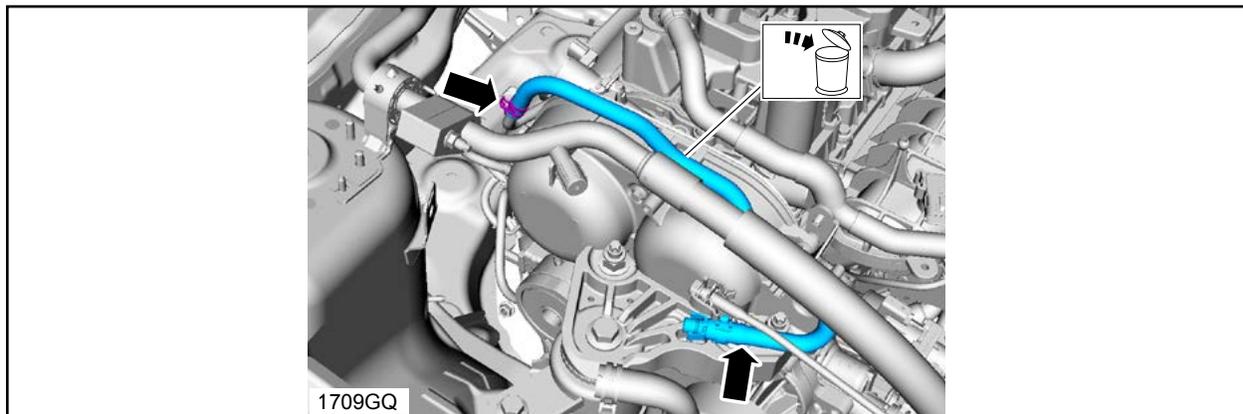


FIGURE I4



4. Detach the retainers, remove and discard the engine degas tube assembly. See Figure I5.

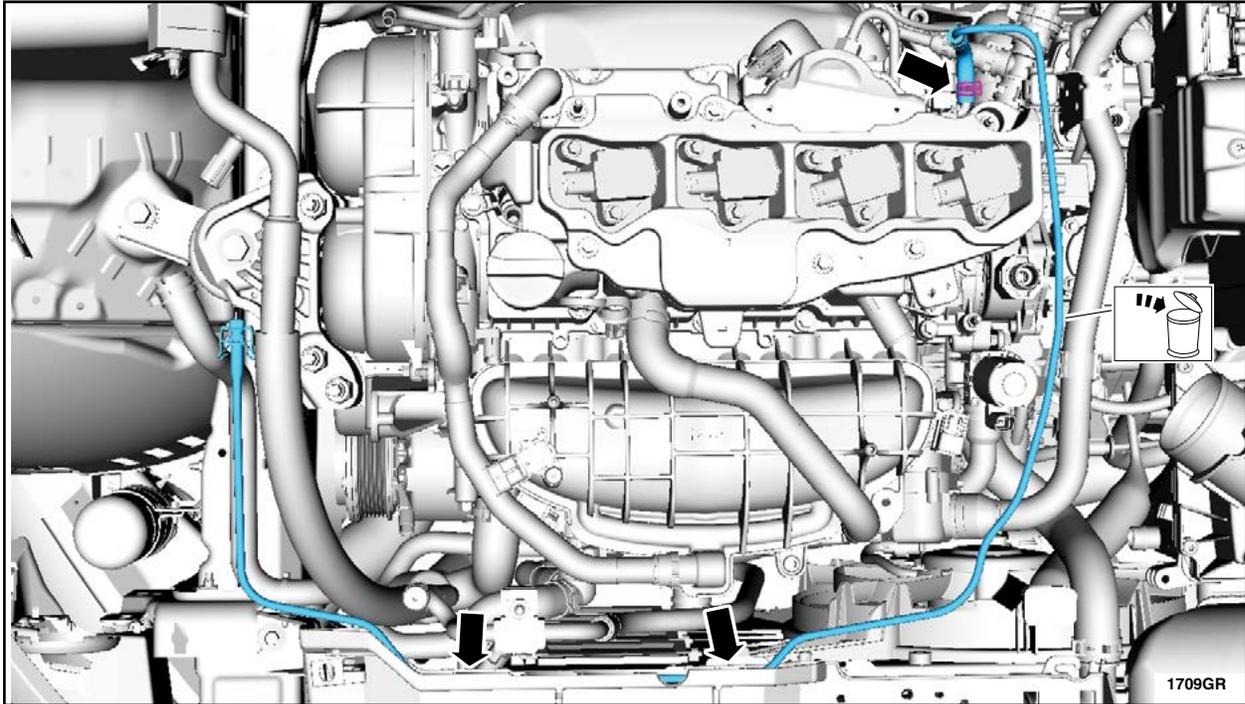


FIGURE I5

5. Disconnect the degas bottle hose from the engine oil cooler assembly. See Figure I6.

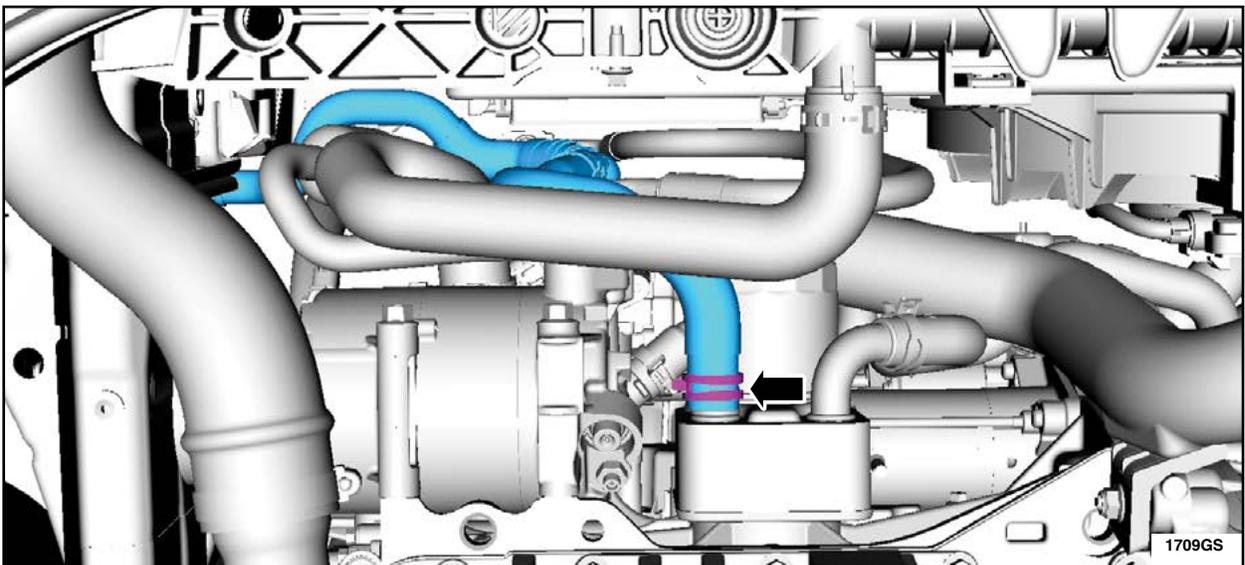
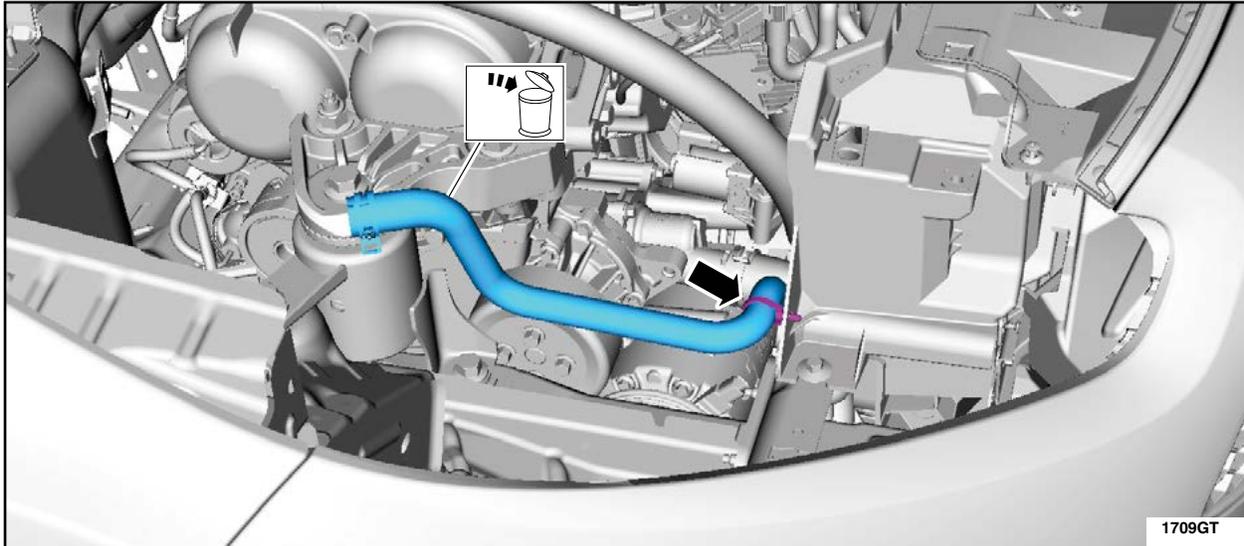


FIGURE I6



6. Detach the retainer, then remove and discard the degas hose assembly. See Figure 17.



**FIGURE 17**

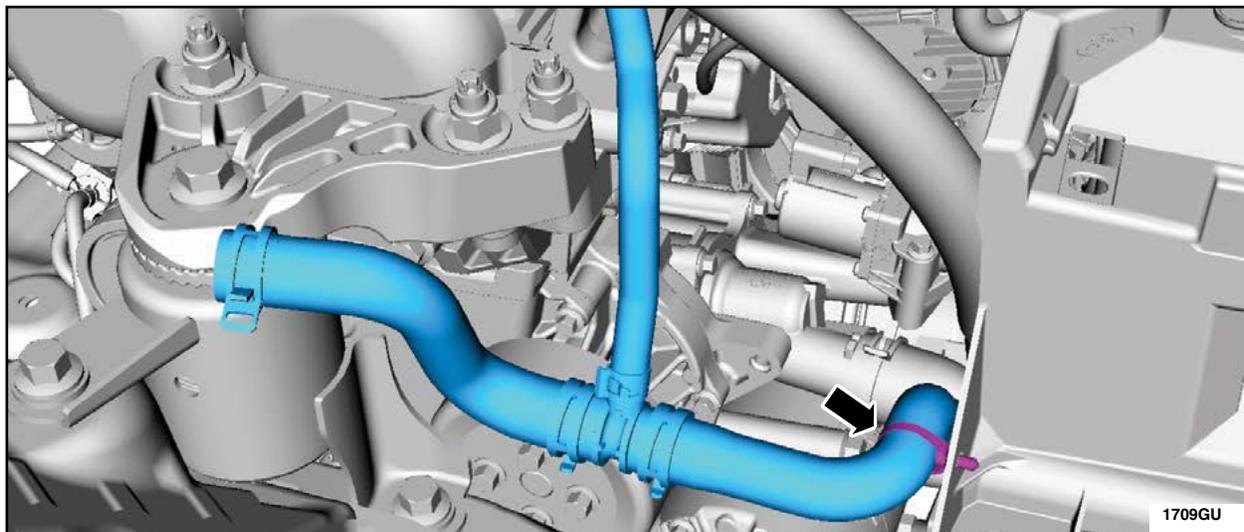
7. Install the generator. Please follow the WSM procedures in Section 412-02.

- Do not re-install the headlamps, connect the battery or install the engine cover at this time.

**NOTE:** Lubricating the new coolant hoses with coolant will aid in easier installation.

**NOTE:** Ensure the inside of the hose fittings are free from dirt and debris.

8. Install the *new* degas bottle hose and attach the retaining clip. Route the lower portion of the hose to the thermostat housing and oil cooler. Route the turbocharger coolant return hose upward to the top of the engine. See Figure 18.



**FIGURE 18**



9. Connect the thermostat quick connect fitting to the thermostat housing. See Figure I9.

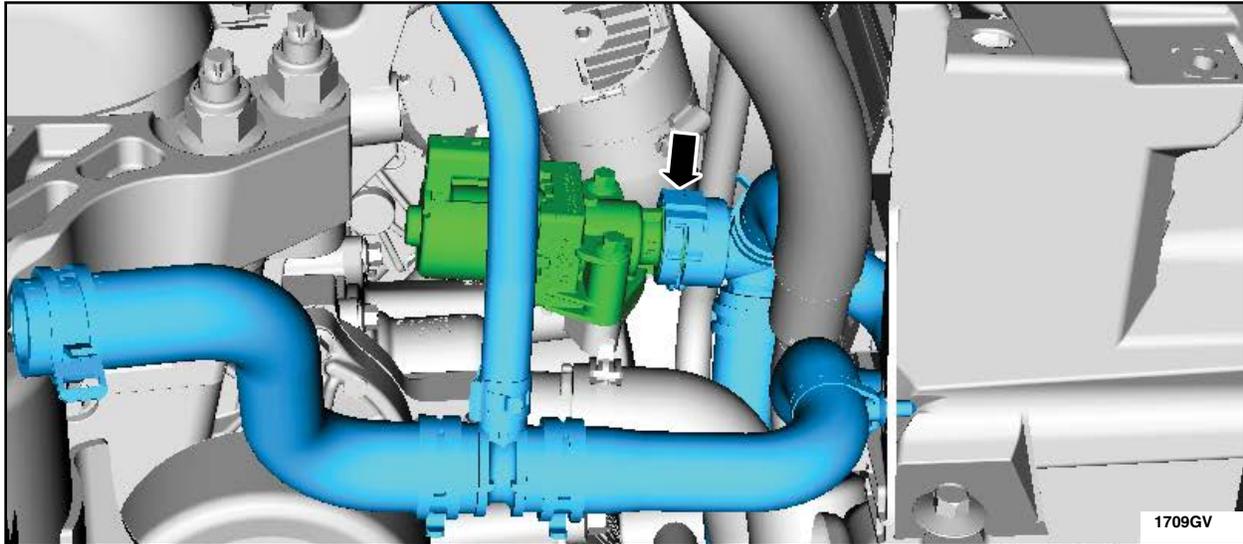


FIGURE I9

10. Connect the *new* turbocharger coolant return hose. See Figure I10.

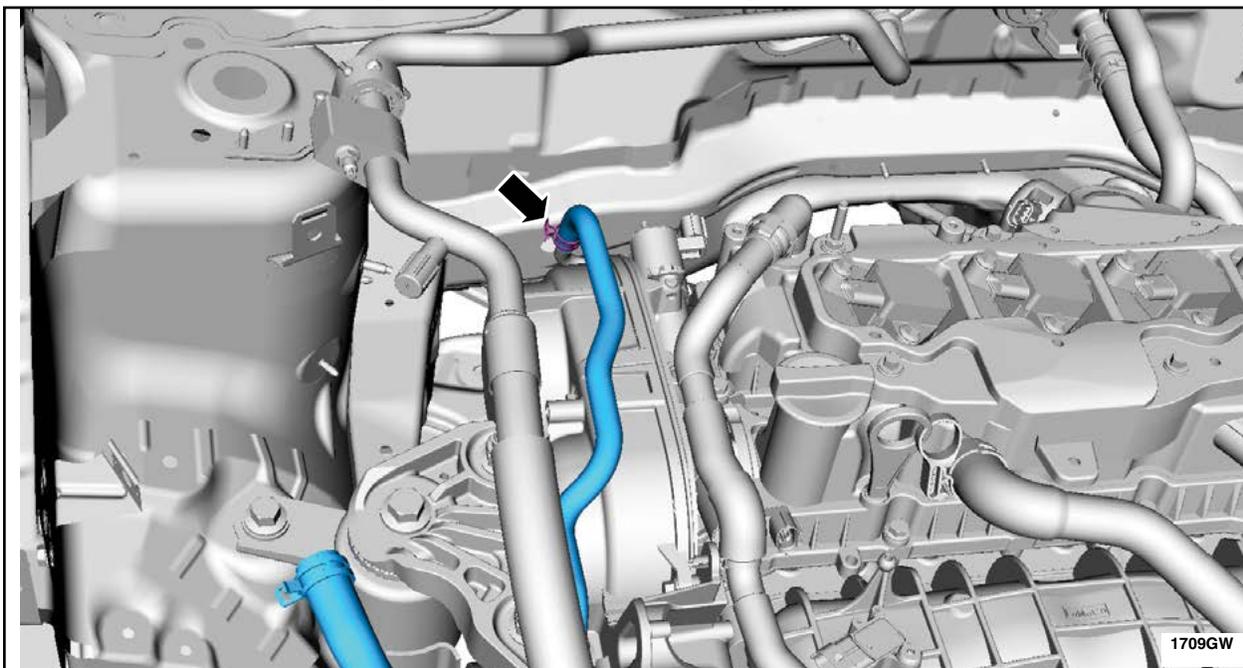


FIGURE I10



11. Install the *new* engine degas tube assembly and connect to the back of the engine. Attach the retaining clips. See Figure I11.

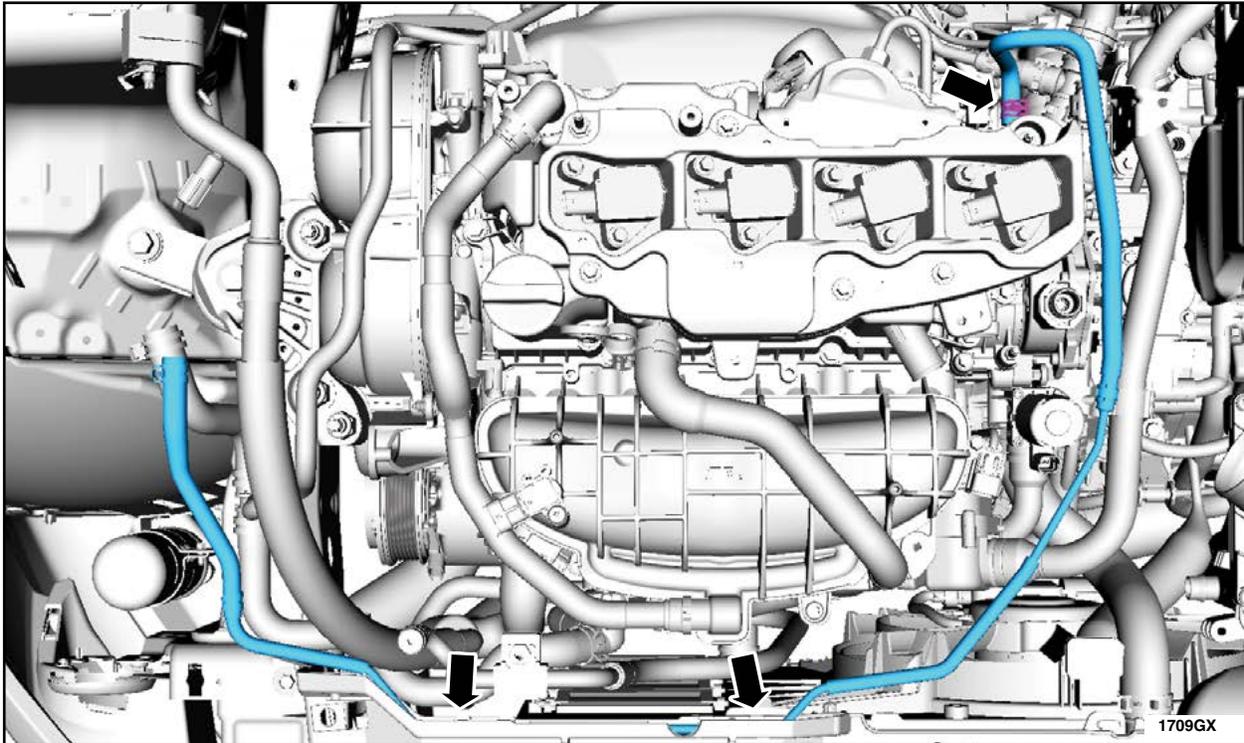


FIGURE I11

12. Connect the *new* degas bottle hose to the engine oil cooler assembly. See Figure I12.

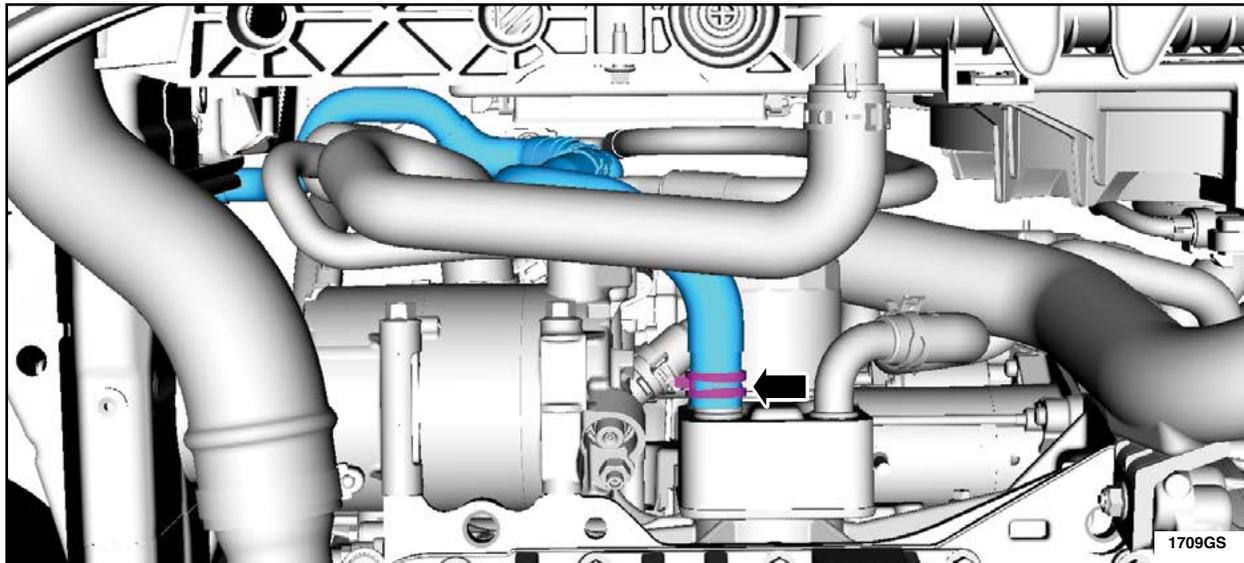


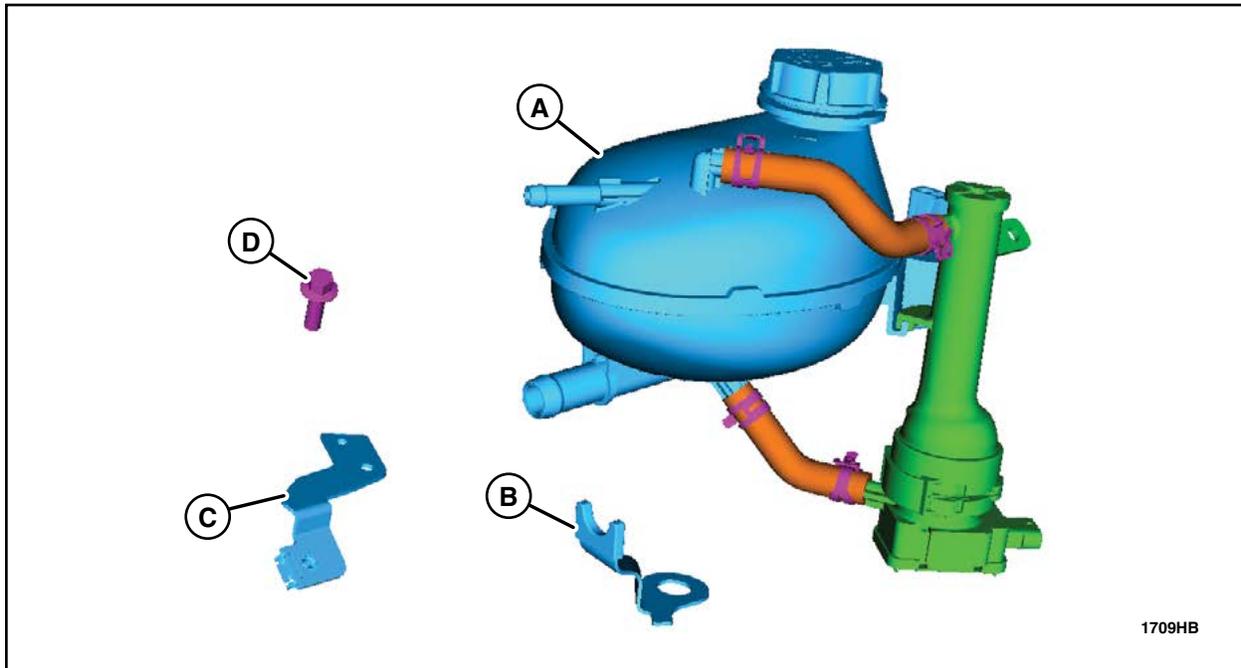
FIGURE I12



## Procedure J - Coolant Stand-pipe, Degas Bottle and Cap Installation

**OVERVIEW:** The coolant stand-pipe provides coolant level information to the PCM and IPC via the CAN network, this prevents overheat issues due to low coolant level by informing the driver when the coolant level is low. The coolant stand-pipe and bracket is installed using the engine mount rear fixing bolt. On installation, the wiring harness is routed across the engine bay wiring loom and the related coolant hoses are attached.

### PARTS / SUPPLIES REQUIRED:

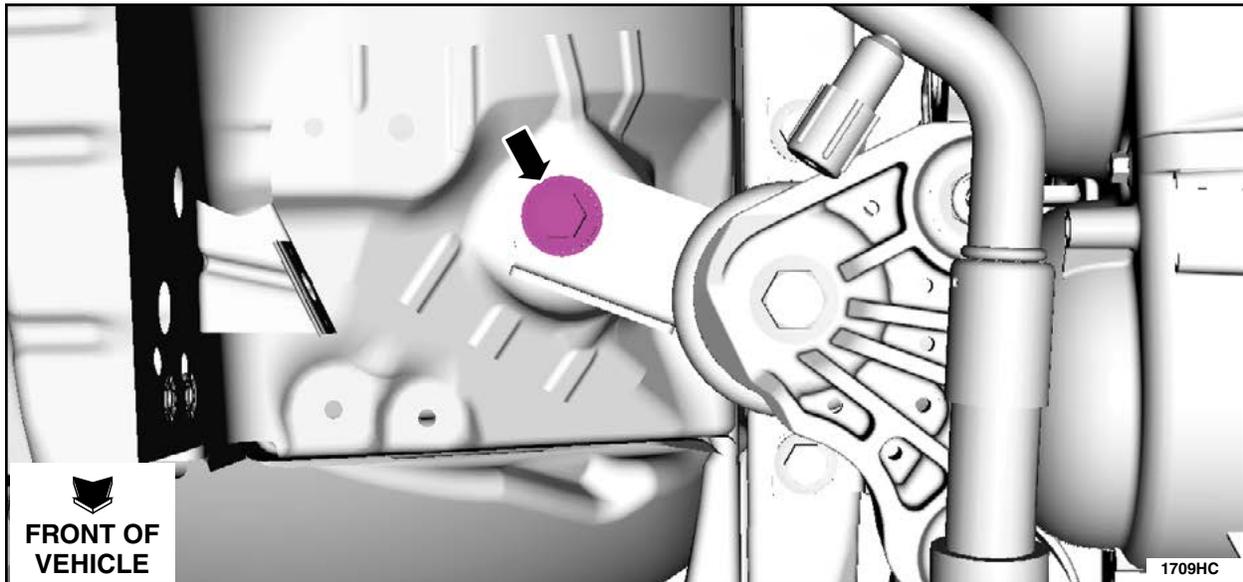


A	Degas Bottle, Cap and Coolant Stand-pipe Assembly (Includes Coolant Level Sensor)
B	Degas Bottle Support Bracket
C	Coolant Stand-pipe Bracket
D	Coolant Stand-pipe to Bracket Bolt

**SERVICE TIPS:** Check that the stand-pipe is properly seated/set onto the degas bottle. Check the 4 degas bottle to stand-pipe clamps to ensure they are set.



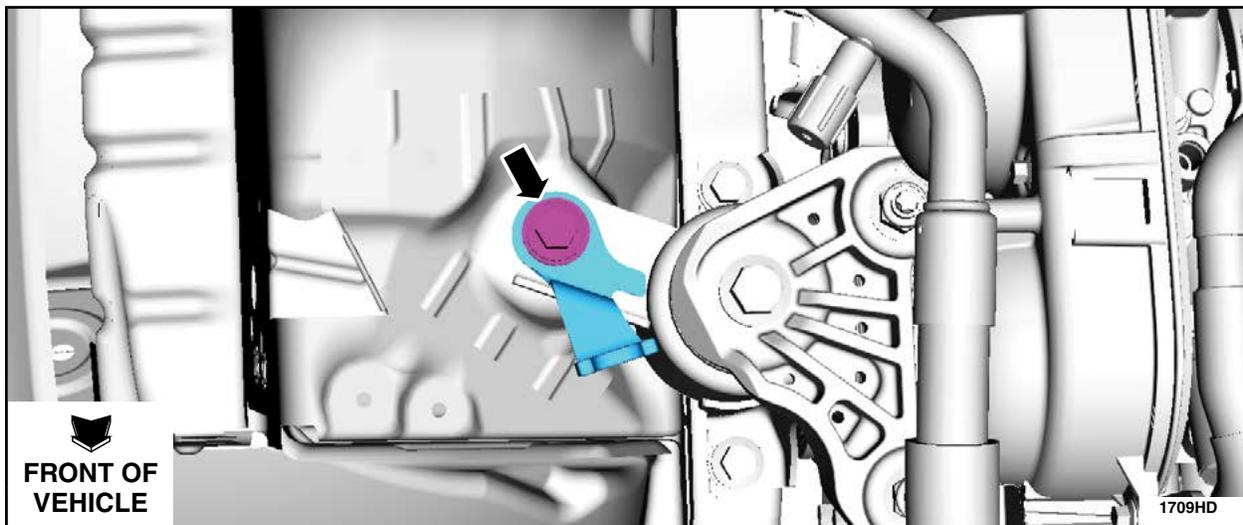
1. Remove the engine mount bolt. See Figure J1.



**FIGURE J1**

2. Position the degas bottle support bracket on the engine mount. The bolt will center the bracket and the locating tab on the bottom of the bracket should be pressed against the engine mount. Hand start the bolt and then tighten both engine mount retaining bolt at this time. See Figure J2.

- Tighten to 48 Nm (35 lb.ft).



**FIGURE J2**

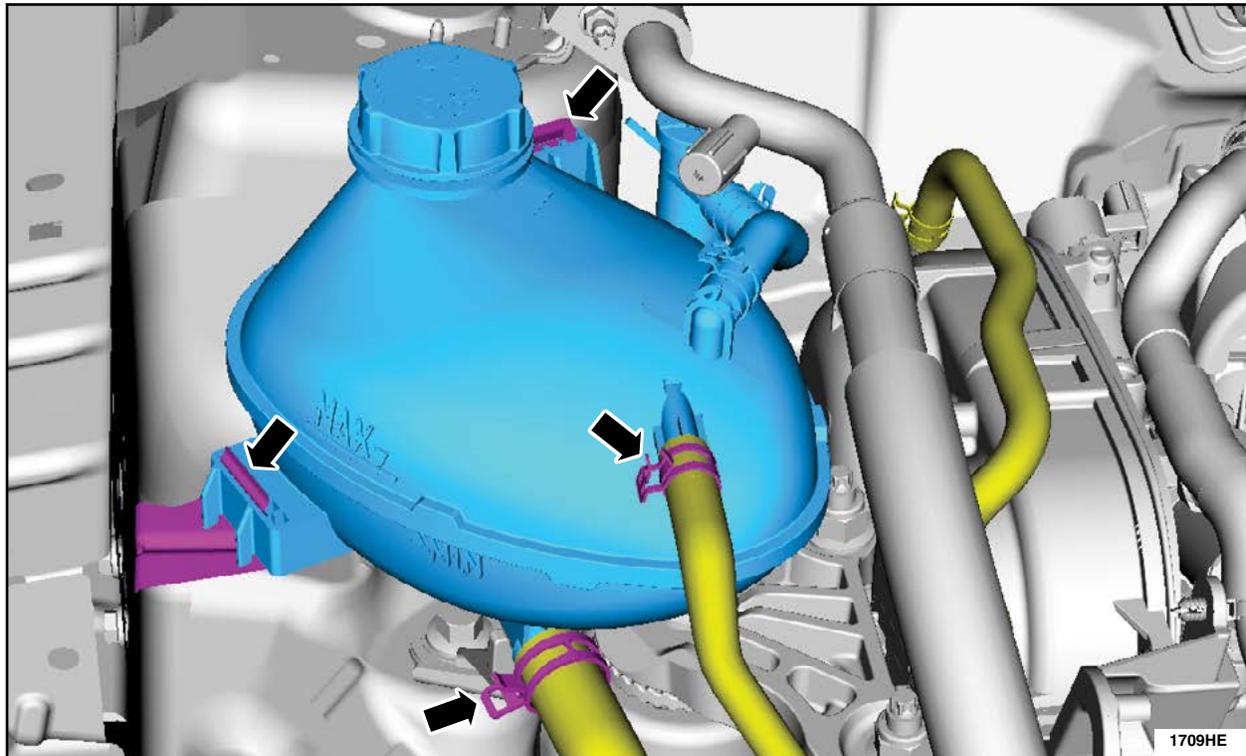


**NOTE:** Lubricating the new coolant hoses with coolant will aid in easier installation.

**NOTE:** When connecting the coolant hoses to the stand-pipe ensure the hoses are fully installed and meet the hose stops, before securing in place with hose clamps.

3. **NOTE:** Do Not fill the cooling system at this time.

Install the *new* degas bottle and cap. Connect the coolant hoses. See Figure J3.



**FIGURE J3**

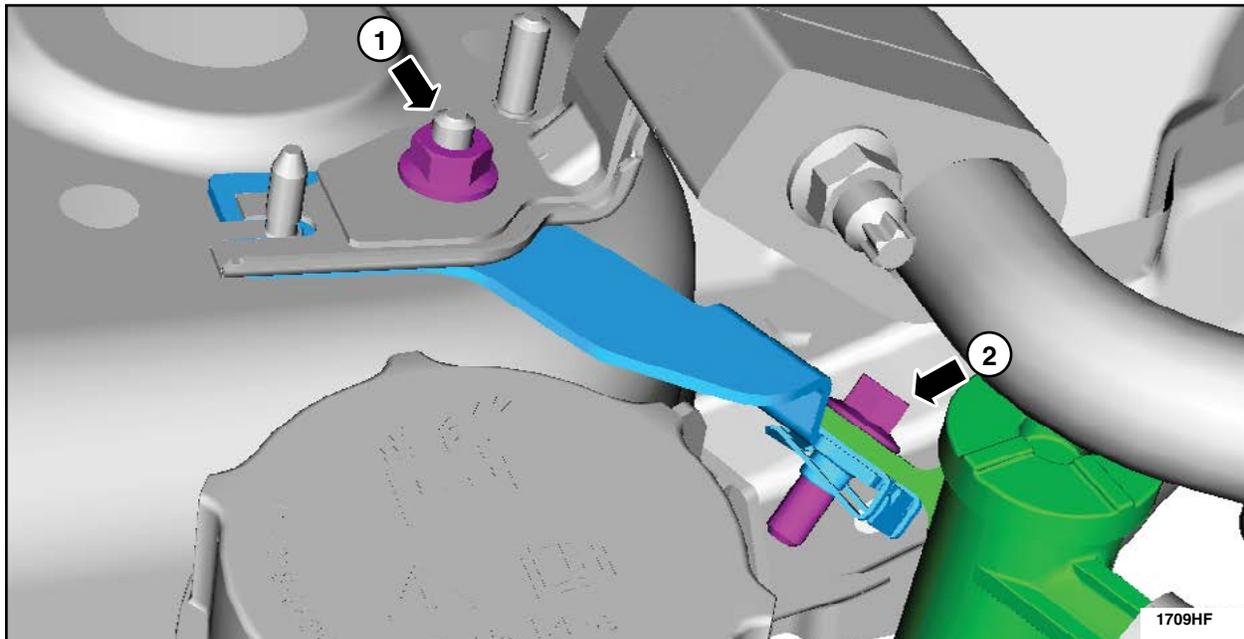


4. Install the stand-pipe bracket and position the A/C compressor inlet line back. See Figure J4 (1).

- Tighten the nut to 10 Nm (89 lb.in).

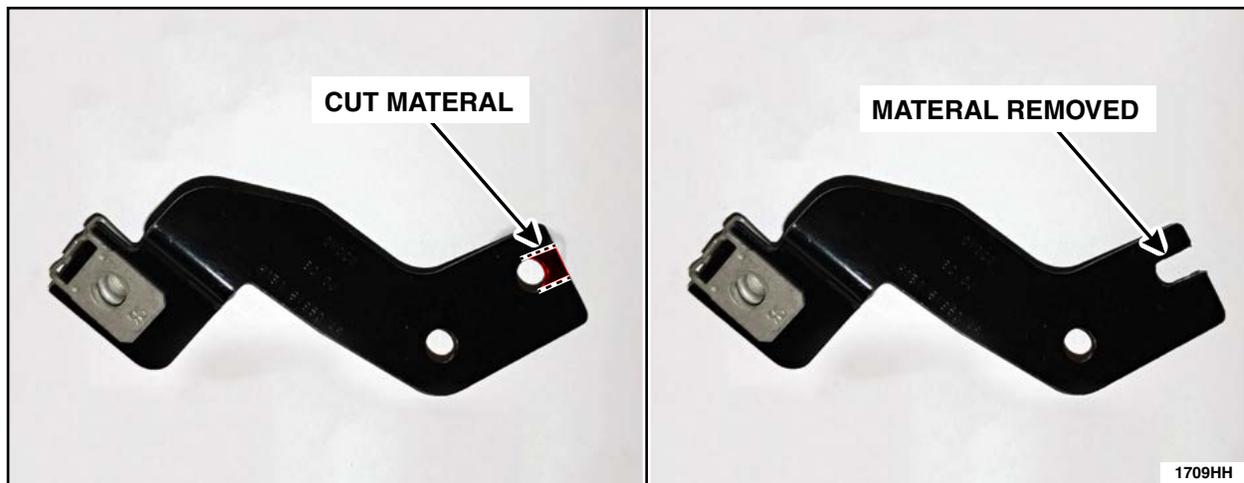
5. Install the stand-pipe to bracket bolt. See Figure J4 (2).

- Tighten the bolt to 5 Nm (44 lb.in).



**FIGURE J4**

6. If the coolant standpipe bracket does not mount properly, using a suitable cutting wheel cut the outer hole to remove the material to make a locating slot on the coolant standpipe bracket. See Figure J5.



**FIGURE J5**



7. Connect coolant stand-pipe wiring harness to the coolant stand-pipe. See Figure J6.



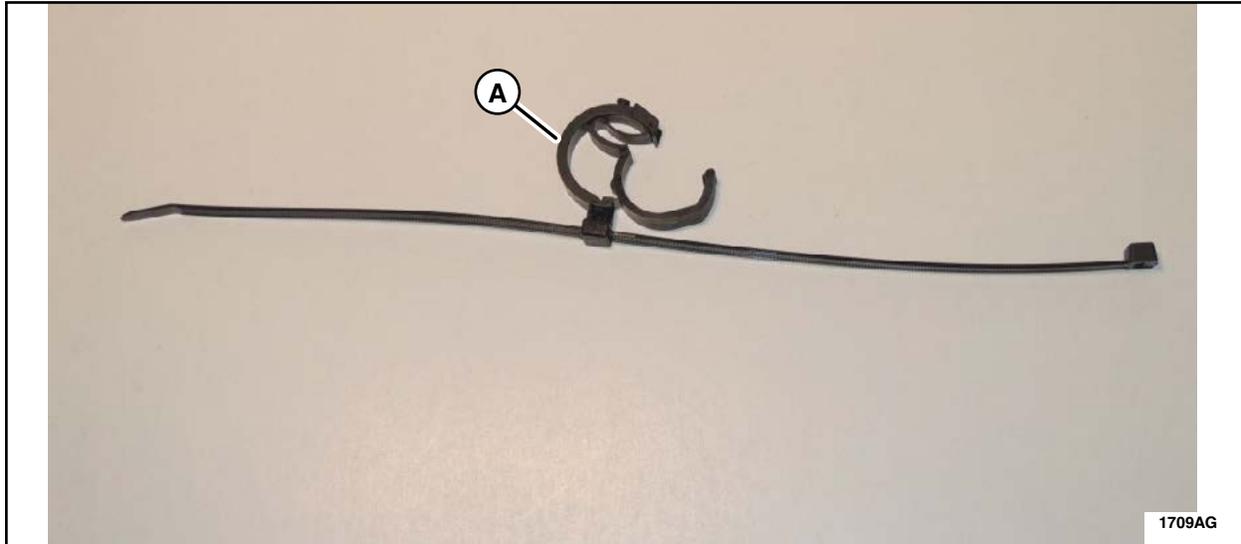
**FIGURE J6**



## Procedure L - Vehicle Reassembly, PCV Tube Retention, and Powertrain Control Module (PCM) Reprogramming

**OVERVIEW:** The vehicle is reassembled, the cooling system is vacuum filled, pressure tested and bled; and a PCV tube retainer is installed. The PCM is reprogrammed and coolant level sensor operation is validated.

### PARTS / SUPPLIES REQUIRED:



A	PCV Tube Retainer / Tie strap
B	Motorcraft® Metal Brake Parts Cleaner (PM-4-A or PM-4-B) (Dealer Procured) (Not Shown)
C	Motorcraft® Orange Antifreeze / Coolant Prediluted (VC-3DIL-B (U.S.) CVC-3DIL-B (Canada) / WSS-M97B44-D2) (Dealer Procured) (Not Shown)

**UNIQUE TOOL REQUIREMENTS:** Vacuum Filling Tool, Hydrometer and/or Refractometer, Cooling System Pressure Tester

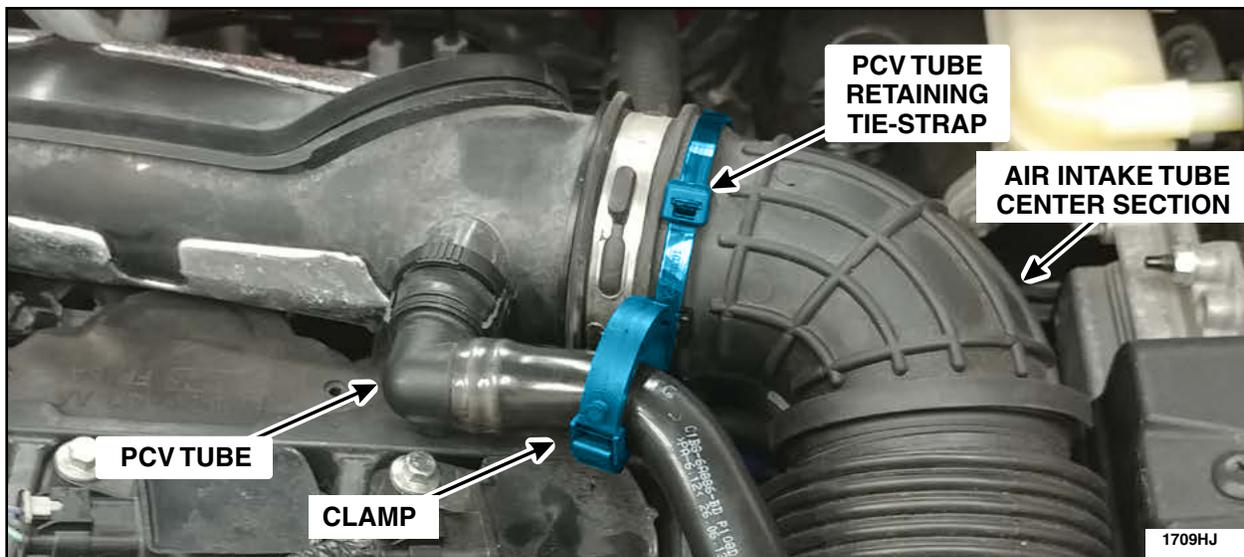
**SERVICE TIPS:** Follow procedure steps to verify proper coolant fill.



**NOTE:** This procedure contains unique steps for reassembly, including installation of *new* components.

**NOTE:** Remove protective covers that were placed over the turbocharger air intake system before re-installing components.

1. Install the battery. Please follow the procedures in WSM Section 414-01.
2. Install the turbocharger inlet pipe and connect the PCV hose to the turbocharger inlet pipe. See Figure A1.
  - Tighten the turbocharger inlet pipe fasteners to 5 Nm (44 lb-in).
  - Tighten the turbocharger inlet pipe-to-turbocharger clamp to 5 Nm (44 lb-in).
3. Install the air cleaner outlet pipe. Please follow the WSM procedures in Section 303-12C.
4. Vacuum fill the cooling system. Refer to WSM Section 303-03 for coolant specifications.
  - Do not bleed the cooling system at this time.
  - Coolant level should be filled to the "MAX" mark on the degas bottle.
5. Install a coolant pressure tester with adapter onto the degas bottle. Pressurize to 138 kPa (20 psi). Once pressure stabilizes, pressure should hold at 138 kPa (20 psi) for a minimum of 2 minutes.
  - If pressure test fails, the source of pressure loss must be identified and repaired as appropriate before proceeding. Retest the cooling system, if required.
6. Install the PCV tube retainer / tie strap provided in the vehicle parts kit. See Figure L1.
  - a. Attach the clamp onto the PCV tube and secure.
  - b. Wrap the tie strap around the air intake tube center section and tighten.
  - c. Trim the excess length from the tie strap.



**FIGURE L1**



7. Install the cowl panel and cowl panel grille. Please follow the WSM procedures in Section 501-02.
8. Bleed the cooling system. Please follow the WSM procedures in Section 303-03.

### **Module Reprogramming**

**NOTE:** The IDS must be updated to software level 109.05 or later to perform the FSA. If the IDS is not updated when the FSA is performed, it may result in various DTCs and drivability concerns. It is important that all steps of this FSA are performed in the order listed. This will ensure proper operation of the vehicle once completed.

**NOTE:** Reprogram appropriate vehicle modules before performing diagnostics and clear all Diagnostic Trouble Codes (DTCs) after programming. For DTCs generated after reprogramming, follow normal diagnostic service procedures.

9. Reprogram the PCM using IDS release 109.05 or higher.

**NOTE:** Follow the IDS on-screen instructions to complete the reprogramming procedure.

### **Important Information for Module Programming**

**NOTE:** When programming or reprogramming a module, use the following basic checks to ensure programming completes without errors.

- Make sure the 12V battery is fully charged before carrying out the programming steps and connect IDS/scan tool to a power source.
- Inspect Vehicle Communication Module (VCM) and cables for any damage. Make sure scan tool connections are not interrupted during programming.
- A hardwired connection is strongly recommended.
- Turn off all unnecessary accessories (radio, heated/cooled seats, headlamps, interior lamps, HVAC system, etc.) and close doors.
- Disconnect/depower any aftermarket accessories (remote start, alarm, power inverter, CB radio, etc.).
- Follow all scan tool on-screen instructions carefully.
- Disable IDS/scan tool sleep mode, screensaver, hibernation modes.
- Create all sessions key on engine off (KOEO). Starting the vehicle before creating a session will cause errors within the programming inhale process.
- Ensure the headlamps and accessories are turned off.



**Recovering a module when programming has resulted in a blank module:  
NEVER DELETE THE ORIGINAL SESSION!**

- a. Obtain the original IDS tool which will have the original IDS session, that was used when the programming error occurred during module reprogramming (MR) or programmable module installation (PMI).
- b. Disconnect the VCM from the data link connector (DLC) and the IDS.
- c. Reconnect the VCM to IDS and then connect to the DLC. Once reconnected, the VCM icon should appear in the corner of the IDS screen. If it does not, troubleshoot the IDS to VCM connection.
- d. Locate the original vehicle session when programming failed. This should be the last session used in most cases. If not, use the session created on the date that the programming failed.

**NOTE:** If the original session is not listed in the previous session list, click the Recycle Bin icon at the lower right of the previous session screen. This loads any deleted sessions and allows you to look through them. Double-click the session to restore it.

- e. Once the session is loaded, the failed process should resume automatically.
- f. If programming does not resume automatically, proceed to the Module Programming menu and select the previously attempted process, PMI or MR.
- g. Follow all on-screen prompts/instructions.
- h. The last screen on the IDS may list additional steps required to complete the programming process. Make sure all applicable steps listed on the screen are followed in order.



## Perform Coolant Level Sensor Check

10. Using IDS select "Coolant Level Sensor Check". See Figure L2.

- Follow the on screen instructions to complete the "Coolant Level Sensor Check" procedure.

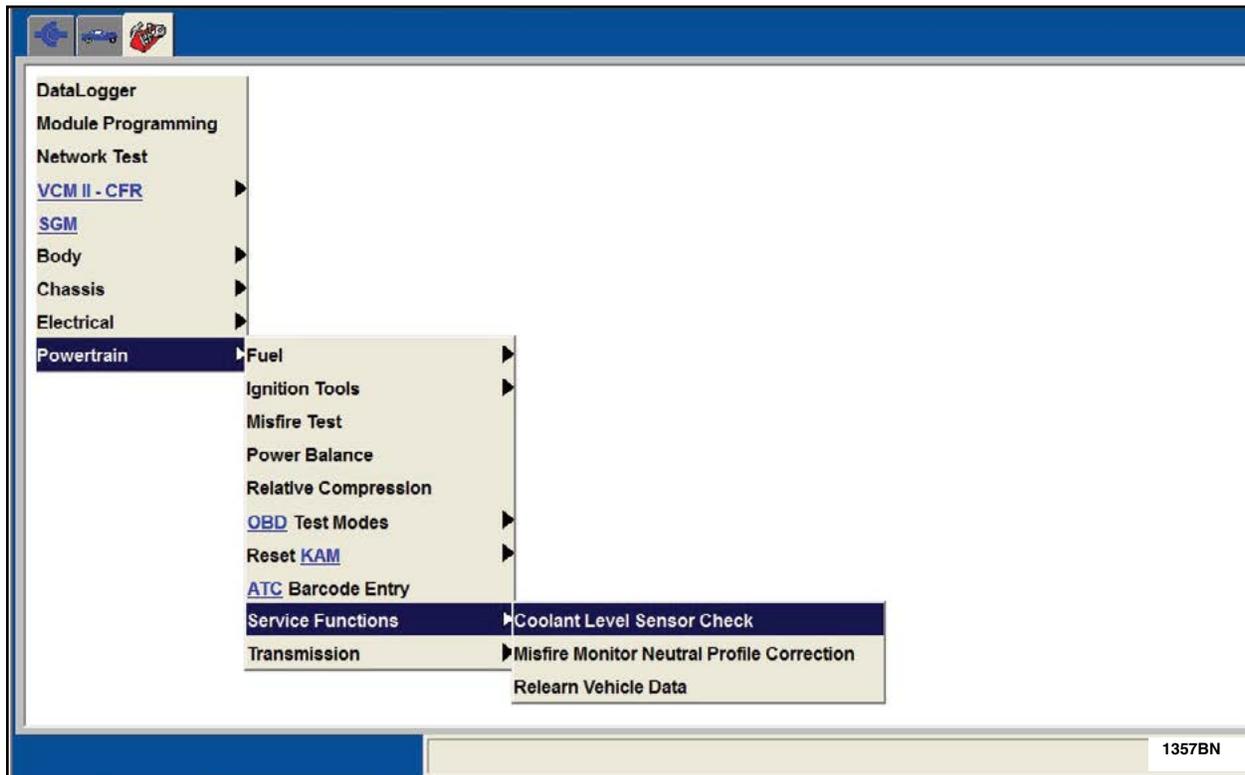
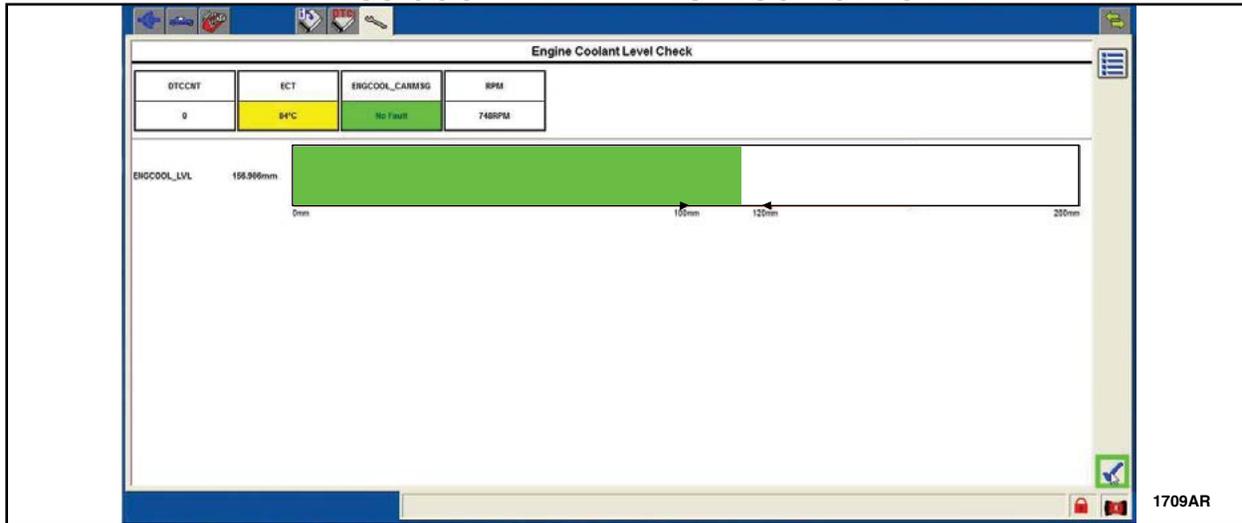


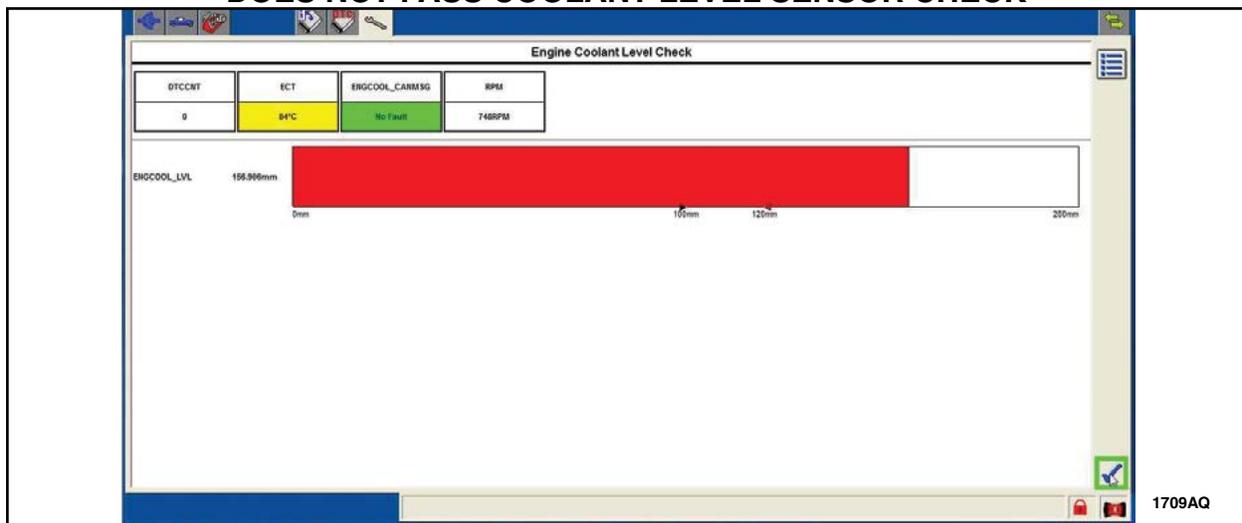
FIGURE L2



### PASS COOLANT LEVEL SENSOR CHECK



### DOES NOT PASS COOLANT LEVEL SENSOR CHECK



**NOTE:** If the coolant level is too high, additional cooling system bleeding is needed. If it is proving difficult to bleed, it may be necessary to drive the vehicle up to 12.5 Miles (20 km) to remove the air from the system.

11. Check coolant concentration using the hydrometer/refractometer to make sure it is at 50%.
12. Perform any other open recalls.
13. Coolant level should be filled to the "MAX" mark on the degas bottle once the engine is cold, prior to returning the vehicle to the customer.



## **CERTAIN 2013-2014 FUSION, 2013-2015 TRANSIT CONNECT, 2014 ESCAPE, AND 2014-2015 FIESTA ST VEHICLES EQUIPPED WITH A 1.6L ECOBOOST ENGINE — COOLANT LEVEL SENSOR SYSTEM INSTALLATION**

### **2014 ESCAPE AND 2013-2015 TRANSIT CONNECT TECHNICAL INFORMATION**

#### **OVERVIEW**

In the affected vehicles, localized overheating of the engine cylinder head may cause the cylinder head to crack, causing a pressurized oil leak that may result in a fire in the engine compartment.

#### **Escape and Transit Connect Vehicles:**

Service parts and repair procedures are now available to address this safety recall. Dealers are to perform repairs following the technical information in this document that include enhancements to the engine cooling and control systems. This service must be performed on all affected vehicles at no charge to the vehicle owner.

**IMPORTANT!** A small number of Escape vehicles will require unique PCM programming instructions. A small number of 2015 MY Transit Connect vehicles will require an additional cylinder head inspection. Please refer to Attachment VI prior to carrying out any repairs on Escape or 2015 MY Transit Connect vehicles, as certain VINs will require a contact to the Special Service Support Center (SSSC) for additional repair instructions.

Due to the complexity of this repair, the following considerations have been made to help the repair procedure go as smoothly as possible:

- Repair procedures have been divided alphabetically into multiple separate procedures.
- Parts have been packaged into kits.
- Each procedure includes:
  - Overview
  - List and photo of the parts required
  - List of unique tools needed
  - Service tips to help complete the repair

**NOTE:** Please read this procedure in its entirety, prior to performing repairs. Additionally, instructional videos have been developed to assist with the repair. Please refer to Attachment VII: Instructional Video Links to view the videos.



**Recommended Tools:**

<b>General Tools</b>	<b>General Equipment</b>
1/4" Drive Ratchet (Power And Hand Tool)	Floor Jack
1/4" Drive 7, 8, and 10 mm Shallow Sockets	Wood Block
1/4" Drive 10 mm, 12 mm Deep Sockets	Coolant Pressure Tester
1/4" Drive T-25 And T-30 Torx Bit Sockets	Drain Pan
1/4" Drive 6 in (152 mm) Extension	Battery Charger
3/8" Drive Ratchet (Power And Hand Tool)	Extension Cord
3/8" Drive 10 mm, 15 mm Swivel Impact Sockets	
3/8" Drive 6 in (152 mm) Extension	<b>Special Tools</b>
3/8" Drive 10 mm, 13 mm Deep Impact Sockets	Hydrometer/Refractometer
1/2" Drive Ratchet Power Tool And Hand Tool	Vacuum Tester/Re-filler
1/2" Drive 15 mm Shallow Impact Socket	IDS and VCM II
1/2" Drive Impact Swivel	
1/2" Drive Impact 6 in (152 mm) Extension	
1/2" Drive 9 in (228 mm) Impact Extension	
1/2" Drive Torque Wrench	
1/4" And 3/8" Drive Torque Wrench	
Needle Nose Vise Grip Pliers	
Needle Nose Pliers	
13 mm Wrench	
Plastic Trim Tools	
Side Cutters	
Coolant Hose Hook Tool	
Pocket Screwdriver	
Inspection Mirror	
Drill	
5.5 mm and 6.2 mm Drill Bits	
Tape Measure/Ruler	
Paint Stick/Pen	
De-burr Tool	
Pick Tool 12 in (304 mm) with 90 Degree Bend	
2 Jaw Puller	
Cable Operated Hose Clamp Pliers	
Scissors	



## SERVICE PROCEDURE

### Procedure A - Initial Disassembly and Preparation for Inspection

**OVERVIEW:** This procedure details the components to be removed to enable initial vehicle inspection.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Please note the following:

- The Inspection / Check Sheet (Attachment V) must be printed and started during "Procedure A".
- The air cleaner, mass air flow sensor and air intake tube are removed as an assembly.
- Cover the turbocharger inlet opening to prevent dropping any parts or debris into the turbocharger while the turbocharger inlet pipe is off.

1. Print a copy of the Inspection / Check Sheet (Attachment V), to record vehicle information and inspection/repair information for the vehicle. The Inspection / Check Sheet is to be attached/filed with the recall repair order following completion, it does not need to be provided to Ford at this time.

2. Fill out top of Inspection / Check Sheet including:

- VIN
- Technician ID
- Repair Order Number
- Repair Date
- Vehicle Mileage
- Vehicle Build Date
- Open Field Service Actions

3. Using OASIS, document vehicle build date on the Inspection / Check Sheet.

4. With the vehicle in NEUTRAL, position it on a hoist. Please follow the Workshop Manual (WSM) procedures in Section 100-02.

5. Using IDS/scan tool, retrieve and record DTCs on the Inspection / Check Sheet.

- Any DTCs recorded will be used later in this procedure.

6. Remove the engine appearance cover.

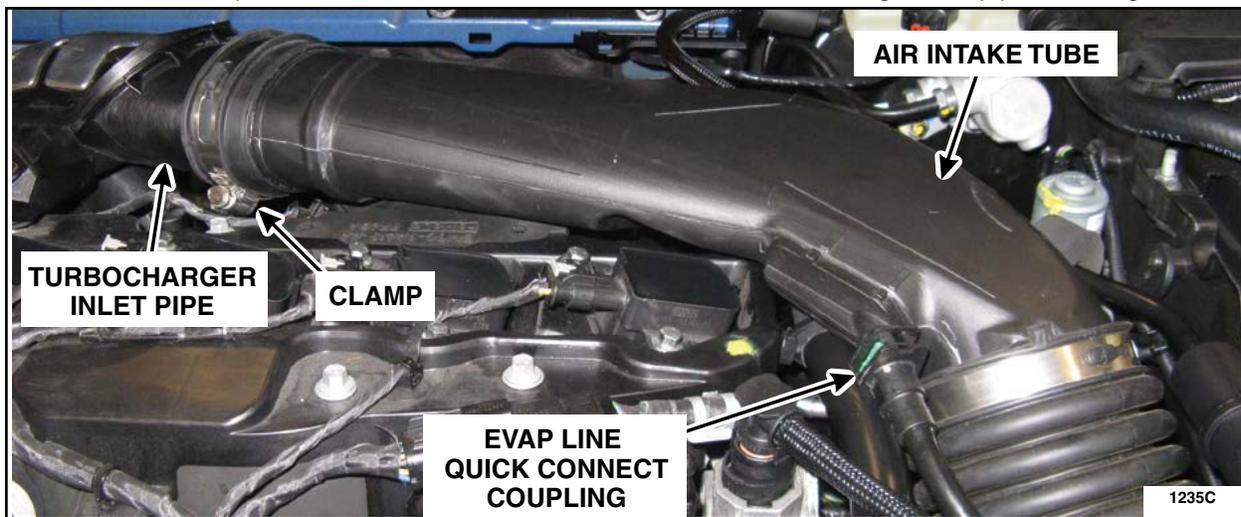
7. Remove the cowl panel. Please follow the WSM procedures in Section 501-02.



**NOTICE:** When working with 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:** Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

8. Disconnect the EVAP line quick connect coupling from the air intake tube center section. Set the clip aside for re-installation to prevent it from falling into the engine compartment. See Figure A1.
9. Loosen the clamp and disconnect the air intake tube from the turbocharger inlet pipe. See Figure A1.



**FIGURE A1**



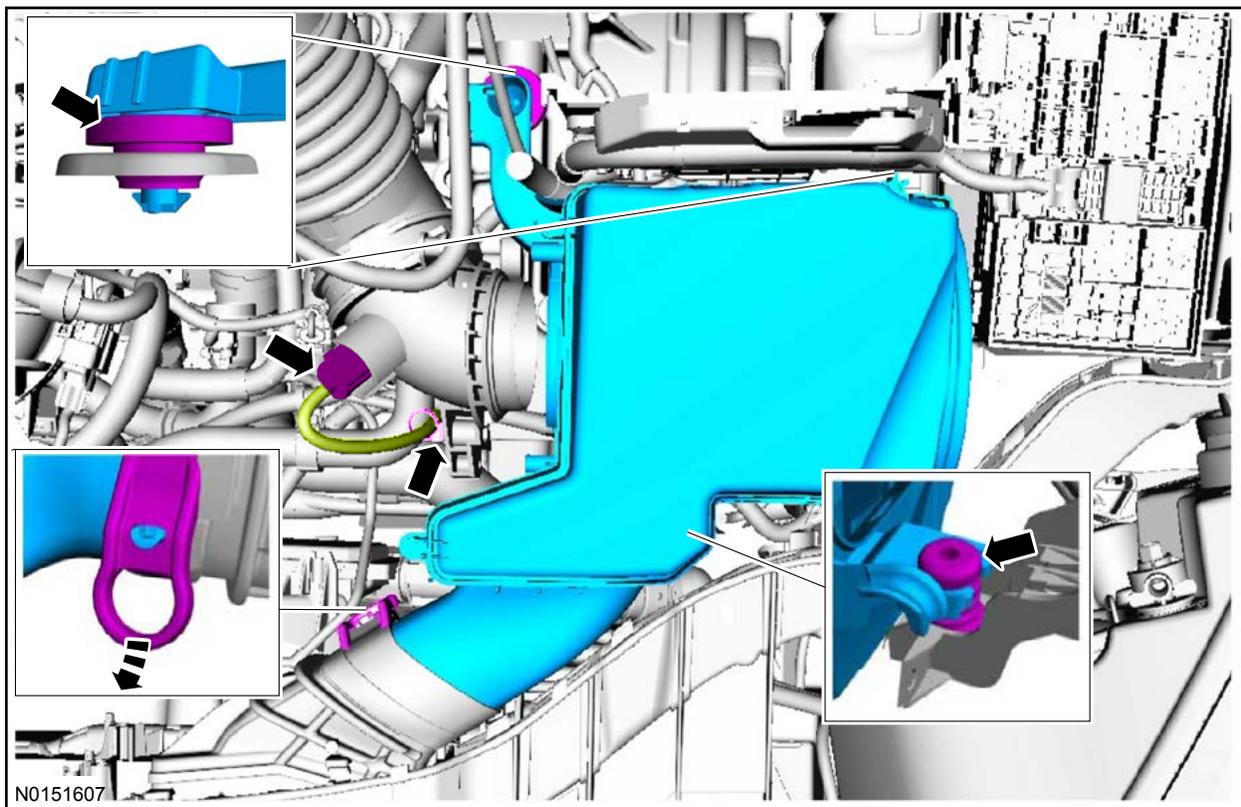
**NOTICE:** Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

**NOTE:** The air cleaner assembly is removed from the vehicle with the mass air flow sensor and air intake tube attached.

**NOTE:** Escape shown, Transit Connect is similar.

10. Remove the air cleaner assembly. See Figure A2.

- a. Disconnect the mass air flow sensor electrical connector.
- b. Release the fresh air intake tube flap.
- c. Detach the mass air flow sensor wire harness retainer from the air cleaner assembly.
- d. Lift upward to disengage the two retaining grommets and remove the air cleaner assembly.



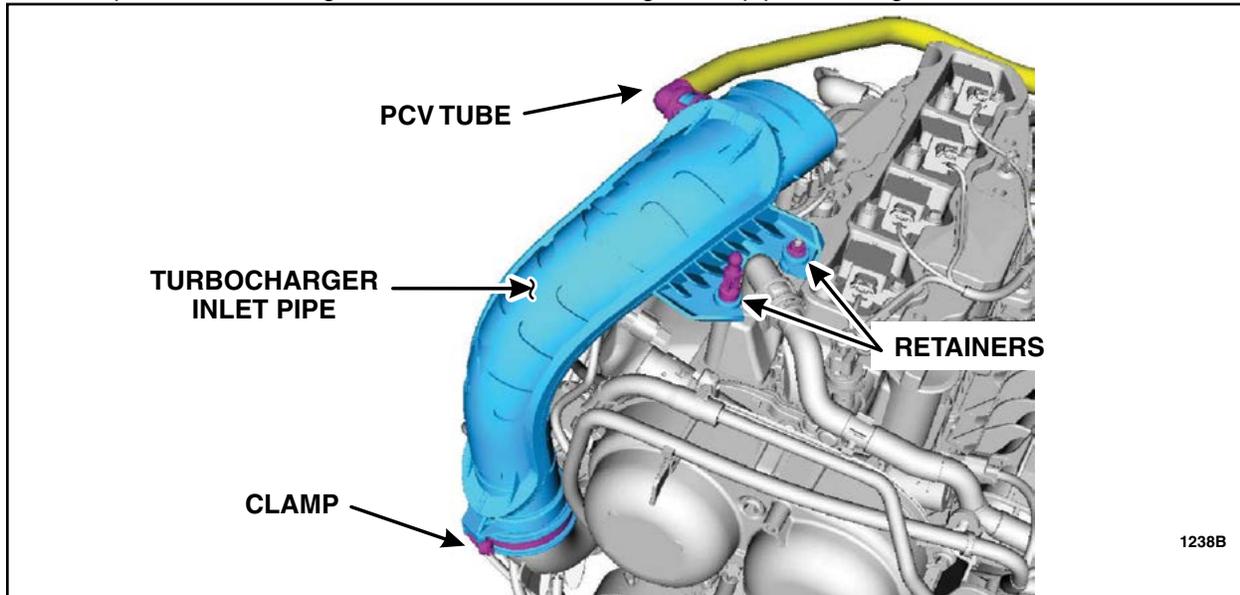
**FIGURE A2**

11. Remove the battery tray. Please follow the WSM procedures in Section 414-01.



**NOTICE:** Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

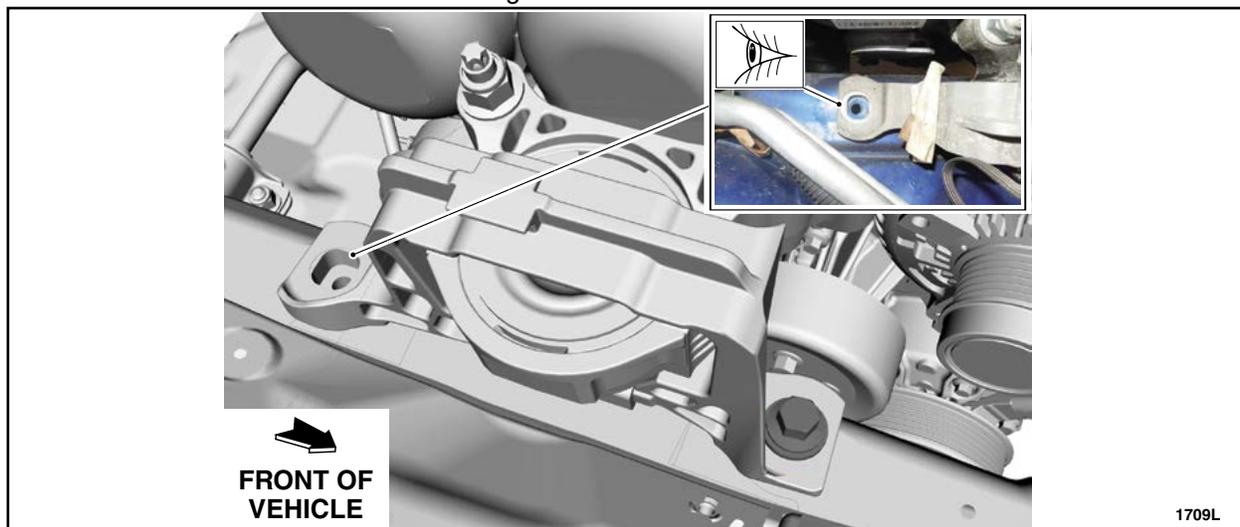
12. Disconnect the PCV tube from the turbocharger inlet pipe. Remove the retainers and loosen the clamp at the turbocharger. Remove the turbocharger inlet pipe. See Figure A3.



**FIGURE A3**

13. Remove the rear engine mount bolt and take note of the bolt hole location. The bolt hole must be centered with the engine mount hole to allow for proper installation of the coolant stand-pipe bracket within Procedure J.

- If the bolt hole is centered with the engine mount, then powertrain assembly mount neutralizing **will not be required** within Procedure C.
- If the hole is not centered, please carry out the powertrain assembly mount neutralizing when instructed in Procedure C. See Figure A4.

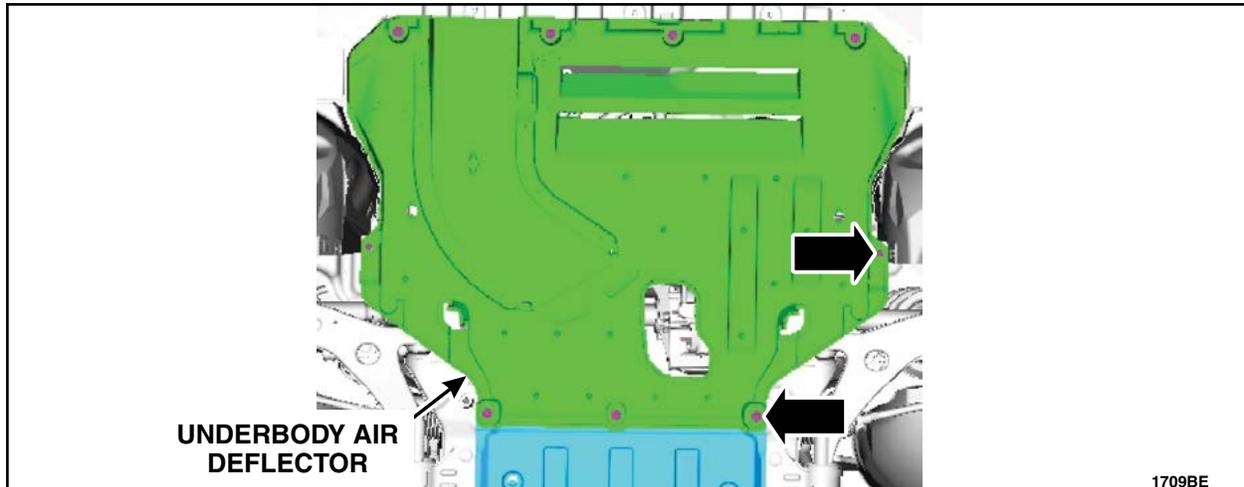


**FIGURE A4**



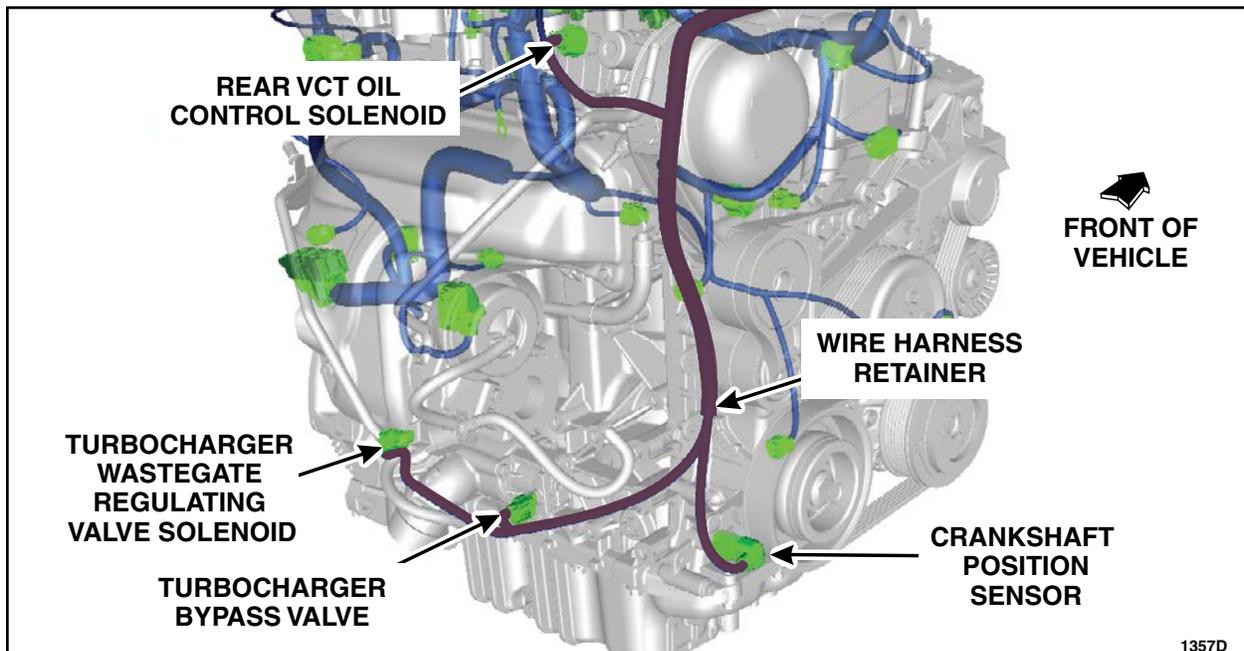
14. Remove the retainers and the front underbody air deflector. See Figure A5.

**NOTE:** Escape shown, Transit Connect is similar.



**FIGURE A5**

15. Detach the wire harness retainer from the front cover, disconnect the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve electrical connectors. See Figure A6.



**FIGURE A6**



## Procedure B - Inspection / Check Sheet Completion

**OVERVIEW:** The Inspection must be completed and documented on the Inspection / Check Sheet. The inspection will check for obvious concerns that require correction with additional focus on cooling system concerns such as:

- Internal coolant leaks
- External coolant leaks
- Any DTC(s) that could indicate a recent engine overheat event or internal engine damage that may have resulted from a previous cooling system concern.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:** Rotunda Cooling System Pressure Tester (STN12270) and adapter (Snap-On TA52, AST ASSFZ-47, Redline RDL95-0750 or equivalent).

**SERVICE TIPS:** Use standard Workshop Manual and PC/ED Diagnostics, if necessary, to diagnose any cooling system or misfire DTC(s) retrieved and for any coolant loss concerns.

**NOTE:** Perform an underhood visual inspection for any obvious coolant, oil, transmission, or fuel leaks.

**NOTE:** If any concerns are identified repair as related damage before proceeding. If the coolant pressure test identifies concerns with the degas bottle, turbocharger return tube, upper section of the degas bottle return hose, or quick connect T-fitting at the coolant shutoff solenoid valve; note the condition. These items will be replaced as part of this recall. Refer to Dealer Bulletin Attachment I, Related Damage, for related damage claiming.

## Vehicle Inspection

1. Visually inspect the coolant level in the degas bottle.

- If the coolant level **is** visible in the degas bottle, proceed to Step 2.
- If the coolant level **is not** visible in the degas bottle, add coolant as necessary, and proceed to Step 2.

**NOTE:** Any gross loss of coolant must be identified and repaired prior to proceeding.

2. Remove the degas bottle cap.

3. Install a coolant pressure tester with adapter onto the degas bottle. Pressurize to 138 kPa (20 psi). Once stabilized, pressure should hold at 138 kPa (20 psi) for a minimum of 2 minutes.

- If cooling system pressure does not hold for a minimum of 2 minutes, the source of pressure loss must be identified and repaired as necessary before proceeding.

4. Visually check for coolant leaks with the system under pressure.



5. Check the engine oil level to ensure it is within normal range, note if it is overfilled. Visually check for engine oil leaks at the rear surface of the cylinder head, above exhaust manifold, that may be the result of a crack in the cylinder head. See Figure B1.

- If an oil leak is detected at the rear surface of the cylinder head, replace the complete cylinder head assembly before proceeding.

**NOTE:** The turbocharger coolant tubes and exhaust manifold heat shield are removed for clarity.

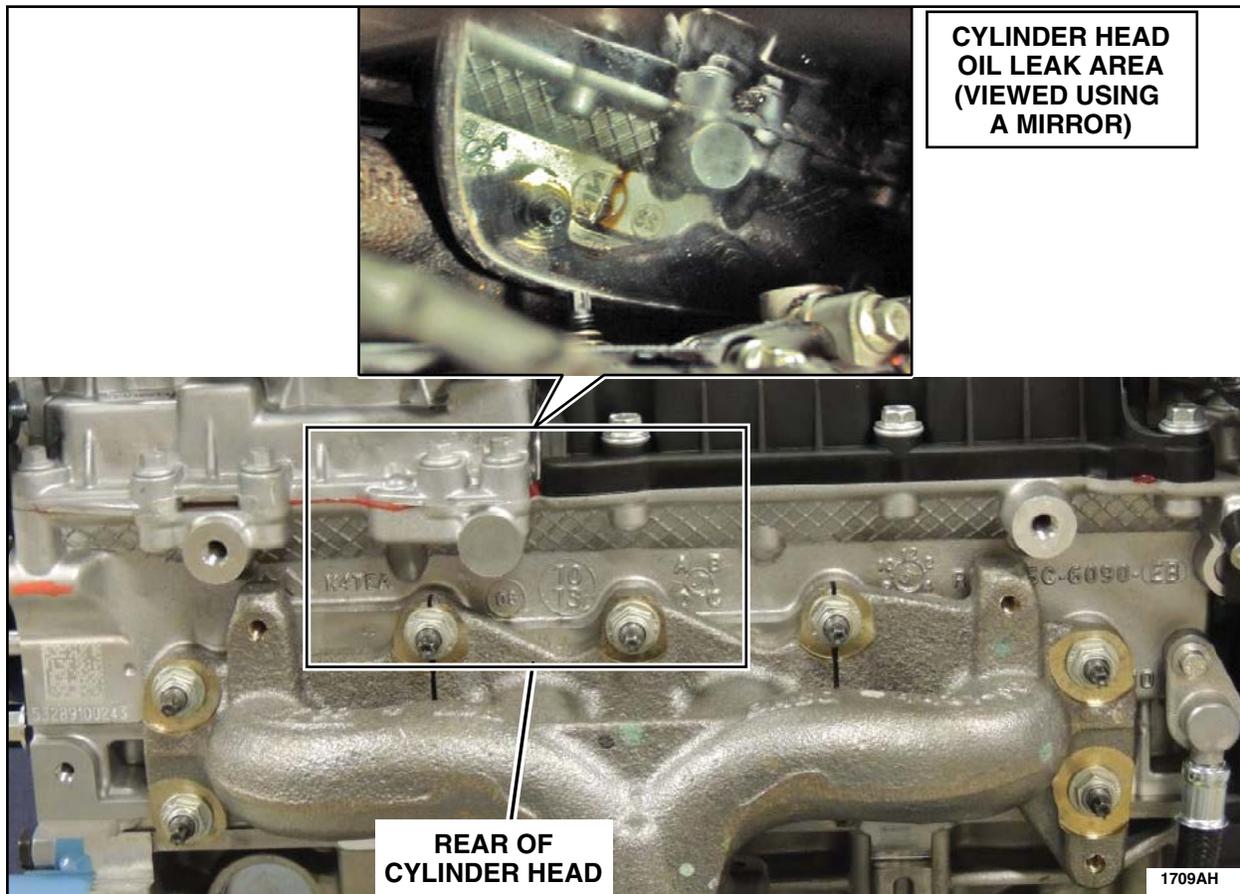


FIGURE B1



6. DTCs - If any of the DTCs listed below are present, note and identify the cause before proceeding.

- If additional DTCs are present, diagnose and repair as required.

**NOTE:** Diagnosis for any of the following DTCs may require reinstallation of the air intake components and battery. Perform diagnosis and repairs as necessary. Refer to Dealer Bulletin Attachment I, Related Damage, for related damage claiming.

<b>Cooling System DTCs</b>	
<b>P0217</b>	Engine Coolant Over Temperature Condition
<b>P0218</b>	Transmission Fluid Over Temperature Condition
<b>P0219</b>	Engine Over Speed Condition
<b>P1299</b>	Cylinder Head Over Temperature Protection Active
<b>Engine Misfire DTCs</b>	
<b>P0300</b>	Random Misfire Detected
<b>P030x</b>	Cylinder X Misfire Detected
<b>P0313</b>	Misfire Detected With Low Fuel
<b>P0316</b>	Misfire Detected On Startup (First 1000 Revolutions)

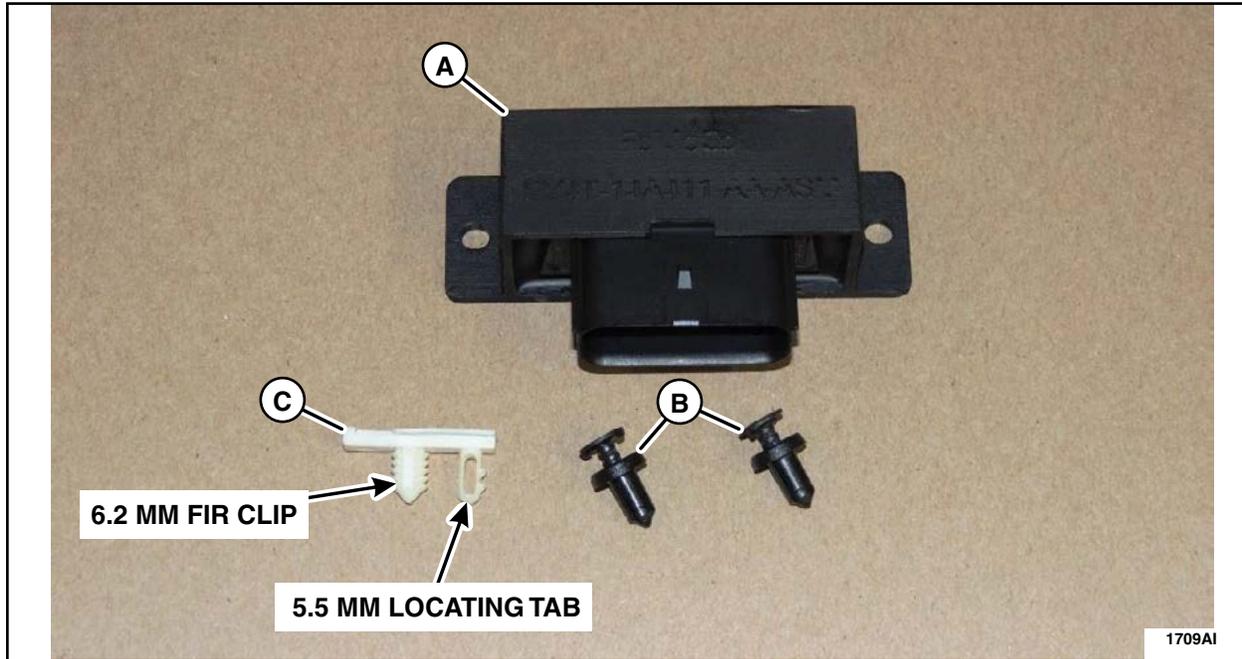
7. Note any concerns identified and repairs made on the Inspection / Check Sheet.



### Procedure C - Battery Tray Modification

**OVERVIEW:** With the battery tray removed, four holes need to be drilled in the right side to allow mounting of wiring harness components that will be added to support coolant level monitoring. The battery is reinstalled to allow module communication for reprogramming while additional repairs are performed.

#### PARTS / SUPPLIES REQUIRED:



A	Connector Junction Box
B	Push Pin Retainers (2 ea.)
C	Wiring Harness Clip

**UNIQUE TOOL REQUIREMENTS:** 5.5 mm (7/32"), 6.2 mm (1/4") drill bits.

**SERVICE TIPS:** Remove the two (2) push pin retainers from the connector junction box, prior to installation. While installing the connector junction box ensure that the push pin retainers are installed in the proper orientation. See Figure C4.



1. **NOTE:** If a 6.2 mm drill bit is not readily available, use a 6 mm drill bit and ream the holes slightly to allow the push-pin retainers and wiring harness clip to fit snug.

Using the dimensions shown below, mark and drill the locations of the two (2) holes that are required for the *new* connector junction box, in the right side of the battery tray. See Figure C1.

- a. Position the *new* connector junction box on the forward right side of the battery tray, 10mm (3/8") down from the top edge of the battery tray. Using the *new* connector junction box as a template, mark the two (2) hole locations on the battery tray. See Figure C1.
- b. Remove the *new* connector junction box from the battery tray.
- c. Using a 6.2 mm (1/4") drill bit, drill the two marked locations on the battery tray.

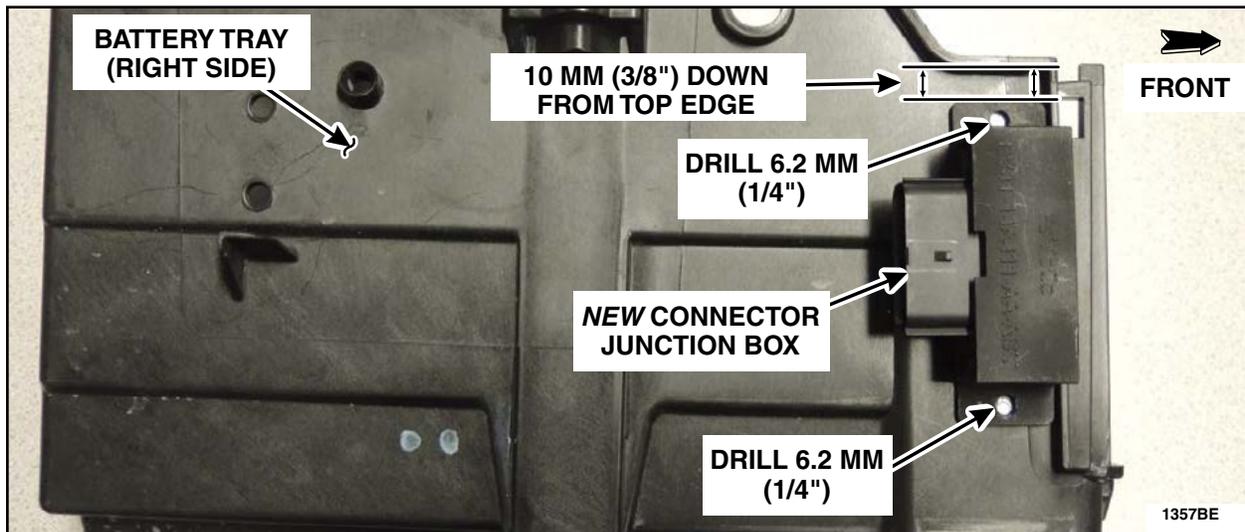


FIGURE C1

2. Measure and mark the two hole locations on the battery tray for the *new* wire harness clip. See Figure C2.

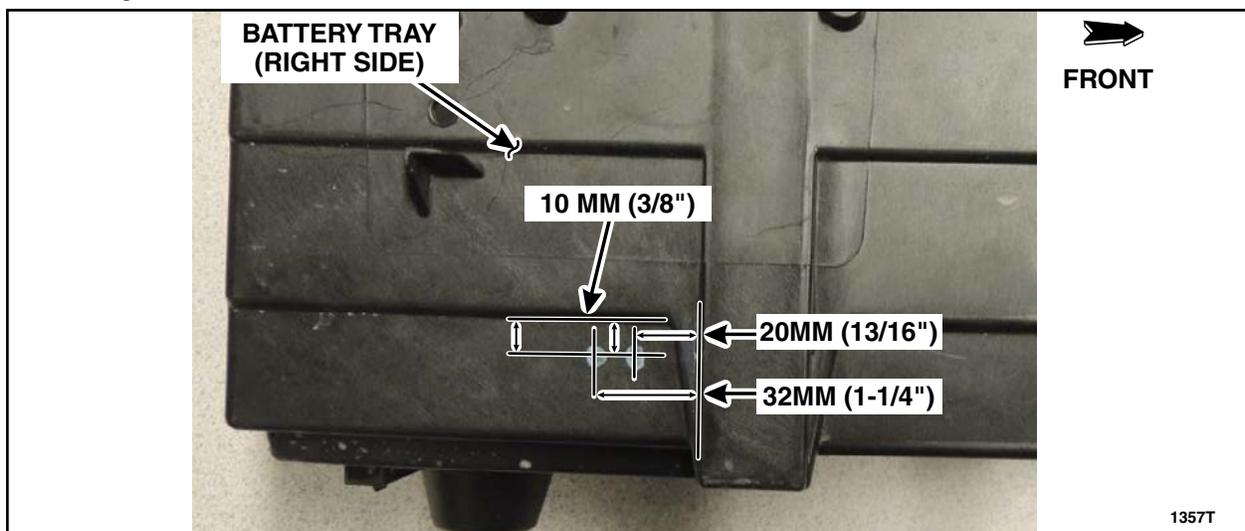


FIGURE C2



- Using the appropriate size drill bit for the two (2) remaining marked locations on the battery tray, 5.5 mm (7/32") and 6.2 mm (1/4") as indicated in Figure C3, drill the two (2) holes. See Figure C3.

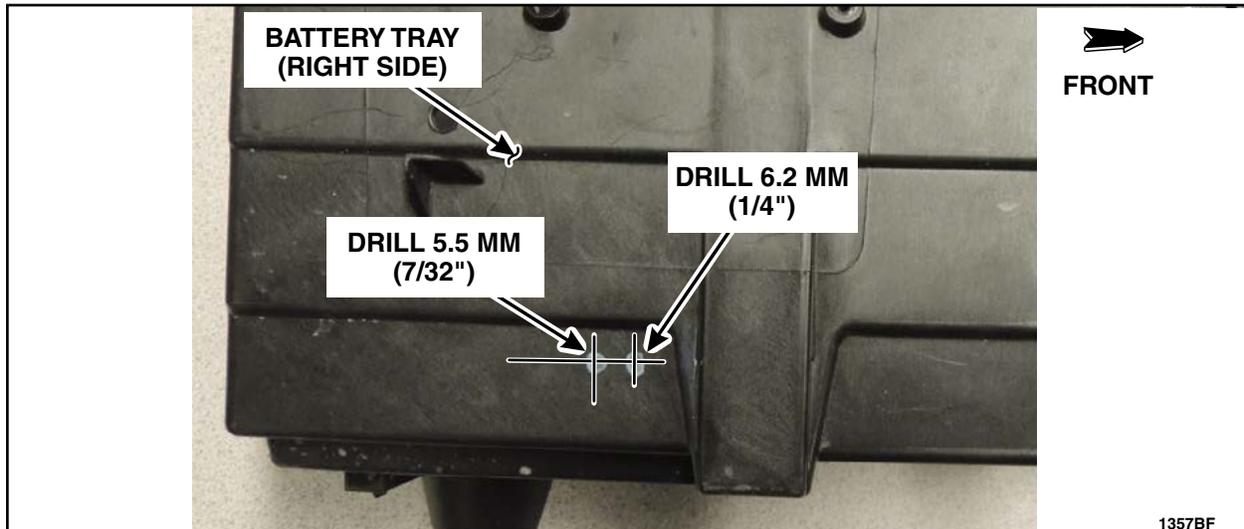


FIGURE C3

- Deburr the four (4) previously drilled holes on the battery tray as necessary.
- Attach the *new* connector junction box to the battery tray using the two (2) *new* push pin retainers. Install the *new* push pin retainers so the heads of the retainers are on the **INSIDE** of the battery tray. See Figure C4.
- Install the *new* wire harness clip onto the battery tray. The christmas tree portion of the *new* wire harness clip is to be installed into the larger of the two mounting holes. See Figure C4.

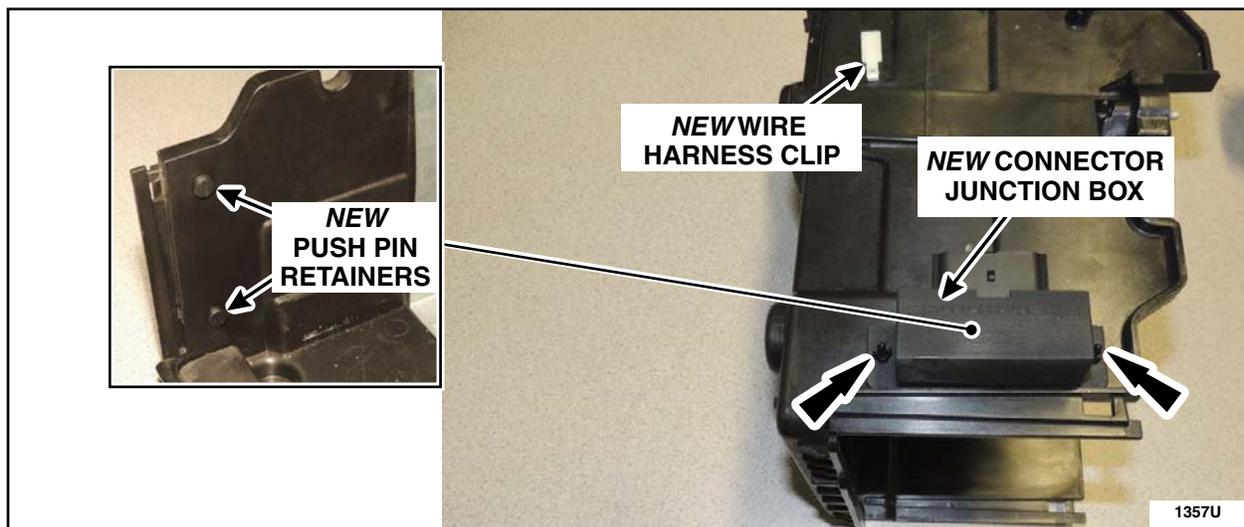


FIGURE C4



7. **NOTE:** This step is only required if the bolt hole is not centered with the engine mount hole. The bolt hole must be centered to allow for proper installation of the coolant stand-pipe bracket in Procedure J.

If required, perform the powertrain assembly mount neutralizing procedure, (reference Step 13 in Procedure A). Please follow the WSM procedures in Section 303-00.

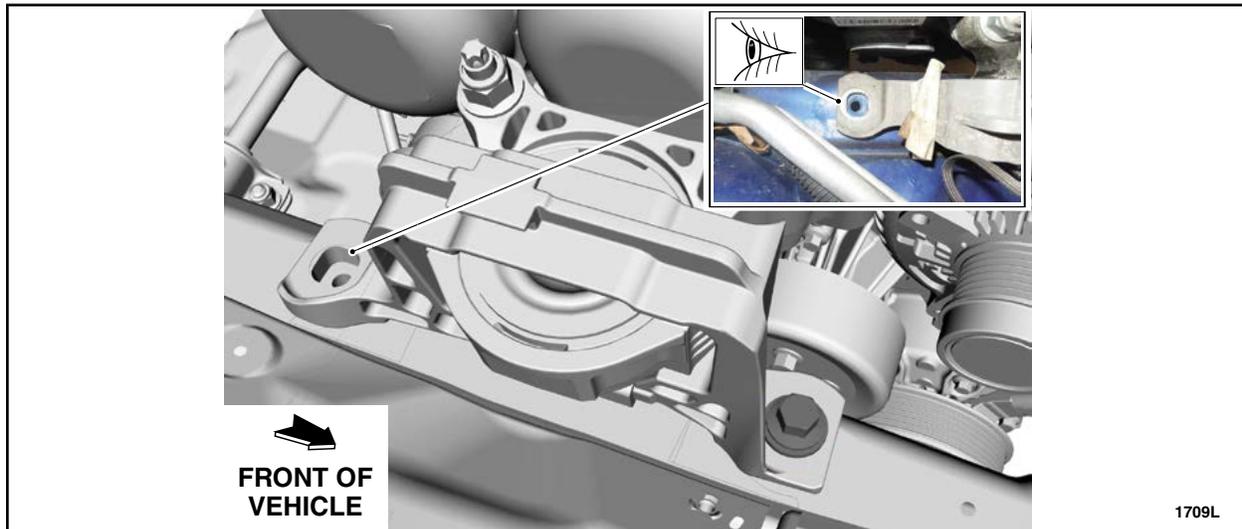


FIGURE C5

8. Position the battery tray back into the vehicle and install the three (3) bolts. See Figure C6.

- 11 Nm (97 lb-in).

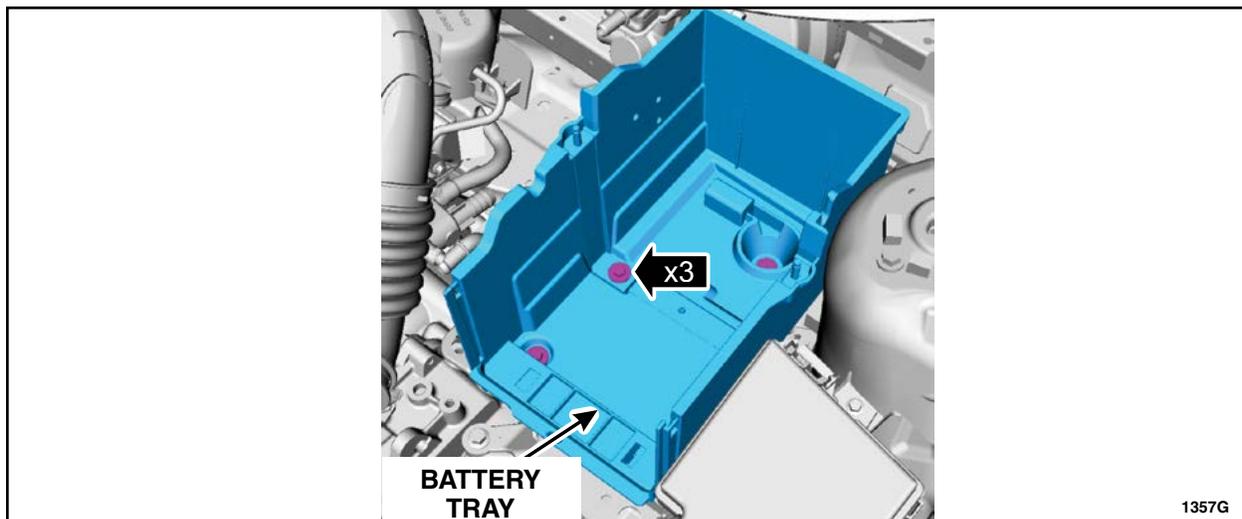


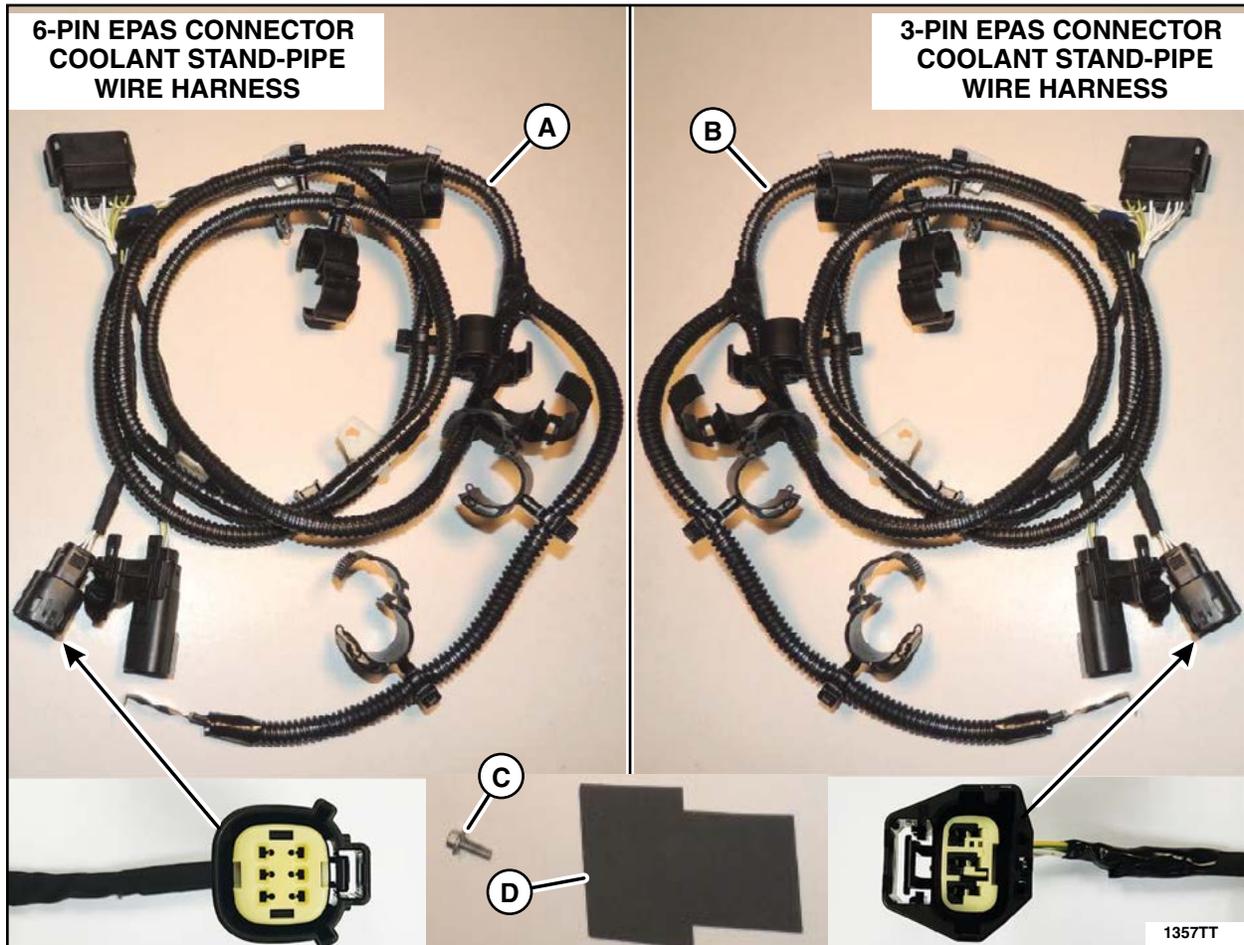
FIGURE C6



**Procedure D - Coolant Stand-pipe Wire Harness Installation**

**OVERVIEW:** The coolant stand-pipe wire harness is partially installed in this procedure to complete the CAN Network connections which will allow module communication for reprogramming.

**PARTS / SUPPLIES REQUIRED:**



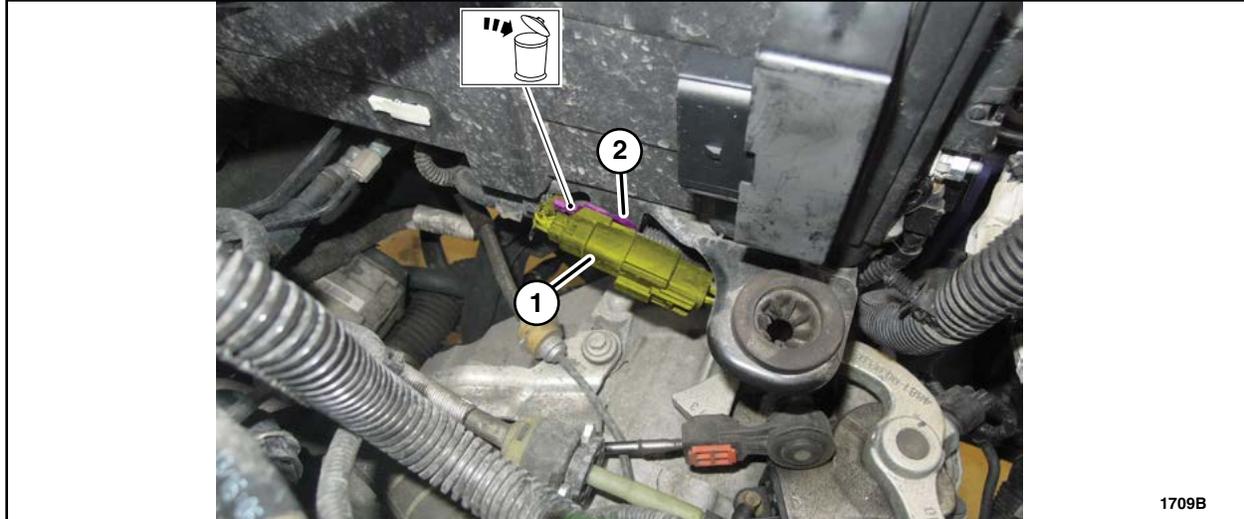
A	6-Pin EPAS Connector Coolant Stand-pipe Wire Harness
B	3-Pin EPAS Connector Coolant Stand-pipe Wire Harness
C	Wire Harness Ground Bolt
D	Protective Foam Pad

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None



1. Detach the retaining clip from the battery tray mounting bracket and disconnect the EPAS electrical connector. See Figure D1.
2. Remove and discard the retaining clip from the EPAS electrical connector. See Figure D1.



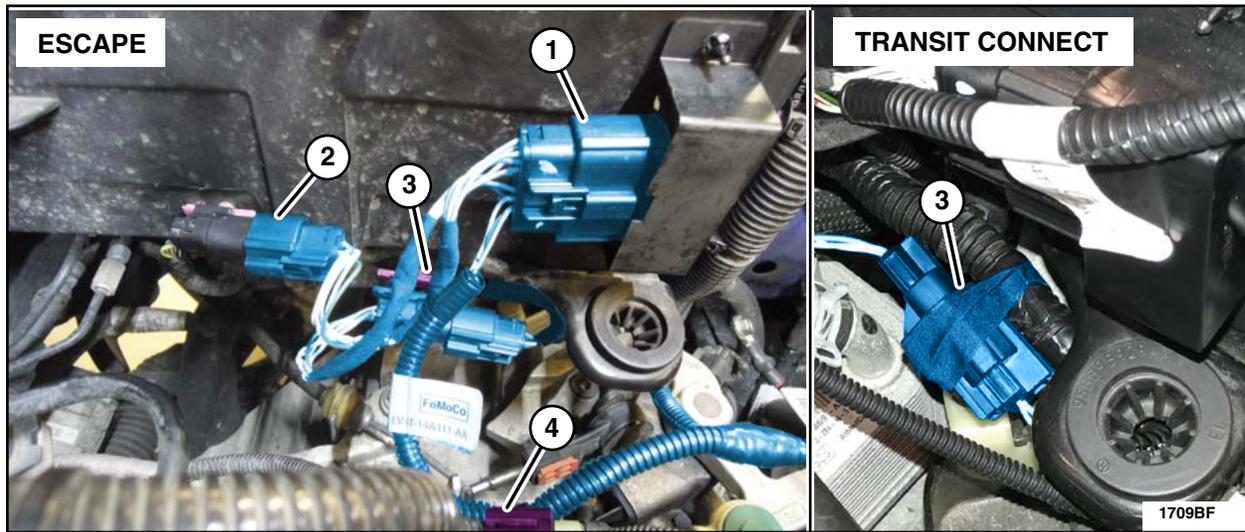
**FIGURE D1**

3. Install and connect the battery. For additional information, refer to WSM Section 414-01.
  - Do not reinstall the engine air cleaner assembly at this time. It will be installed in one of the following procedures.



**NOTE:** Escape shown, Transit Connect is similar.

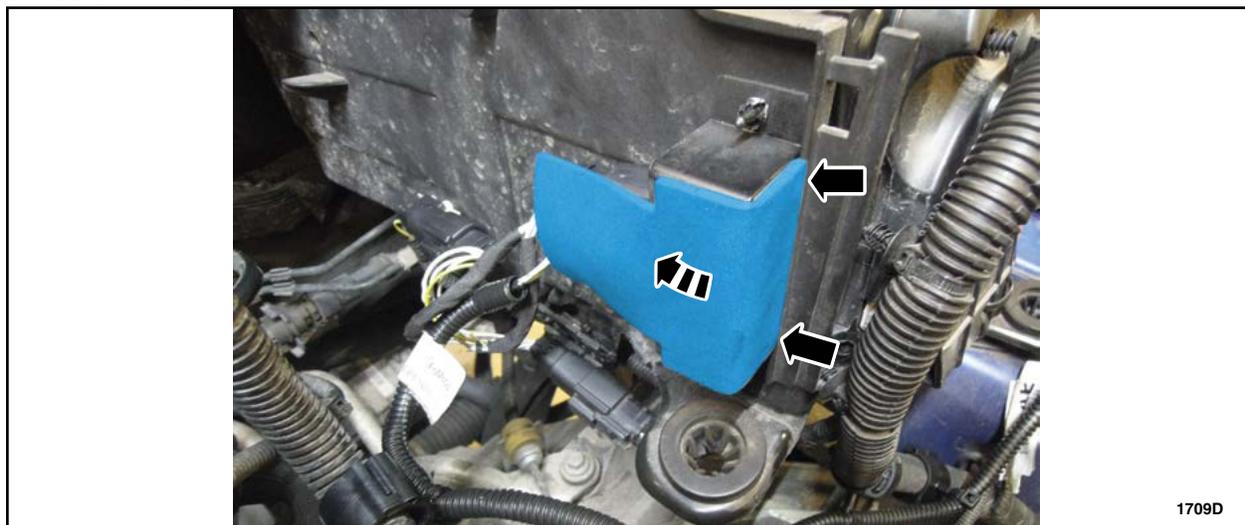
4. Install the coolant stand-pipe wiring harness. See Figure D2.
  1. Connect the electrical connector to the connector junction box on the battery tray.
  2. Connect and attach the electrical connectors to the white retaining clip that was previously installed on the battery tray.
  3. **Escape Vehicles:** Connect and attach the coolant stand-pipe wiring harness electrical connector to the EPAS electrical connector.
  - Transit Connect Vehicles:** Connect the coolant stand-pipe wiring harness electrical connector to the EPAS electrical connector and tape it to the battery cable harness.
4. Pre-route the wiring harness. Using the clips to attach to the engine compartment wiring harness.



**FIGURE D2**

5. **NOTICE:** Ensure the junction box surface is clean and free of any dirt and debris prior to foam pad installation.

Apply foam pad over the connector junction box and electrical connector. See Figure D3.



**FIGURE D3**



6. **NOTICE:** Ensure the surface is clean and free of any dirt and debris prior to installing the *new* ground bolt.

Install the *new* coolant stand-pipe wire harness ground eyelet to the vehicle using the *new* wire harness ground bolt. See Figure D4.

- 12 Nm (106 lb-in).

**NOTE:** The new coolant stand-pipe wire harness is highlighted to show routing and connection points.

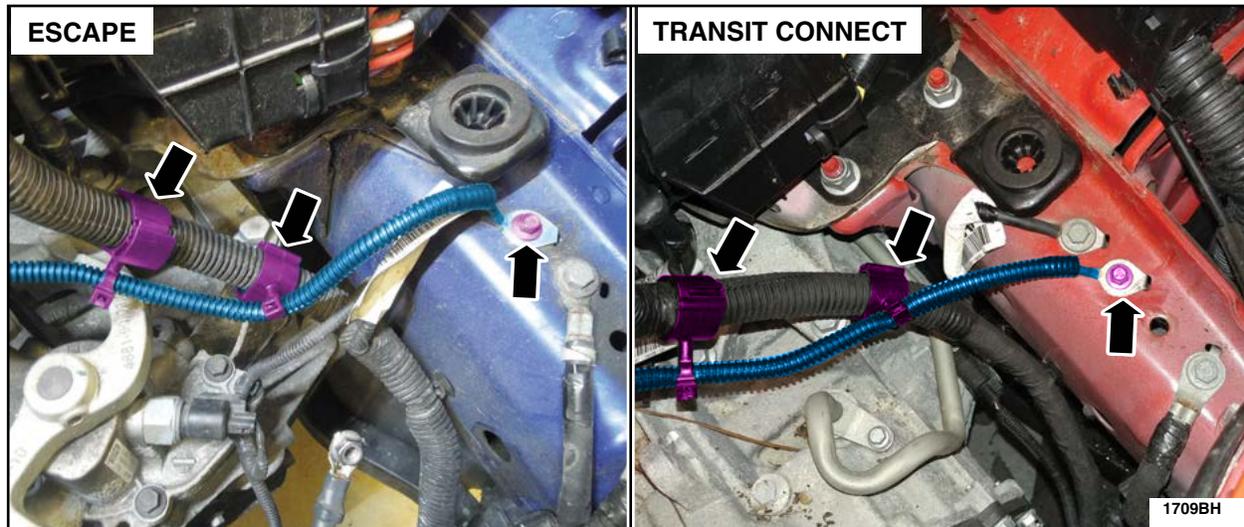


FIGURE D4

7. Position the stand-pipe wire harness aside. It will be routed/secured and connected later.
8. Install the transmission fluid heater coolant control valve to the battery tray and install the two (2) retainers. See Figure D5.

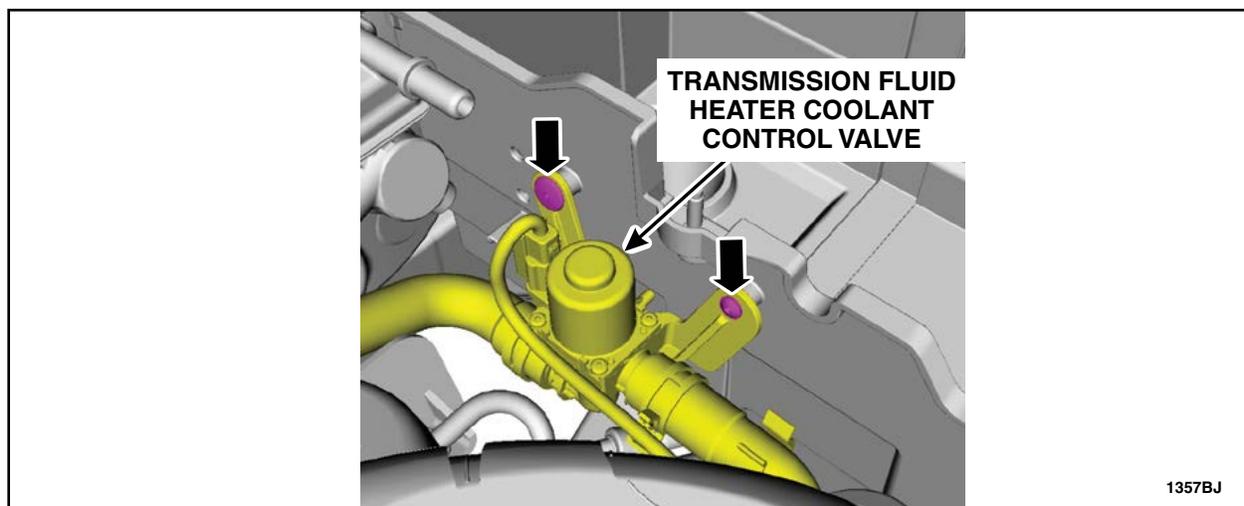


FIGURE D5



## Procedure E - Instrument Panel Cluster (IPC) Reprogramming

**OVERVIEW:** The IPC software is being updated to coordinate cooling system improvements and instrument cluster messaging. IPC reprogramming can be performed while performing other repairs on the vehicle. The PCM must be reprogrammed during Procedure L after cooling system repairs and bleeding are completed.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:**

- IDS with release 108.03 or higher
- Portable battery charger (10 to 20 amps)

**SERVICE TIPS:** Begin IPC reprogramming and continue to perform repairs during IPC reprogramming. Reprogramming times for the IPC can be significantly reduced by using a VCM II instead of a VCM.

### Important Information for Module Programming

**NOTE:** When programming or reprogramming a module, use the following basic checks to ensure programming completes without errors.

- Make sure the 12V battery is fully charged before carrying out the programming steps and connect IDS/scan tool to a power source.
- Inspect Vehicle Communication Module (VCM) and cables for any damage. Make sure scan tool connections are not interrupted during programming.
- A hardwired connection is strongly recommended.
- Turn off all unnecessary accessories (radio, heated/cooled seats, headlamps, interior lamps, HVAC system, etc.) and close doors.
- Disconnect/depower any aftermarket accessories (remote start, alarm, power inverter, CB radio, etc.).

**NOTE:** Accessory remote start systems have been reported to interfere with IPC module reprogramming and can result in loss of module communication. If the vehicle is equipped with an accessory remote start system it must be disconnected prior to attempting IPC module reprogramming.

- Follow all scan tool on-screen instructions carefully.
- Disable IDS/scan tool sleep mode, screensaver, hibernation modes.
- Create all sessions key on engine off (KOEO). Starting the vehicle before creating a session will cause errors within the programming inhale process.
- Ensure the headlamps and accessories are turned off.



### Additional Instructions Required for Transit Connect - IPC Inspection Prior To Module Reprogramming

**NOTE:** Some instrument clusters require replacement prior to module reprogramming to prevent a potential battery drain concern.

1. Inspect the cluster appearance. Does the instrument cluster have a chrome bezel and a large information display screen. See Figure E1.

Yes – Proceed to the next step.

No – Proceed to IPC module reprogramming, All Vehicles.



**FIGURE E1**

2. Connect the IDS and begin the IPC reprogramming. At the start of programming the IDS will display the IPC module software part number. Note the IPC software part number.

3. Is the IPC module software part number any of the following?  
DT1T-14C026-ZA, DT1T-14C026-ZB, or DT1T-14C026-ZC

Yes – Replace the IPC then proceed to IPC module reprogramming. Refer to WSM Section 413-01, for IPC replacement.

No – IPC replacement is not necessary. Proceed with the IPC module reprogramming.



## Module Reprogramming

**NOTE:** The IDS must be updated to software level 108.03 or later to perform the FSA. If the IDS is not updated when the FSA is performed, it may result in various DTCs and drivability concerns. It is important that all steps of this FSA are performed in the order listed. This will ensure proper operation of the vehicle once completed.

**NOTE:** Reprogram appropriate vehicle modules before performing diagnostics and clear all Diagnostic Trouble Codes (DTCs) after programming. For DTCs generated after reprogramming, follow normal diagnostic service procedures.

1. The IPC reprogramming can take up to 1 hour or more. Connect a portable battery charger of 10 to 20 amps to an extension cord and to the 12V battery. This will allow the vehicle to be raised and lowered as needed while completing the remaining repair procedures, and ensure uninterrupted reprogramming is achieved. Programming times can be significantly reduced by using a VCMII.

**NOTE:** Periodically check the status of the reprogramming progress to continue the process, as required.

2. Reprogram the IPC using IDS release 108.03 or higher.

**NOTE:** If DTC U2101 is set after reprogramming of the IPC, please configure the Car Configuration Parameters. Using the IDS, select Tool Box/Module Programming/Programmable Parameters/Car Configuration Parameters(s)/Retrieve PTS derived ASBUILT data.

**NOTE:** Follow the IDS on-screen instructions to complete the reprogramming procedure.

### **Recovering a module when programming has resulted in a blank module: NEVER DELETE THE ORIGINAL SESSION!**

- a. Obtain the original IDS tool which will have the original IDS session, that was used when the programming error occurred during module reprogramming (MR) or programmable module installation (PMI).
- b. Disconnect the VCM from the data link connector (DLC) and the IDS.
- c. Reconnect the VCM to IDS and then connect to the DLC. Once reconnected, the VCM icon should appear in the corner of the IDS screen. If it does not, troubleshoot the IDS to VCM connection.
- d. Locate the original vehicle session when programming failed. This should be the last session used in most cases. If not, use the session created on the date that the programming failed.

**NOTE:** If the original session is not listed in the previous session list, click the Recycle Bin icon at the lower right of the previous session screen. This loads any deleted sessions and allows you to look through them. Double-click the session to restore it.

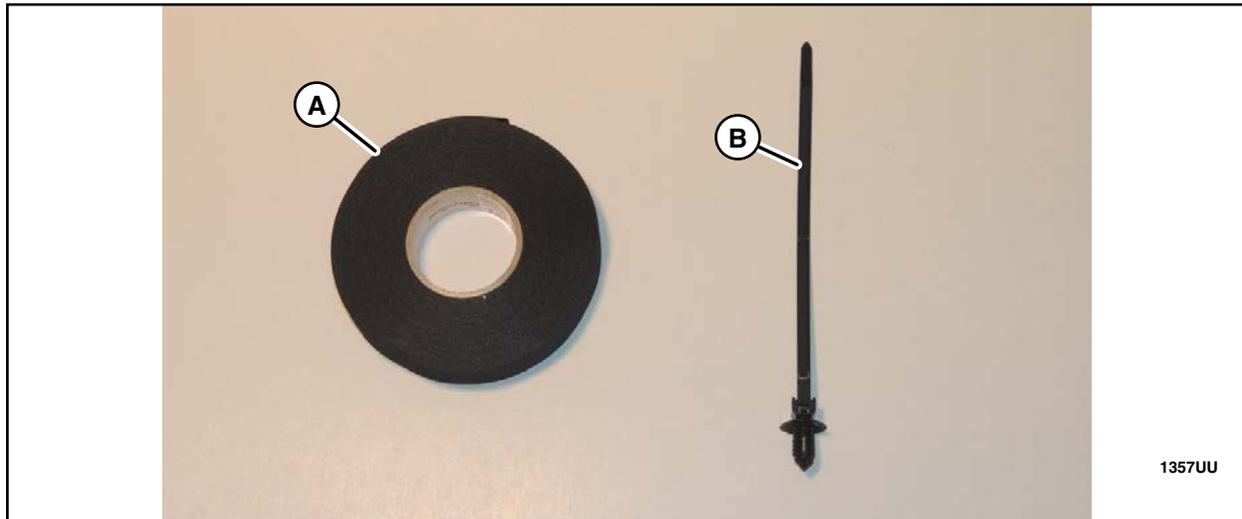
- e. Once the session is loaded, the failed process should resume automatically.
- f. If programming does not resume automatically, proceed to the Module Programming menu and select the previously attempted process, PMI or MR.
- g. Follow all on-screen prompts/instructions.
- h. The last screen on the IDS may list additional steps required to complete the programming process. Make sure all applicable steps listed on the screen are followed in order.



## Procedure F - Turbocharger Wire Harness Taping

**OVERVIEW:** This procedure wraps the turbocharger wire harness with Coroplast® tape to prevent the entry/buildup of fluids and debris in the convolute which could ignite from an ignition source.

### PARTS / SUPPLIES REQUIRED:



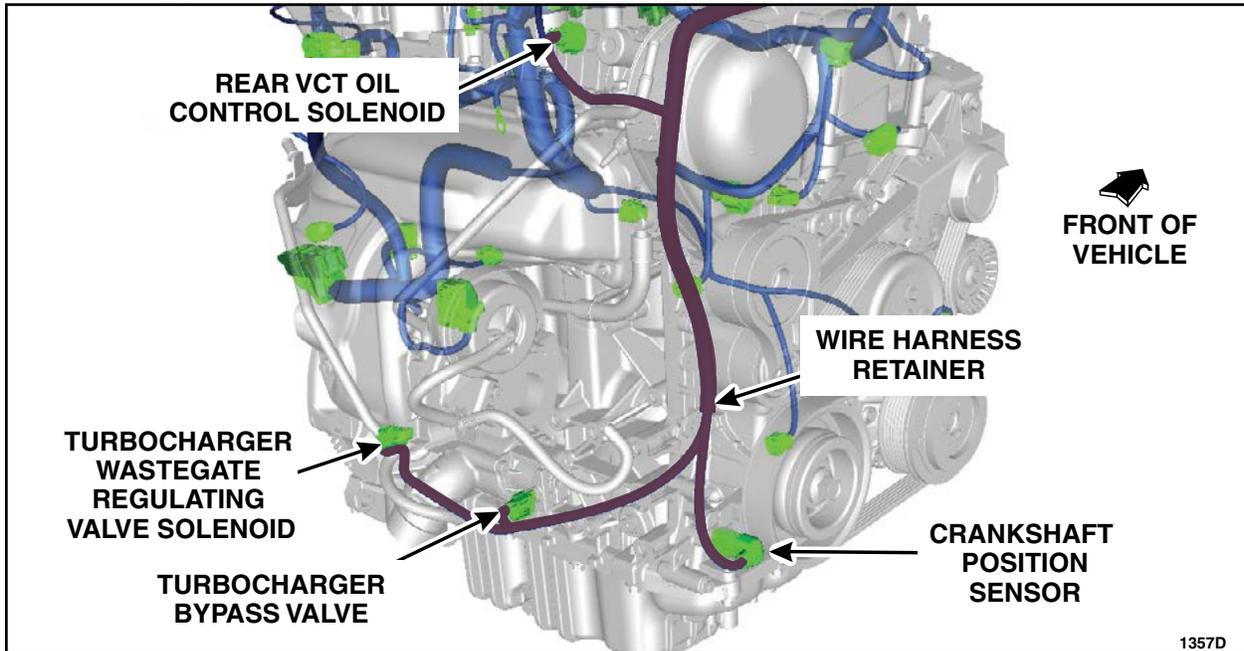
A	Coroplast® Tape
B	Wire Harness Retainer w/Tie-Strap

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Tips for wrapping the harness are included in the procedure.

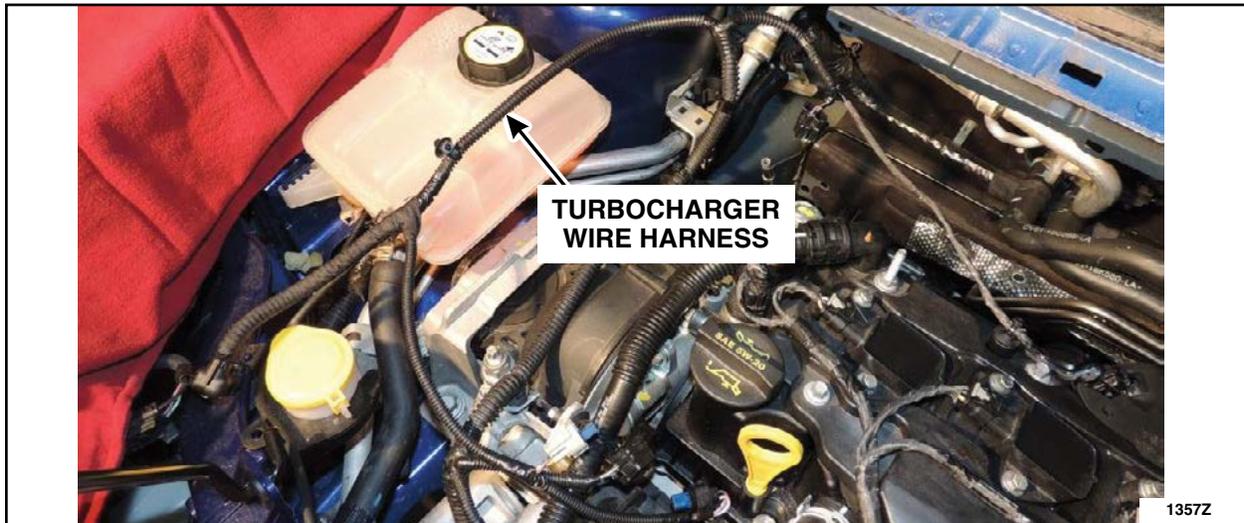


**NOTE:** Figure F1 is for reference only the harness retainers were previously disconnected in Procedure A.



**FIGURE F1**

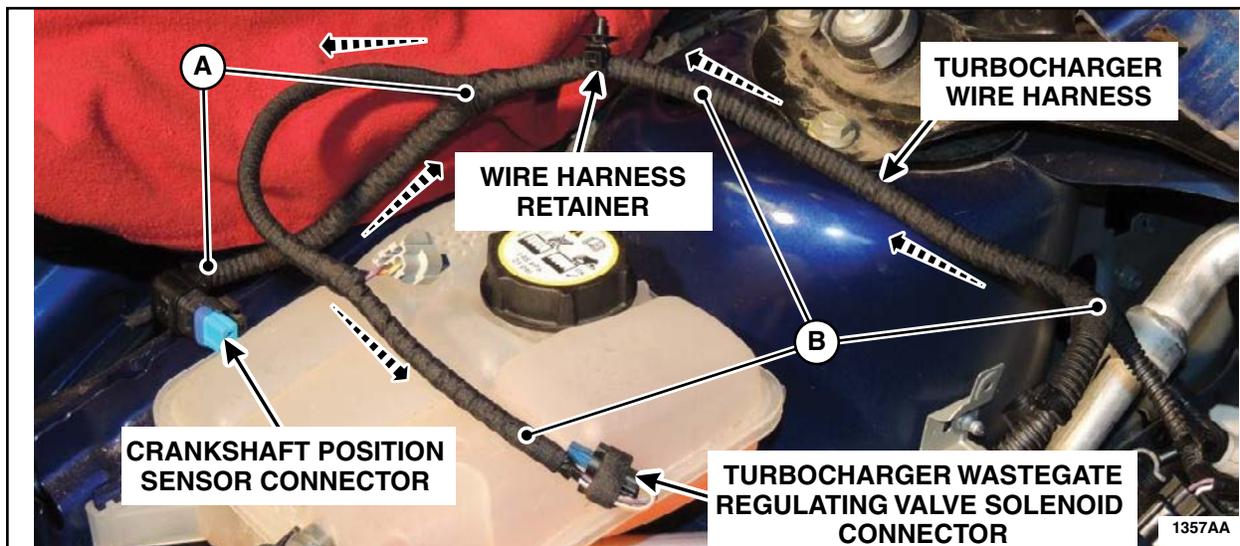
1. Route the turbocharger wire harness to the top of the engine compartment. See Figure F2.



**FIGURE F2**



2. Disconnect the rear Variable Camshaft Timing (VCT) oil control solenoid. See Figure F1.
  - Detach the VCT harness retaining clip from the turbocharger outlet tube.
3. Replace the wire harness retainer with a *new* one supplied in the vehicle parts kit. See Figure F3.
  - Mark the wire harness retainer location before removal.
4. Wrap the turbocharger wire harness convolute with the Coroplast® tape provided in the service kit. See Figure F3.
  - Start and finish each length of tape applied with three (3) initial and three (3) finishing wraps.
  - Apply each wrap of tape with a 50% overwrap.
  - First, wrap the takeout for the crankshaft position sensor. Begin the wrap at the connector and end this portion of wrapping by going around the main harness at the takeout. See Figure F3, (A).
  - Wrap the turbocharger harness starting at the takeout to the rear VCT solenoid. Proceed down the remaining length of harness to the turbocharger wastegate regulating valve solenoid connector. See Figure F3, (B).



**FIGURE F3**

5. Connect the rear VCT oil control solenoid. See Figure F1.
  - Attach the VCT harness retaining clip to the turbocharger outlet tube.
6. Route the wire harness back down to the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve. See Figure F1.
7. Attach the wire harness retainer to the front cover. Connect the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve electrical connectors. See Figure F1.



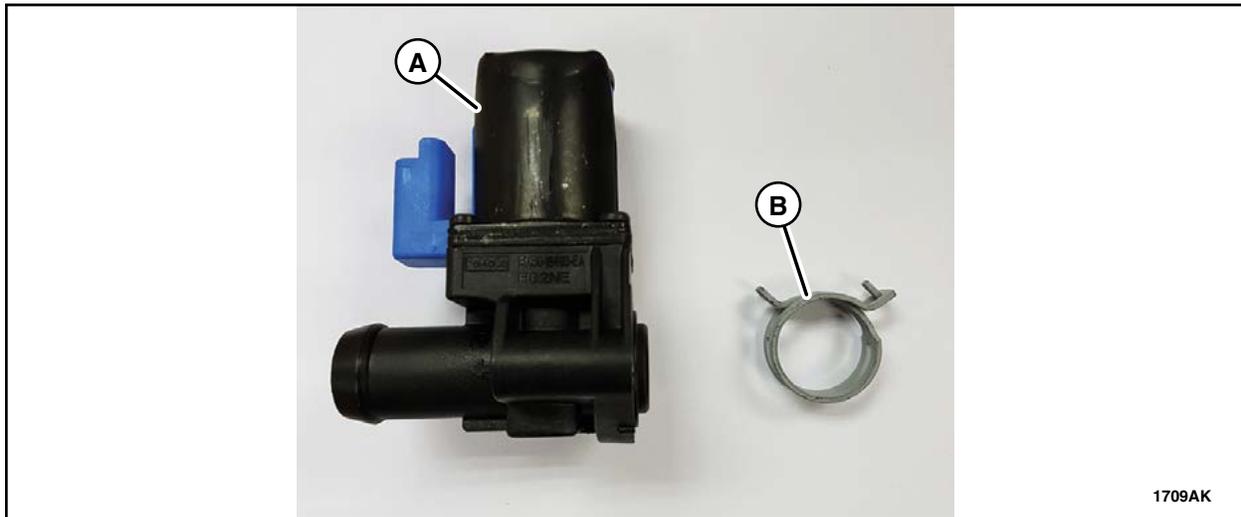
### Procedure G - Thermostat Replacement - (Not required for Any Escape or Transit Connect Vehicles)

**OVERVIEW:** Thermostat replacement is not required for any Escape or Transit Connect Vehicles.  
Proceed to Procedure H.

### Procedure H - Engine Coolant Bypass Valve Replacement

**OVERVIEW:** The engine coolant bypass valve is being replaced in this procedure.

#### PARTS / SUPPLIES REQUIRED:



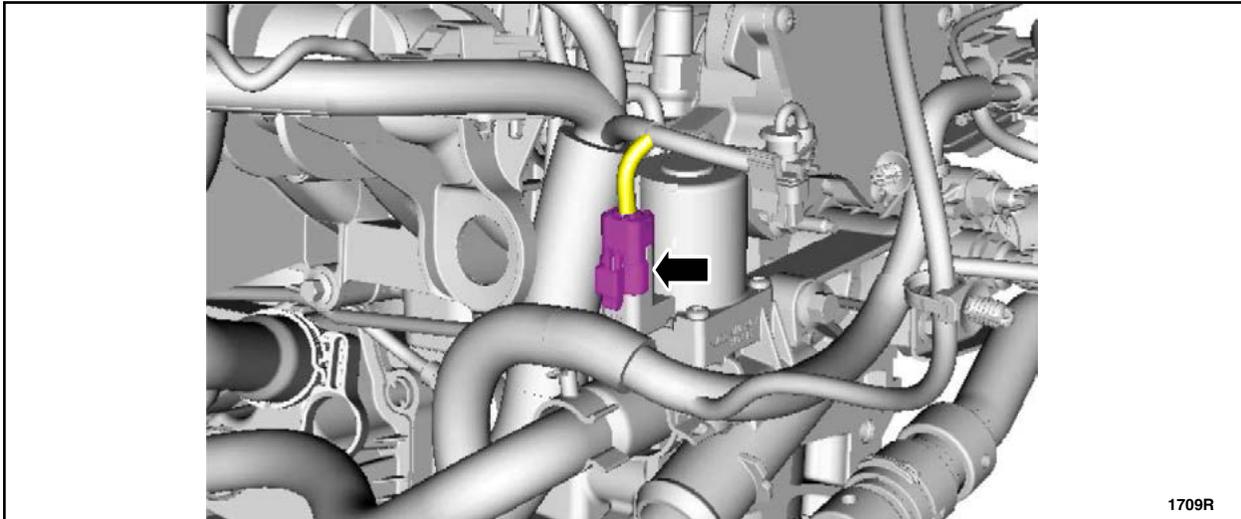
A	Engine Coolant Bypass Valve
B	Hose Clamp

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None

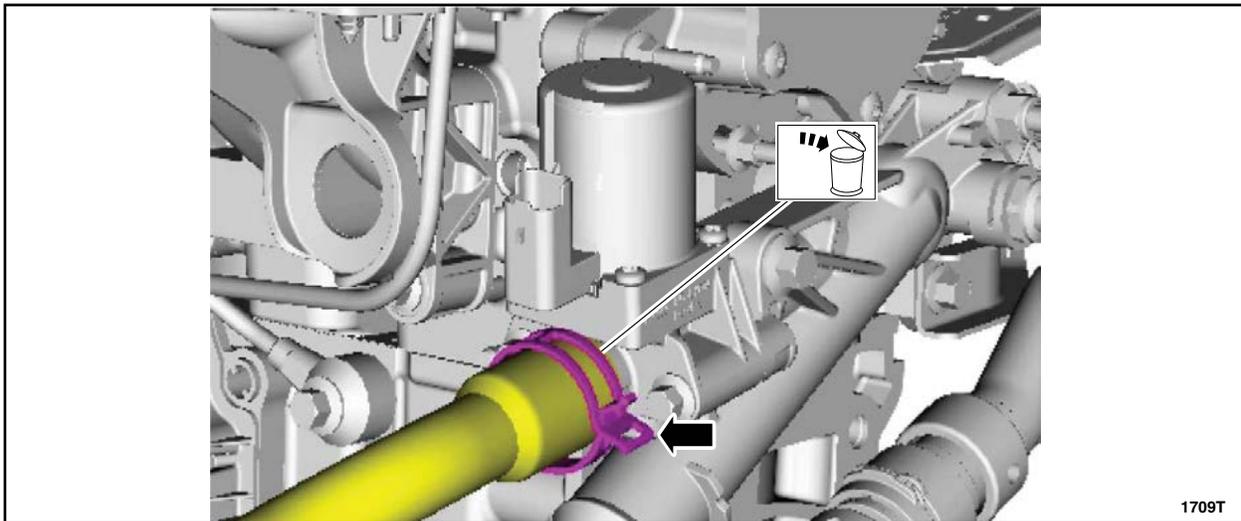


1. Drain the cooling system. Please follow the WSM procedures in Section 303-03.
2. Disconnect the engine coolant bypass valve electrical connector. See Figure H1.



**FIGURE H1**

3. Release the clamp and disconnect the coolant hose. Discard the clamp. See Figure H2.

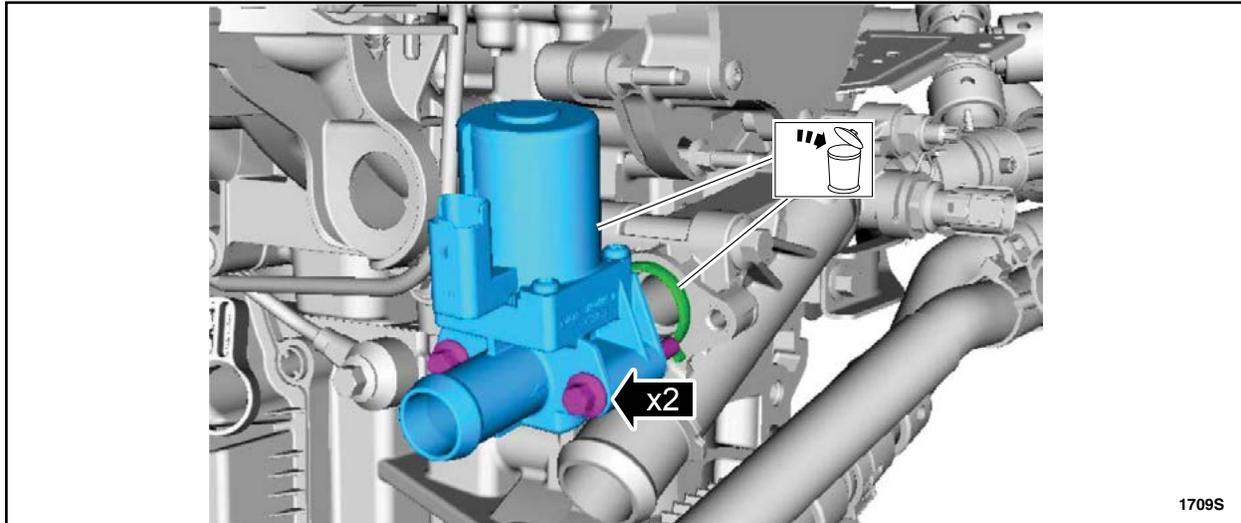


**FIGURE H2**



4. Remove the bolts from the engine coolant bypass valve. Remove and discard the valve and O-ring seal. See Figure H3.

- 89 lb.in (10 Nm).



**FIGURE H3**

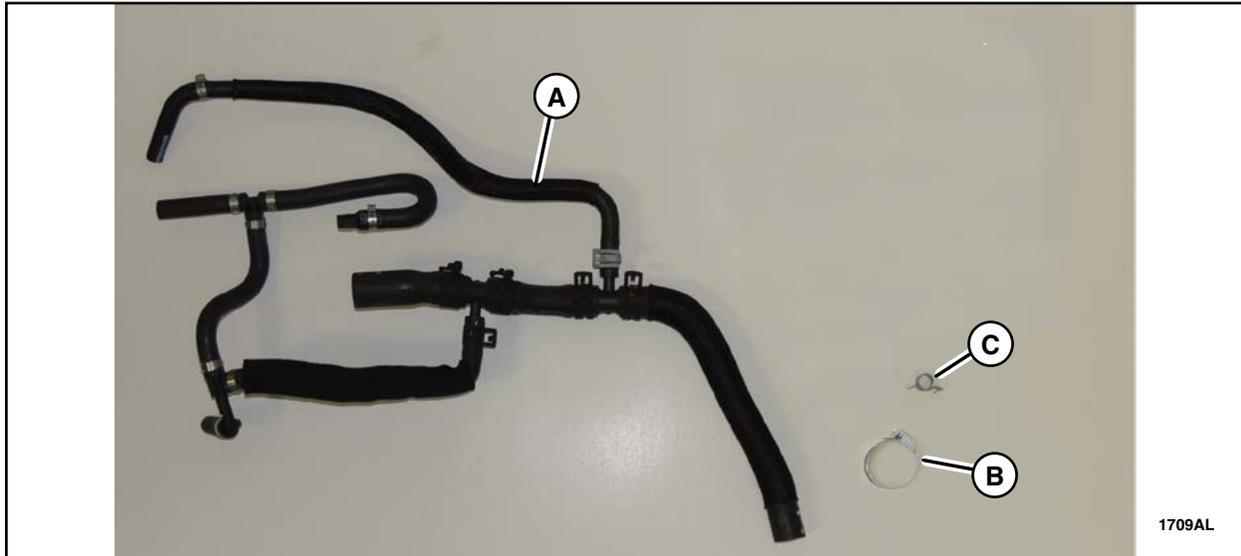
5. Install a *new* engine coolant bypass valve and O-ring seal by reversing the removal procedure.



### Procedure I - Coolant Degas Bottle, Degas Bottle Cap, and Coolant Hose Replacement

**OVERVIEW:** In this procedure, the coolant hose that runs between the degas bottle and thermostat quick connect T-fitting is replaced with an updated hose that allows for connection to the turbocharger coolant return line and the *new* coolant stand-pipe.

#### PARTS / SUPPLIES REQUIRED:

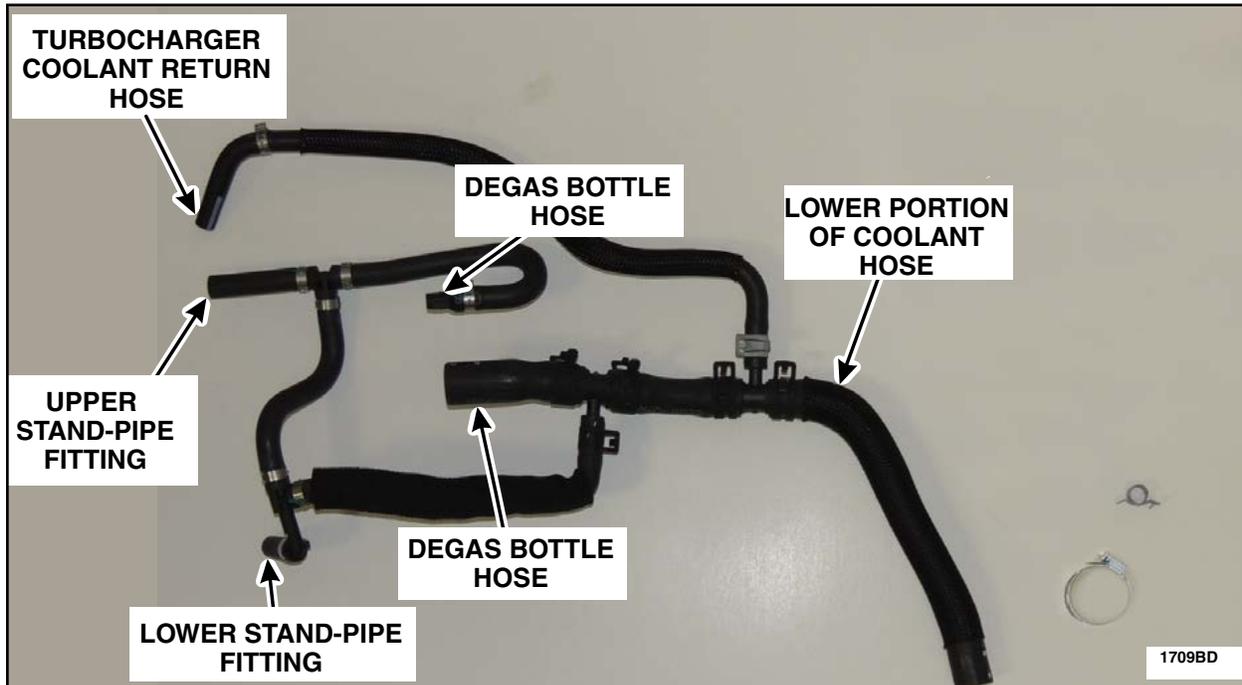


A	Coolant Degas Bottle to Thermostat Housing Hose
B	Large Hose Clamps
C	Small Hose Clamp

**UNIQUE TOOL REQUIREMENTS:** None

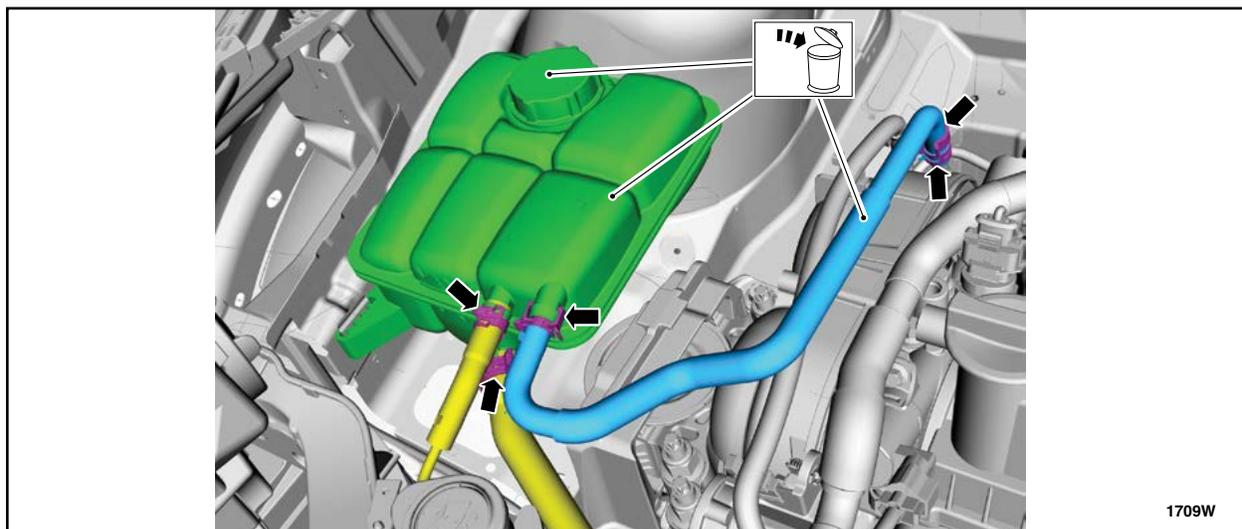


**SERVICE TIPS:** The new coolant hoses and connection points are called out below. See Figure I1



**FIGURE I1**

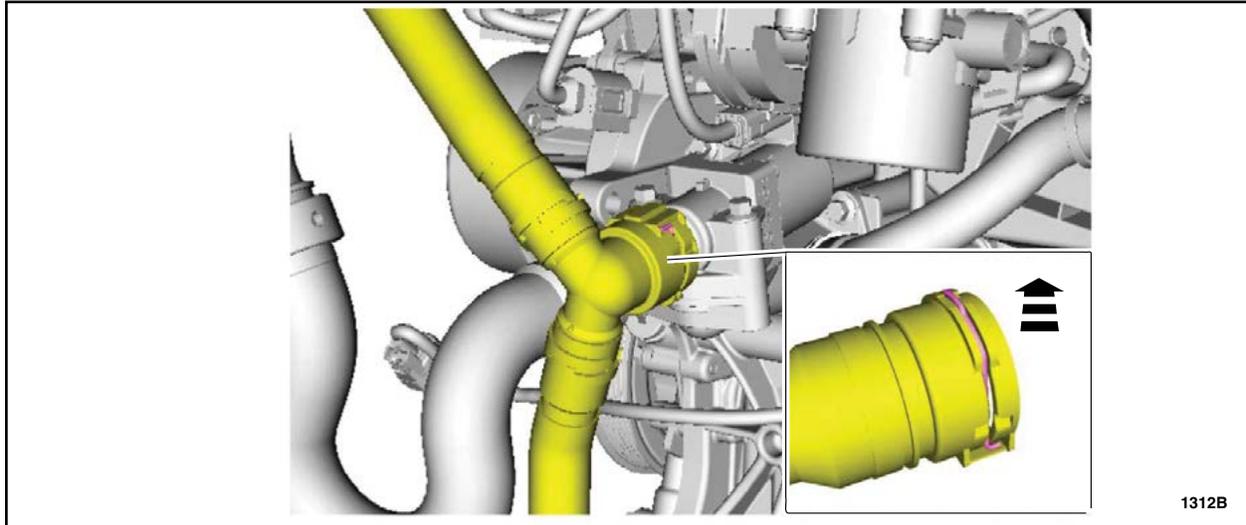
1. Remove and discard the turbocharger coolant return hose. See Figure I2.
2. Remove and discard the degas bottle and cap. See Figure I2.



**FIGURE I2**

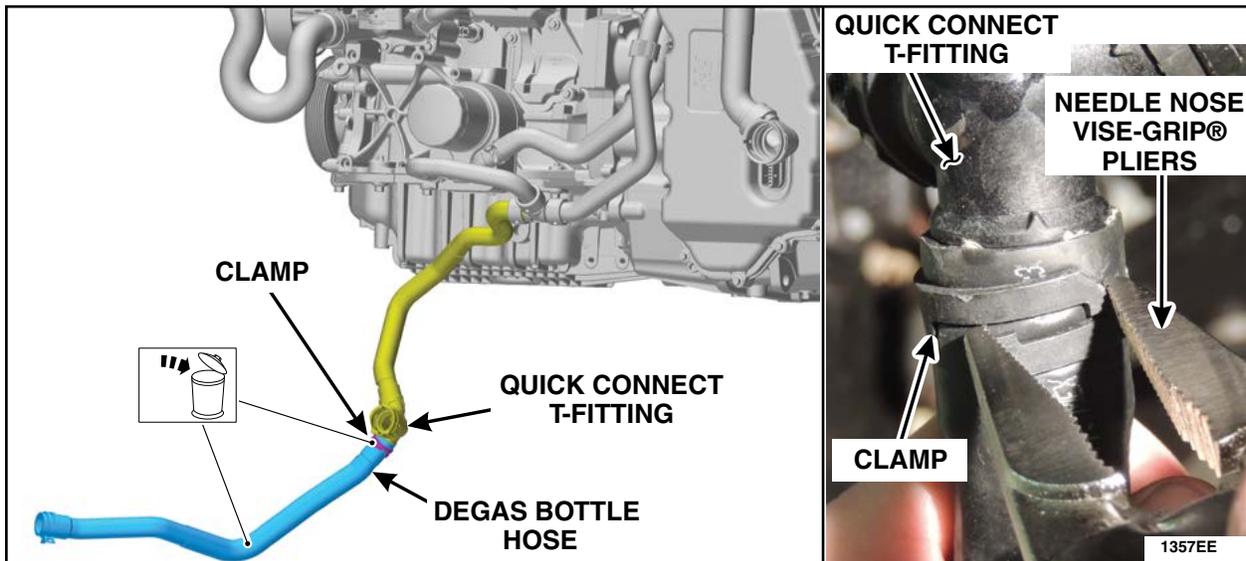


3. Release the clip and disconnect the quick connect T-fitting from the coolant shutoff solenoid valve. See Figure I3.



**FIGURE I3**

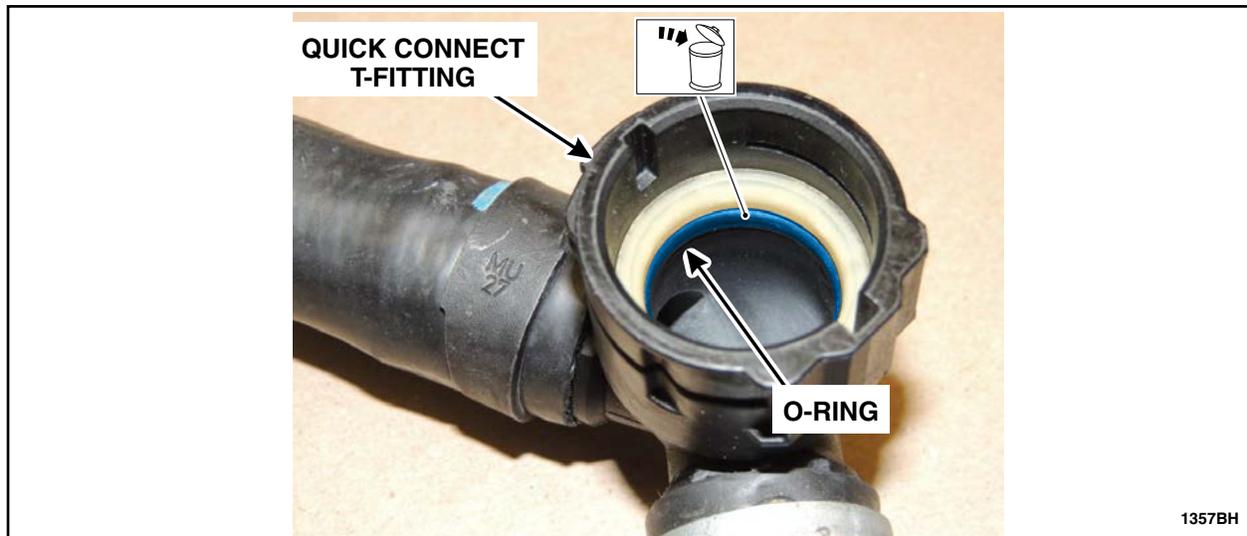
4. Position the degas bottle hose downward out the bottom of the engine compartment. See Figure I4.
5. Use a pair of needle nose VISE-GRIP® pliers to compress the degas bottle hose clamp and slide the clamp downward off of the quick connect T-fitting. See Figure I4.
  - Space the needle nose VISE-GRIP® plier teeth 6.35 mm (1/4") apart when closed so that they will fully compress the hose clamp when locked, to allow the clamp to be slid down the hose for hose removal.



**FIGURE I4**

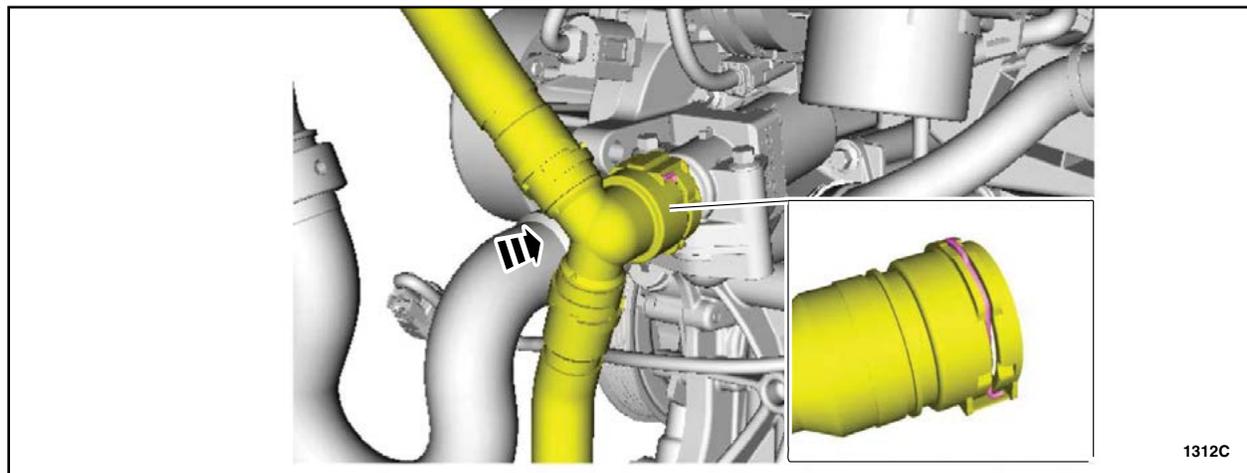


6. Remove and discard the degas bottle hose and clamp. See Figure 14.
7. Remove and discard the o-ring inside the quick connect T-fitting. See Figure 15.



**FIGURE 15**

8. Ensure the inside of the quick connect T-fitting is free from dirt and debris.
9. Lubricate the new o-ring with coolant and install it into the quick connect T-fitting. See Figure 15.
10. Route the degas bottle hose upward, back to the degas bottle and to the turbocharger outlet tube.
11. Connect the quick connect T-fitting to the coolant shutoff solenoid valve. See Figure 16.

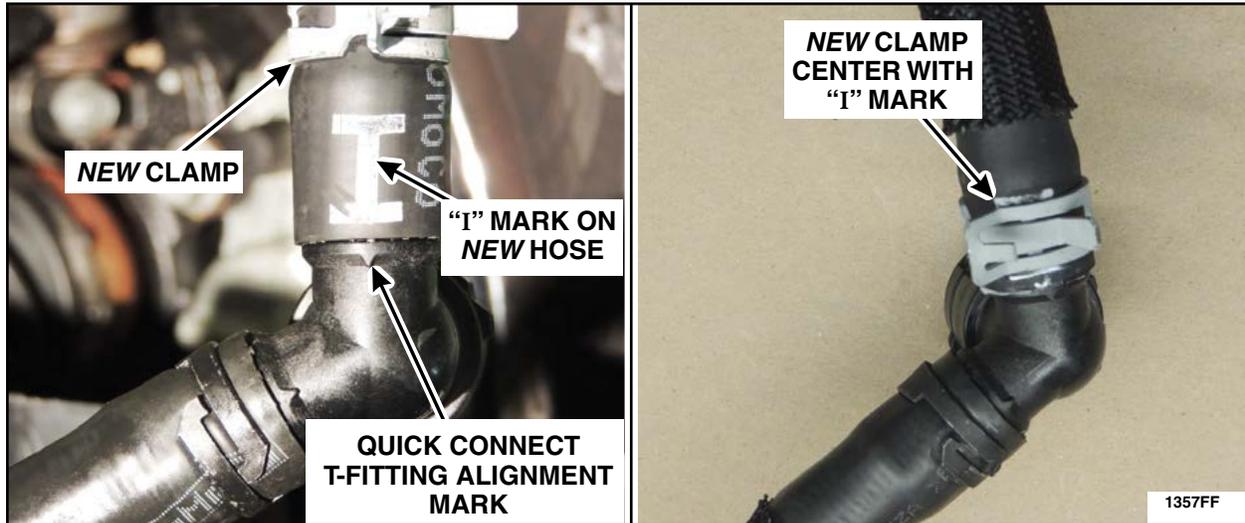


**FIGURE 16**



**NOTE:** Lubricating the new coolant hoses with coolant will aid in easier installation.

12. Position a *new* clamp onto the longer section of the *new* degas bottle hose and install the hose onto the quick connect T-fitting. Ensure the "I" mark on the *new* degas bottle hose is aligned with the alignment mark on the quick connect T-fitting. Also align the clamp center with the "I" mark. See Figure 17.



**FIGURE 17**

13. Connect the *new* turbocharger coolant return hose to the turbocharger coolant outlet tube and release the clamp. Attach the wire harness retainer to the *new* turbocharger coolant return hose. See Figure 18.



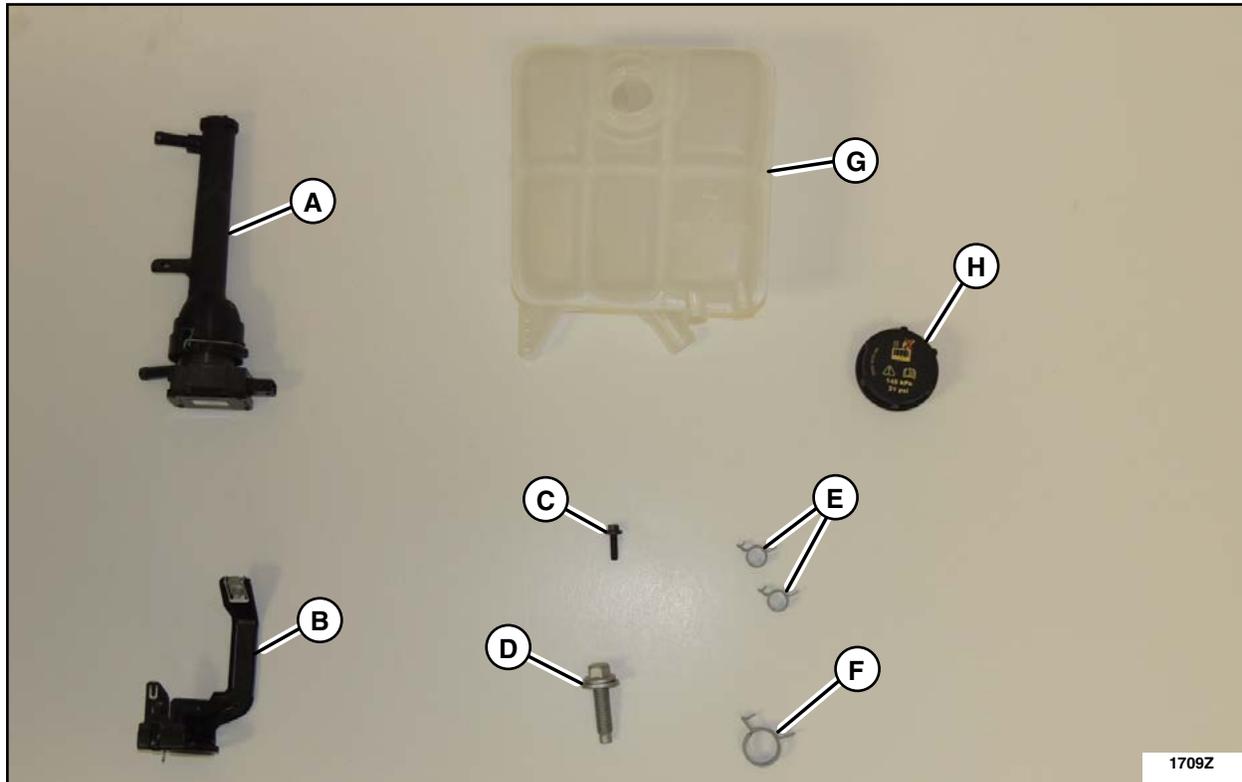
**FIGURE 18**



## Procedure J - Coolant Stand-pipe, Degas Bottle and Cap Installation

**OVERVIEW:** The coolant stand-pipe provides coolant level information to the PCM and IPC via the CAN network, this prevents overheat issues due to low coolant level by informing the driver when the coolant level is low. The coolant stand-pipe and bracket is installed using the engine mount rear fixing bolt. On installation, the wiring harness is routed across the engine bay wiring loom and the related coolant hoses are attached.

### PARTS / SUPPLIES REQUIRED:



A	Coolant Stand-pipe (Includes Coolant Level Sensor)
B	Coolant Stand-pipe Bracket
C	Coolant Stand-pipe to Bracket Bolt
D	Engine Mount Bolt
E	Small Hose Clamps (x2)
F	Large Hose Clamp
G	Degas Bottle
H	Degas Bottle Cap

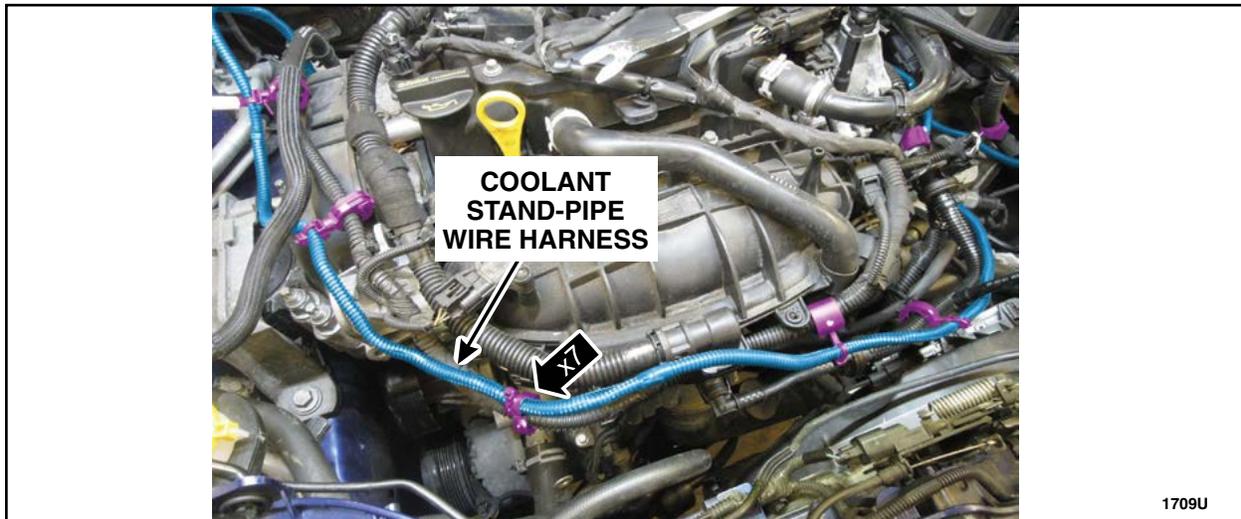


1. Route and secure the *new* coolant stand-pipe wiring harness along the engine wiring harness.  
See Figure J1.

**NOTE:** The coolant stand-pipe electrical connector will be connected after the coolant stand-pipe is installed.

**NOTE:** The *new* coolant stand-pipe wire harness is highlighted to show routing and connection points.

**NOTE:** The coolant by-pass hose is removed for clarity.

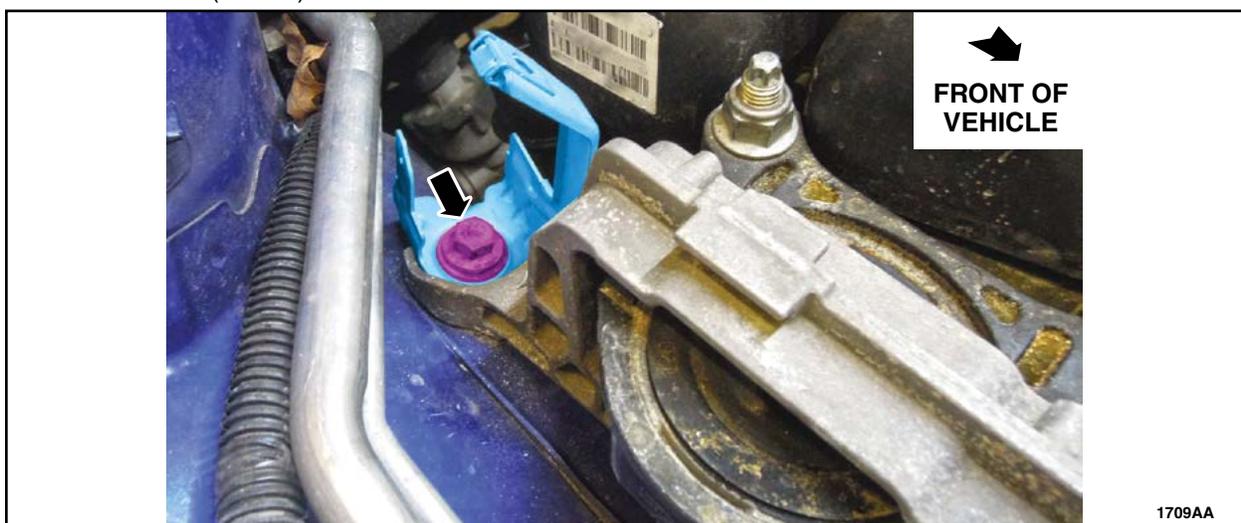


**FIGURE J1**

2. **NOTICE:** The bolt hole must be centered with the engine mount hole to allow for proper installation of the coolant stand-pipe bracket. **DO NOT** use power tools to re-install the bolt.

Position the *new* coolant stand-pipe bracket on the engine mount. The bolt will center the bracket and the locating tab on the bottom of the bracket should be pressed against the engine mount. Hand start the bolt and then tighten both engine mount retaining bolts at this time. See Figure J2.

- 90 Nm (66 lb.ft).



**FIGURE J2**



3. Install the coolant stand-pipe to the bracket. See Figure J3.

1. Push the coolant stand-pipe fully down in to position.
2. Tighten the bolt to 5 Nm (44 lb.in).
3. Connect the electrical connector.
4. Install the harness push pin to the A/C Line bracket.



FIGURE J3

**NOTE:** Lubricating the new coolant hoses with coolant will aid in easier installation.

**NOTE:** When connecting the coolant hoses to the stand-pipe ensure the hoses are fully installed and meet the hose stops, before securing in place with hose clamps.

4. Install the *new* coolant hoses to the coolant stand-pipe. See Figure J4.



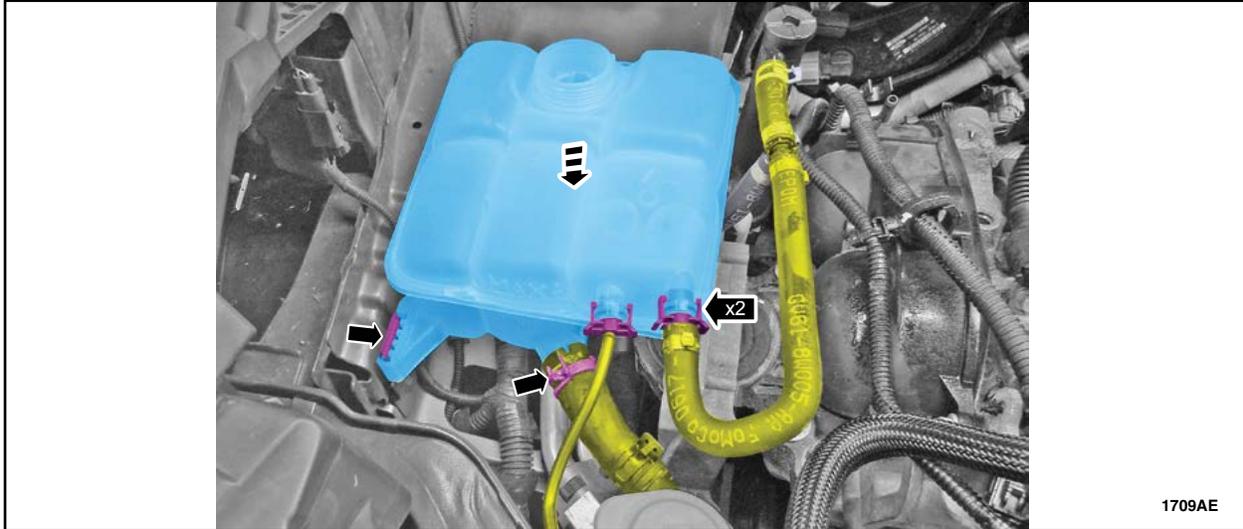
FIGURE J4

**NOTE:** Check the status of the IPC reprogramming progress.



5. **NOTE:** Do Not fill the cooling system at this time.

Install the degas bottle and connect the coolant hoses. See Figure J5.



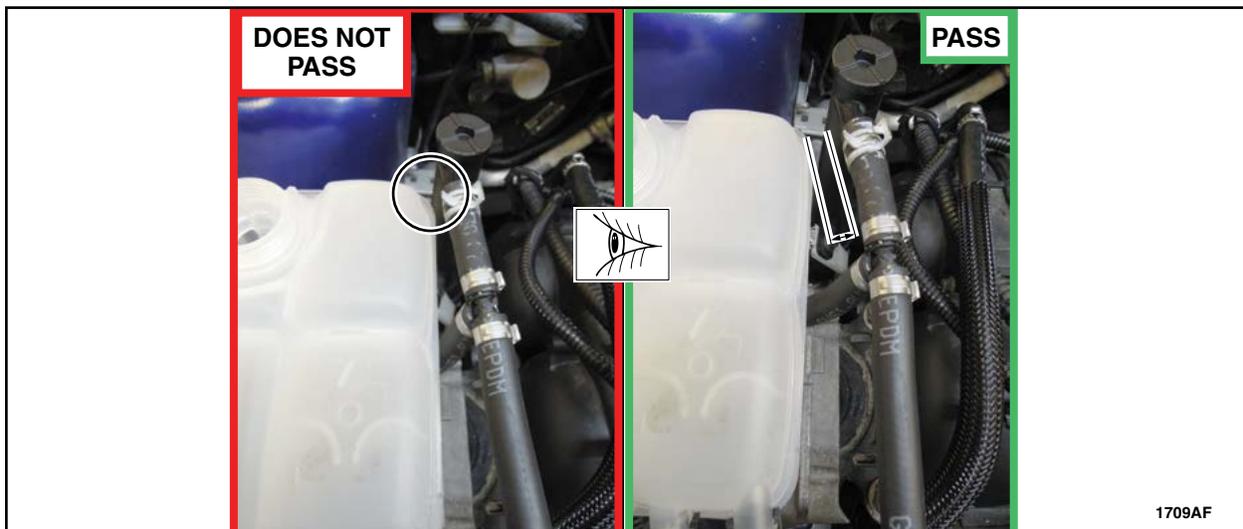
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**FIGURE J5**

6. **NOTE:** There must be a minimum clearance of 10 mm (3/8") between the coolant stand-pipe and degas bottle. To achieve this, it may be necessary to adjust the coolant stand-pipe mounting bracket and the coolant hose positions as necessary.

**NOTE:** Make sure that no strain is placed on the coolant hose and pipe.

Make sure the coolant stand-pipe is not contacting the coolant degas bottle. Adjust the coolant stand-pipe mounting bracket if required. See Figure J6.



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**FIGURE J6**

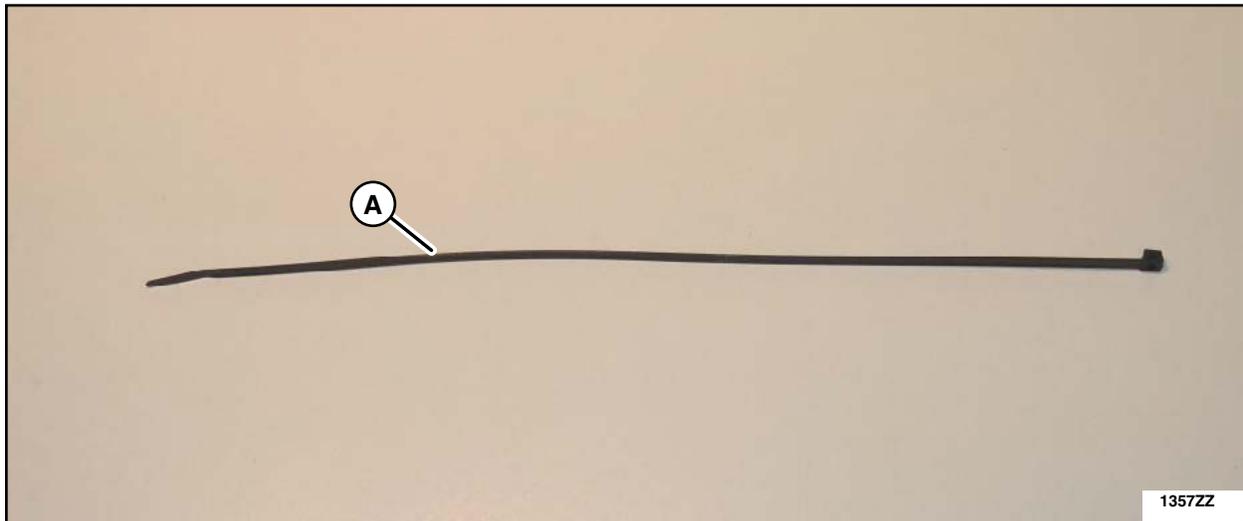


## Procedure K - Escape Vehicles Only - Battery B+ Terminal Cable Routing Inspection and Tie-Strap Retention

**NOTE:** The Battery B+ Terminal Cable Routing Inspection is only required on Escape vehicles equipped with an Automatic Transmission. **Procedure K does not apply to Transit Connect vehicles.**

**OVERVIEW:** Ensure the battery positive cable to the generator is routed correctly. If routed incorrectly, the cable may contact and chafe at the transmission lifting eye on top of the transmission. Upon inspection, if the cable is routed incorrectly, it must be re-routed properly and secured to the engine main wiring harness using a tie-strap.

### PARTS / SUPPLIES REQUIRED:



A	Tie-Strap
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**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None



1. Inspect the battery B+ terminal cable for improper routing and/or any signs of wire and insulation damage. See Figures K1 and K2.

- If the battery cable is damaged, replace it prior to proceeding.
- A **properly routed** cable can be identified by having the cable routed from the generator across the front of the engine and with the cable secured to the main engine wiring harness with a tie-strap near the forward left side of the intake manifold. See Figure K1.
- An **improperly routed** cable can be identified by the cable being routed forward of the engine near the radiator, and is not attached to the main engine wiring harness with a tie-strap. See Figure K2.

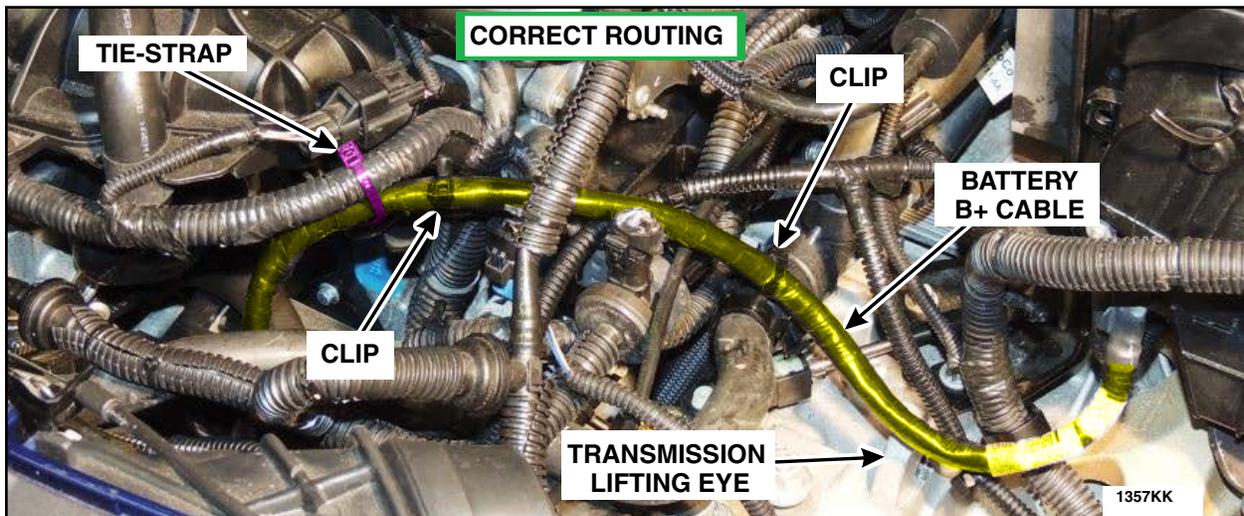


FIGURE K1

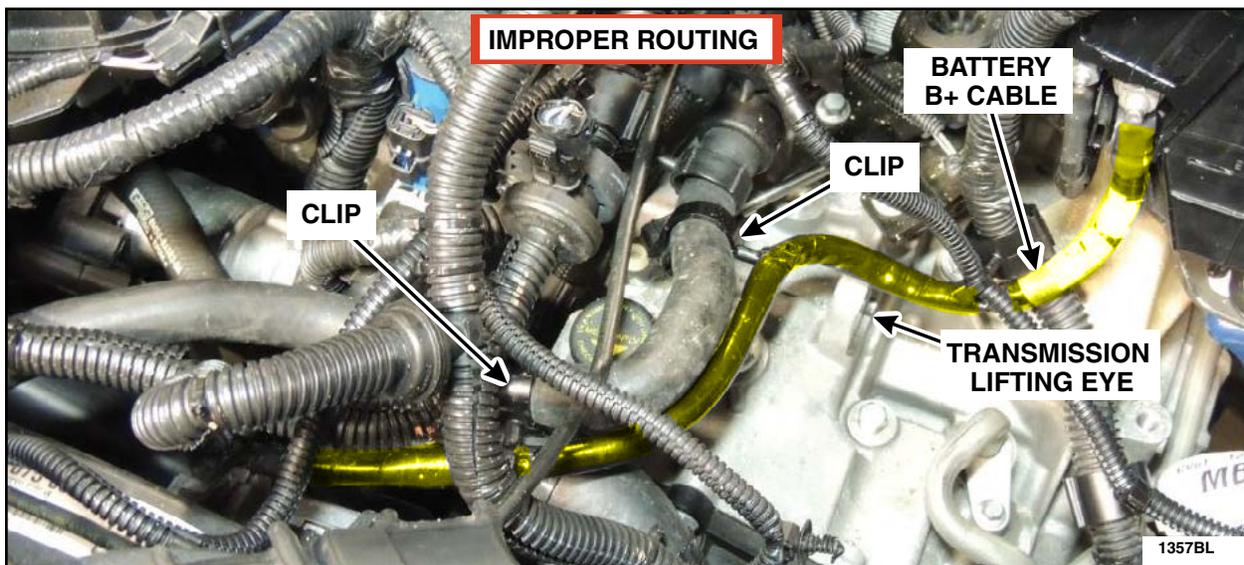


FIGURE K2



**NOTICE: Ensure the IPC reprogramming has completed prior to disconnecting battery cables, if required.**

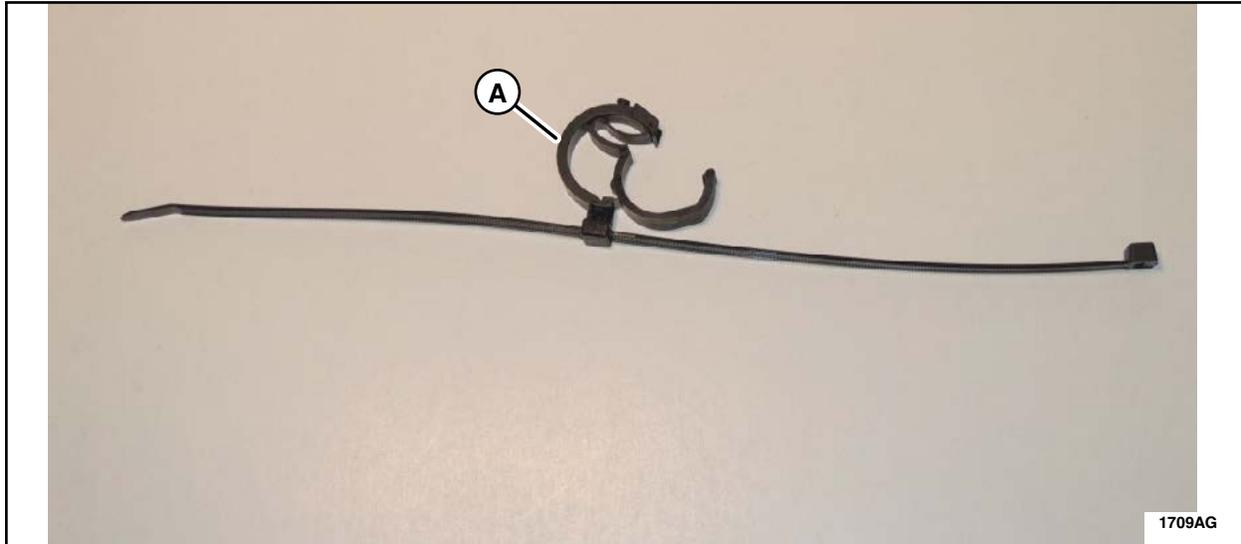
2. If the battery positive terminal cable is routed improperly and isn't damaged, pull it back through to the center of the engine compartment. Then re-route it up and near the front left side of the engine. Secure it to the main engine wiring harness using the tie-strap and existing clips as shown. See Figure K1.
  - If required to disconnect the battery B+ terminal cable for rerouting, the battery negative cable must be disconnected. Please use the procedures in WSM section 414-01. Reconnect the battery after the rerouting and reinstallation of the battery B+ terminal cable is completed.
  - If removed, tighten the battery B+ terminal cable to 12 Nm (106 lb-in).
3. Install the tie-strap provided in the kit to secure the starter/generator battery positive cable to the engine wire harness and prevent the cable from contacting the transmission lifting eye. See Figure K1.



## Procedure L - Vehicle Reassembly, PCV Tube Retention, and Powertrain Control Module (PCM) Reprogramming

**OVERVIEW:** The vehicle is reassembled, the cooling system is vacuum filled, pressure tested and bled; and a PCV tube retainer is installed. The PCM is reprogrammed and coolant level sensor operation is validated.

### PARTS / SUPPLIES REQUIRED:



A	PCV Tube Retainer / Tie-Strap
B	Motorcraft® Orange Antifreeze / Coolant Prediluted (VC-3DIL-B (U.S.) CVC-3DIL-B (Canada) / WSS-M97B44-D2) (Obtain Locally) (Not Shown)

**UNIQUE TOOL REQUIREMENTS:** Vacuum Filling Tool, Hydrometer and/or Refractometer, Cooling System Pressure Tester

**SERVICE TIPS:** Follow procedure steps to verify proper coolant fill.



**NOTE:** This procedure contains unique steps for reassembly, including installation of *new* components.

1. If disconnected previously, connect the battery cables.

- a. Install and tighten the battery B+ terminal cable to 12 Nm (106 lb-in).
- b. Connect the battery negative cable to ground. Please follow the WSM procedures in Section 414-01.

**NOTE:** Remove protective covers that were placed over the turbocharger air intake system before re-installing components.

2. Install the turbocharger inlet pipe and connect the PCV hose to the turbocharger inlet pipe. See Figure A3.

- Tighten the turbocharger inlet pipe fasteners to 5 Nm (44 lb-in).
- Tighten the turbocharger inlet pipe-to-turbocharger clamp to 5 Nm (44 lb-in).

3. Vacuum fill the cooling system. Refer to WSM Section 303-03 for coolant specifications.

- Do not bleed the cooling system at this time.
- Coolant level should be filled to the "MAX" mark on the degas bottle.

4. Install a coolant pressure tester with adapter onto the degas bottle. Pressurize to 138 kPa (20 psi). Once pressure stabilizes, pressure should hold at 138 kPa (20 psi) for a minimum of 2 minutes.

- If pressure test fails, the source of pressure loss must be identified and repaired as appropriate before proceeding. Retest the cooling system, if required.

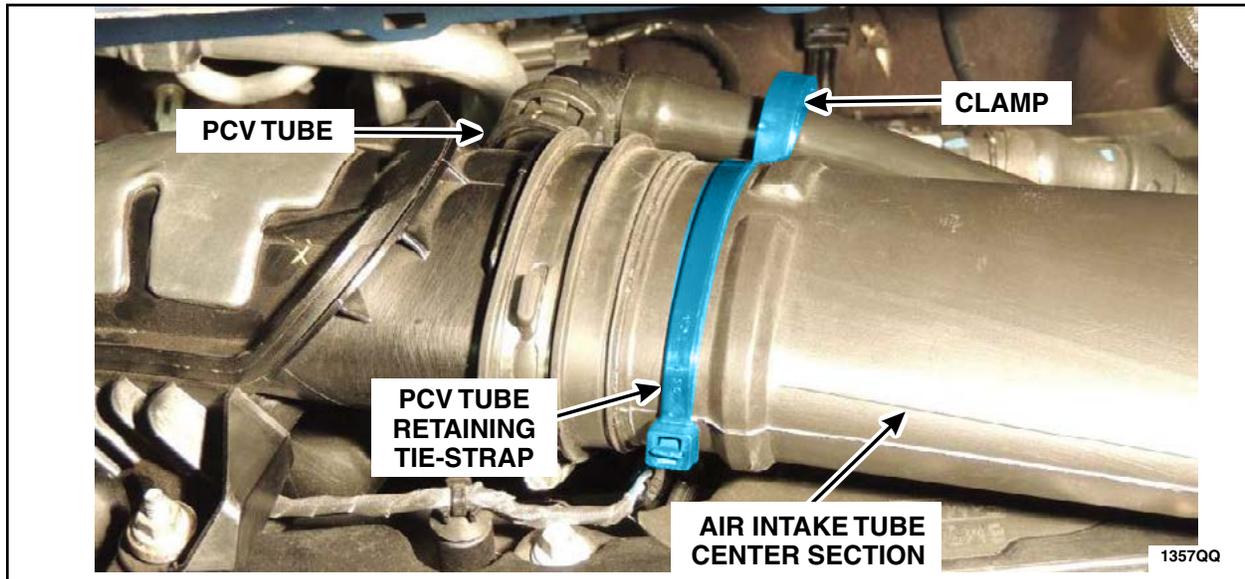
5. Install the air cleaner assembly. See Figure A2.

- a. Install the air cleaner assembly.
- b. Attach the fresh air intake tube flap.
- c. Connect the mass air flow sensor electrical connector.
- d. Tighten the clamp to 5 Nm (44 lb-in).

6. Connect the EVAP line quick connect coupling to the air intake tube center section and install the retention clip. See Figure A1.



7. Install the PCV tube retainer / tie-strap provided in the vehicle parts kit. See Figure L1.
  - a. Attach the clamp onto the PCV tube and secure.
  - b. Wrap the tie strap around the air intake tube center section and tighten.
  - c. Trim the excess length from the tie strap.



**FIGURE L1**

8. Install the front under-body air deflector and retainers. See Figure A5.
9. Bleed the cooling system. Please follow the WSM procedures in Section 303-03.



10. Reprogram the PCM using IDS release 108.03 or higher. For additional information, Refer to "Procedure E" (Important Information for Module Reprogramming).

11. Using IDS select "Coolant Level Sensor Check". See Figure L2.

- Follow the on screen instructions to complete the "Coolant Level Sensor Check" procedure.

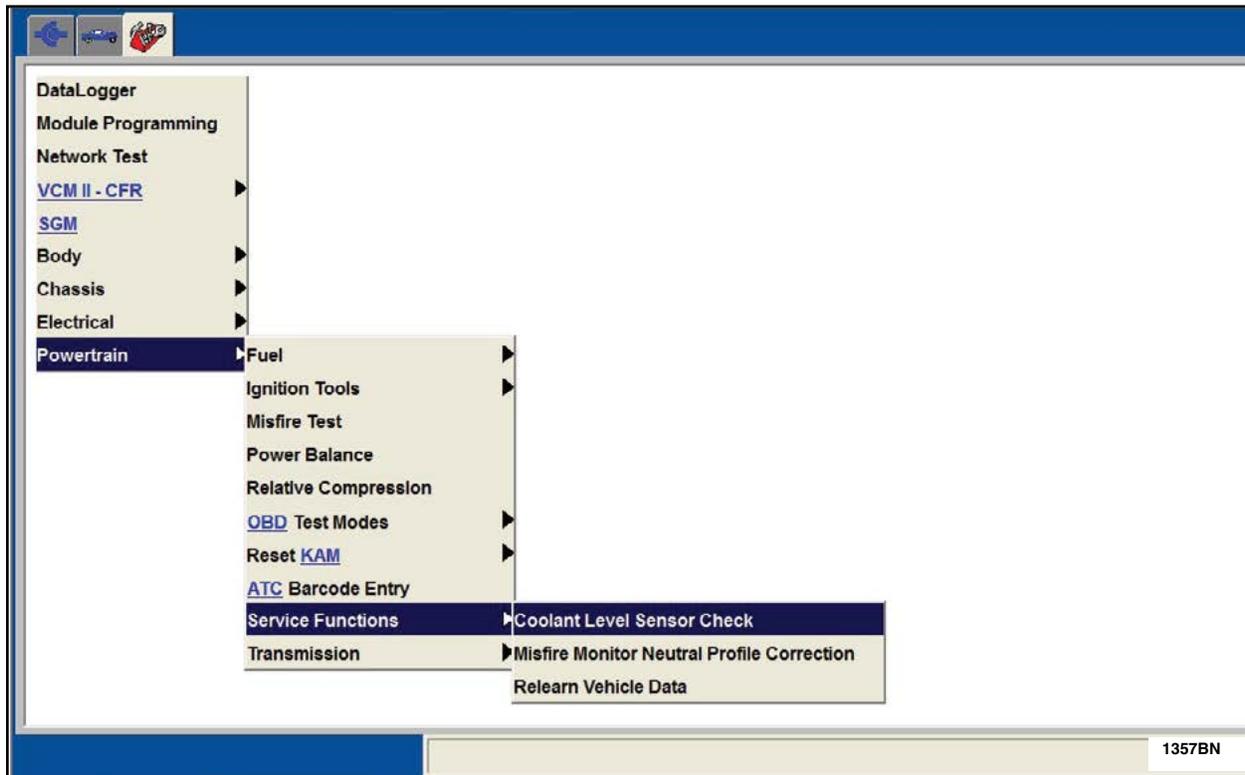
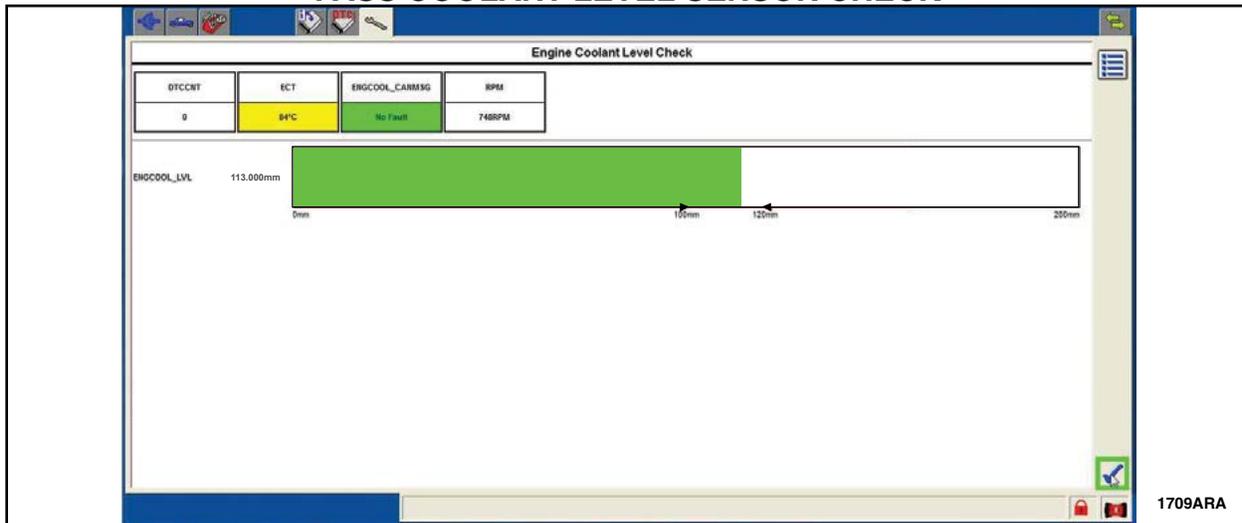


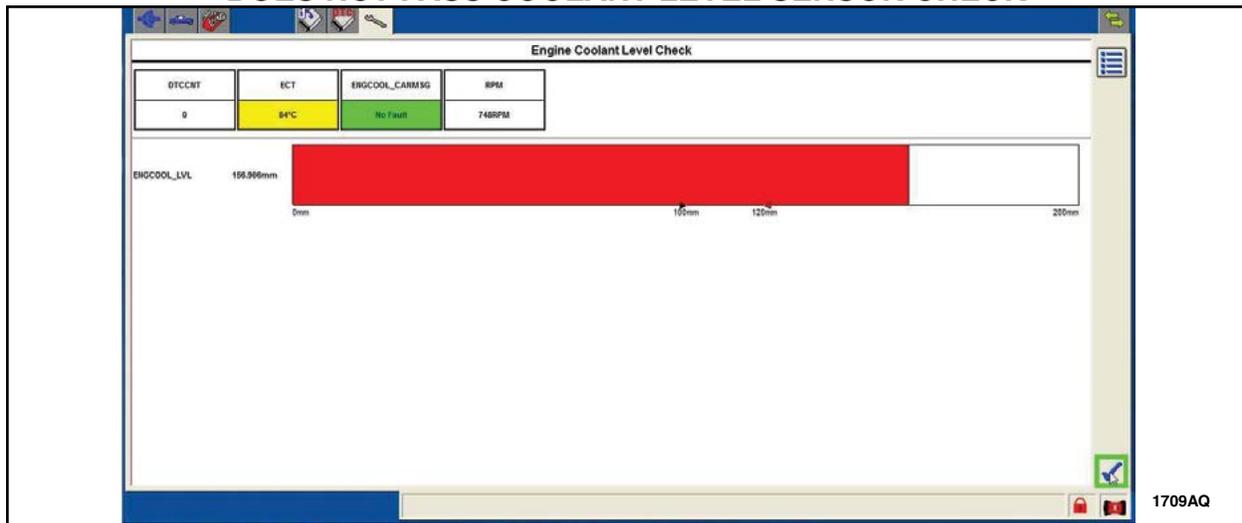
FIGURE L2



## PASS COOLANT LEVEL SENSOR CHECK



## DOES NOT PASS COOLANT LEVEL SENSOR CHECK



**NOTE:** If the coolant level is too high, additional cooling system bleeding is needed. If it is proving difficult to bleed, it may be necessary to drive the vehicle up to 12.5 Miles (20 km) to remove the air from the system.

12. Check coolant concentration using the hydrometer/refractometer to make sure it is correct for the local climate.
13. Remove the portable battery charger and install the battery cover.
14. Install the cowl panel. Please follow the WSM procedures in Section 501-02.
15. Install the engine appearance cover.
16. Perform any other open recalls.
17. Coolant level should be filled to the "MAX" mark on the degas bottle once the engine is cold, prior to returning the vehicle to the customer.



# Vehicle Identification Number (VIN)

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## 17S09 VEHICLE INSPECTION / CHECK SHEET

ATTACHMENT V  
INSPECTION / CHECK SHEET  
SAFETY RECALL 17S09-S3

Technician ID: \_\_\_\_\_ Repair Order#: \_\_\_\_\_

Vehicle Mileage: \_\_\_\_\_ Repair Date: \_\_\_\_\_

Vehicle Build Date: \_\_\_\_\_ Open FSA(s): \_\_\_\_\_

**INSTRUCTIONS:** Complete this Inspection / Check Sheet and attach / file it with the recall repair order following completion.

1. Record any DTCs present. Check appropriate box.

- Pass - No DTCs present.
- Fail - DTCs present.

If fail, document any DTCs retrieved below, and reference during "Procedure B".

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2. Inspect the coolant level and coolant concentration in the degas bottle. Check appropriate box.

- Pass - Coolant level **is** correct in the degas bottle.
- Fail - Coolant level **is not** correct in the degas bottle, needed to add coolant.
- Pass - Coolant concentration **is** correct.
- Fail - Coolant concentration **is not** correct, needed to adjust coolant concentration.

If fail, document any repairs performed below.

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3. Pressure test cooling system. Check appropriate box.

- Pass - Cooling system holds pressure for 2 minutes.
- Fail - Cooling system **does not** hold pressure for 2 minutes.

If fail, document any repairs performed below.

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4. Visually check for coolant leaks with the system under pressure. Check appropriate box.

- Pass - No coolant leak(s) found.
- Fail - Coolant leak(s) found.

If fail, document any repairs performed below.

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5. Visually inspect the engine oil level and check for engine oil leaks at the rear surface of cylinder head, above exhaust manifold. Check appropriate box.

- Pass - No engine oil leak(s) found.
- Fail - Engine oil leak(s) found.
- Pass - Correct oil level.
- Fail - Engine oil not at correct level.

If fail, document any repairs performed below.

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**Safety Recall 17S09 – Supplement #3**

Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**UNIQUE VEHICLE REPAIRS**

Use the following charts, arranged by VIN, to identify the vehicles that require additional assistance from the Special Service Support Center (SSSC) to carry out the FSA repair.

1. Determine if the vehicle VIN is in the chart below.
  - In Adobe Reader menu, click "EDIT", then click "FIND", then insert the VIN, then press ENTER, **Or**
  - Press Ctrl and F simultaneously, then insert the VIN, then press ENTER.
2. If the vehicle VIN is in the chart below, create a VIN specific contact to the SSSC for additional repair instructions.
3. If the vehicle VIN is not in the chart below, proceed with coolant level sensor installation as outlined in the technical instructions.

**Escape Unique PCM Programming Required**

VIN	VIN	VIN
1FMCU0GX1EUA00024	1FMCU0GX7EUA00027	1FMCU9GX2EUA00022
1FMCU0GX0EUA00015	1FMCU0GX8EUA00005	1FMCU9GX5EUA00001
1FMCU0GX4EUA00003	1FMCU0JX5EUA00021	1FMCU9JX2EUA00028
1FMCU0GX4EUA00017	1FMCU0JX9EUA00006	1FMCU9JX5EUA00010
1FMCU0GX4EUA00020		

**2015 Model Year Transit Connect Additional Cylinder Head Inspection Required**

VIN	VIN	VIN
NM0LS7FX3F1193801	NM0LS7FX8F1190831	NM0LS7EX5F1191095
NM0LE7EX1F1190839	NM0KS6EX9F1190828	NM0LE7EX1F1181431
NM0LS7FX5F1191208	NM0KS6FXXF1190822	NM0LS7FX4F1180538
NM0LE7EX8F1191258	NM0LS7FX0F1191245	NM0LS7FX1F1181680
NM0LS7EX1F1191000	NM0LS7FX9F1190966	NM0LS7FX4F1179809
NM0LS7EX8F1190815	NM0KS6FXXF1190836	

**Safety Recall 17S09 – Supplement #3**

Certain 2013-2014 Fusion, 2013-2015 Transit Connect, 2014 Escape, and  
2014-2015 Fiesta ST Vehicles Equipped with a 1.6L EcoBoost Engine  
Coolant Level Sensor System Installation

**INSTRUCTIONAL VIDEO LINKS**

**Video Links:** Escape shown, Fiesta, Fusion and Transit Connect is similar.

[Procedure A – Initial Disassembly and Preparation for Inspection](#)

[Procedure B – Inspection and Check Sheet Completion](#)

[Procedure C – Battery Tray Modification](#) – Escape and Transit Connect vehicles only

[Procedure D – Coolant Stand-pipe Wire Harness Installation](#)

[Procedure E – Instrument Panel Cluster \(IPC\) Reprogramming](#)

[Procedure F – Turbocharger Wire Harness Taping](#)

[Procedure H – Engine Coolant Bypass Valve Replacement](#)

[Procedure I – Coolant Hose Replacement](#)

[Procedure J – Coolant Stand-pipe, Degas Bottle and Cap Installation](#)

[Procedure K – Battery B+ Cable Routing Inspection and Retention](#) – Escape vehicles only

[Procedure L – Vehicle Reassembly, PCV Tube Retention, and PCM Reprogramming](#)

## CERTAIN 2013-2014 FUSION, 2013-2015 TRANSIT CONNECT, 2014 ESCAPE, AND 2014-2015 FIESTA ST VEHICLES EQUIPPED WITH A 1.6L ECOBOOST ENGINE — COOLANT LEVEL SENSOR SYSTEM INSTALLATION

### 2013-2014 FUSION TECHNICAL INFORMATION

#### OVERVIEW

In the affected vehicles, localized overheating of the engine cylinder head may cause the cylinder head to crack, causing a pressurized oil leak that may result in a fire in the engine compartment.

Service parts and repair procedures are now available to address this safety recall. Dealers are to perform repairs following the technical information in this document that include enhancements to the engine cooling and control systems. This service must be performed on all affected vehicles at no charge to the vehicle owner.

Due to the complexity of this repair, the following considerations have been made to help the repair procedure go as smoothly as possible:

- Repair procedures have been divided alphabetically into multiple separate procedures.
- Parts have been packaged into kits.
- Each procedure includes:
  - Overview
  - List and photo of the parts required
  - List of unique tools needed
  - Service tips to help complete the repair

**NOTE:** Please read this procedure in its entirety, prior to performing repairs. Additionally, instructional videos have been developed to assist with the repair. Please refer to Attachment VII: Instructional Video Links to view the videos.



**Recommended Tools:**

<b>General Tools</b>	<b>General Equipment</b>
1/4" Drive Ratchet (Power and Hand Tool)	Floor Jack
1/4" Drive 7, 8, and 10 mm Shallow Sockets	Wood Block
1/4" Drive 10 mm, 12 mm Deep Sockets	Coolant Pressure Tester
1/4" Drive 8 mm Swivel Socket	Drain Pan
1/4" Drive E8 Inverted Torx Socket	Battery Charger
1/4" Drive T-30 Torx Bit Sockets	Extension Cord
1/4" Drive 4 in (101 mm) and 16 in (406 mm) Extensions	Tape/Electrical Tape
3/8" Drive Ratchet (Power and Hand Tool)	
3/8" Drive 11 mm, 13 mm, and 15 mm Deep Impact Socket	
3/8" Drive 15 mm Shallow Impact Socket	<b>Special Tools</b>
3/8" Drive 15 mm Swivel Impact Socket	Hydrometer/Refractometer
3/8" Drive 1 in (25 mm) Extension	Vacuum Tester/Re-filler
1/2" Drive Ratchet Power Tool and Hand Tool	IDS and VCM II
1/4" and 1/2" Drive Impact Swivel	
1/2" Drive 18 mm Deep Impact Socket	
1/2" Drive 15mm Shallow Impact Socket	
1/2" Drive 6" (152 mm) and 10" (254 mm) Impact Extensions	
1/2" Drive Torque Wrench	
1/4" And 3/8" Drive Torque Wrench	
15 mm Ratchet Wrench	
17 mm Wrench 15 in (381 mm)	
Channel Lock Pliers	
Trim Tool 7 in (177 mm) and 12 in (304 mm)	
Inspection Mirror	
Screwdriver 8 in (203 mm)	
Paint Stick/Pen	
Scissors	
Cable Operated Hose Pliers	
4 in (101 mm) Pick Tool	
Pocket Screwdriver	
Side Cutters	
Needle Nose Pliers 8 in (203 mm) and 11 in (279 mm)	
Hose Hook Tool	



## SERVICE PROCEDURE

### Procedure A - Initial Disassembly and Preparation for Inspection

**OVERVIEW:** This procedure details the components to be removed to enable initial vehicle inspection.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Please note the following:

- The Inspection / Check Sheet (Attachment IV) must be printed and started during "Procedure A".
- The air cleaner, mass air flow sensor and air intake tube are removed as an assembly.
- Cover the turbocharger inlet opening to prevent dropping any parts or debris into the turbocharger while the turbocharger inlet pipe is off.

1. Print a copy of the Inspection / Check Sheet (Attachment IV), to record vehicle information and inspection/repair information for the vehicle. The Inspection / Check Sheet is to be attached/filed with the recall repair order following completion, it does not need to be provided to Ford at this time.

2. Fill out top of Inspection / Check Sheet including:

- VIN
- Technician ID
- Repair Order Number
- Repair Date
- Vehicle Mileage
- Vehicle Build Date
- Open Recalls

3. Using OASIS, document vehicle build date on the Inspection / Check Sheet.

4. With the vehicle in NEUTRAL, position it on a hoist. Please follow the Workshop Manual (WSM) procedures in Section 100-02.

5. Using IDS/scan tool, retrieve and record DTCs on the Inspection / Check Sheet.

- Any DTCs recorded will be used later in this procedure.

6. Remove the engine appearance cover.

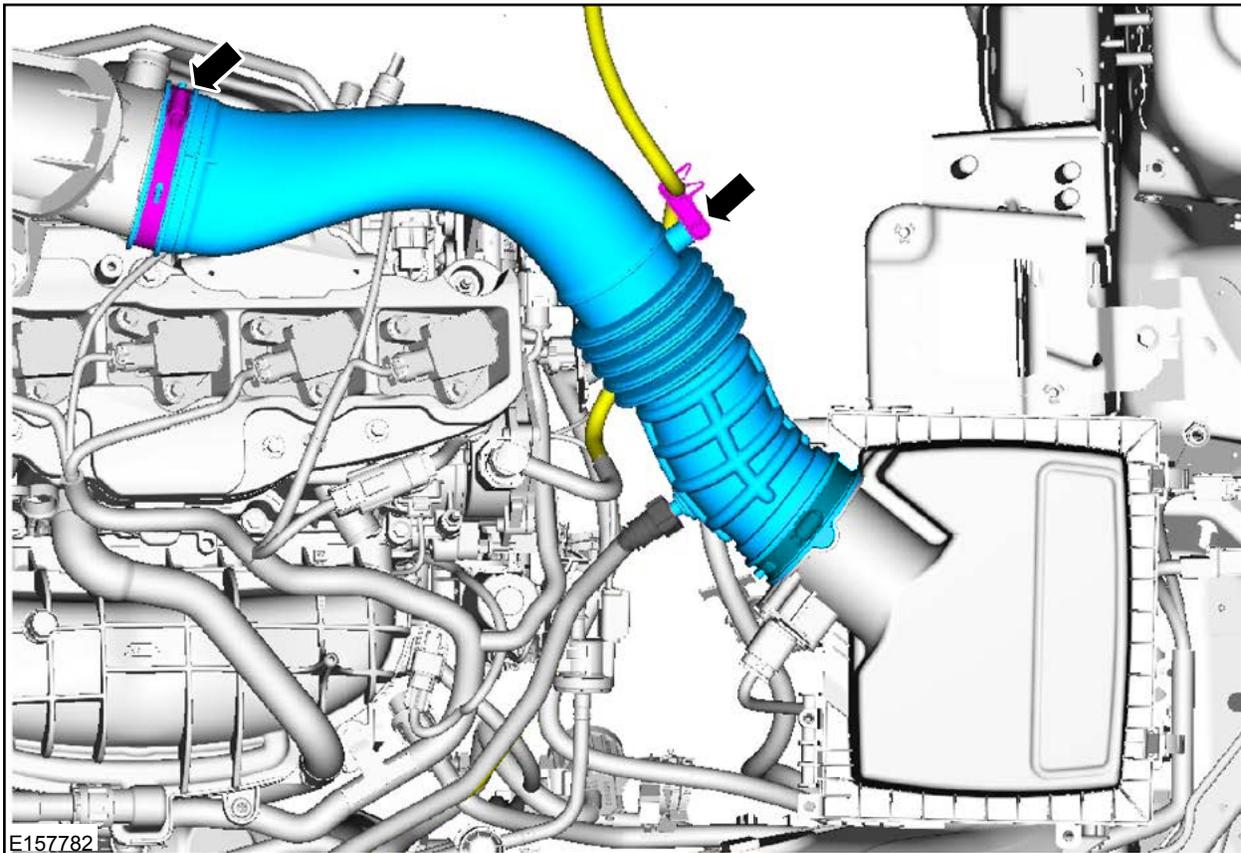


## All Vehicles

**NOTICE:** When working with 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:** Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

7. Detach the EVAP line from the clip on the air intake tube center section. See Figure A1.
8. Loosen the clamp and disconnect the air intake tube from the turbocharger inlet pipe. See Figure A1.



**FIGURE A1**



**NOTE:** The air cleaner assembly is removed from the vehicle with the mass air flow sensor and air intake tube attached.

9. Remove the air cleaner assembly. See Figure A2.

- a. Remove the two bolts
- b. Disconnect the mass air flow sensor electrical connector and wire harness retainer from the air cleaner assembly.
- c. Disconnect the EVAP hose from the air cleaner outlet tube.
- d. Lift upward to disengage the retaining grommets and remove the air cleaner assembly.

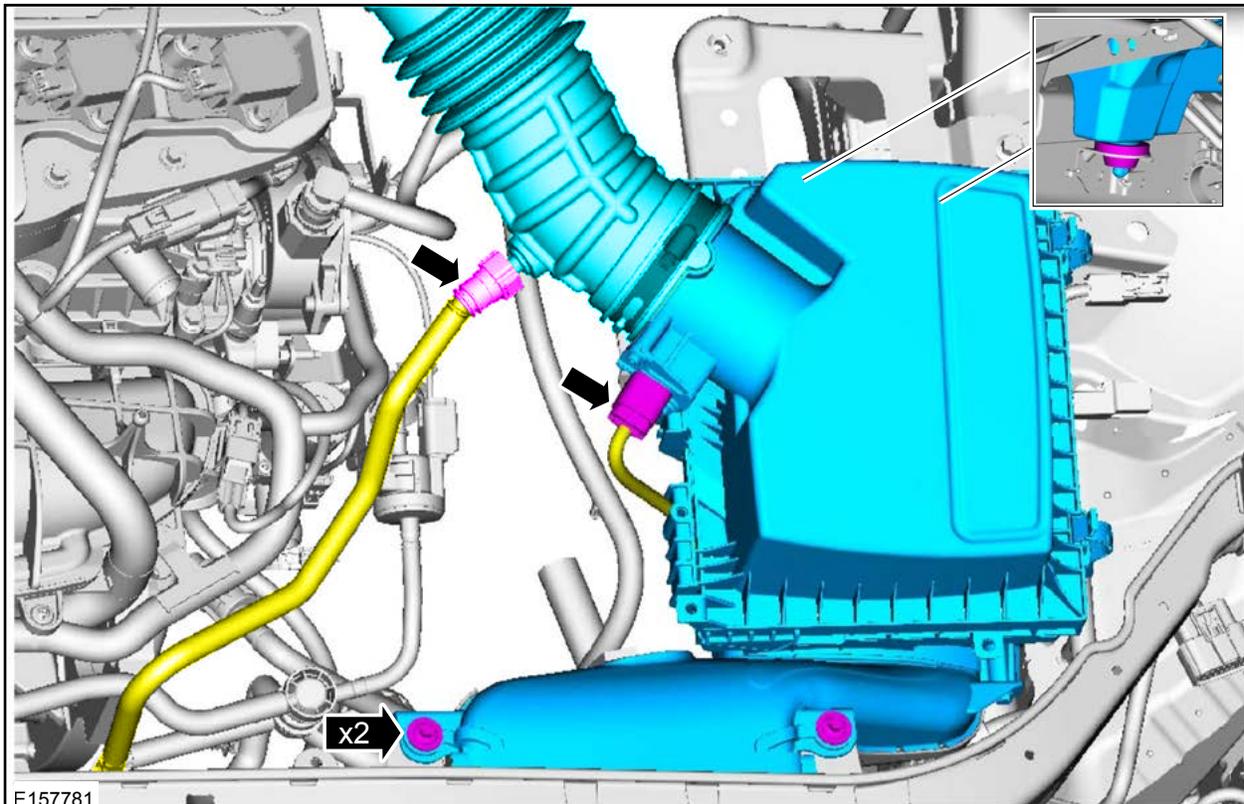


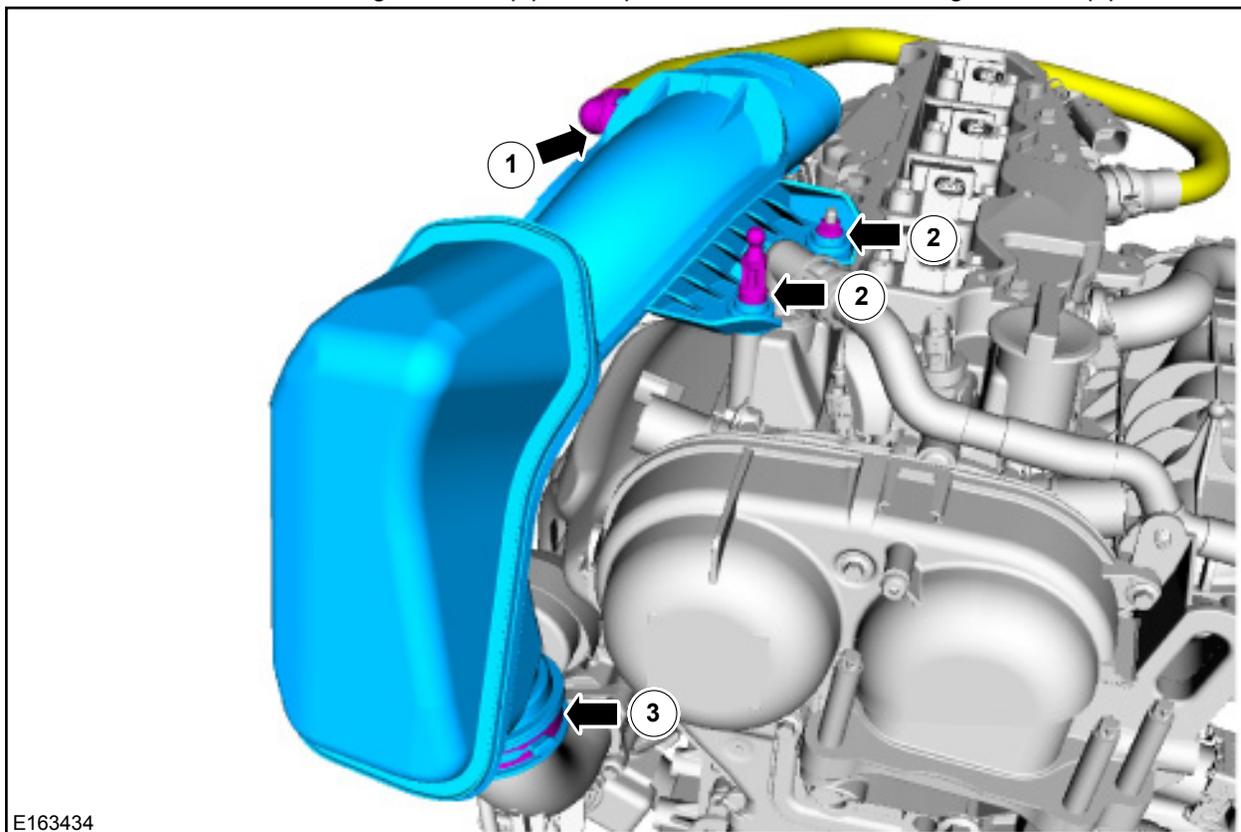
FIGURE A2



**NOTICE:** Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

10. Remove the turbocharger air inlet pipe. See Figure A3.

1. Disconnect the crankcase ventilation tube quick release coupling.
2. Remove the turbocharger air inlet pipe retaining nut, the turbocharger air inlet pipe ball stud, and the turbocharger air inlet pipe clamp.
3. Loosen the turbocharger air inlet pipe clamp and remove the turbocharger air inlet pipe.



E163434

**FIGURE A3**



11. Remove the retainers and the front underbody air deflectors. See Figures A4 and A5.

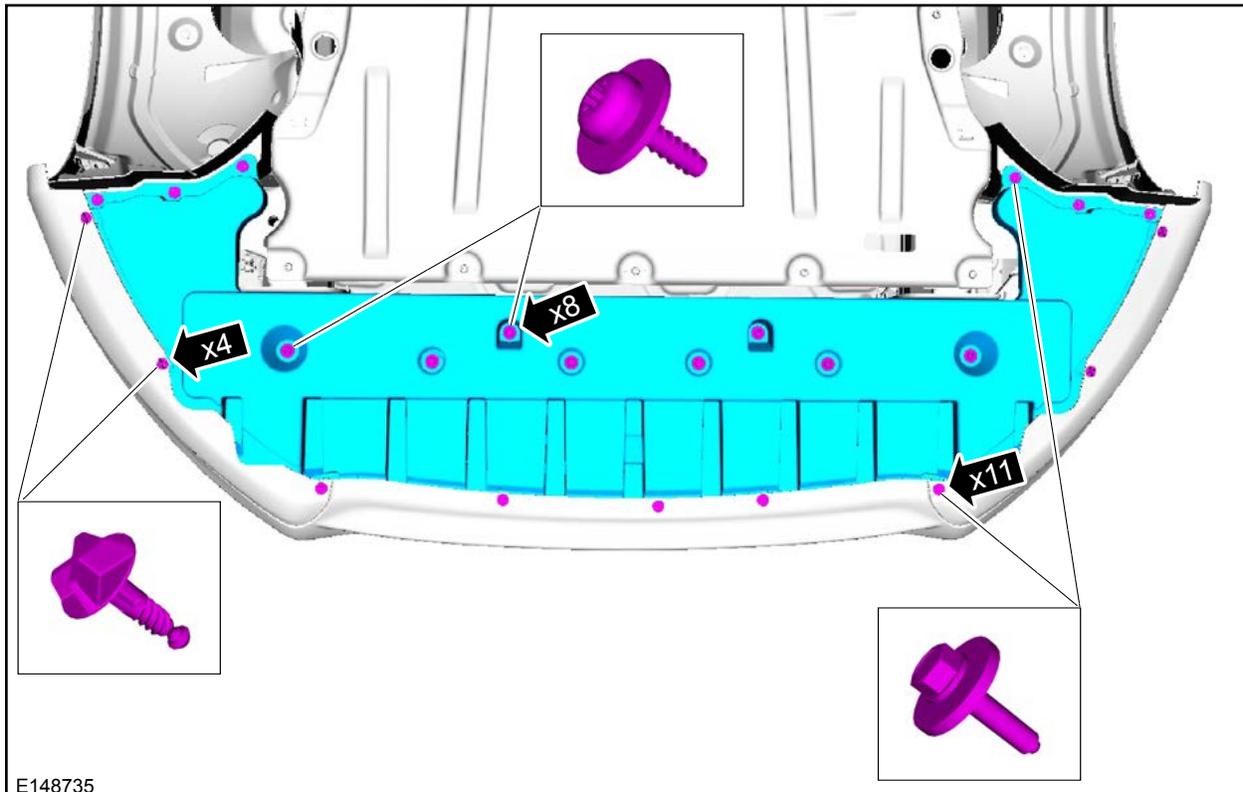


FIGURE A4

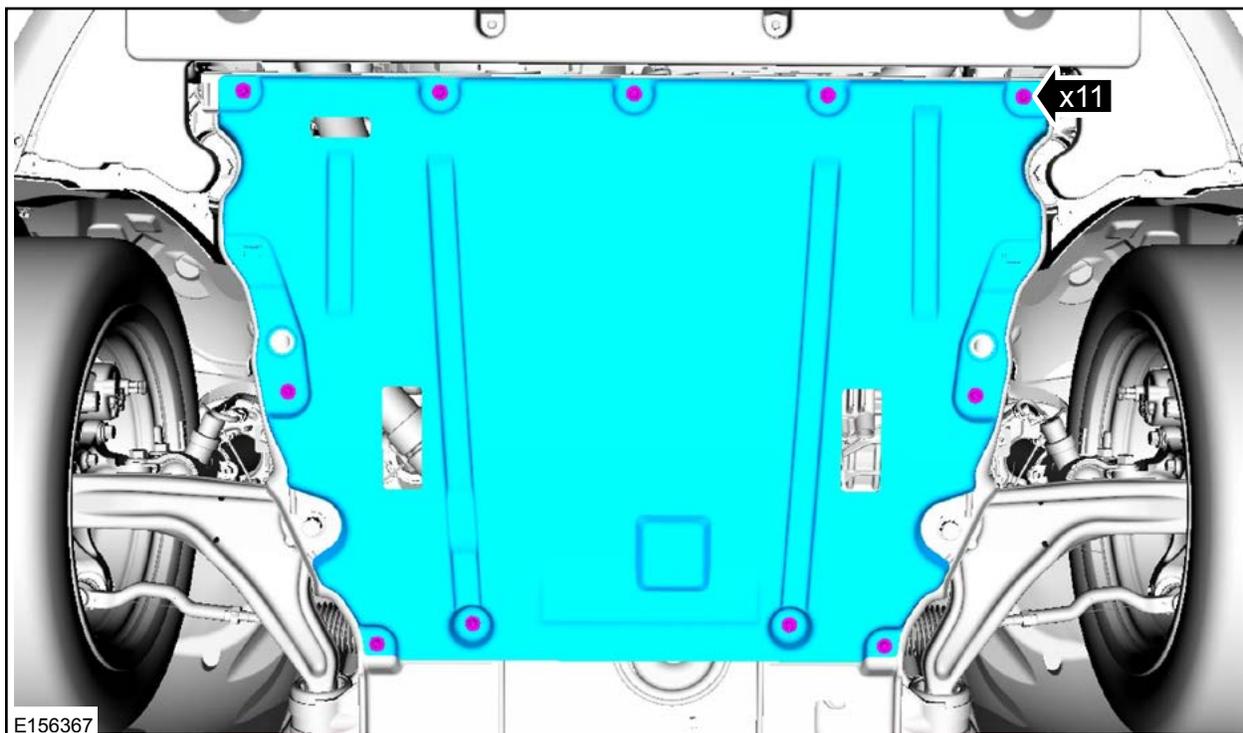


FIGURE A5



12. Detach the three wire harness retainers, disconnect the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve electrical connectors.  
See Figure A6.

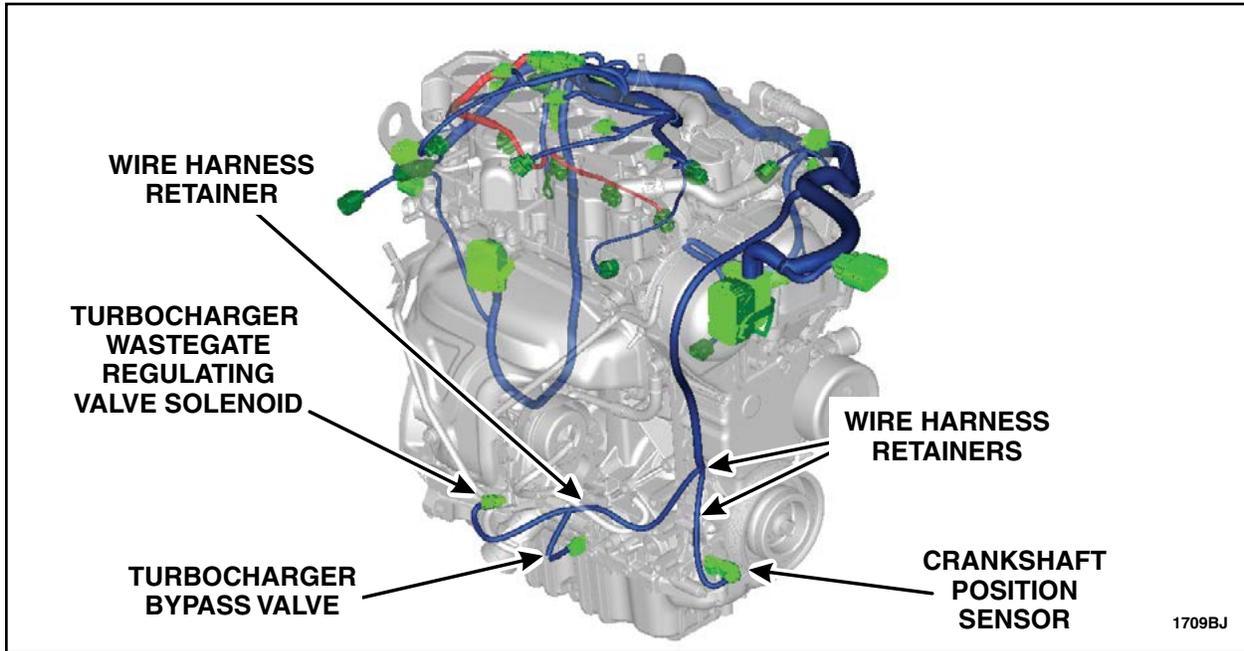


FIGURE A6

13. Remove the three nuts and position the Powertrain Control Module (PCM) aside. See Figure A7.

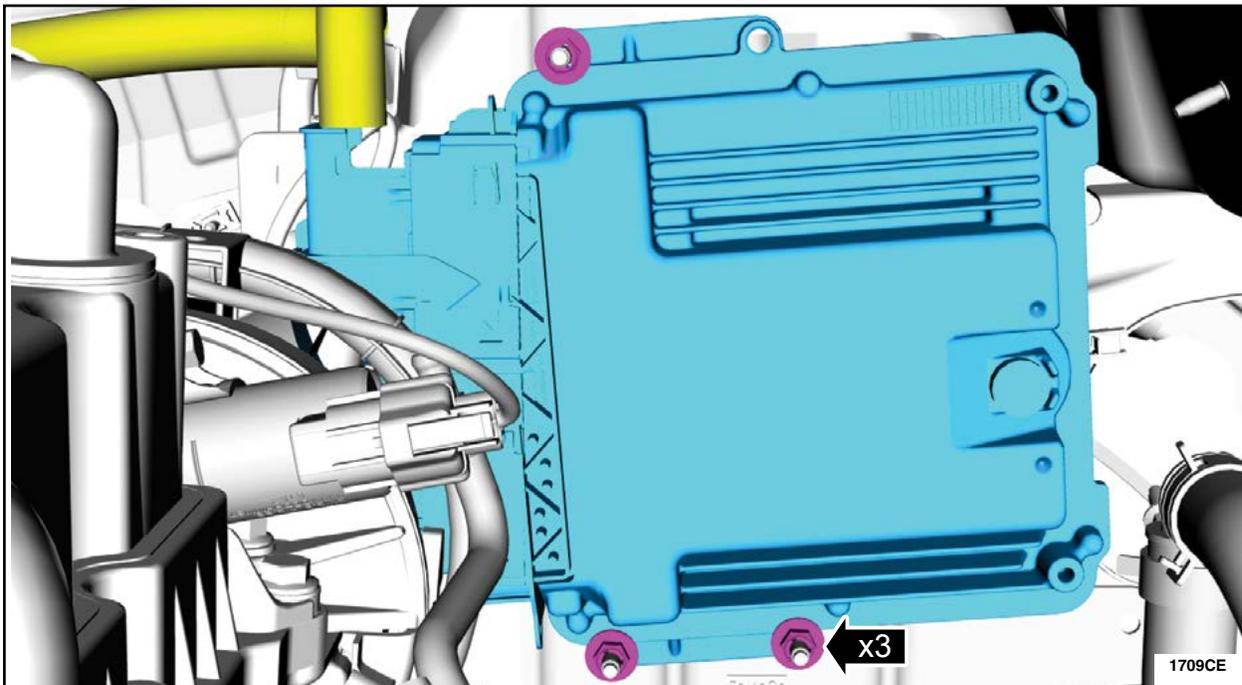


FIGURE A7



## Procedure B - Inspection / Check Sheet Completion

**OVERVIEW:** The Inspection must be completed and documented on the Inspection / Check Sheet. The inspection will check for obvious concerns that require correction with additional focus on cooling system concerns such as:

- Internal coolant leaks
- External coolant leaks
- Any DTC(s) that could indicate a recent engine overheat event or internal engine damage that may have resulted from a previous cooling system concern.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:** Rotunda Cooling System Pressure Tester (STN12270) and adapter (Snap-On TA52, AST ASSFZ-47, Redline RDL95-0750 or equivalent).

**SERVICE TIPS:** Use standard Workshop Manual and PC/ED Diagnostics, if necessary, to diagnose any cooling system or misfire DTC(s) retrieved and for any coolant loss concerns.

**NOTE:** Perform an underhood visual inspection for any obvious coolant, oil, transmission, or fuel leaks.

**NOTE:** If any concerns are identified repair as related damage before proceeding. If the coolant pressure test identifies concerns with the degas bottle, turbocharger return tube, upper section of the degas bottle return hose, or quick connect T-fitting at the coolant shutoff solenoid valve; note the condition. These items will be replaced as part of this recall. Refer to Dealer Bulletin Attachment I, Related Damage, for related damage claiming.

## Vehicle Inspection

1. Visually inspect the coolant level in the degas bottle.

- If the coolant level **is** visible in the degas bottle, proceed to Step 2.
- If the coolant level **is not** visible in the degas bottle, add coolant as necessary, and proceed to Step 2.

**NOTE:** Any gross loss of coolant must be identified and repaired prior to proceeding.

2. Remove the degas bottle cap.

3. Install a coolant pressure tester with adapter onto the degas bottle. Pressurize to 138 kPa (20 psi). Once stabilized, pressure should hold at 138 kPa (20 psi) for a minimum of 2 minutes.

- If cooling system pressure does not hold for a minimum of 2 minutes, the source of pressure loss must be identified and repaired as necessary before proceeding.

4. Visually check for coolant leaks with the system under pressure.



5. Check the engine oil level to ensure it is within normal range, note if it is overfilled. Visually check for engine oil leaks at the rear surface of the cylinder head, above exhaust manifold, that may be the result of a crack in the cylinder head. See Figure B1.

- If an oil leak is detected at the rear surface of the cylinder head, replace the complete cylinder head assembly before proceeding.

**NOTE:** The turbocharger coolant tubes and exhaust manifold heat shield are removed for clarity.

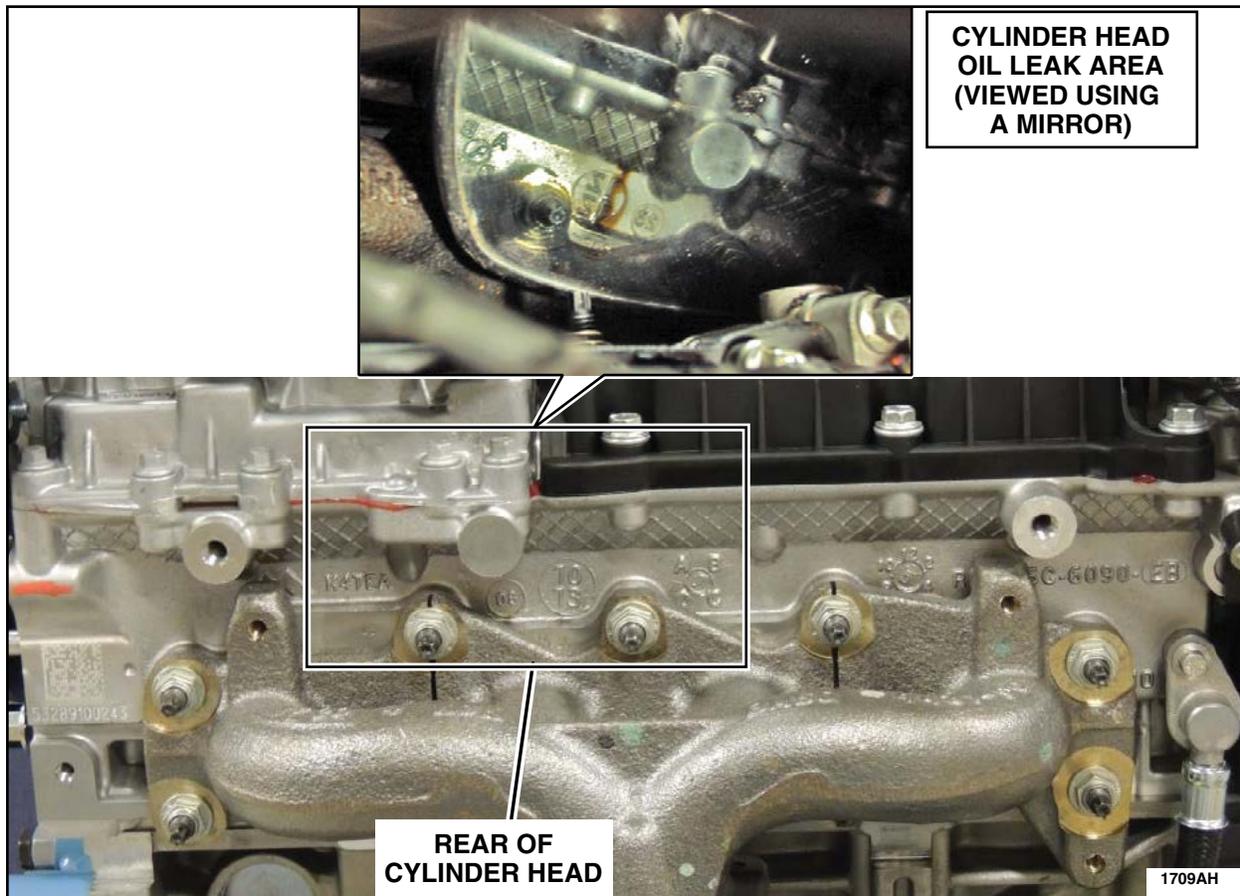


FIGURE B1



6. DTCs - Note and identify the cause of the following DTCs before proceeding:

- If additional DTCs are present, diagnose and repair as required.

**NOTE:** Diagnosis for any of the following DTCs may require reinstallation of the air intake components and battery. Perform diagnosis and repairs as necessary.

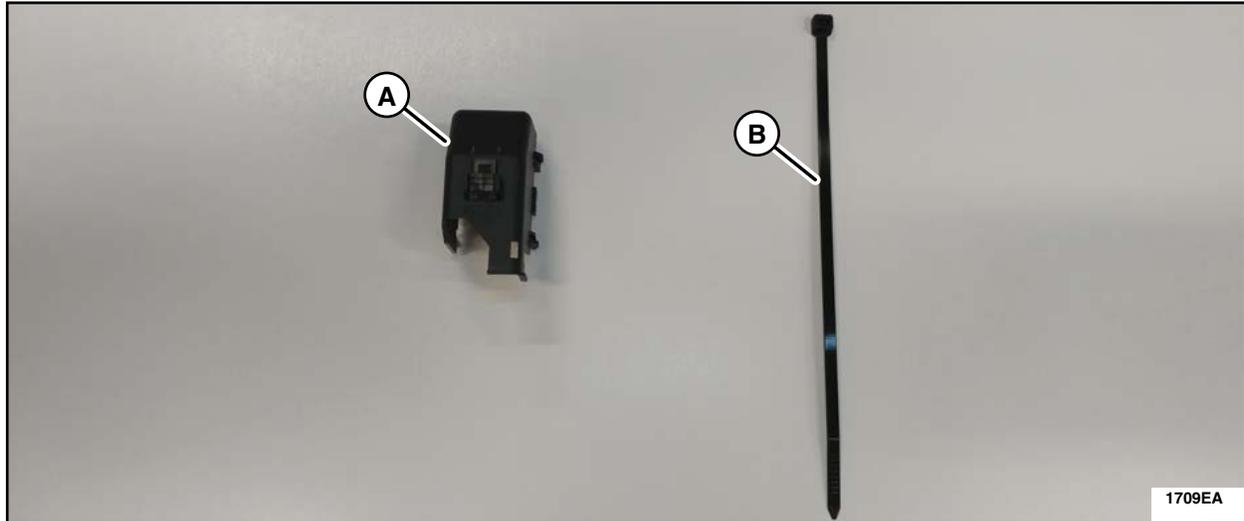
<b>Cooling System DTCs</b>	
<b>P0217</b>	Engine Coolant Over Temperature Condition
<b>P0218</b>	Transmission Fluid Over Temperature Condition
<b>P0219</b>	Engine Over Speed Condition
<b>P1299</b>	Cylinder Head Over Temperature Protection Active
<b>Engine Misfire DTCs</b>	
<b>P0300</b>	Random Misfire Detected
<b>P030x</b>	Cylinder X Misfire Detected
<b>P0313</b>	Misfire Detected With Low Fuel
<b>P0316</b>	Misfire Detected On Startup (First 1000 Revolutions)

7. Note any issues and/or repairs made on the Inspection / Check Sheet.



### Procedure C - Powertrain Control Module Connector Back Shell Replacement - (Manual Transmission Vehicles Only)

**OVERVIEW:** Powertrain Control Module (PCM) connector back shell replacement is only required for vehicles equipped with a manual transmission. The new PCM connector back shell will allow for clearance between the PCM connector back shell and the new stand-pipe.



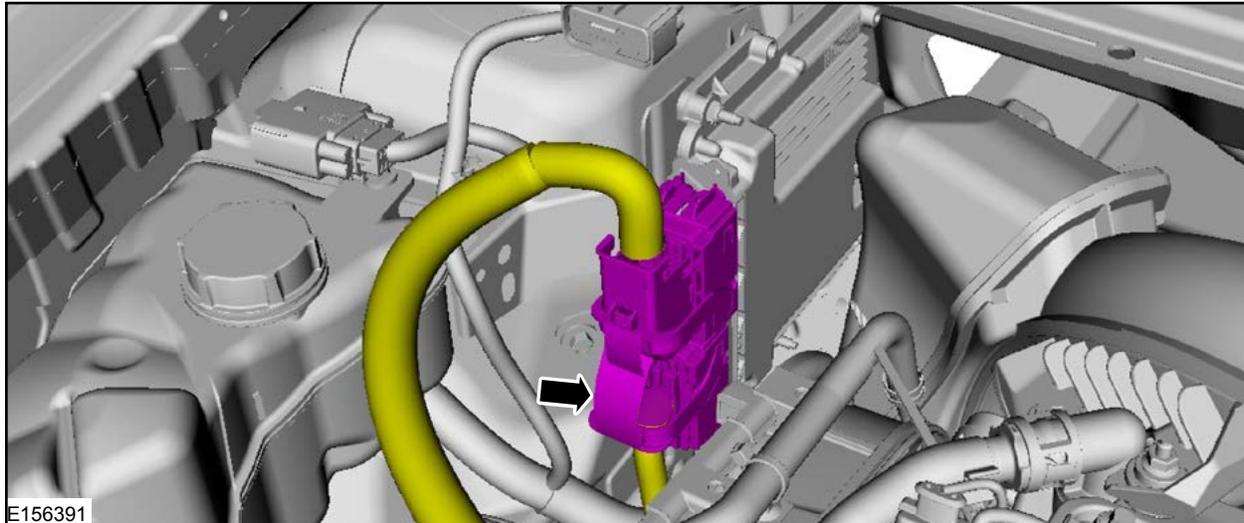
A	PCM Connector Back Shell
B	Tie-Strap

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None



1. Disconnect the battery cable to ground. Please follow the procedures in WSM Section 414-01.
2. Disconnect the lower PCM electrical connector. See Figure C1.



**FIGURE C1**

3. Replace the connector back shell with the *new* connector back shell. Secure the PCM connector wires to the back shell and the *new* tie-strap. See Figure C2.



**FIGURE C2**

4. Connect the lower PCM electrical connector. See Figure C1.

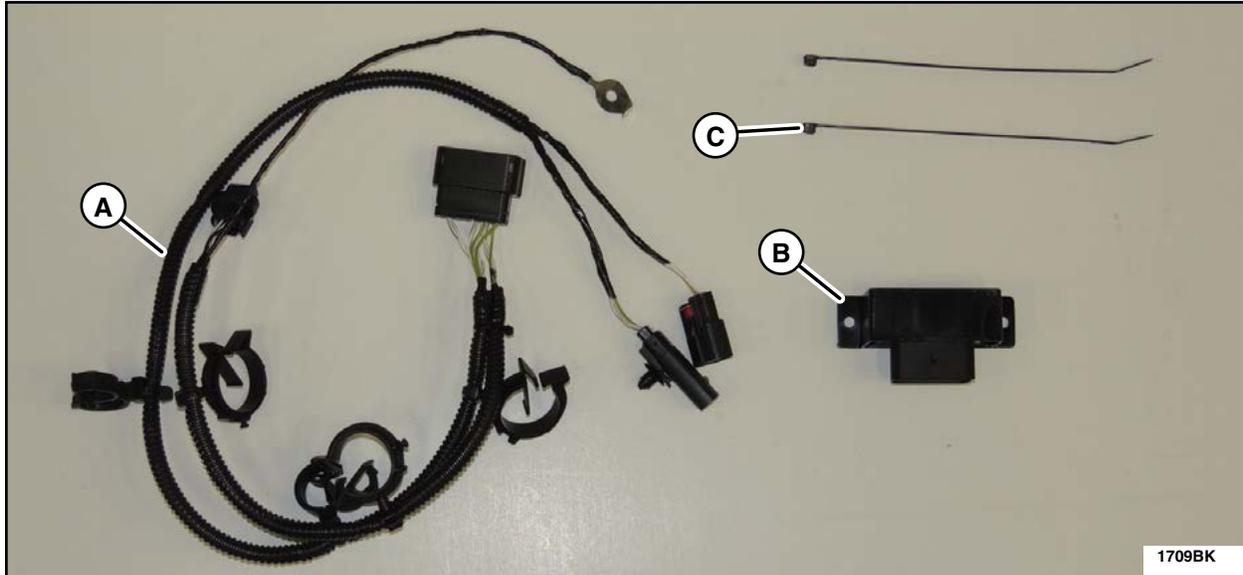
**NOTE:** Do not reconnect the battery cable to ground at this time. It will be reconnected later in the procedure.



## Procedure D - Coolant Stand-pipe Wire Harness Installation

**OVERVIEW:** The coolant stand-pipe wire harness is partially installed in this procedure. This is necessary to complete the connections at the electronic power assist steering (EPAS) electrical connectors which are a part of the CAN Network. The CAN Network must be complete to allow module programming.

### PARTS / SUPPLIES REQUIRED:



A	Coolant Stand-pipe Wire Harness
B	Junction Box
C	Tie-Straps x2

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None



1. If not done previously, disconnect the battery cable to ground. Please follow the procedures in WSM Section 414-01.
2. Install the junction box and coolant stand-pipe wiring harness. See Figure D1.
  1. Position the junction box onto the engine wire harness, behind the Powertrain Control Module (PCM) and secure with the two tie-straps.
  2. Connect the electrical connector to the connector junction box.
  3. Route the coolant stand-pipe wire harness downward to the EPAS and secure to the bulkhead wire harness and A/C line as shown in Figure D1.

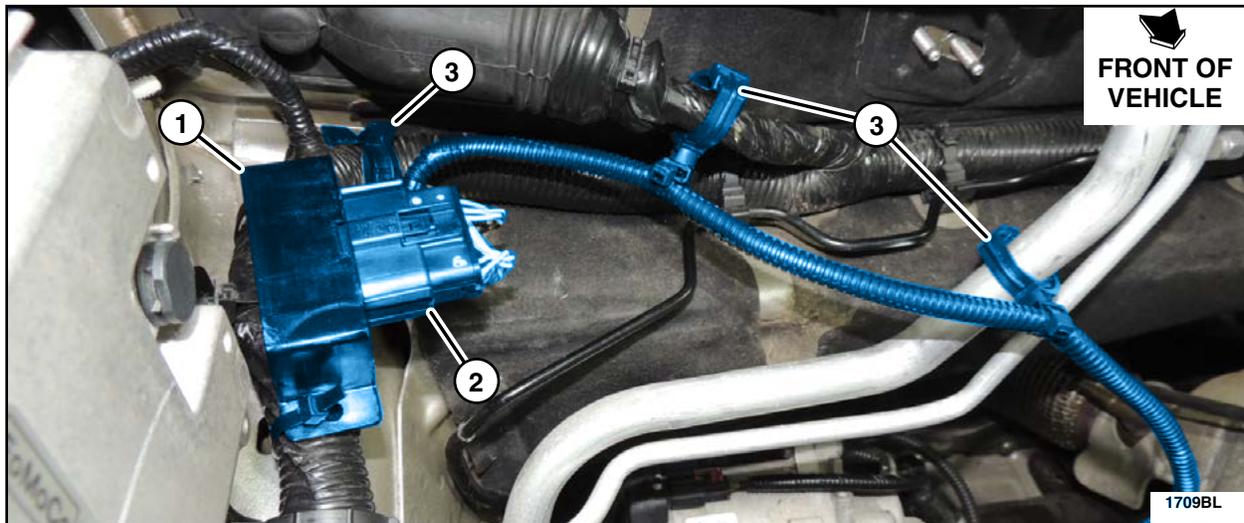


FIGURE D1

3. Disconnect the EPAS electrical connector and connect the coolant stand-pipe wiring harness to the EPAS module and the EPAS electrical connector. See Figure D2.

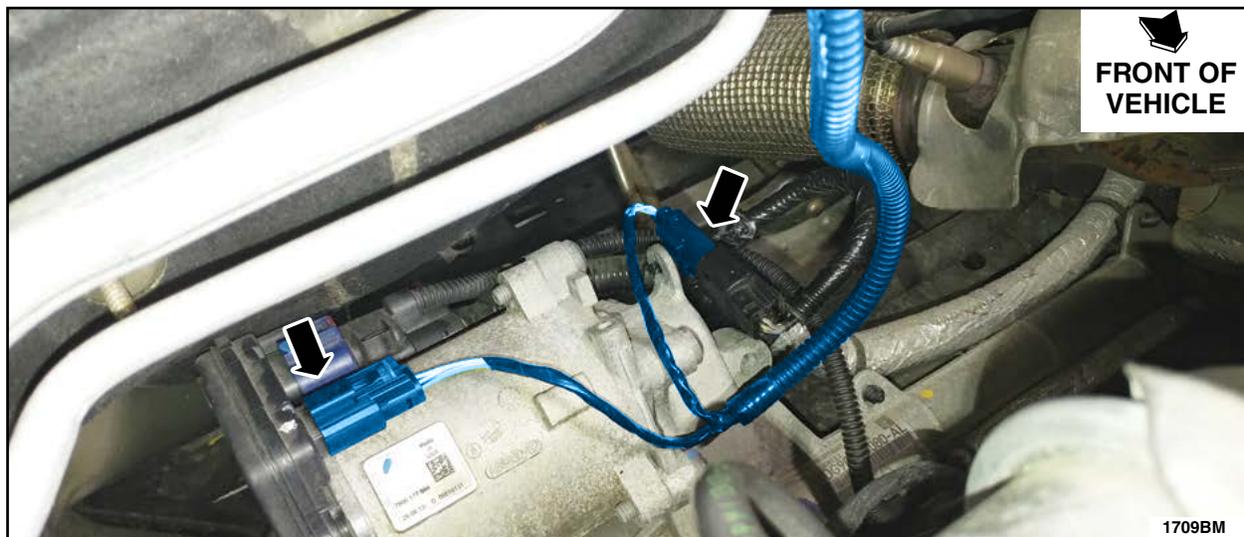


FIGURE D2



4. Route the coolant stand-pipe wire harness stand pipe electrical connector and ground eyelet wire along the lower PCM connector wire harness. Secure the stand-pipe wire harness as shown in Figure D3.



FIGURE D3

5. **NOTICE:** Ensure the surface is clean and free of any dirt and debris prior to re-installing the ground bolt.

Install the *new* coolant stand-pipe wire harness ground eyelet to the vehicle using the existing wire harness ground bolt. See Figure D4.

- Remove and reattach the upper PCM connector harness retaining clip to access the ground bolt.
- When installing tighten to 106 lb.in (12 Nm)

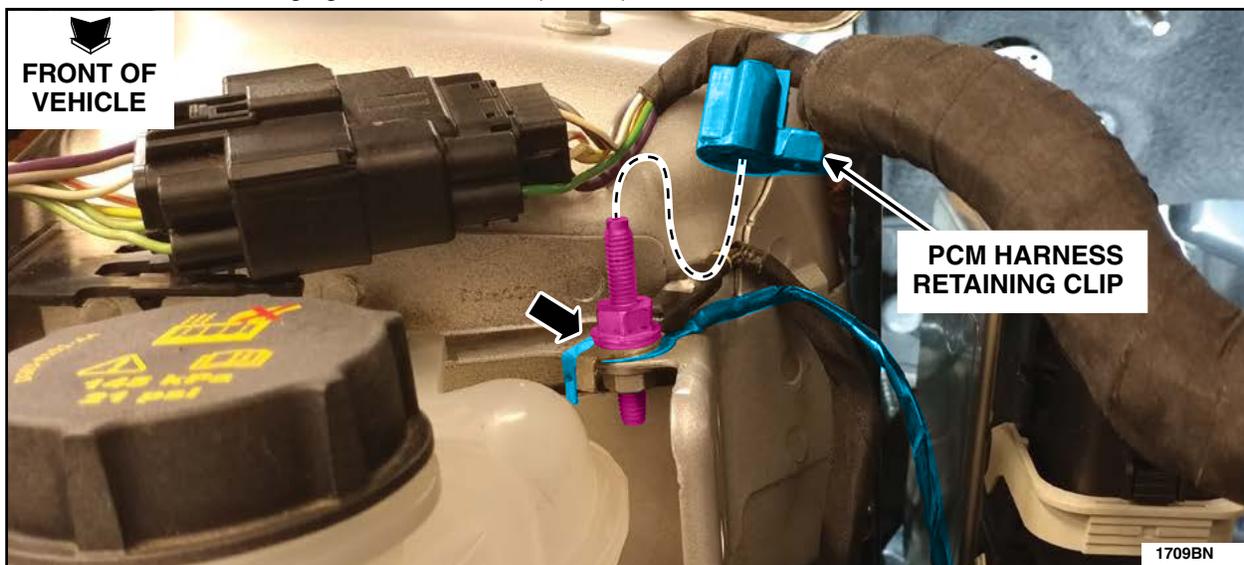
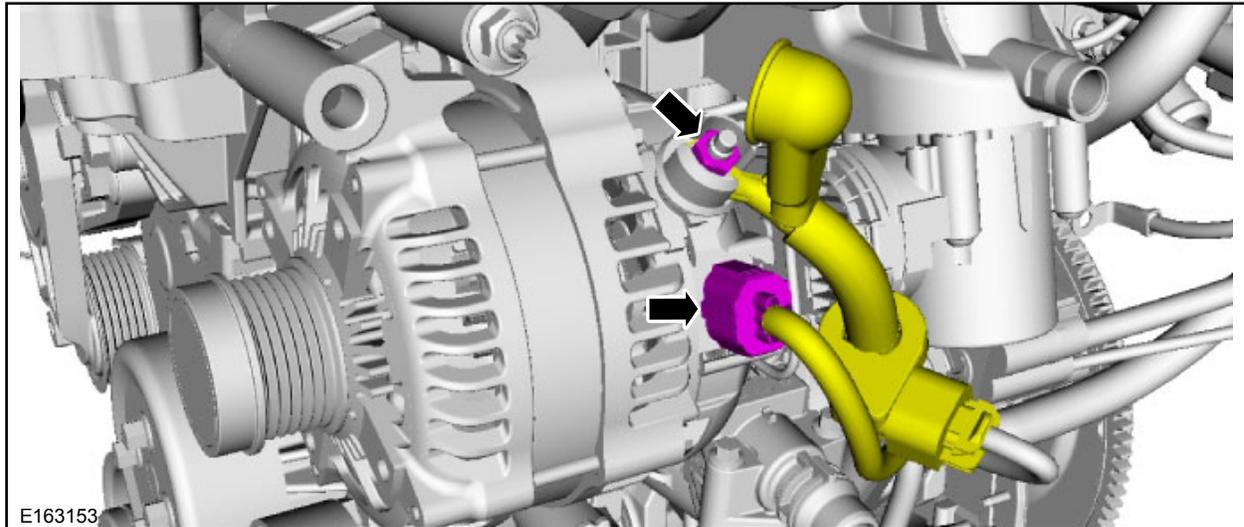


FIGURE D4



6. Position the stand-pipe wire harness electrical connector aside. It will be connected later.
7. Remove the nut and disconnect the generator battery cable and electrical connector. See Figure D5.
  - Cover the cable end using electrical tape.



**FIGURE D5**

8. Connect the battery cable to ground. Please follow the procedures in WSM Section 414-01.



## Procedure E - Instrument Panel Cluster (IPC) Reprogramming

**OVERVIEW:** The IPC software is being updated to coordinate cooling system improvements and instrument cluster messaging. IPC reprogramming can be performed while performing other repairs on the vehicle. The PCM must be reprogrammed during Procedure L after cooling system repairs and bleeding are completed.

**PARTS / SUPPLIES REQUIRED:** None

**UNIQUE TOOL REQUIREMENTS:**

- IDS with release 108.03 or higher
- Portable battery charger (10 to 20 amps)

**SERVICE TIPS:** Begin IPC reprogramming and continue to perform repairs during IPC reprogramming. Reprogramming times for the IPC can be significantly reduced by using a VCM II instead of a VCM.

### Important Information for Module Programming

**NOTE:** When programming or reprogramming a module, use the following basic checks to ensure programming completes without errors.

- Make sure the 12V battery is fully charged before carrying out the programming steps and connect IDS/scan tool to a power source.
- Inspect Vehicle Communication Module (VCM) and cables for any damage. Make sure scan tool connections are not interrupted during programming.
- A hardwired connection is strongly recommended.
- Turn off all unnecessary accessories (radio, heated/cooled seats, headlamps, interior lamps, HVAC system, etc.) and close doors.
- Disconnect/depower any aftermarket accessories (remote start, alarm, power inverter, CB radio, etc.).
- Follow all scan tool on-screen instructions carefully.
- Disable IDS/scan tool sleep mode, screensaver, hibernation modes.
- Create all sessions key on engine off (KOEO). Starting the vehicle before creating a session will cause errors within the programming inhale process.
- Ensure the headlamps and accessories are turned off.



## Module Reprogramming

**NOTE:** The IDS must be updated to software level 108.03 or later to perform the FSA. If the IDS is not updated when the FSA is performed, it may result in various DTCs and drivability concerns. It is important that all steps of this FSA are performed in the order listed. This will ensure proper operation of the vehicle once completed.

**NOTE:** Reprogram appropriate vehicle modules before performing diagnostics and clear all Diagnostic Trouble Codes (DTCs) after programming. For DTCs generated after reprogramming, follow normal diagnostic service procedures.

1. The IPC reprogramming can take up to 1 hour or more. Connect a portable battery charger of 10 to 20 amps to an extension cord and to the 12V battery. This will allow the vehicle to be raised and lowered as needed while completing the remaining repair procedures, and ensure uninterrupted reprogramming is achieved. Programming times can be significantly reduced by using a VCMII.

**NOTE:** Periodically check the status of the reprogramming progress to continue the process, as required.

2. Reprogram the IPC using IDS release 108.03 or higher.

**NOTE:** Follow the IDS on-screen instructions to complete the reprogramming procedure.

### **Recovering a module when programming has resulted in a blank module: NEVER DELETE THE ORIGINAL SESSION!**

- a. Obtain the original IDS tool which will have the original IDS session, that was used when the programming error occurred during module reprogramming (MR) or programmable module installation (PMI).
- b. Disconnect the VCM from the data link connector (DLC) and the IDS.
- c. Reconnect the VCM to IDS and then connect to the DLC. Once reconnected, the VCM icon should appear in the corner of the IDS screen. If it does not, troubleshoot the IDS to VCM connection.
- d. Locate the original vehicle session when programming failed. This should be the last session used in most cases. If not, use the session created on the date that the programming failed.

**NOTE:** If the original session is not listed in the previous session list, click the Recycle Bin icon at the lower right of the previous session screen. This loads any deleted sessions and allows you to look through them. Double-click the session to restore it.

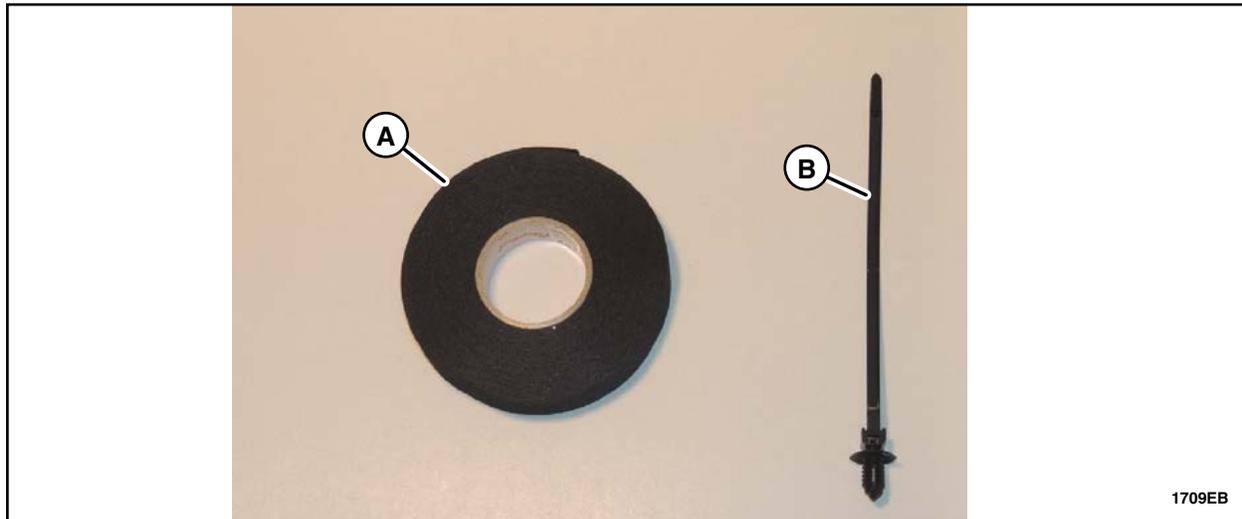
- e. Once the session is loaded, the failed process should resume automatically.
- f. If programming does not resume automatically, proceed to the Module Programming menu and select the previously attempted process, PMI or MR.
- g. Follow all on-screen prompts/instructions.
- h. The last screen on the IDS may list additional steps required to complete the programming process. Make sure all applicable steps listed on the screen are followed in order.



## Procedure F - Turbocharger Wire Harness Taping

**OVERVIEW:** This procedure wraps the turbocharger wire harness with Coroplast® tape to prevent the entry/buildup of fluids and debris in the convolute which could ignite from an ignition source.

### PARTS / SUPPLIES REQUIRED:



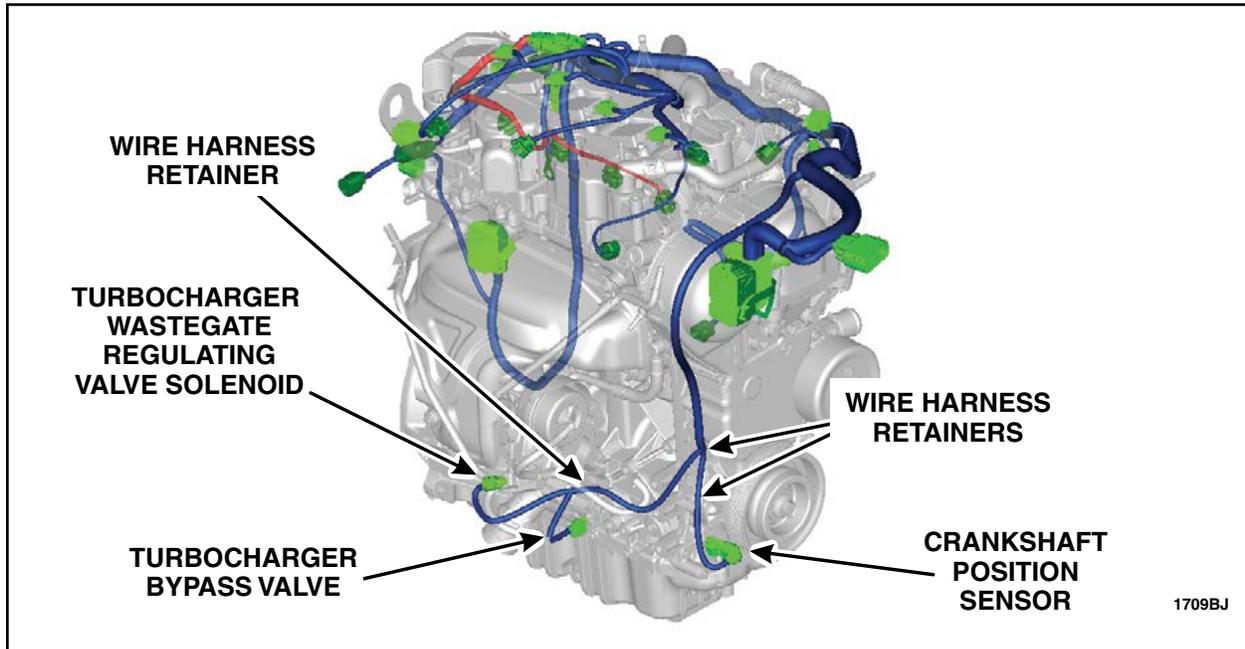
A	Coroplast® Tape
B	Wire Harness Retainer w/Tie-Strap

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Tips for wrapping the harness are included in the procedure.



**NOTE:** Figure F1 is for reference only the harness retainers were previously disconnected in Procedure A.



**FIGURE F1**

1. Route the turbocharger wire harness to the top of the engine compartment. See Figure F2.
2. If broken, replace the wire harness retainer with the *new* one supplied in the vehicle parts kit. See Figures F1 and F2.
  - Mark the wire harness retainer location before removal.



3. Wrap the turbocharger wire harness convolute with the Coroplast® tape provided in the service kit. See Figure F2.

- Start and finish each length of tape applied with three (3) initial and three (3) finishing wraps.
- Apply each wrap of tape with a 50% overwrap.
- First, wrap the takeout for the crankshaft position sensor. Begin the wrap at the connector and end this portion of wrapping by going around the main harness at the takeout. See Figure F2, (A).
- Wrap the turbocharger harness starting at the side of the harness closest to the engine. Proceed down the remaining length of harness to the turbocharger wastegate regulating valve solenoid connector and turbocharger bypass valve electrical connectors. See Figure F2, (B).

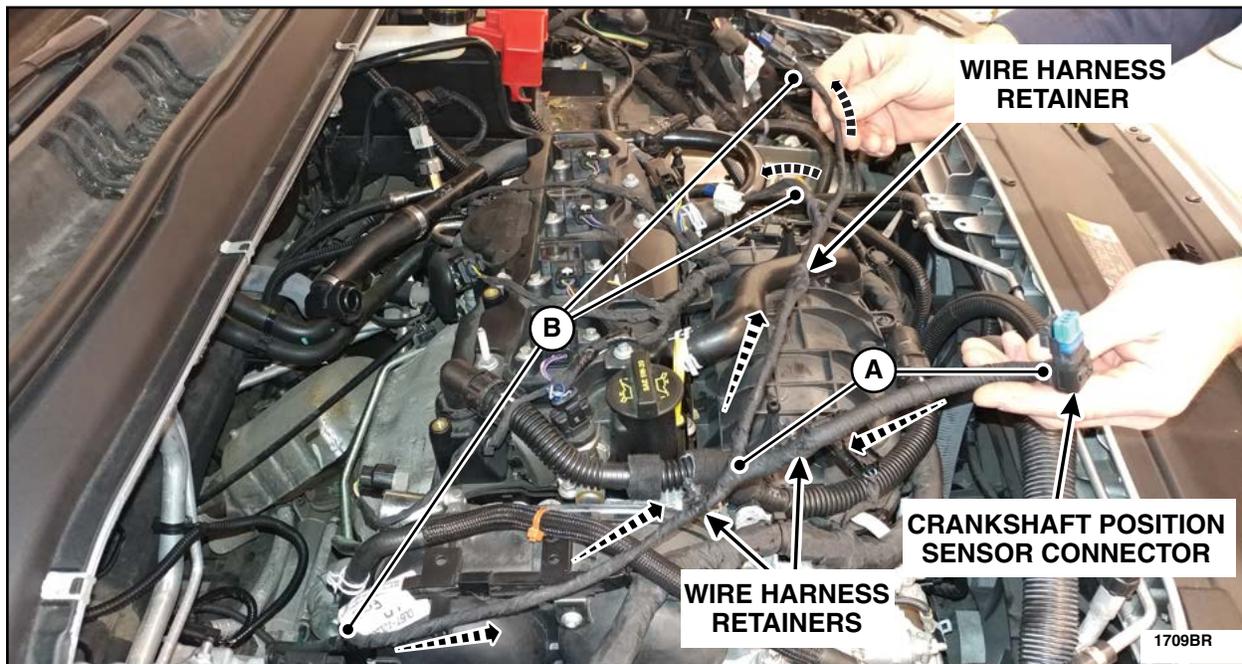


FIGURE F2

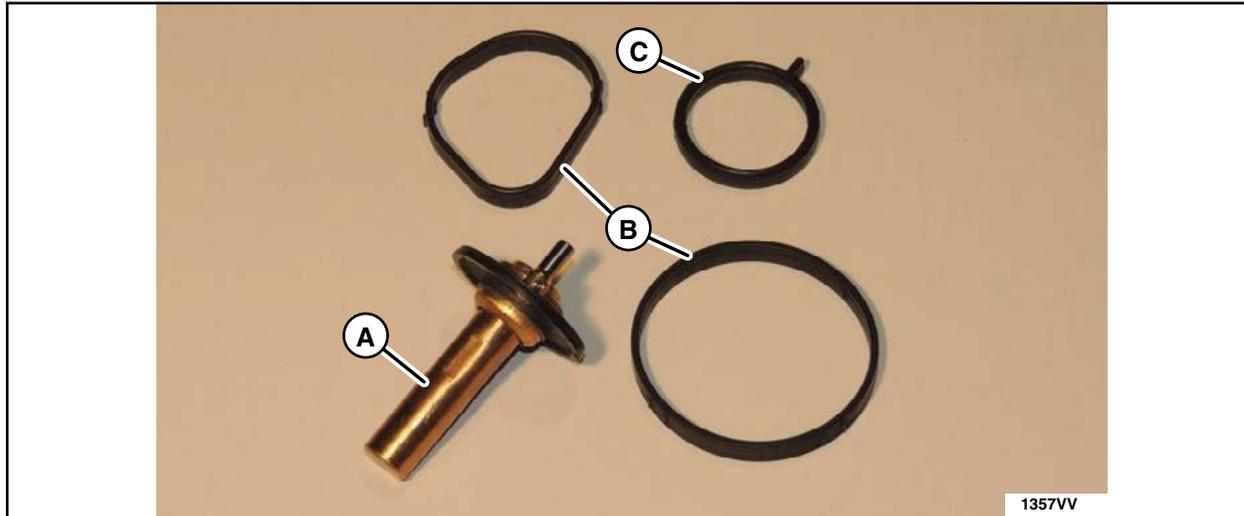
4. Route the wire harness back down to the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve. See Figure F1.
5. Connect the crankshaft position sensor, turbocharger wastegate regulating valve solenoid, and turbocharger bypass valve electrical connectors. Attach the wire harness retainers to the engine. See Figure F1.



## Procedure G - Thermostat Replacement

**OVERVIEW:** An updated 82° C (179.6° F) thermostat will be installed to improve cooling system performance

### PARTS / SUPPLIES REQUIRED:



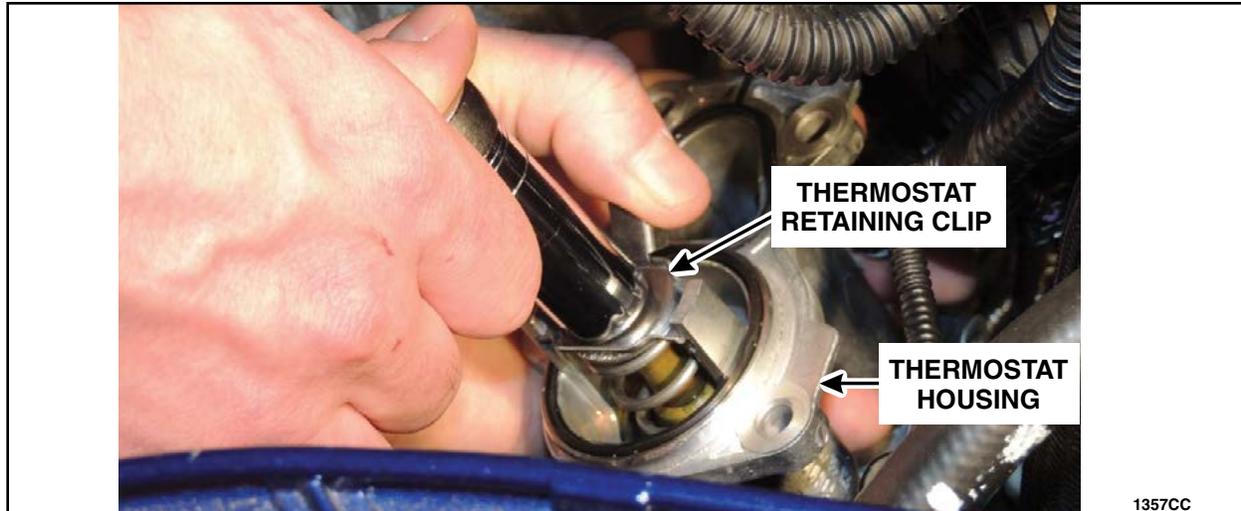
A	Thermostat
B	Thermostat housing to cylinder block O-rings (2 ea.)
C	Thermostat Housing to coolant valve O-Ring (1 ea.)

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** Make sure the air bleed hole in the thermostat is in the “UP” position when installed to allow any air trapped in the system to pass.

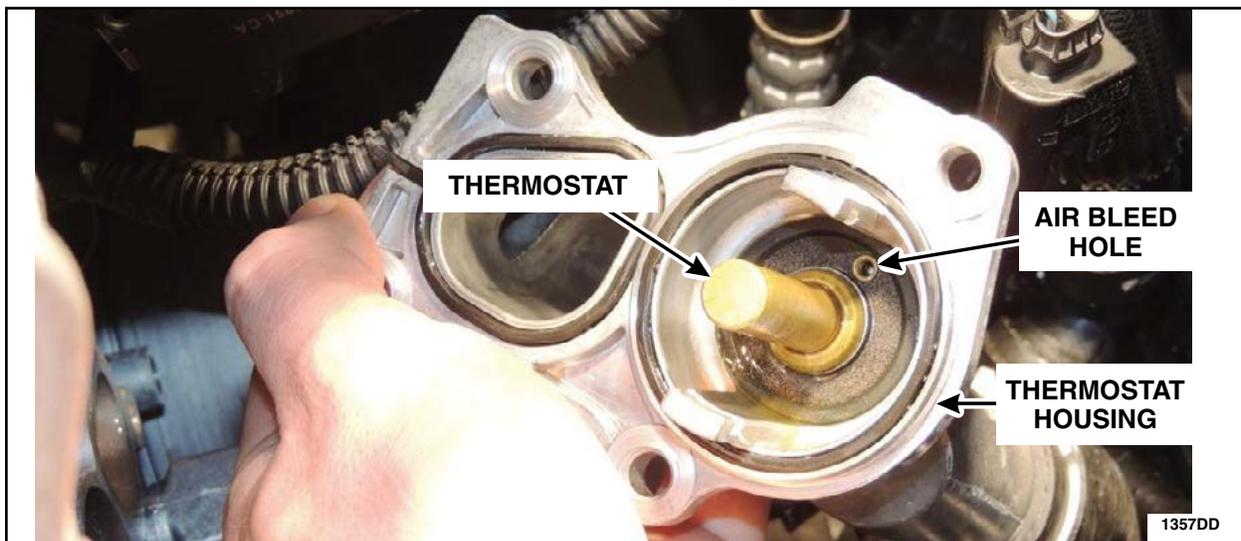


1. Remove the thermostat housing. Please follow the WSM procedures in 303-03.
  - Discard the thermostat housing gaskets.
2. Use a 13 mm (1/2 in) deep well socket to press downward on the thermostat retaining clip and rotate to remove it from the thermostat housing. Remove the thermostat spring. See Figure H2.
  - Note the position of the thermostat retaining clip and thermostat prior to removing. See Figures G1 and G2.



**FIGURE G1**

3. Remove and discard the thermostat. See Figure G2.
4. Position the *new* thermostat into the housing with the air bleed hole positioned upward. Use a 13 mm (1/2 in) deep well socket to install the thermostat spring and clip. The retaining clip must be in the same orientation that it was in prior to removal. See Figures G2 and G3.

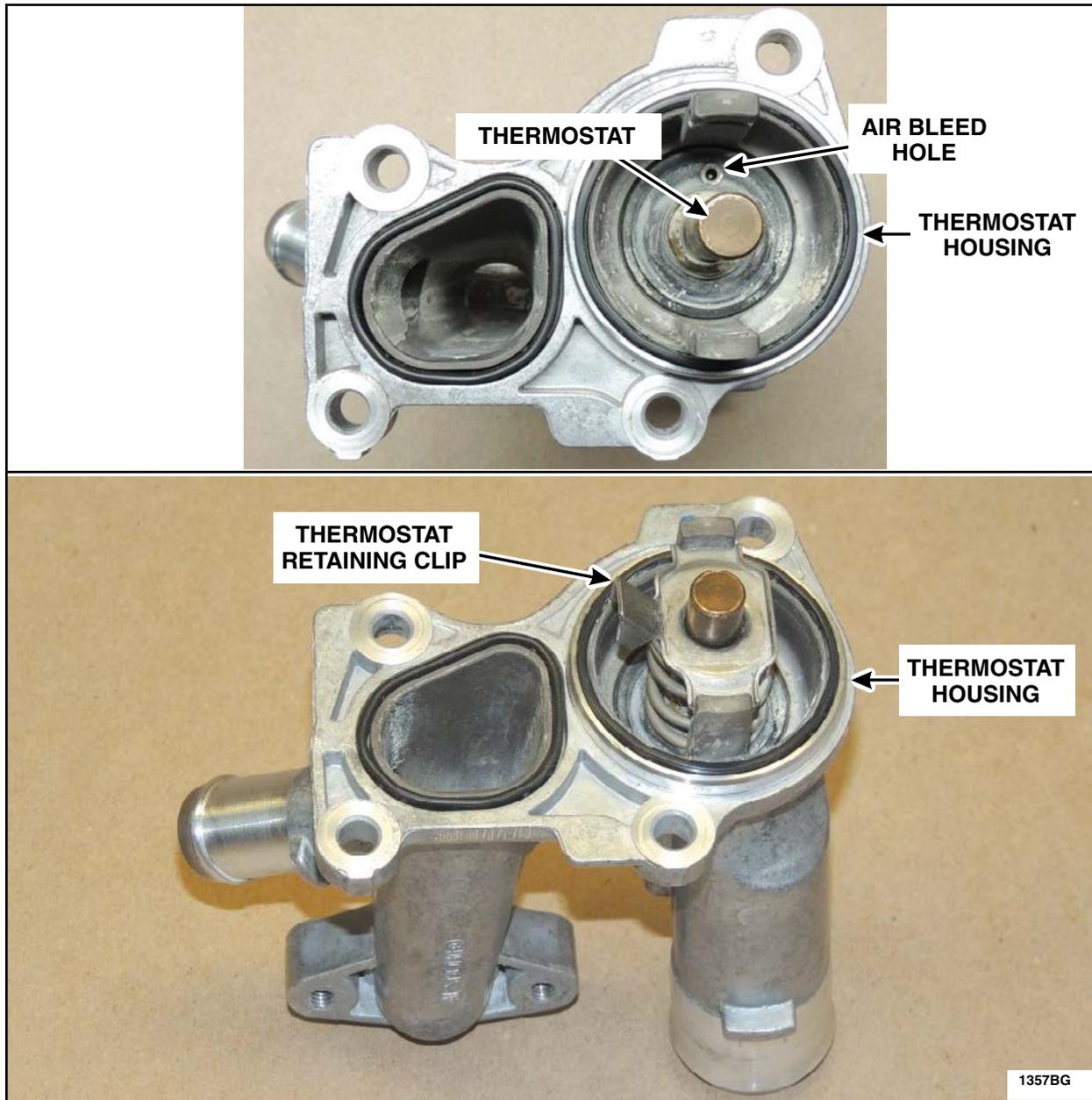


**FIGURE G2**



**NOTICE:** Do not use pliers or other tools to install the thermostat.

**NOTE:** The thermostat retaining clip must be installed in the position as shown. See Figure G3.



**FIGURE G3**

5. Install the *new* thermostat housing gaskets and install the thermostat housing. Please follow the WSM procedures in 303-03.

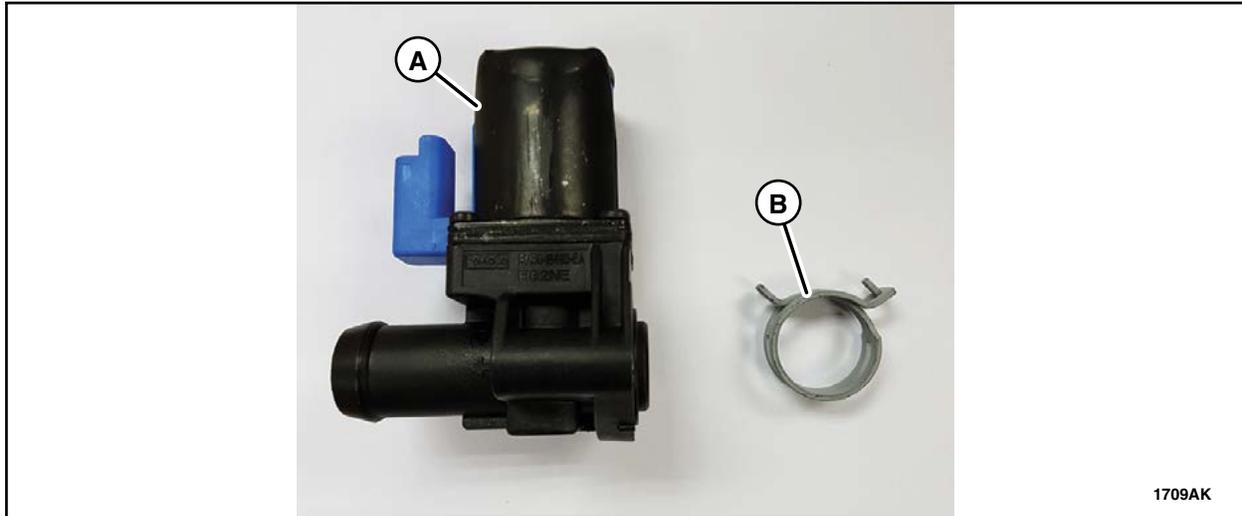
- Do not re-connect the degas bottle to thermostat housing coolant hose at this time.
- Do not re-connect the generator battery cable and electrical connector to the generator at this time.
- Do not refill the engine coolant at this time.



## Procedure H - Engine Coolant Bypass Valve Replacement

**OVERVIEW:** The engine coolant bypass valve is being replaced in this procedure.

### PARTS / SUPPLIES REQUIRED:



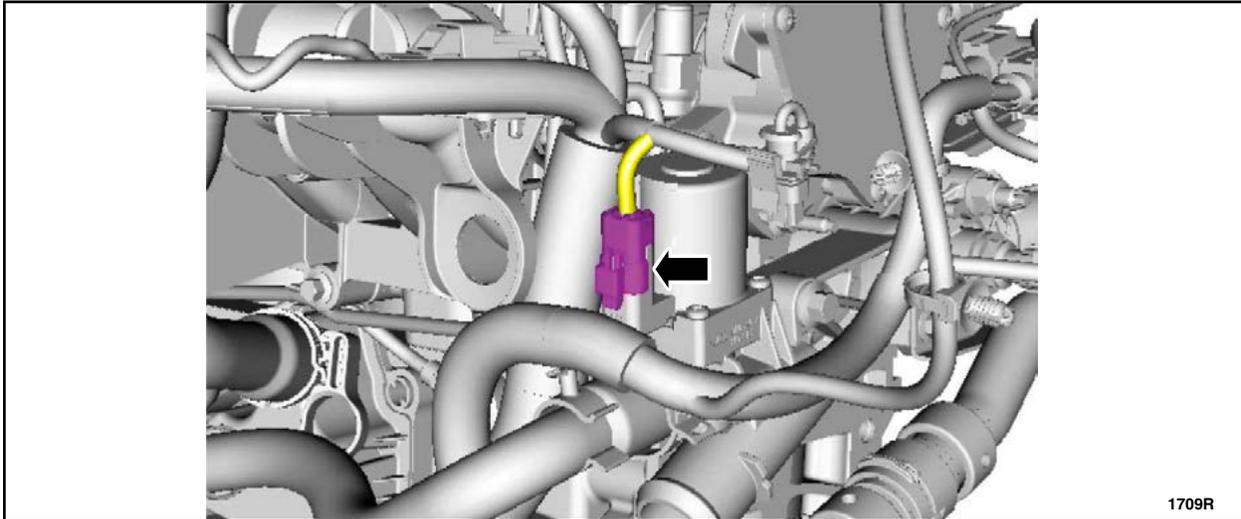
A	Engine Coolant Bypass Valve
B	Hose Clamp

**UNIQUE TOOL REQUIREMENTS:** None

**SERVICE TIPS:** None

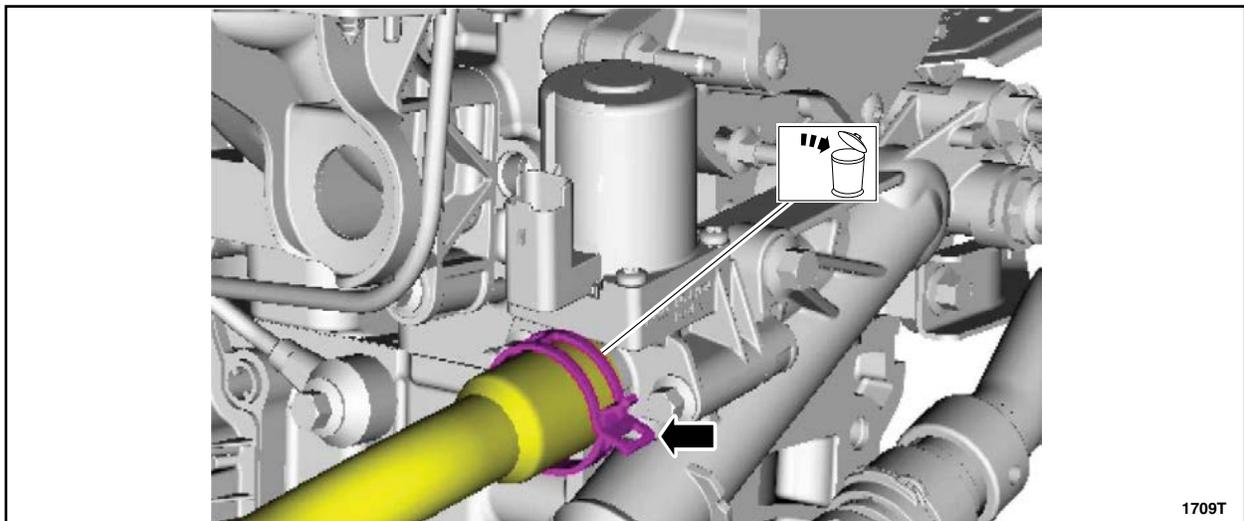


1. Disconnect the engine coolant bypass valve electrical connector. See Figure H1.



**FIGURE H1**

2. Release the clamp and disconnect the coolant hose. Discard the clamp. See Figure H2.

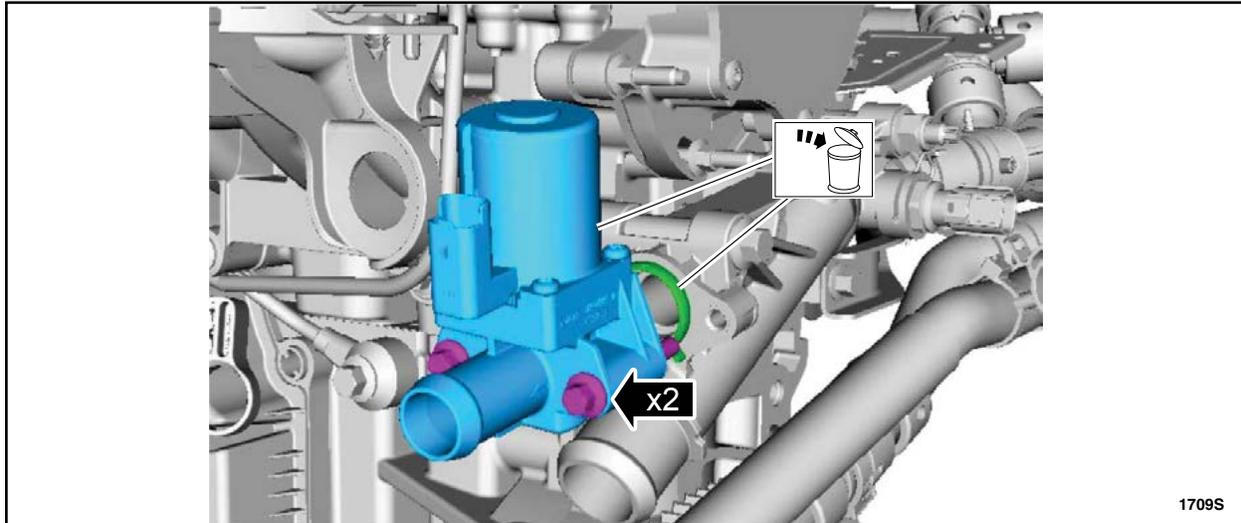


**FIGURE H2**



3. Remove the bolts from the engine coolant bypass valve. Remove and discard the valve and O-ring seal. See Figure H3.

- Tighten to 89 lb.in (10 Nm).



**FIGURE H3**

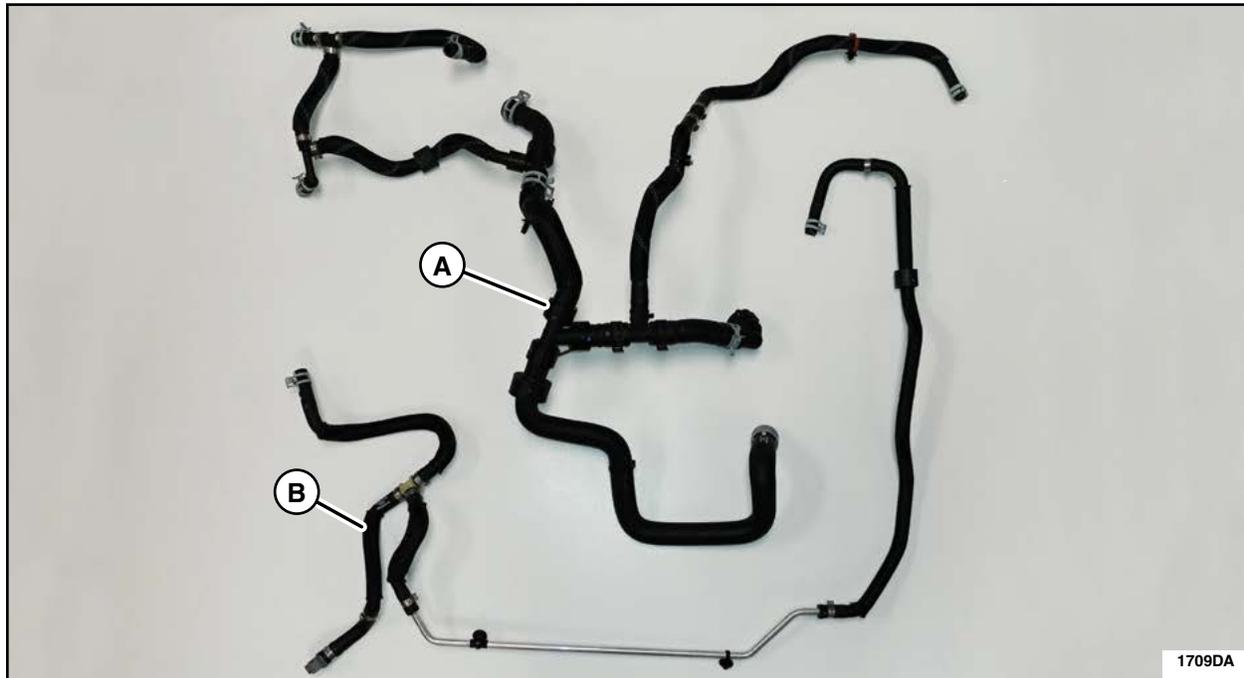
4. Install a *new* engine coolant bypass valve and O-ring seal by reversing the removal procedure.



## Procedure I - Coolant Hose Replacement

**OVERVIEW:** In this procedure, the coolant hose that runs between the degas bottle and thermostat quick connect T-fitting is replaced with an updated hose that allows for connection to the turbocharger coolant return line and the *new* coolant stand-pipe. The engine degas tube is also being replaced with an updated assembly that allows for connection to the radiator degas hose and degas bottle.

### PARTS / SUPPLIES REQUIRED:



A	Coolant Degas Bottle to Thermostat Housing Hose
B	Engine Degas Tube

**UNIQUE TOOL REQUIREMENTS:** None



**SERVICE TIPS:** The degas bottle hose assembly will need to be separated (an upper and lower portion) at the reusable clamp to allow it to be fitted to the vehicle. The clamp will be re-used during the installation. The new coolant hoses and connection points are called out below. See Figures I1A and I1B.

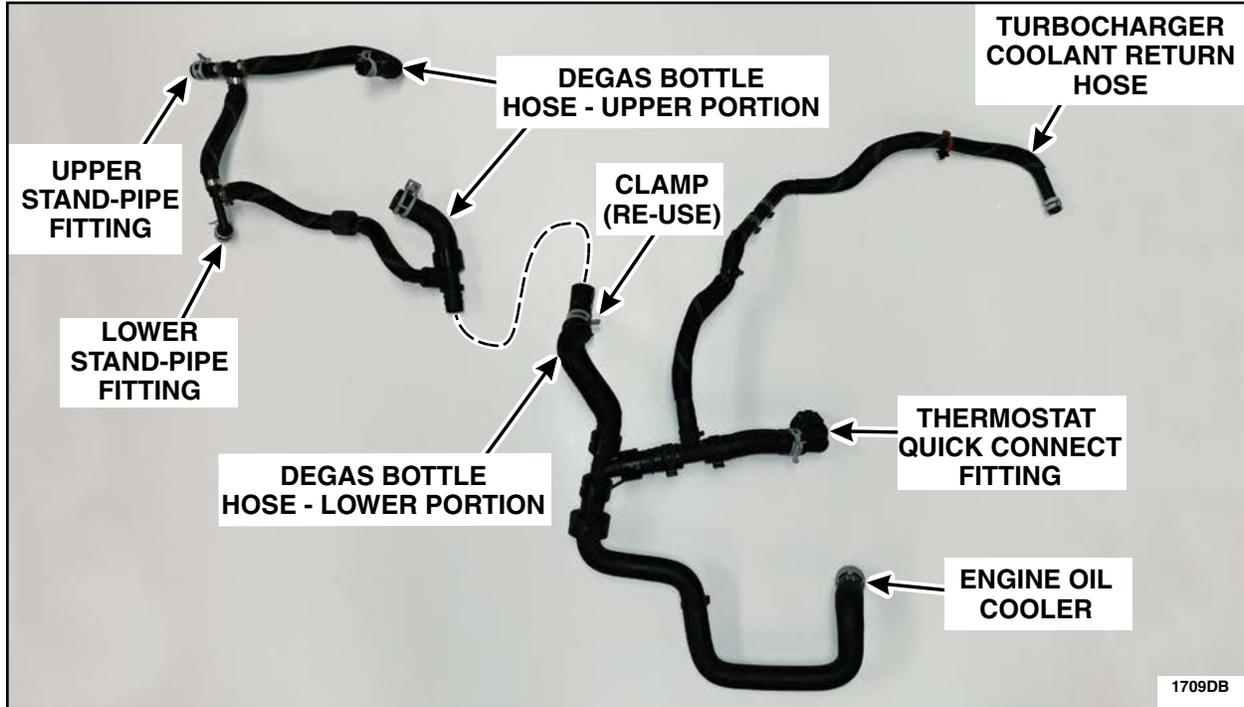


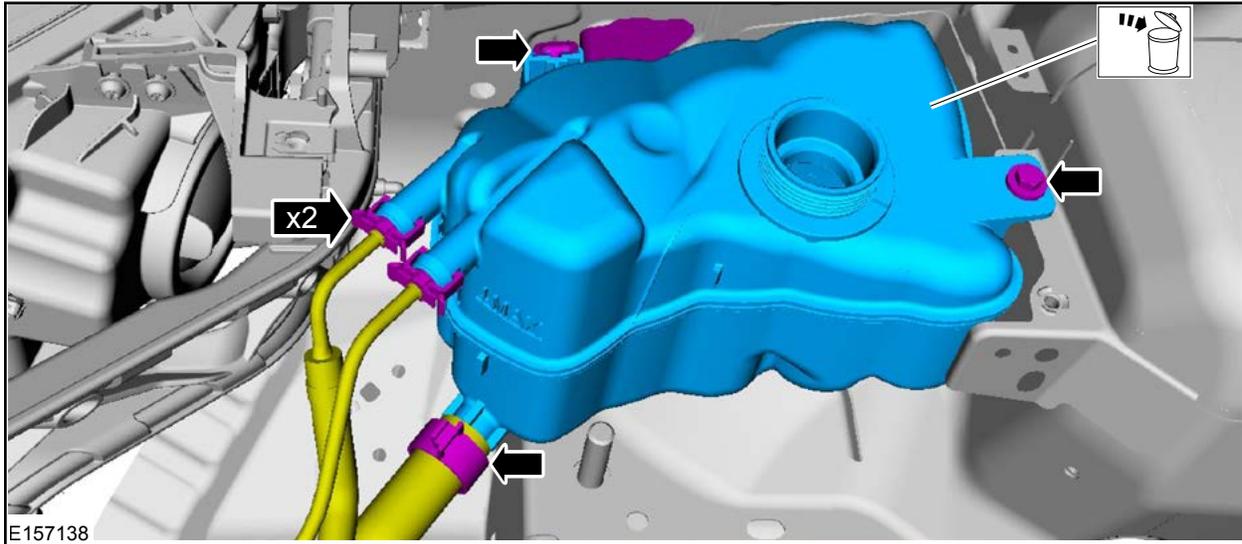
FIGURE I1A



FIGURE I1B

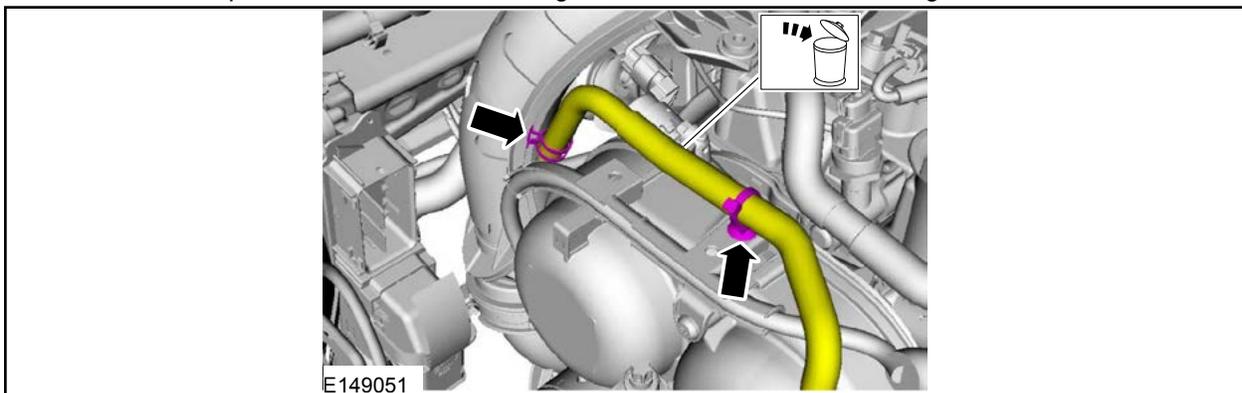


1. Remove and discard the degas bottle and cap. See Figure I2.



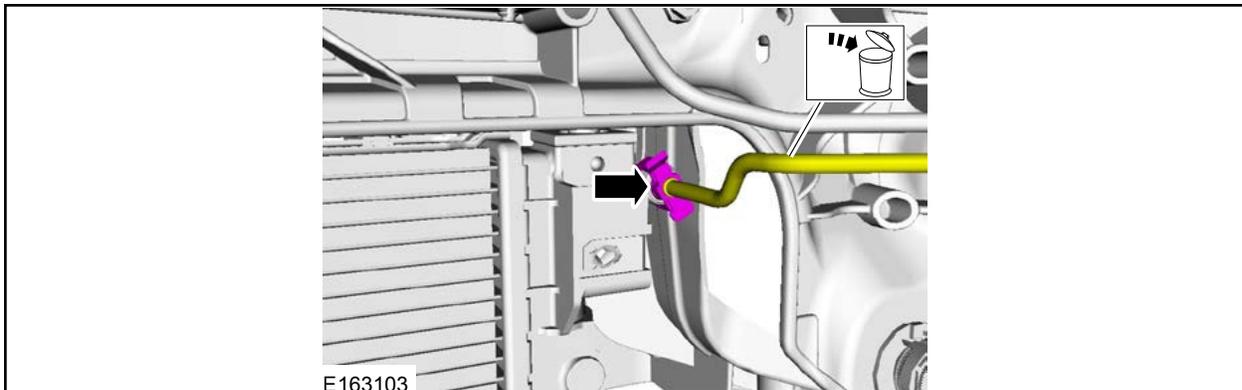
**FIGURE I2**

2. Disconnect and position aside the turbocharger coolant return hose. See Figure I3.



**FIGURE I3**

3. Disconnect the degas bottle coolant hose from the radiator and discard. See Figure I4.



**FIGURE I4**



4. Detach the retainers, remove and discard the engine degas tube assembly. See Figure I5.

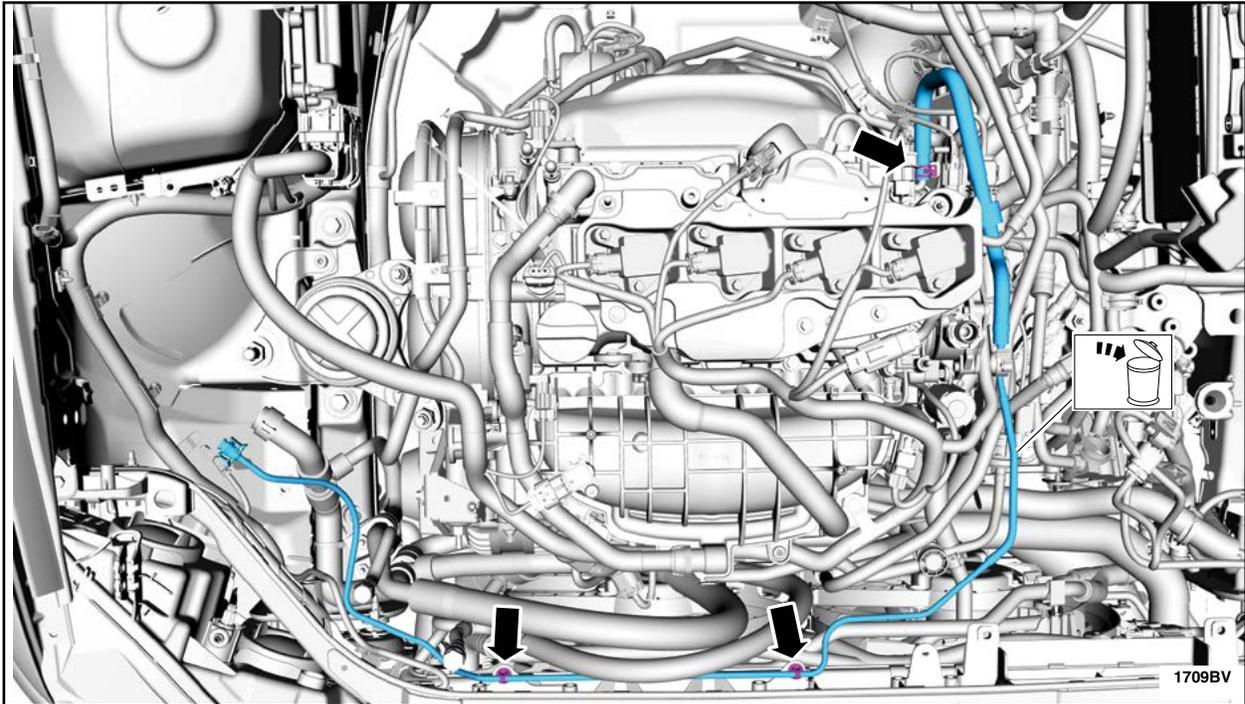


FIGURE I5

5. Detach the retainer, then route the degas hose assembly out from under the A/C line, to allow for easier removal. See Figure I6.

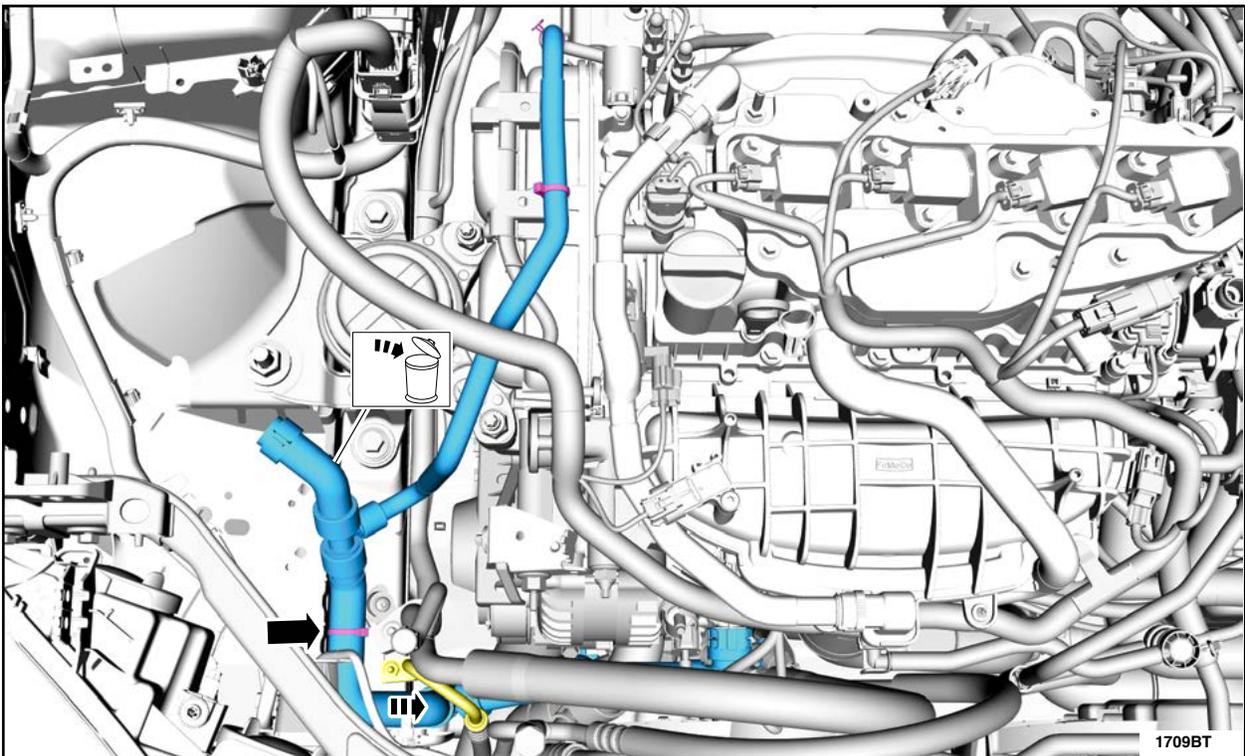


FIGURE I6



6. Detach the retaining clip and disconnect the degas bottle hose from the engine oil cooler assembly. Remove and discard the degas hose assembly. See Figure 17.

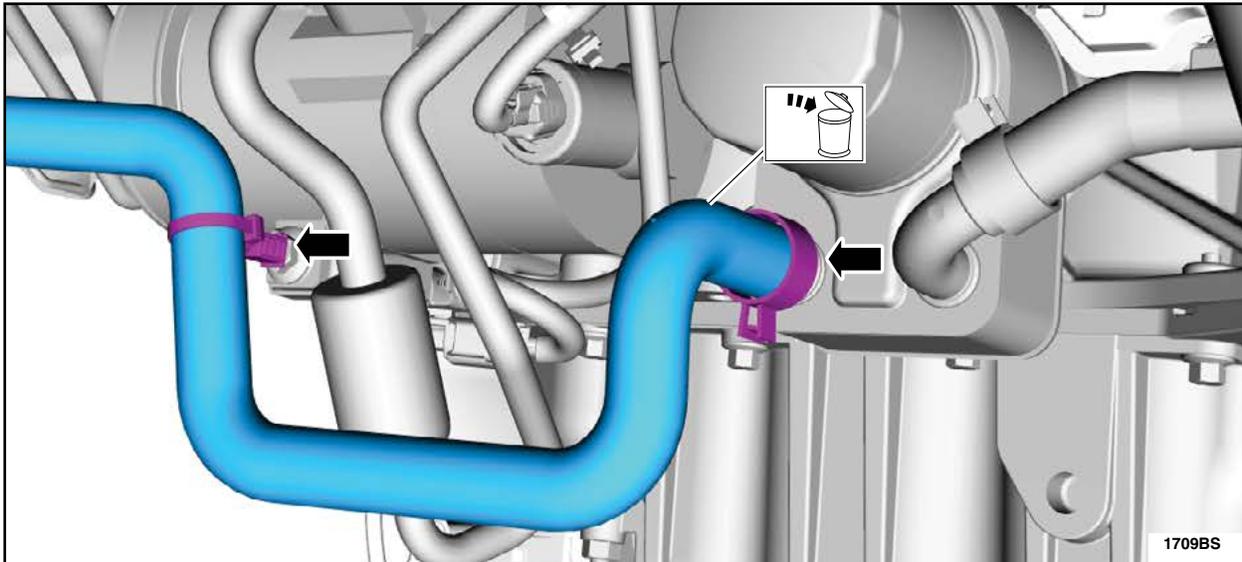


FIGURE 17

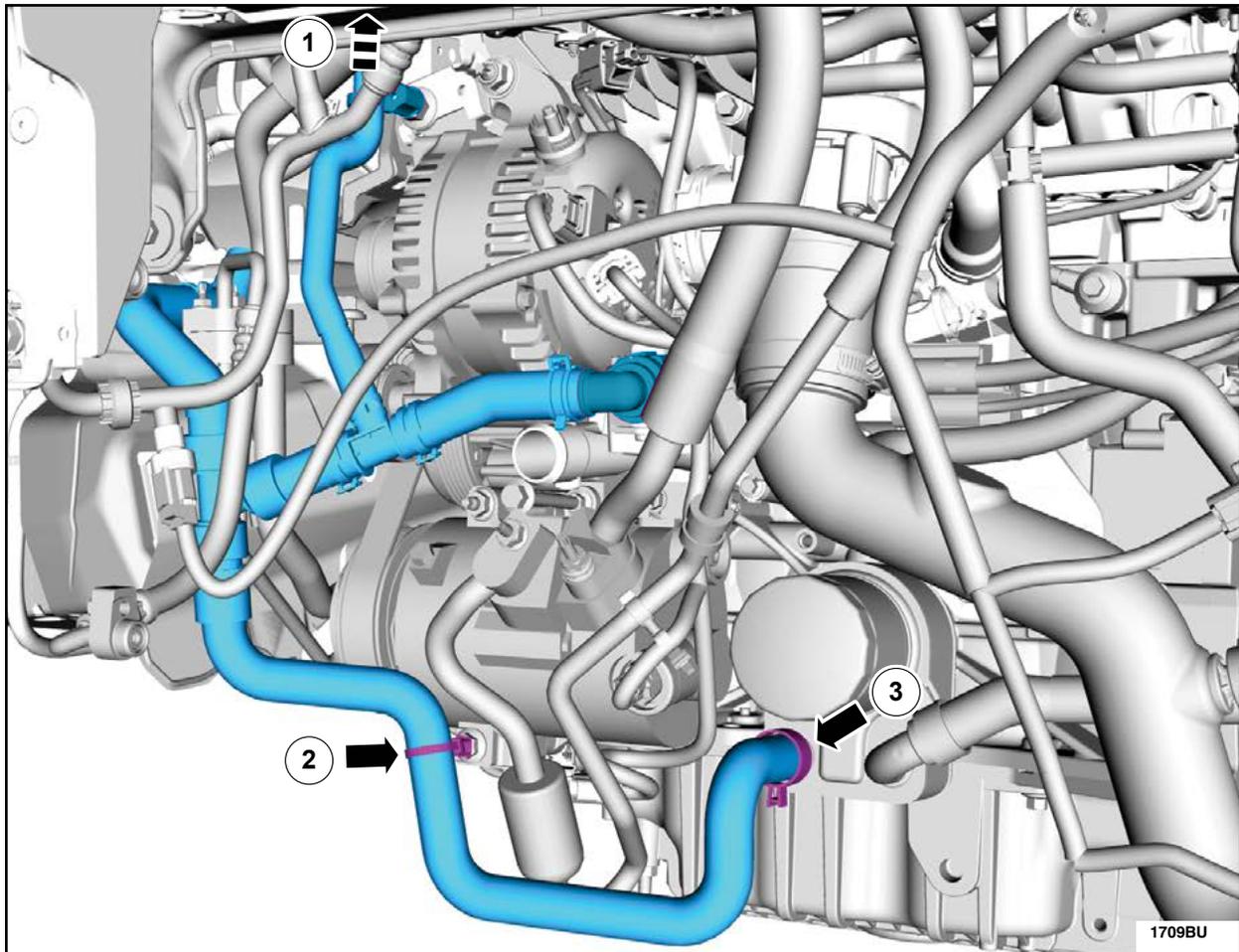


**NOTE:** Lubricating the new coolant hoses with coolant will aid in easier installation.

**NOTE:** Ensure the inside of the hose fittings are free from dirt and debris.

7. Install the *new* lower portion of the degas bottle hose. See Figure I8.

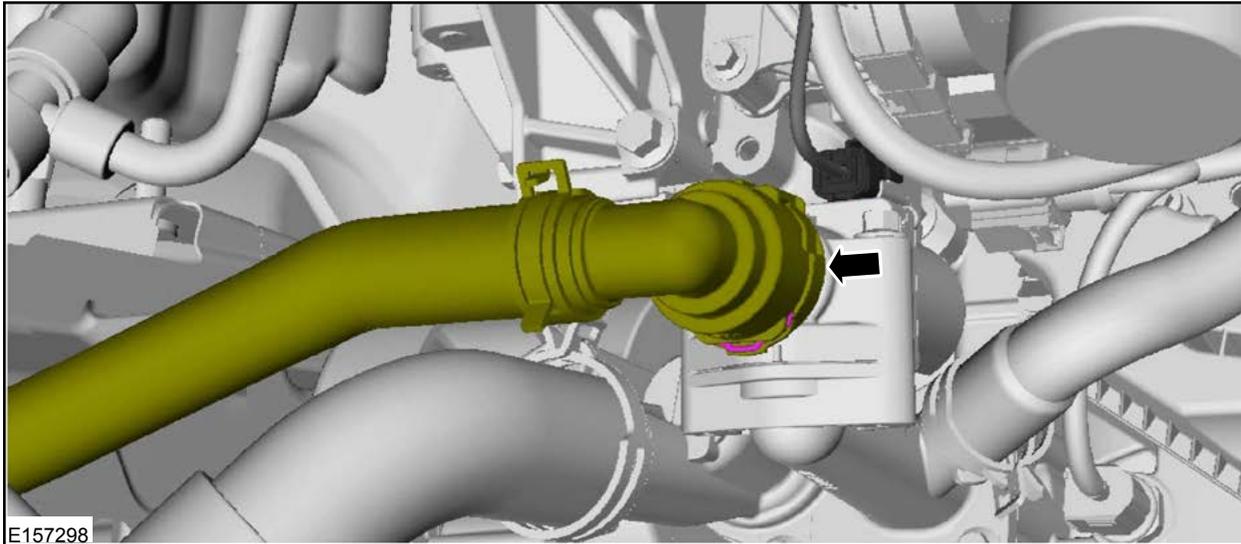
1. Route the turbocharger coolant return hose upward to the top of the engine.
2. Position the lower portion of the degas bottle hose. Attach the lower retaining clip.
3. Connect the lower hose to the engine oil cooler.



**FIGURE I8**



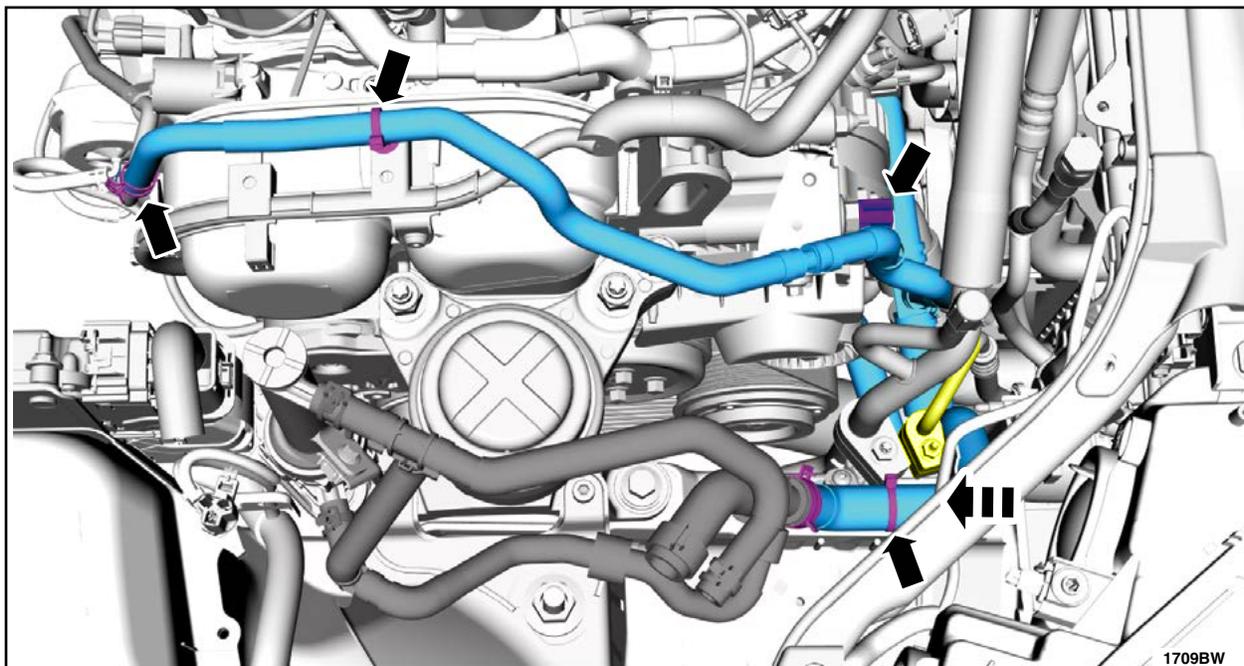
8. Connect the thermostat quick connect fitting to the thermostat housing. See Figure I9.



**FIGURE I9**

9. Route the lower degas hose upward around the A/C line and to the degas bottle area. Install the lower degas hose push pin retainers to the A/C line bracket and generator stud. See Figure I10.
10. Connect the *new* turbocharger coolant return hose and attach the retaining clip. See Figure I10.

**NOTE:** The coolant stand-pipe is shown installed for reference only. It will be installed later in this procedure.



**FIGURE I10**



11. Install and connect the *new* upper portion of the *new* degas hose, to the previously installed *new* lower degas hose. Align the hose with the marks and install the hose clamp. See Figure I11.

**NOTE:** The coolant stand-pipe is shown installed for reference only. It will be installed later in this procedure.

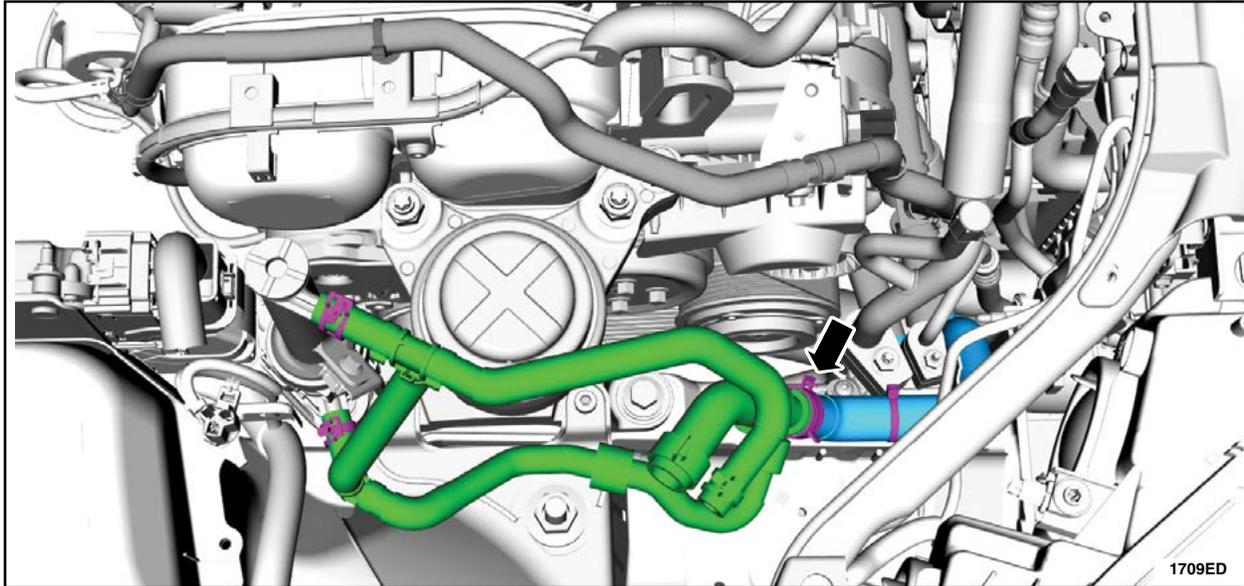


FIGURE I11

12. Install the *new* engine degas tube assembly and connect to the back of the engine. Connect the engine degas tube assembly to the radiator. Attach the retaining clips. See Figure I12.

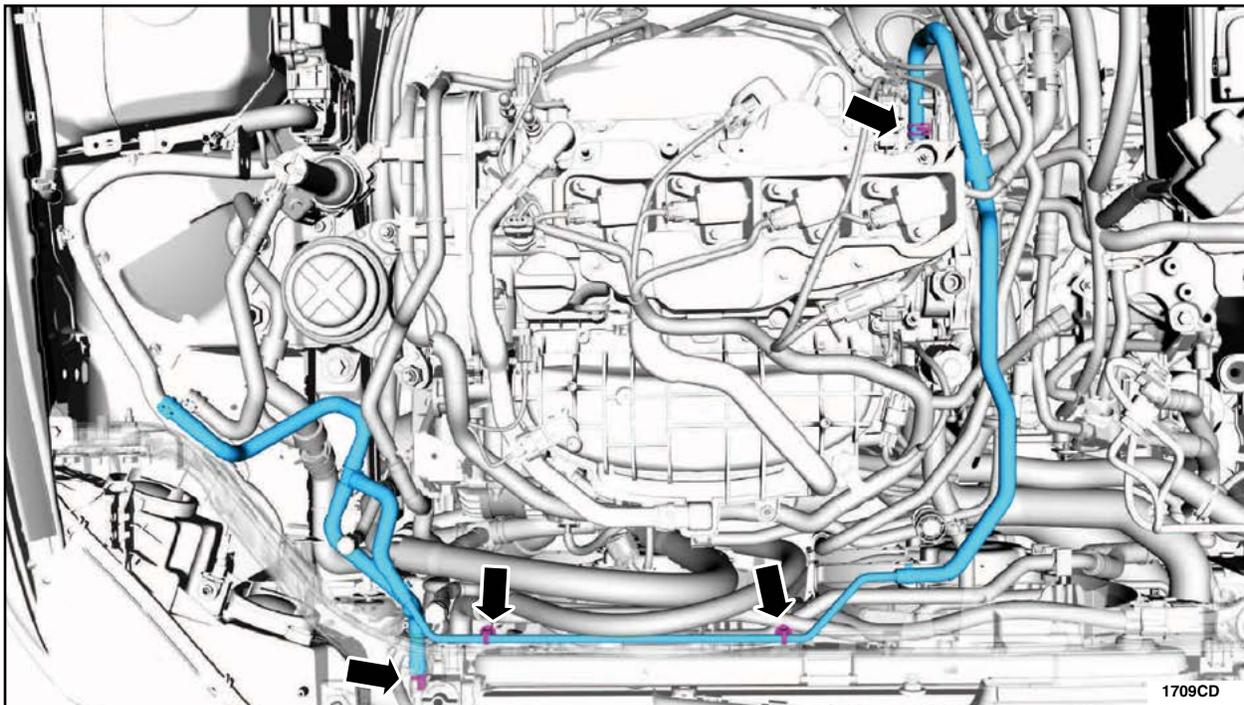


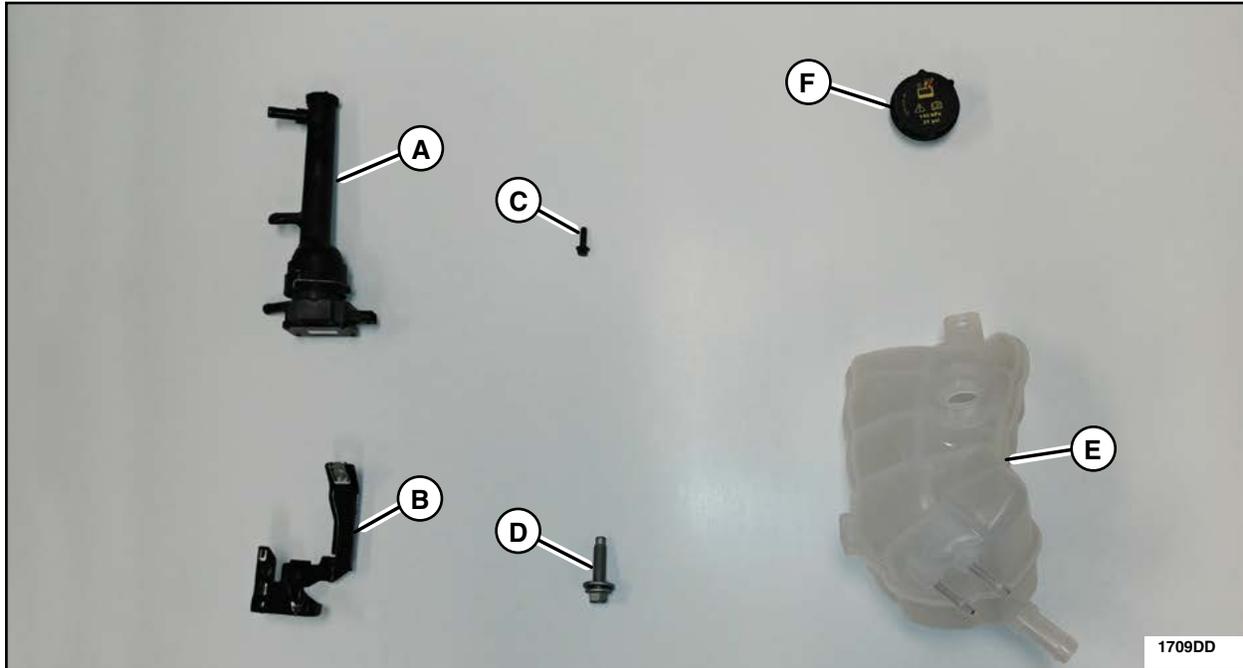
FIGURE I12



## Procedure J - Coolant Stand-pipe, Degas Bottle and Cap Installation

**OVERVIEW:** The coolant stand-pipe provides coolant level information to the PCM and IPC via the CAN network, this prevents overheat issues due to low coolant level by informing the driver when the coolant level is low. The coolant stand-pipe and bracket is installed using the engine mount rear fixing bolt. On installation, the wiring harness is routed across the engine bay wiring loom and the related coolant hoses are attached.

### PARTS / SUPPLIES REQUIRED:



A	Coolant Stand-pipe (Includes Coolant Level Sensor)
B	Coolant Stand-pipe Bracket
C	Coolant Stand-pipe to Bracket Bolt
D	Engine Mount Bolt
E	Degas Bottle
F	Degas Bottle Cap



1. Remove the rear engine mount bolt and take note of the bolt hole location. The bolt hole must be centered with the engine mount hole to allow for proper installation of the coolant stand-pipe bracket. See Figure J1.
  - If the bolt hole is centered with the engine mount, then powertrain assembly mount neutralizing will not be required. Proceed to Step 2.
  - If the hole is not centered, carry out the powertrain assembly mount neutralizing procedure. Please follow the WSM procedures in Section 303-00. Then proceed to Step 2.

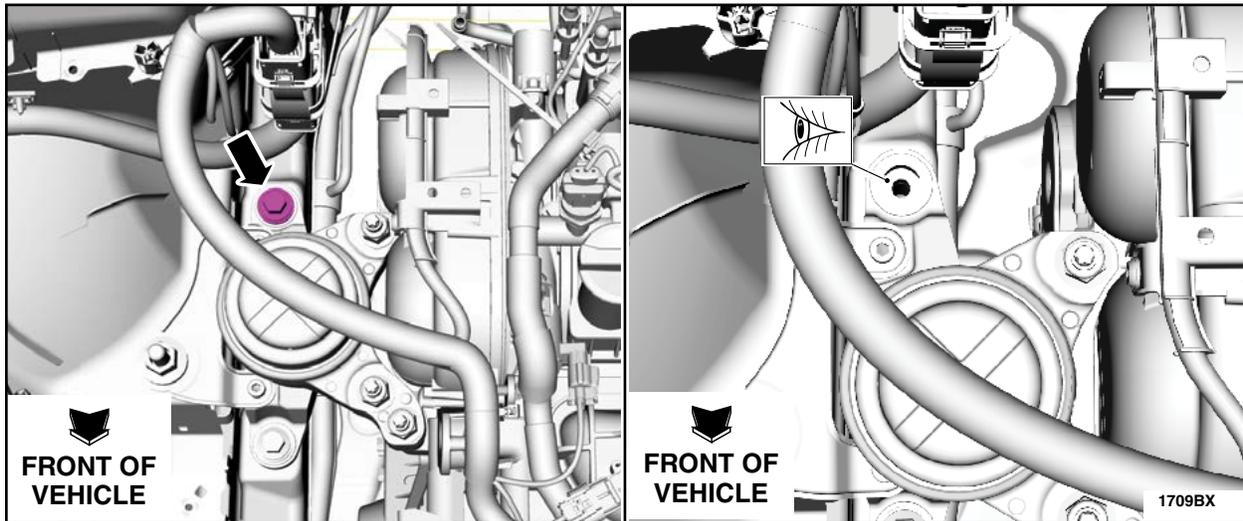


FIGURE J1

2. **NOTICE:** The bolt hole must be centered with the engine mount hole to allow for proper installation of the coolant stand-pipe bracket. **DO NOT** use power tools to re-install the bolt.

Position the coolant stand-pipe bracket on the engine mount. The bolt will center the bracket and the locating tab on the bottom of the bracket should be pressed against the engine mount. Hand start the bolt and then tighten both engine mount retaining bolts at this time. See Figure J2.

- Tighten to 90 Nm (66 lb.ft).

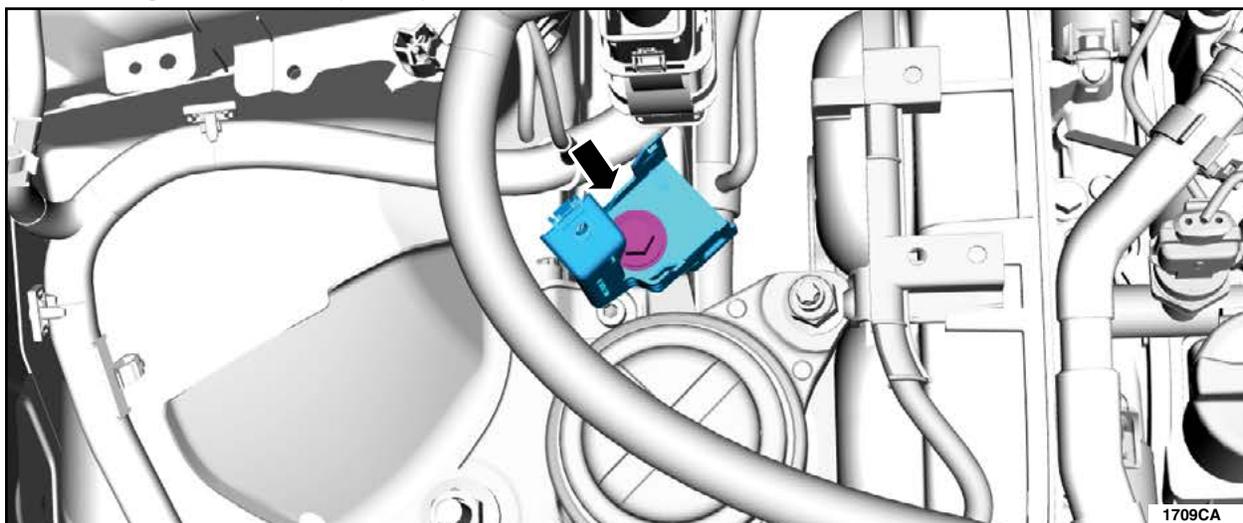
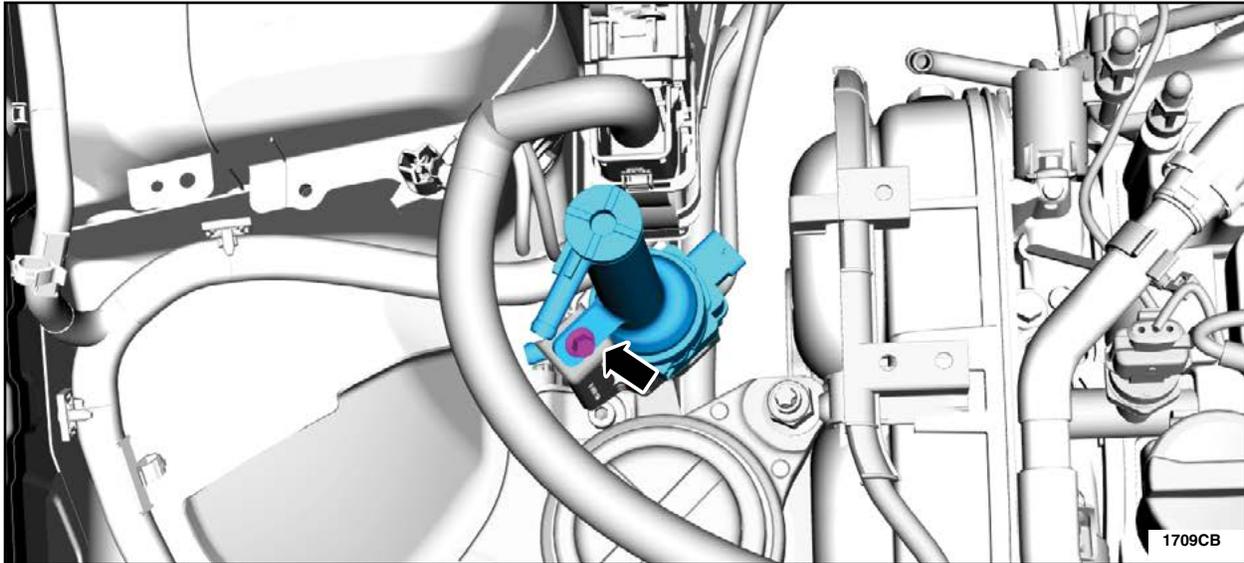


FIGURE J2



3. Install the coolant stand-pipe to the bracket. See Figure J3.

1. Push the coolant stand-pipe fully down in to position on the bracket.
2. Tighten the bolt to 5 Nm (44 lb.in).



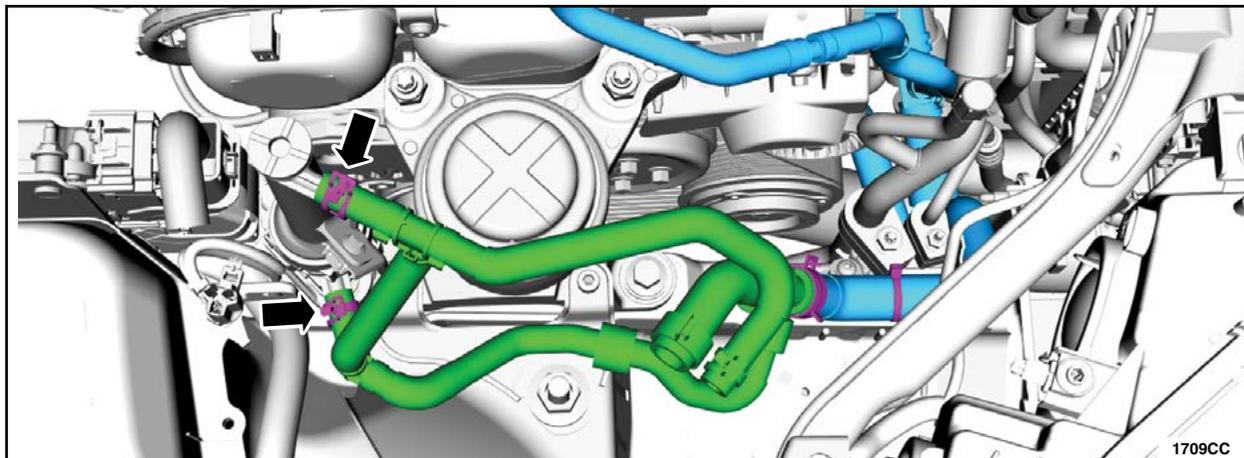
**FIGURE J3**

**NOTE:** Lubricating the new coolant hoses with coolant will aid in easier installation.

**NOTE:** When connecting the coolant hoses to the stand-pipe ensure the hoses are fully installed and meet the hose stops, before securing in place with hose clamps.

**NOTE:** Make sure that no strain is placed on the coolant hose and pipe.

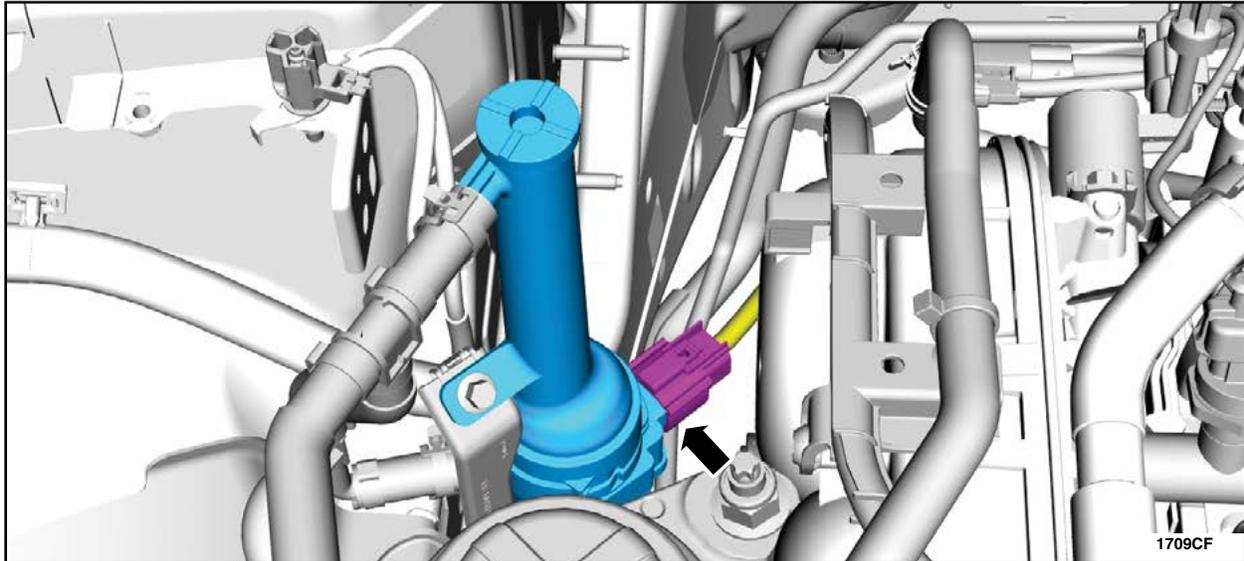
4. Connect the *new* coolant hoses to the *new* coolant stand-pipe. See Figure J4.



**FIGURE J4**



5. Connect coolant stand-pipe wiring harness to the coolant stand-pipe. See Figure J5.

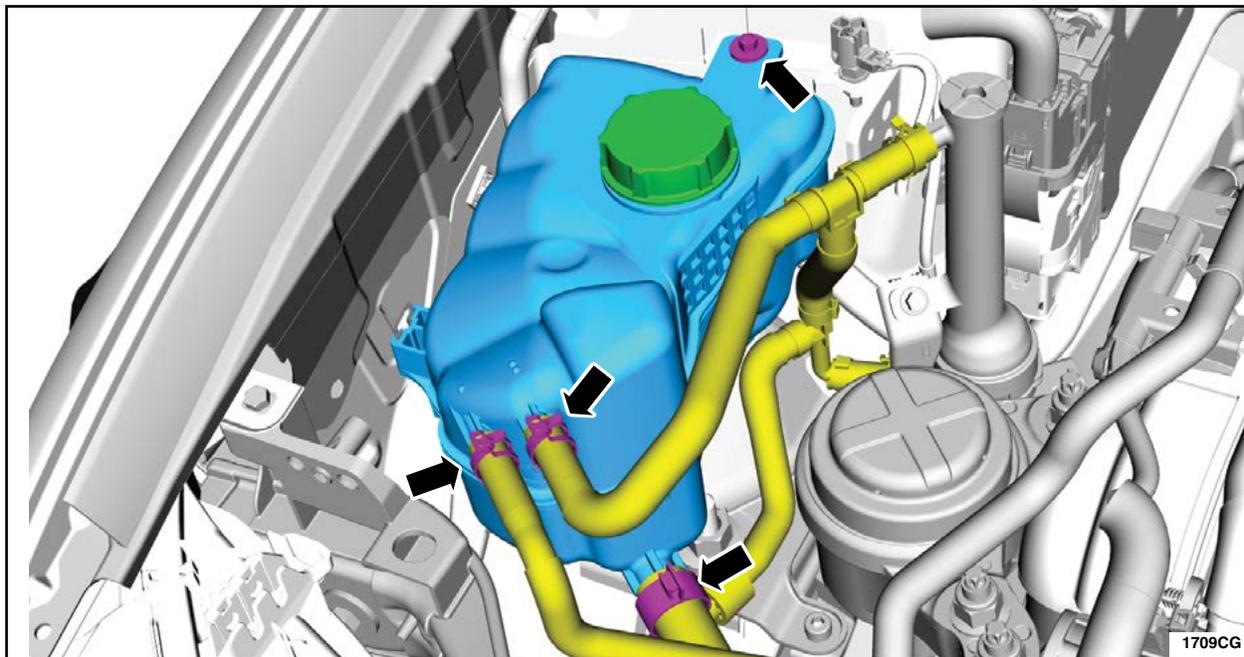


**FIGURE J5**

6. **NOTE:** Do Not fill the cooling system at this time.

Install the *new* degas bottle, install the bolt and cap. Connect the coolant hoses. See Figure J6.

- Tighten to 9 Nm (80 lb.in).



**FIGURE J6**

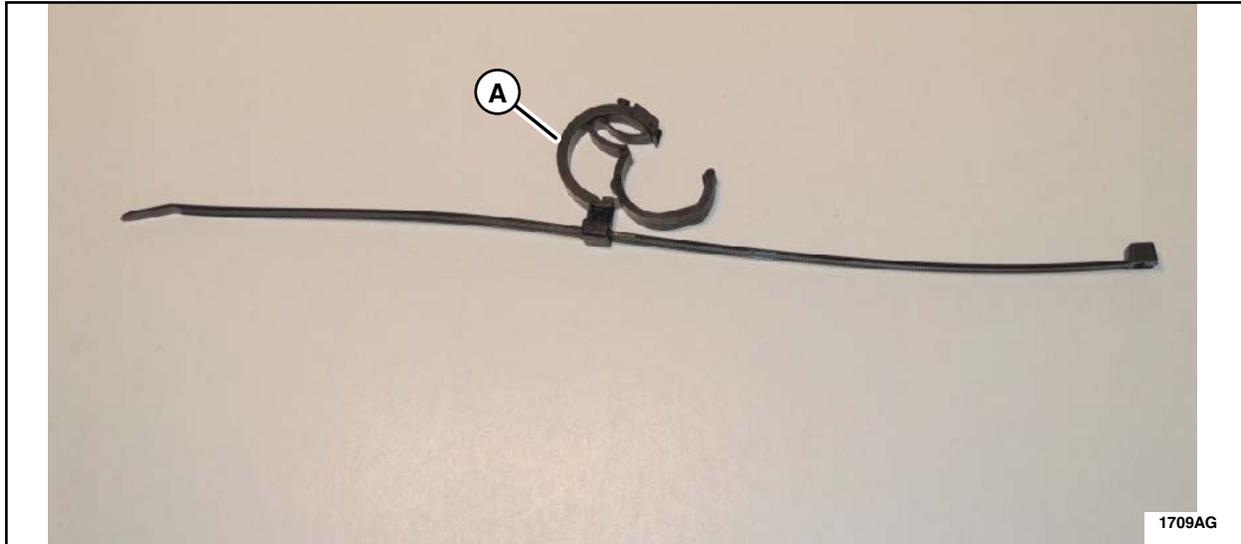
**NOTE:** Check the status of the IPC reprogramming progress.



## Procedure L - Vehicle Reassembly, PCV Tube Retention, and Powertrain Control Module (PCM) Reprogramming

**OVERVIEW:** The vehicle is reassembled, the cooling system is vacuum filled, pressure tested and bled; and a PCV tube retainer is installed. The PCM is reprogrammed and coolant level sensor operation is validated.

### PARTS / SUPPLIES REQUIRED:



A	PCV Tube Retainer / Tie strap
B	Motorcraft® Metal Brake Parts Cleaner (PM-4-A or PM-4-B) (Dealer Procured) (Not Shown)
C	Motorcraft® Orange Antifreeze / Coolant Prediluted (VC-3DIL-B (U.S.) CVC-3DIL-B (Canada) / WSS-M97B44-D2) (Dealer Procured) (Not Shown)

**UNIQUE TOOL REQUIREMENTS:** Vacuum Filling Tool, Hydrometer and/or Refractometer, Cooling System Pressure Tester

**SERVICE TIPS:** Follow procedure steps to verify proper coolant fill.



**NOTE:** This procedure contains unique steps for reassembly, including installation of *new* components.

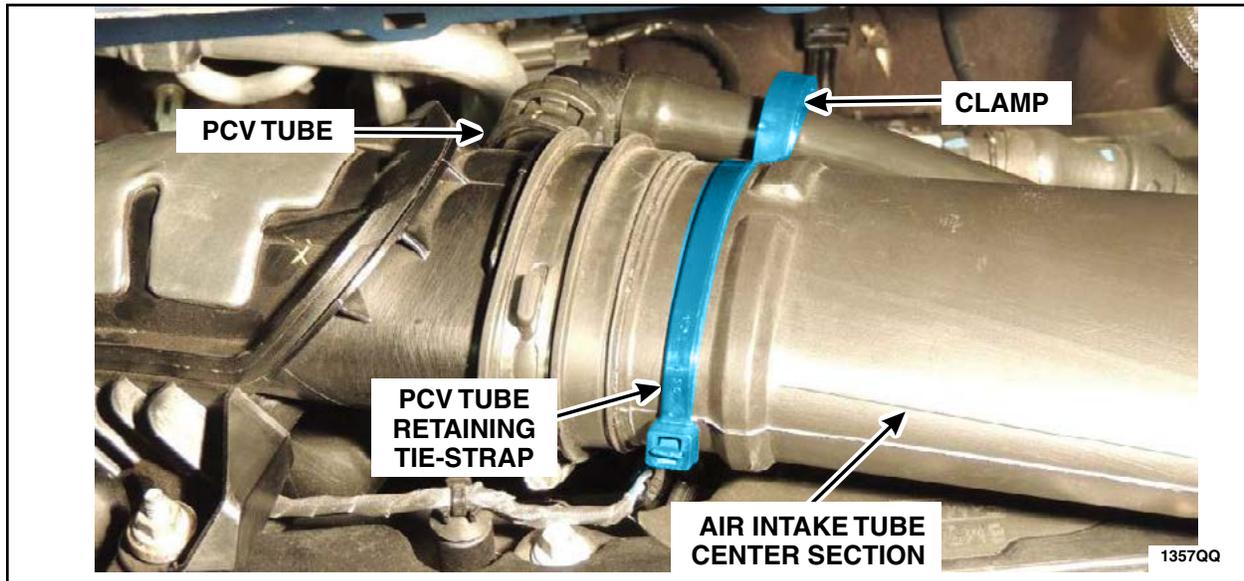
1. Disconnect the battery cable to ground. Please follow the WSM procedures in Section 414-01.
2. Position the PCM back onto the bracket and install the three nuts. See Figure A7.
  - Tighten to 10 Nm (89 lb-in).
3. Uncover the generator battery cable end then connect to the generator, install the nut. See Figure D5.
  - Tighten to 15 Nm (133 lb-in).
4. Connect the generator electrical connector. See Figure D5.
5. Connect the battery negative cable to ground. Please follow the WSM procedures in Section 414-01.

**NOTE:** Remove protective covers that were placed over the turbocharger air intake system before re-installing components.

6. Install the turbocharger inlet pipe and connect the PCV hose to the turbocharger inlet pipe. See Figure A3.
  - Tighten the turbocharger inlet pipe fasteners to 5 Nm (44 lb-in).
  - Tighten the turbocharger inlet pipe-to-turbocharger clamp to 5 Nm (44 lb-in).
7. Install the air cleaner and outlet pipe assembly. See Figures A1 and A2.
  - a. Tighten the bolts and clamp to 5 Nm (44 lb-in).
  - b. Connect the vent tube to the air cleaner outlet pipe
  - c. Connect the EVAP line to the air tube center section.
  - d. Connect the mass air flow electrical connector.
8. Vacuum fill the cooling system. Refer to WSM Section 303-03 for coolant specifications.
  - Do not bleed the cooling system at this time.
  - Coolant level should be filled to the "MAX" mark on the degas bottle.
9. Install a coolant pressure tester with adapter onto the degas bottle. Pressurize to 138 kPa (20 psi). Once pressure stabilizes, pressure should hold at 138 kPa (20 psi) for a minimum of 2 minutes.
  - If pressure test fails, the source of pressure loss must be identified and repaired as appropriate before proceeding. Retest the cooling system, if required.



10. Install the PCV tube retainer / tie strap provided in the vehicle parts kit. See Figure L1.
  - a. Attach the clamp onto the PCV tube and secure.
  - b. Wrap the tie strap around the air intake tube center section and tighten.
  - c. Trim the excess length from the tie strap.



**FIGURE L1**

11. Install the front under-body air deflector and retainers. See Figure A5.
12. Bleed the cooling system. Please follow the WSM procedures in Section 303-03.



13. Reprogram the PCM using IDS release 108.03 or higher. For additional information, Refer to "Procedure E" (Important Information for Module Reprogramming).
14. Reprogram the Gateway Module (GWM) using IDS release 108.03 or higher. For additional information, Refer to "Procedure E" (Important Information for Module Reprogramming).
15. Using IDS select "Coolant Level Sensor Check". See Figure L2.

- Follow the on screen instructions to complete the "Coolant Level Sensor Check" procedure.

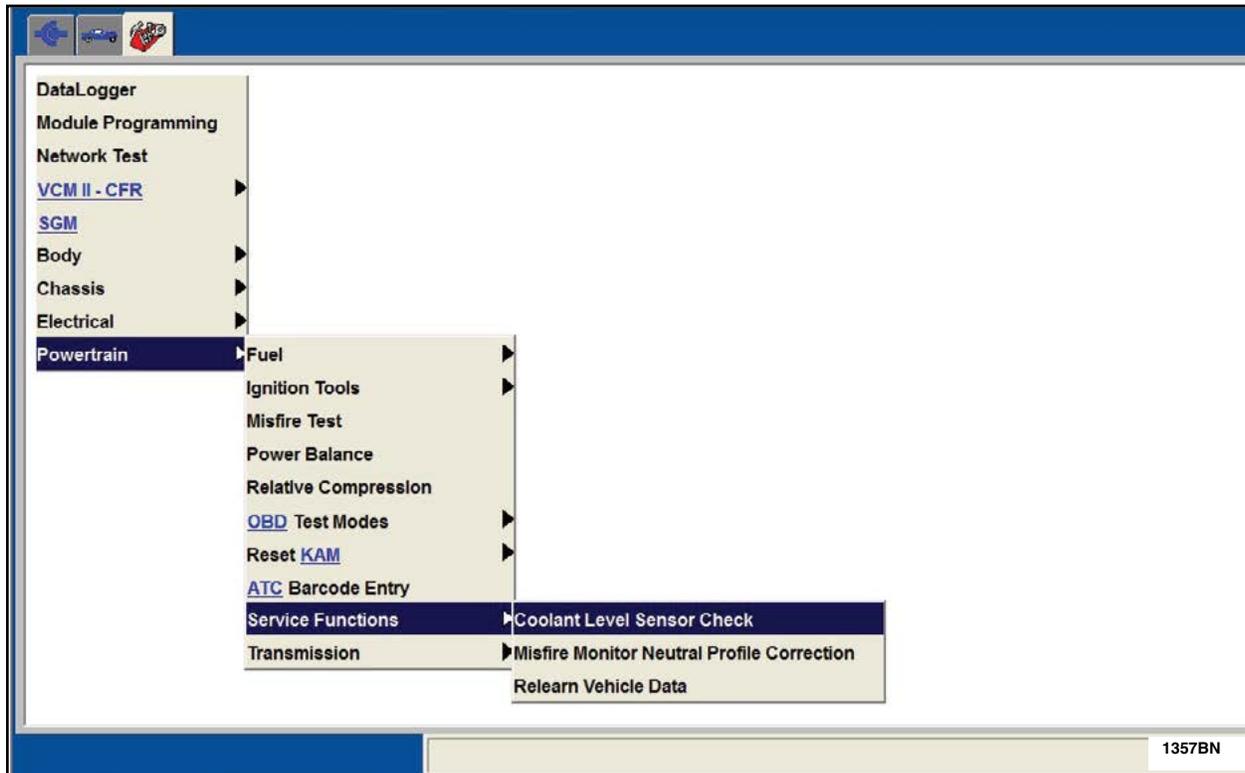
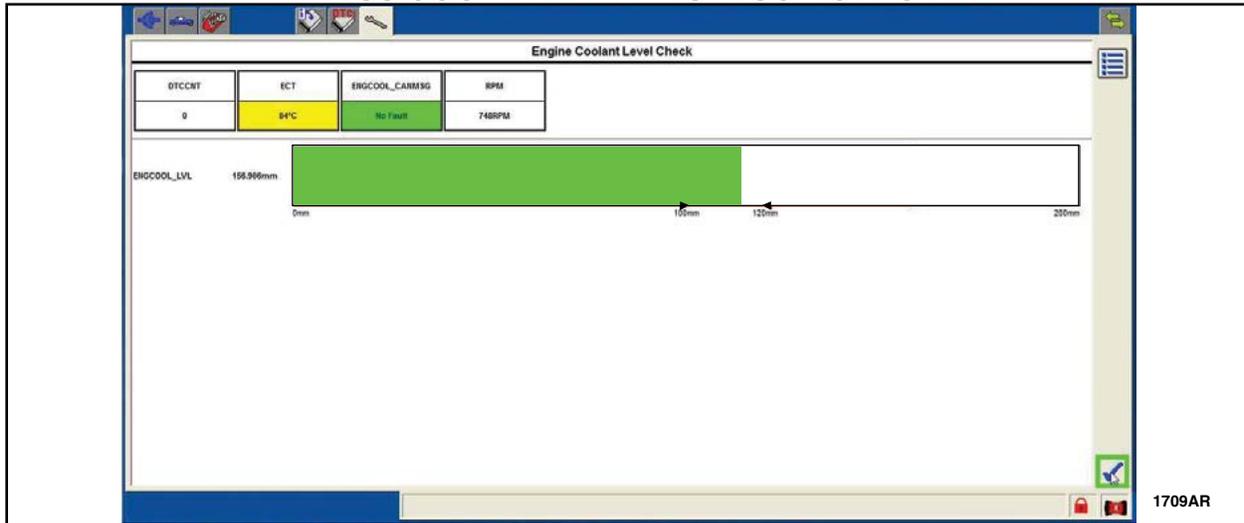


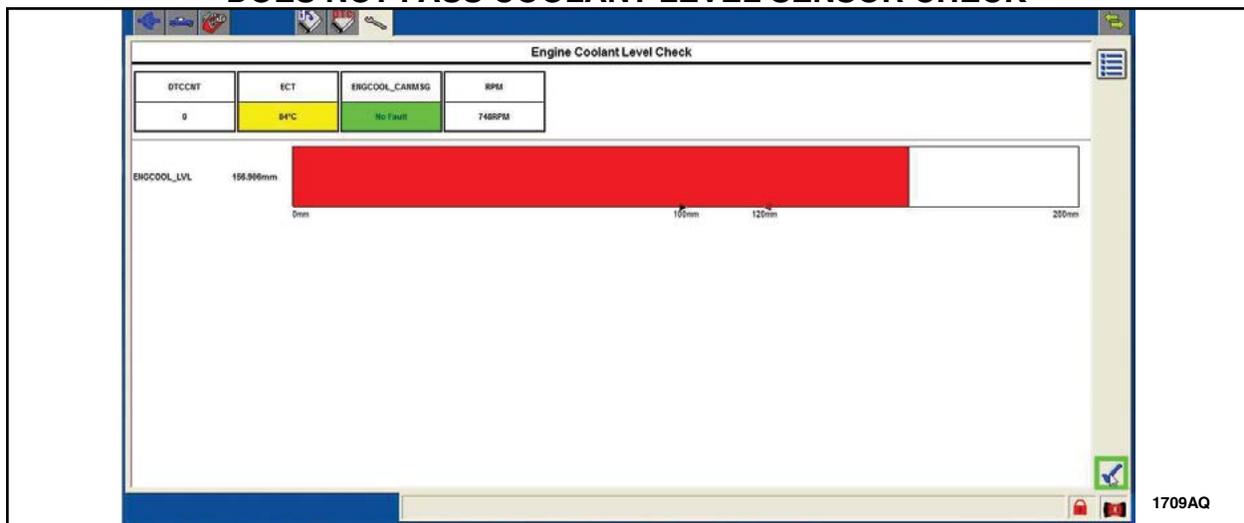
FIGURE L2



## PASS COOLANT LEVEL SENSOR CHECK



## DOES NOT PASS COOLANT LEVEL SENSOR CHECK



**NOTE:** If the coolant level is too high, additional cooling system bleeding is needed. If it is proving difficult to bleed, it may be necessary to drive the vehicle up to 12.5 Miles (20 km) to remove the air from the system.

16. Check coolant concentration using the hydrometer/refractometer to make sure it is at 50%.
17. Remove the portable battery charger.
18. Install the engine appearance cover.
19. Perform any other open recalls.
20. Coolant level should be filled to the "MAX" mark on the degas bottle once the engine is cold, prior to returning the vehicle to the customer.

