Authorized Field Change

NAVISTAR®

AFC 12905

Date: June 2012

Subject File: ENGINE

Subject: Removal and Replacement of the MaxxForce® 11 and MaxxForce® 13 EGR Inlet Tubes

Model: LoneStar®, PayStar®, ProStar®, TransStar®, and WorkStar®
Start Date: 01 June 2011 End Date: 21 October 2011

Engine Family: MaxxForce® 11 and MaxxForce® 13

DESCRIPTION

EGR inlet tubes for certain MaxxForce® 11 and MaxxForce® 13 engines can crack during vehicle operation, causing progressive engine damage up to and including engine harness. This AFC describes a repair procedure to replace EGR inlet tubes for all affected engines and to replace EGR valve if damaged.

PARTS INFORMATION

Table 1 Parts Information

Part Number	Description	Quantity
3007670C95	EGR Inlet Tube	1
3007671C95	EGR Inlet Tube	1
3007672C94	EGR Valve (if necessary)	1

Table 2 Equipment Required

Part Number	Description	Quantity
KL5007NAV	Coolant Management Tool	1

Tools Required

Table 3 Tool Information

Description	Tool Number / Type
Torque Wrench	⅜ in, ¼ in
Ratchet Wrench	⅜ in, ½ in, 10 mm, 12 mm
Socket	¼ in drive 7 mm, ¼ in drive 8 mm, ⅜ in drive 10 mm, ⅜ in drive 13 mm, ⅜ in drive 14 mm, ½ in drive 36 mm

PARTS INFORMATION (CONT.)

Table 3 Tool Information (cont.)

Socket Deep Well	⅜ in drive 11/16 in, ⅜ in drive 10 mm, ⅜ in drive ⅜ in, ⅜ in drive 13 mm, ⅜ in drive 15 mm
Extension	½ in drive 6 in, ⅜ in drive 12 in, ⅜ in drive 10 in, ⅜ in drive 6 in, ⅜ in drive 3 in.
Combination Open End Wrenches	1-¼ in, 1-1/16 in, 10 mm, 12 mm, 13 mm, 14 mm, 17 mm, 18 mm
Crow's Foot	⅜ in drive ⅞ in, ⅜ in drive 10 mm , ⅜ in drive 13 mm, ⅜ in drive 14 mm, ⅜ in drive 17 mm
Swivel Socket	⅜ in drive 10 mm, ⅜ in drive 13 mm
Blue Point Trim Removal Tool	#YA331
Pliers	-
Telescopic Magnet	-
Angle Pick	-
Allen Socket	⅜ in drive 6 mm

PARTS INFORMATION (CONT.)

WARNING – Park vehicle on hard flat surface, turn the engine off, set the parking brake, and block the wheels to prevent the vehicle from moving in both directions. Failure to do so may result in property damage, personal injury, and/or death.

WARNING – If the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over, potentially resulting in property damage, personal injury, and/or death.

WARNING – Always wear safe eye protection when performing vehicle maintenance. Failure to do so may result in serious eye injury.

WARNING – Keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases. Failure to do so may result in property damage, personal injury, and/or death.

WARNING – Remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last. Failure to do so may result in property damage, personal injury, and/or death.

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE

1. Read and follow all safety precautions listed above.

2. Turn vehicle wheels to right and remove engine cover. Refer to Engine Cover Removal procedure in the MaxxForce® 11 / MaxxForce® 13 EGR Cooler Resource Center.

3. Using Coolant Management Tool (KL5007NAV), drain cooling system. Refer to TSI 12–12–01.

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

4. Disconnect engine coolant temperature (ECT) sensor (2) (Figure 1).

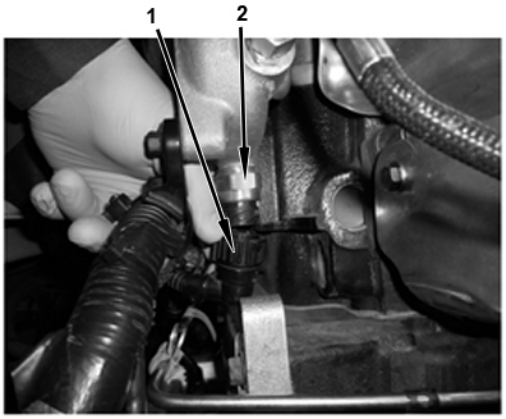

Figure 1 Engine Coolant Temperature Sensor

1. Engine Harness
2. Engine Coolant Temperature Sensor

5. Disconnect EGR valve engine harness connector (2) (Figure 2).

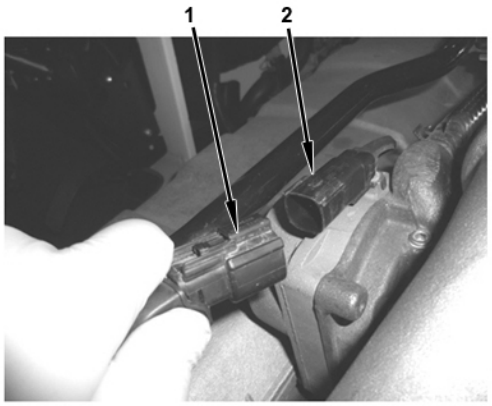

Figure 2 EGR Valve Engine Harness Connector

1. Engine Harness
2. EGR Valve Engine Harness Connector

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

6. Cut and remove wire tie (1) near EGR valve electrical connector (2) (Figure 3).

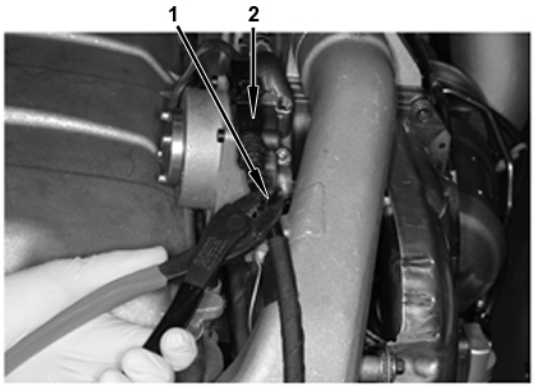

Figure 3 EGR Valve Electrical Connector

1. Wire Tie
2. EGR Valve Electrical Connector

7. Remove engine harness guide (1) from bolt (2) (Figure 4).

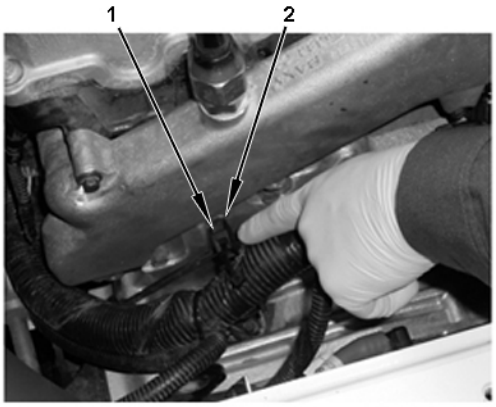

Figure 4 Engine Harness Guide

1. Engine Harness Guide
2. Bolt (Not shown, located behind engine harness guide)

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

8. Remove engine harness guide (1) from bolt (2) (Figure 5).

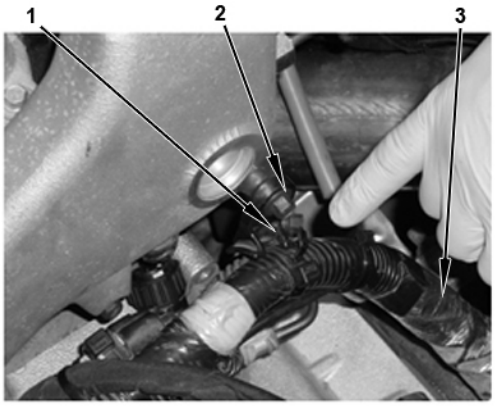

Figure 5 Engine Harness Guide

1. Engine Harness Guide
2. Bolt
3. Engine Harness

9. Remove cab heater supply tube support brackets (1) from EGR cooler (2) (Figure 6).

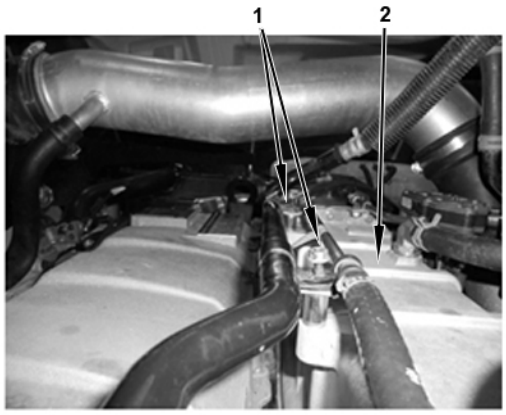

Figure 6 Cab Heater Supply Tube Brackets

1. Cab Heater Supply Tube Brackets
2. EGR Cooler

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

10. Disconnect cab heat tube (1) from heat tube nipple (2) on coolant manifold (Figure 7).

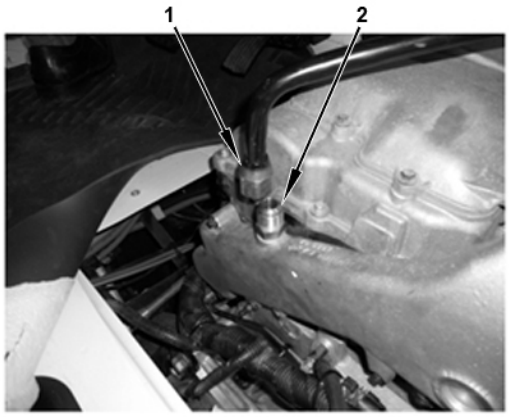

Figure 7 Cab Heat Tube

1. Cab Heat Tube
2. Heat Tube Nipple

11. Remove hydrocarbon injector (HCI) coolant supply tube nut (1) from coolant manifold (2) (Figure 8).

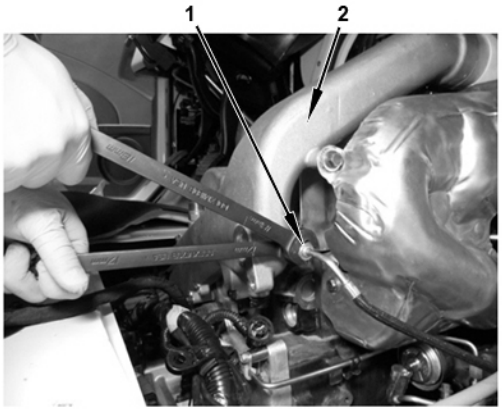

Figure 8 Coolant Manifold

1. HCI Coolant Supply Tube Nut
2. Coolant Manifold

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

CAUTION – To prevent component damage, do not bend fuel supply line.

CAUTION – To prevent component damage, do not drop hydrocarbon injector onto a hard surface. The HCI Nozzle tip is easily damaged. If this happens, replace the injector.

12. Remove and cap HCI fuel supply line (2) and inlet nut (1) (Figure 9).

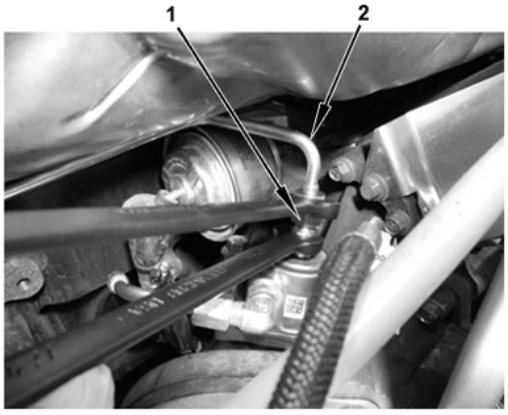

Figure 9 HCI Fuel Supply Line

1. HCI Fuel Inlet Nut
2. HCI Fuel Supply Line

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

13. Remove HCI coolant outlet tube (1) (Figure 10).

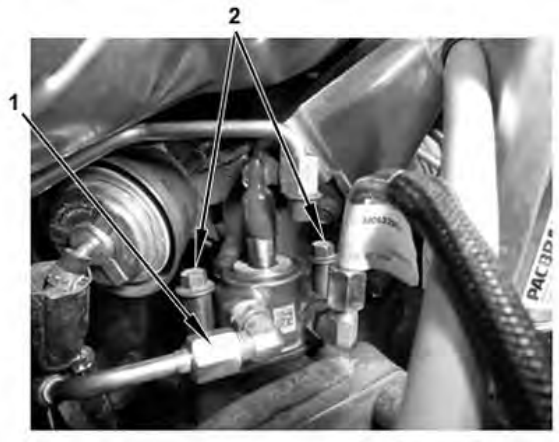

Figure 10 HCI Fuel Inlet

1. HCI Coolant Outlet Tube
2. HCI Bolts (2)

14. Remove two HCI bolts (2), and remove HCI from thermal management valve housing (Figure 10).

15. Discard HCI bolts and gasket (1) (Figure 11).

16. Place cap (2) on thermal management valve housing port (Figure 11).

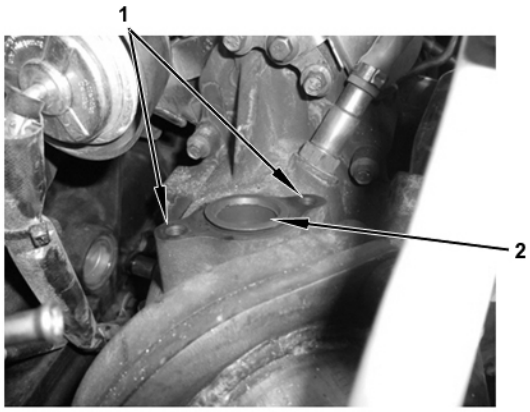

Figure 11 Thermal Management Valve Housing Port

1. HCI Bolts and Gasket
2. Thermal Management Valve Housing Port

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

17. Remove EGR inlet tube heat shield (1), remove one heat-resistant bolt (2), and remove three M8 x 12 bolts (3) (Figure 12).

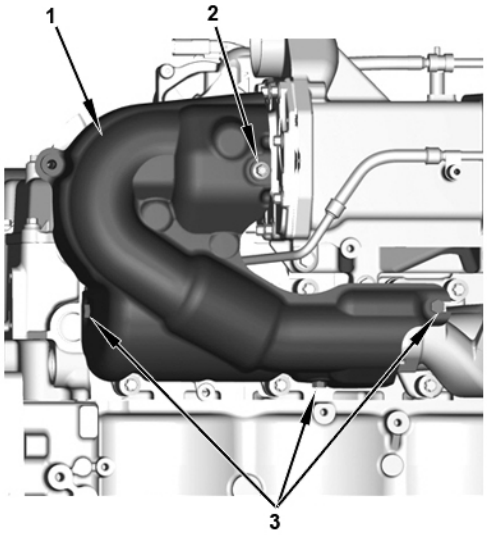

Figure 12 EGR Inlet Tube Heat Shield

1. EGR Inlet Tube Heat Shield
2. Heat-resistant Bolt
3. Bolts (3)

NOTE – Place drip pan under truck to prevent coolant from leaking on ground.

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

18. Remove coolant manifold (1), remove two bolts (2), and one stud bolt (3) (Figure 13).

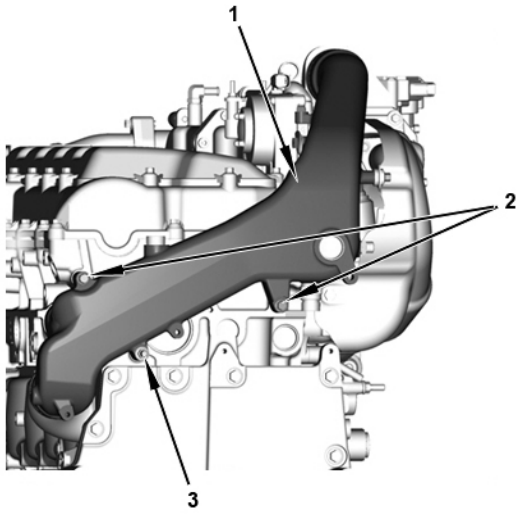

Figure 13 Coolant Manifold

1. Coolant Manifold
2. Bolt (2)
3. Stud Bolt

CAUTION – To prevent engine damage, extension tubes should be handled with care.

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

19. Remove EGR inlet tube (1), and remove and discard four heat-resistant bolts (2) (Figure 14).

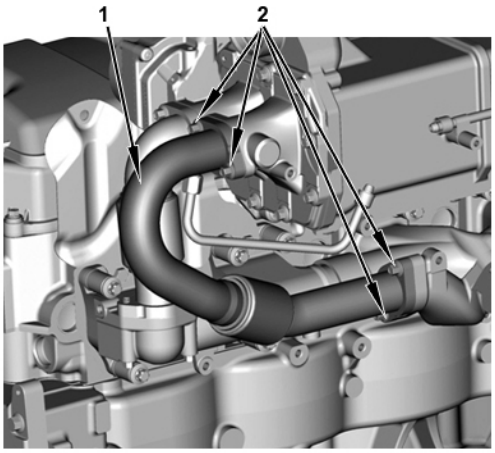

Figure 14 EGR Inlet Tube (Outside)

1. EGR Inlet Tube (Outside)
2. Heat-resistant bolt (4)

20. Remove EGR inlet tubes (1), remove and discard two heat-resistant bolts (2), and remove and discard two heat-resistant bolts (3) (Figure 15).

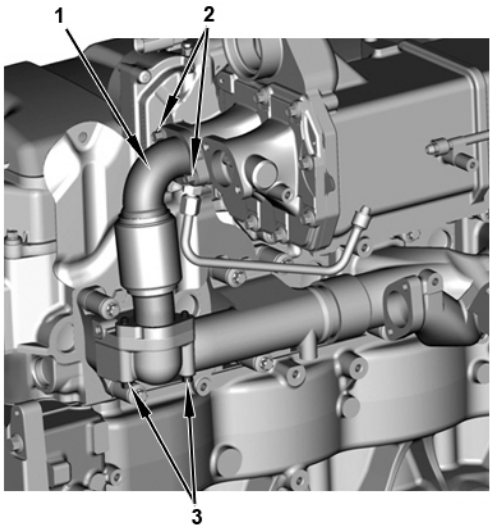

Figure 15 EGR Inlet Tube (Inside)

1. EGR Inlet Tube (Inside)
2. Heat-resistant Bolt (2)
3. Heat-resistant Bolt (2)

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

21. Place cap on rear exhaust manifold outlet (1) (Figure 16).

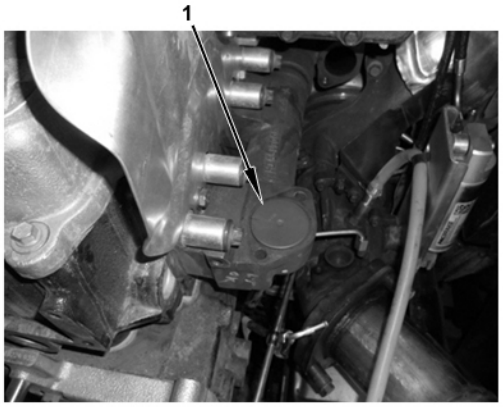

Figure 16 Rear Exhaust Manifold Outlet Cap

22. Inspect EGR valve for a cracked or broken shaft and damaged or missing parts. Make sure all six screws are present and shaft is not cracked or broken (Figure 17). If EGR valve flap screw is missing, or shaft is cracked or broken, replace EGR valve. If EGR valve is replaced, check high-temp EGR cooler for damage and replace, if necessary. Charge EGR cooler repair to Regular 01 Warranty, not to AFC.

    If EGR valve is not damaged, proceed to step 7 of EGR Valve Installation Instructions in this AFC.

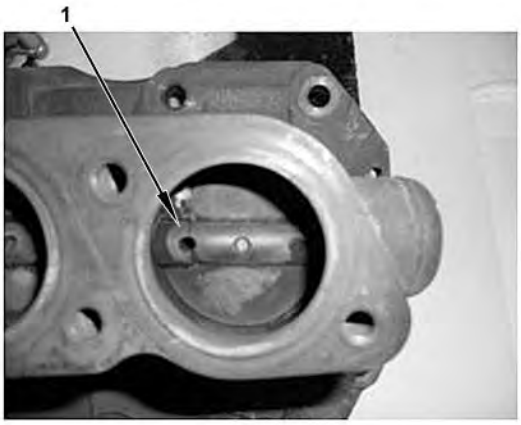

Figure 17 EGR Valve Missing Screw and Cracked Shaft

1. Missing Screw and Cracked Shaft

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

23. Remove the EGR valve coolant supply tube nut (1) and position the coolant supply tube away from the EGR valve (2) (Figure 18).

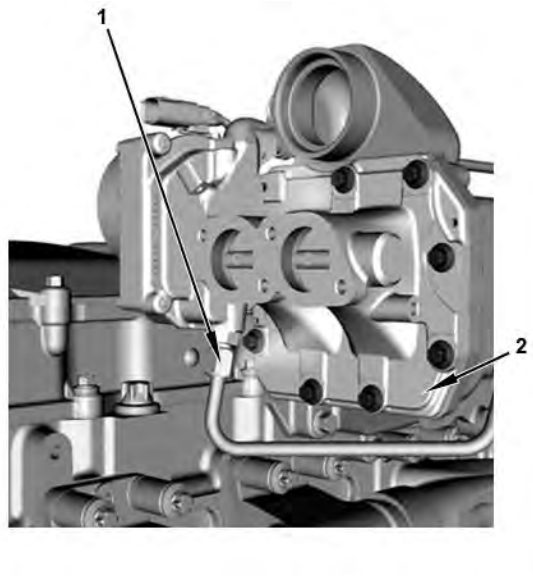

Figure 18 EGR Valve

1. EGR Valve Coolant Supply Tube Nut
2. EGR Valve

24. Remove EGR heat shield (1) and remove two bolts (2) (Figure 19).

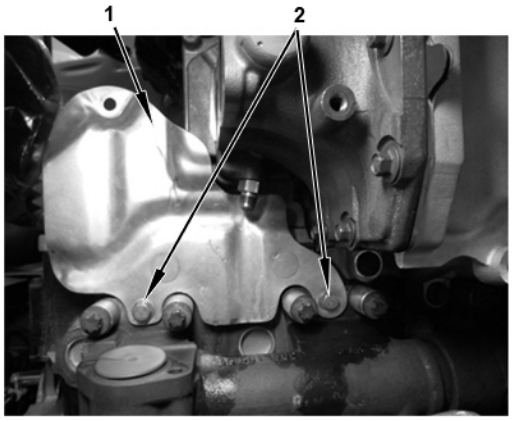

Figure 19 EGR Heat Shield

1. EGR Heat Shield
2. Bolts (2)

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

25. Remove the EGR valve (1), remove EGR valve coolant return tube assembly, and position out of the way (2). Remove seven heat-resistant bolts (3) and remove two heat-resistant bolts (3) (Figure 20).

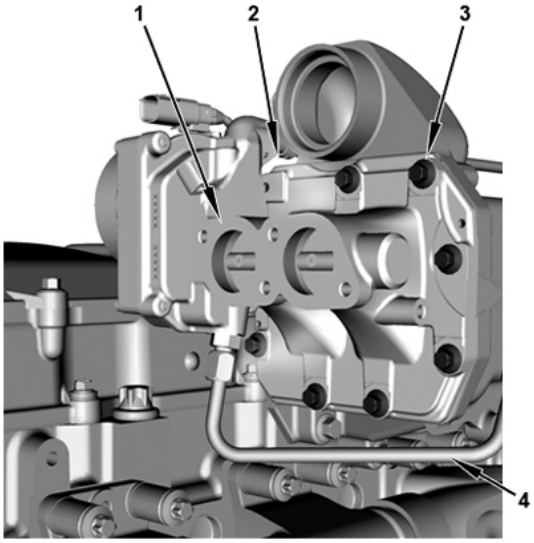

Figure 20 EGR Valve

1. EGR Valve
2. EGR Valve Coolant Return Tube Assembly
3. Heat-resistant Bolt (9)
4. EGR Valve Coolant Supply Tube (previously removed)

NOTE – Discard gasket upon removal of the EGR valve.

EGR INLET TUBE REPLACEMENT AND EGR VALVE INSPECTION PROCEDURE (CONT.)

26. Inspect EGR cooler inlet for damage caused by loose parts from damaged EGR valve (Figure 21). If damage is found, replace the high-temp EGR cooler. Charge EGR cooler repairs to Regular 01 Warranty and not to this AFC. Repairs coded to AFC 12905 will be disallowed.

    NOTE – EGR cooler inlet damage similar to example below requires replacement of the high-temp EGR cooler (Figure 21).

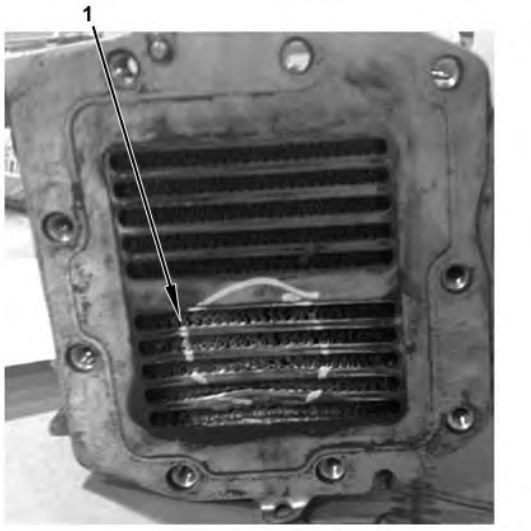

Figure 21 EGR Cooler Inlet Damage from EGR Valve Broken Shaft or Flap

NOTE – EGR cooler inlet may have signs of internal rust due to condensation. This condition is normal and does not require replacement of high temp EGR cooler (Figure 22).

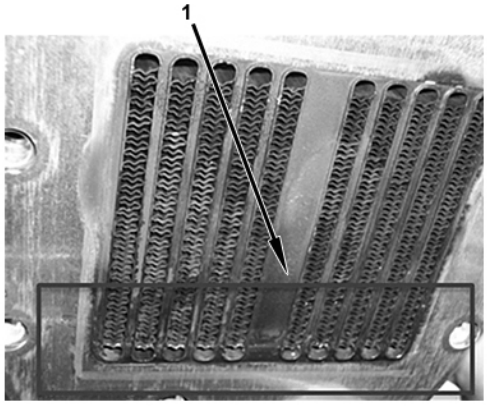

Figure 22 EGR Cooler Inlet Internal Rust

EGR VALVE INSTALLATION INSTRUCTIONS

1. Install EGR valve (1) with nine new M8 x 30 heat-resistant bolts (3) and tighten finger tight. Install EGR valve coolant return tube assembly (2) (Figure 23).

NOTE – Use new gasket when replacing EGR valve.

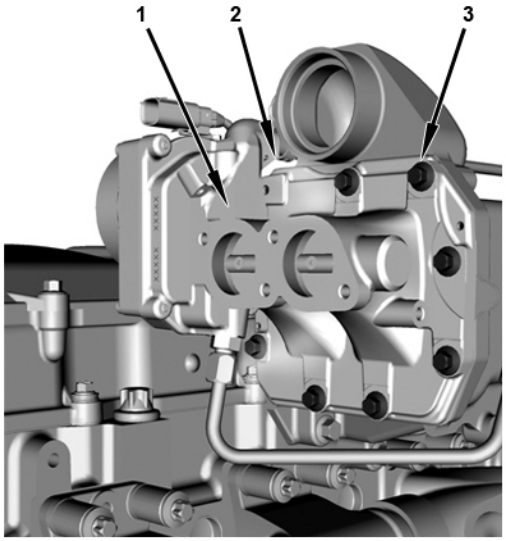

Figure 23 EGR Valve

1. EGR Valve
2. EGR Valve Coolant Return Tube Assembly
3. M8 x 30 Heat-resistant Bolt (9)

2. Torque four new M8 x 30 heat-resistant bolts to 45 lb-in (5 N·m) (Figure 24).

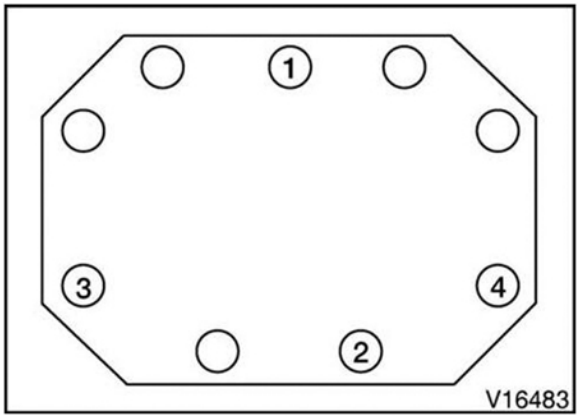

Figure 24 Bolt Tightening Sequence

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

3. Torque all nine M8 x 30 heat-resistant bolts to 12 lb-ft (16 N·m) in sequence (Figure 25). Repeat sequence and torque to 18 lb-ft (24 N•m).

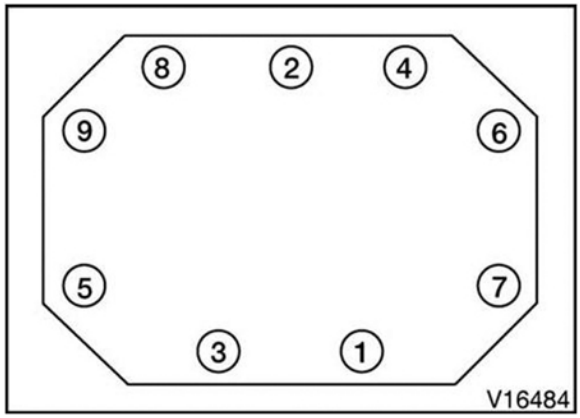

Figure 25 Bolt Tightening Sequence

4. Install EGR heat shield (1), install two M8 x 12 bolts (2), and torque to 18 lb-ft (24 N•m) (Figure 26).

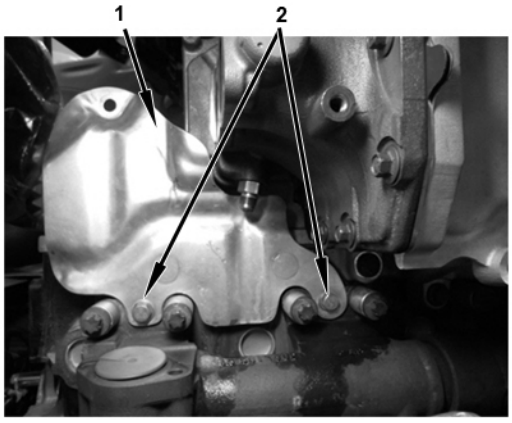

Figure 26 EGR Heat Shield

1. EGR Heat Shield
2. M8 x 12 Bolts (2)

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

5. Install the EGR valve coolant supply tube (1) and torque the coolant supply tube nut (2) to 18 lb-ft (24 N•m) (Figure 27).

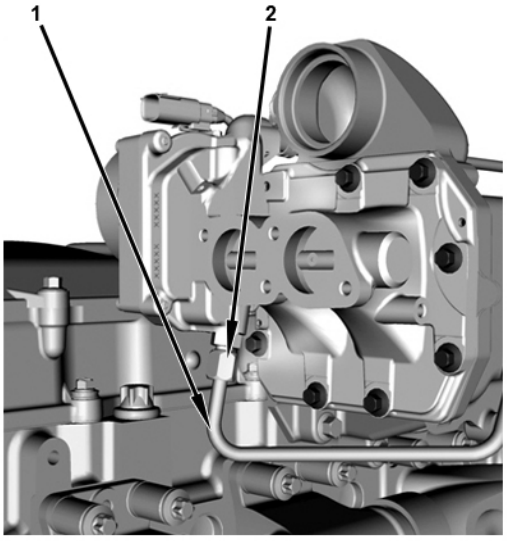

Figure 27 EGR Valve Coolant Supply Tube

1. EGR Valve Coolant Supply Tube
2. EGR Valve Coolant Supply Tube Nut

NOTE – Ensure gasket tab is on inside of mating surface.

6. Remove cap on rear exhaust manifold outlet and install gasket (1) (Figure 28).

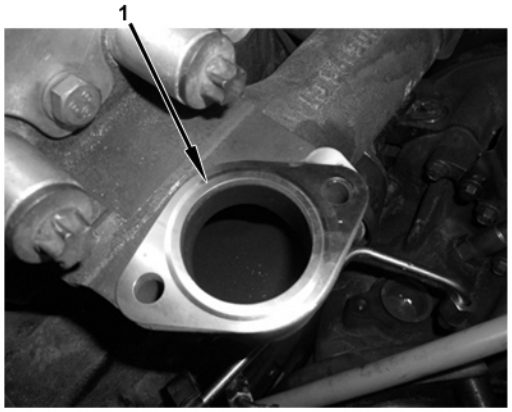

Figure 28 Rear Exhaust Manifold Outlet Gasket

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

CAUTION – To prevent engine damage, ensure EGR inlet tube gaskets have the tab (1) at the top so gaskets do not overlap (Figure 29).

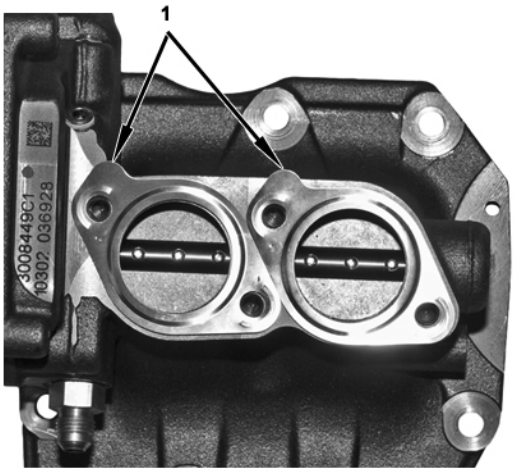

Figure 29 EGR Inlet Tube Gaskets

1. EGR Inlet Tube Gaskets

7. Install new EGR inlet tube (1). Install two M8 x 25 heat-resistant bolts (2) and torque to 18 lb-ft (24 N•m). Install two M8 x 65 heat-resistant bolts and torque to 18 lb-ft (24 N•m) (3) (Figure 30).

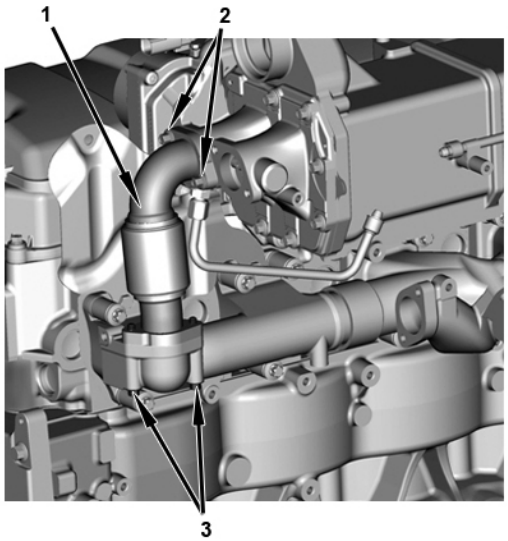

Figure 30 EGR Inlet Tube (Inside)

1. EGR Inlet Tube (Inside)
2. M8 x 25 Heat-resistant Bolt (2)
3. M8 x 65 Heat-resistant Bolt (2)

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

8. Install new EGR inlet tube (1). Install four M8 x 25 heat-resistant bolts (2) and torque to 18 lb-ft (24 N•m) (Figure 31).

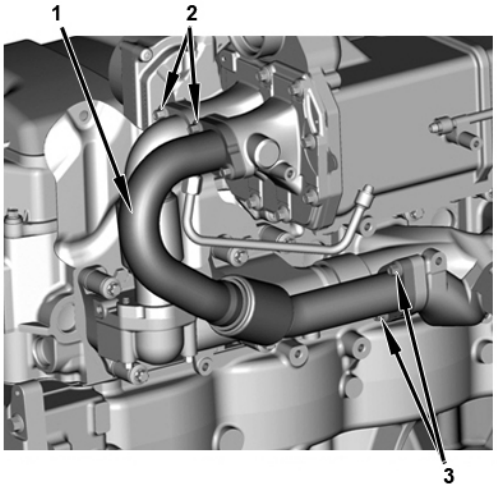

Figure 31 EGR Inlet Tube (Outside)

1. EGR Inlet Tube (Outside)
2. M8 x 25 Heat-resistant Bolt (2)
3. M8 x 25 Heat-resistant Bolt (2)

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

9. Install coolant manifold (1). Install two M8 x 45 bolts (2), one M8 x 50 x 16 stud bolt (3), and torque to 26 lb-ft (35.2 N•m) (Figure 32).

> **CAUTION – To prevent engine damage, extension tubes should be handled with care.**

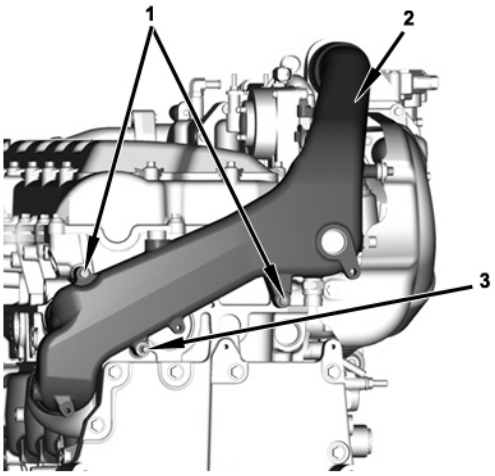

Figure 32 Coolant Manifold

1. M8 x 45 Bolt (2)
2. Coolant Manifold
3. M8 x 50 x 16 Stud Bolt

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

10. Install EGR inlet tube heat shield (1). Install one M8 x 25 heat-resistant bolt (2), three M8 x 12 bolts (3), and torque to 18 lb-ft (24 N•m) (Figure 33).

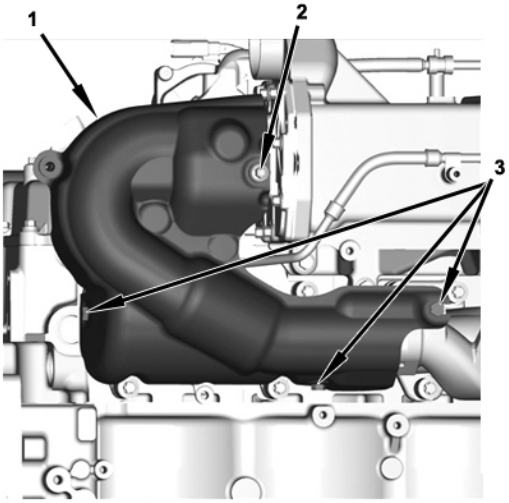

Figure 33 EGR Inlet Tube Heat Shield

1. EGR Inlet Tube Heat Shield
2. M8 x 25 Heat-resistant Bolt
3. M8 x 12 Bolts (3)

NOTE – Install two new M8 x 45 bolts and tighten. Pre-torque bolts to 97 lb-in (11 N·m)) and final-torque bolts to 18 lb·ft (24 N•m). Do not over tighten.

11. Remove HCI cap. Install HCI on thermal management valve housing (1) with two M8 x 45 bolts (2) and torque to 18 lb-ft (24 N•m) (Figure 34).

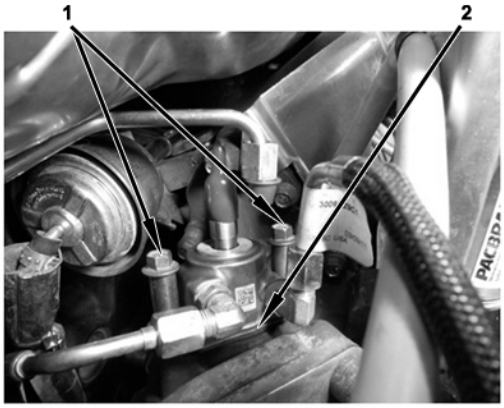

Figure 34 Thermal Management Valve Housing

1. HCI M8 x 45 bolts (2)
2. Thermal Management Valve Housing

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

CAUTION – To prevent component damage, do not drop hydrocarbon injector onto a hard surface. The HCI nozzle tip is easily damaged. If this happens, replace the injector.

12. Install HCI coolant outlet tube (1) to HCI, tighten HCI coolant outlet tube nut (2), and torque to 11 lb-ft (14.9 N•m) (Figure 35).

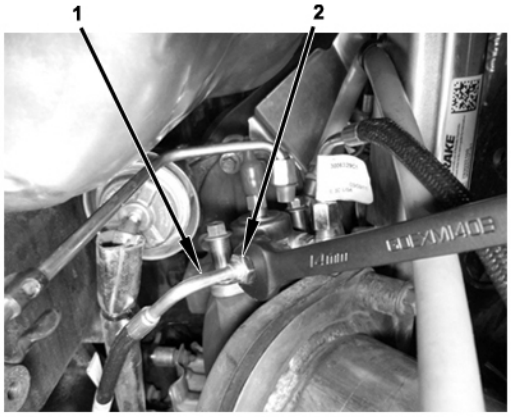

Figure 35 HCI Coolant Outlet Tube

1. HCI Coolant Outlet Tube
2. HCI Coolant Outlet Tube Nut

13. Remove HCI fuel supply line cap (1) and HCI fuel inlet cap (2) (Figure 36).

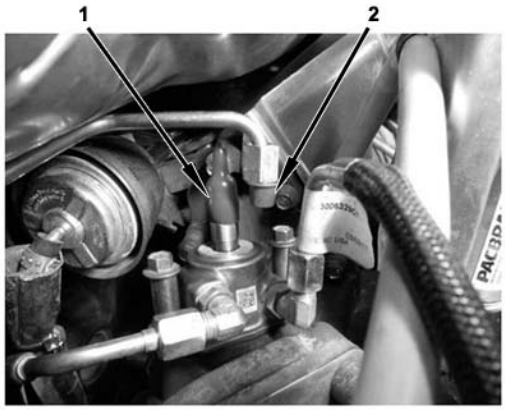

Figure 36 HCI Fuel Supply Line

1. HCI Fuel Supply Line with Cap
2. HCI Fuel Inlet Cap

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

> **CAUTION – To prevent component damage, do not bend fuel supply line.**

14. Attach HCI fuel supply line nut (1) to HCI fuel inlet (2) and torque to 18 lb-ft (24 N•m) (Figure 37).

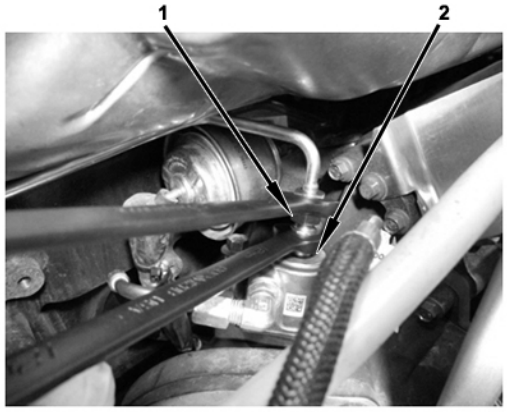

Figure 37 HCI Fuel Inlet

1. HCI Fuel Supply Line Nut
2. HCI Fuel Inlet

15. Install hydrocarbon injector (HCI) coolant supply tube nut (1) to the coolant manifold (2) and torque to 18 lb-ft (24 N•m) (Figure 38).

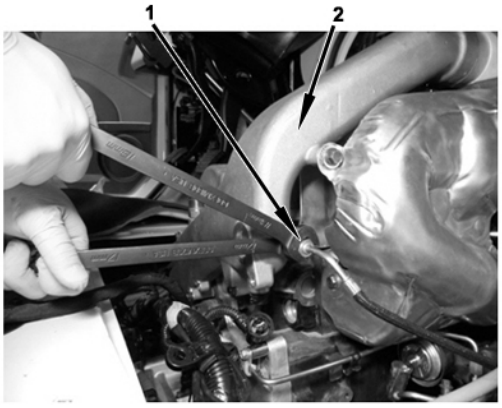

Figure 38 Coolant Manifold

1. HCI Coolant Supply Tube Nut
2. Coolant Manifold

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

16. Connect cab heat tube (1) to coolant manifold (2) (Figure 39).

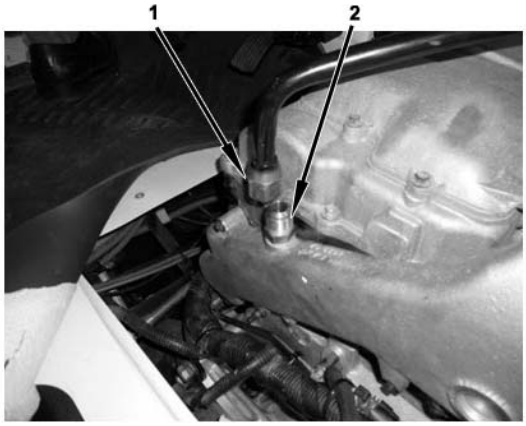

Figure 39 Cab Heat Tube

1. Cab Heat Tube
2. Coolant Manifold

17. Install cab heater supply tube support brackets (1) to EGR cooler (2) and torque to 13 lb-ft (17.6 N•m) (Figure 40).

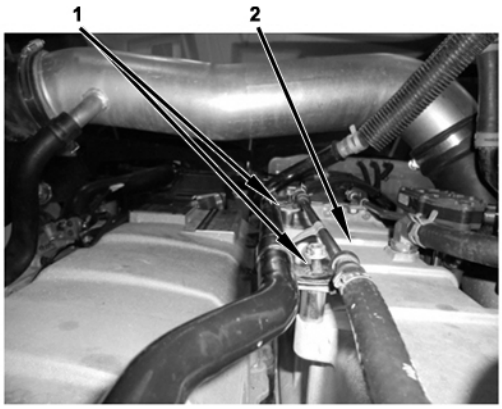

Figure 40 EGR Cooler

1. Cab Heater Supply Tube Brackets
2. EGR Cooler

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

18. Install the engine harness guide (1) to M8 x 45 bolt (2) and torque to 26 lb-ft (35.2 N•m) (Figure 41).

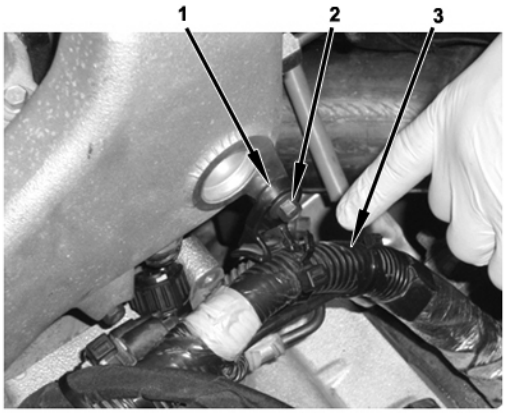

Figure 41 Engine Harness Guide

1. Engine Harness Guide
2. M8 x 45 Bolt
3. Engine Harness

19. Install the engine harness guide (1) to M8 x 50 x 16 stud bolt (2) and torque to 26 lb-ft (35.2 N•m) (Figure 42).

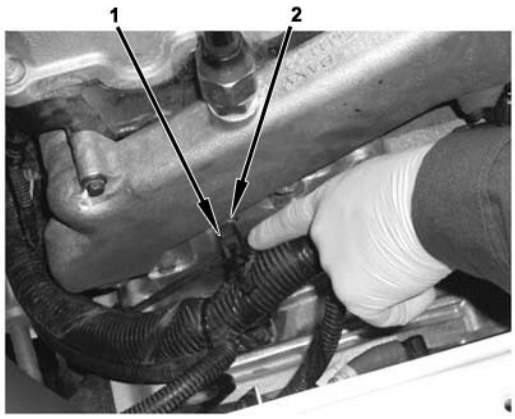

Figure 42 Engine Harness Guide

1. Engine Harness Guide
2. M8 x 50 x 16 Stud Bolt (Not shown, located behind Engine Harness Guide)

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

20. Install wire tie (1) located before the EGR valve electrical connector (2) (Figure 43).

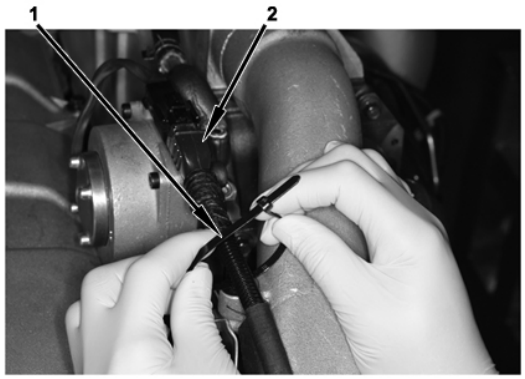

Figure 43 EGR Valve Electrical Connector

1. Wire Tie
2. EGR Valve Electrical Connector

21. Connect engine harness (1) to EGR valve engine harness connector (2) (Figure 44).

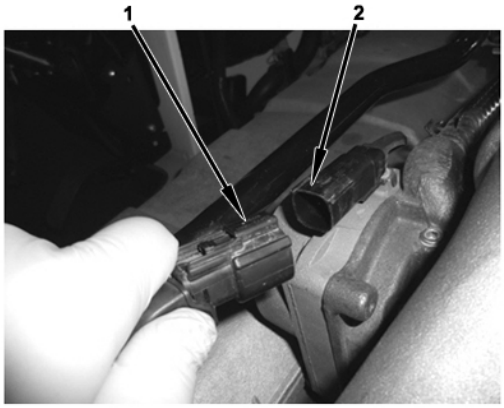

Figure 44 EGR Valve Engine Harness Connector

1. Engine Harness
2. EGR Valve Engine Harness Connector

EGR VALVE INSTALLATION INSTRUCTIONS (CONT.)

22. Connect engine harness (1) to engine coolant temperature sensor (2) (Figure 45).

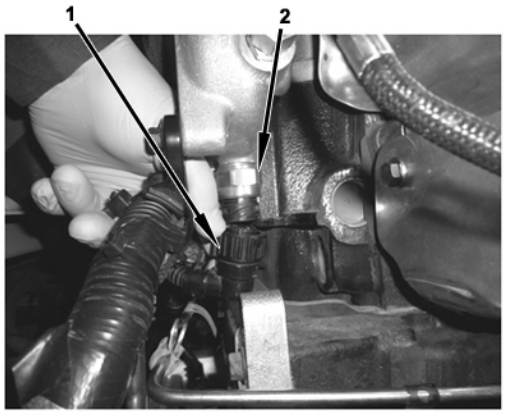

Figure 45 Engine Coolant Temperature Sensor

1. Engine Harness
2. Engine Coolant Temperature Sensor

23. Refill cooling system using the Coolant Management Tool (KL5007NAV). Refer to TSI 12–12–01.

24. Install engine cover. Refer to the Engine Cover Removal procedure in the MaxxForce® 11 / MaxxForce® 13 EGR Cooler Resource Center.

LABOR INFORMATION

Operation number must appear on all claims.

Table 4 Labor Information

Operation No.	Description	Time
A40-12905-1	Replace EGR Inlet Tubes – ProStar® and LoneStar®	2.9 hr
A40-12905-2	Replace EGR Inlet Tubes – WorkStar® and PayStar®	2.2 hr
A40-12905-3	Replace EGR Inlet Tubes – TransStar®	2.2 hr
A40-12905-4	Replace EGR Inlet Tubes – TransStar® with Premium Interior	2.8 hr
A40-12905-5	Replace EGR Inlet Tubes and EGR Valve – ProStar® and LoneStar®	3.5 hr
A40-12905-6	Replace EGR Inlet Tubes and EGR Valve – WorkStar® and PayStar®	2.8 hr
A40-12905-7	Replace EGR Inlet Tubes and EGR Valve – TransStar®	2.8 hr
A40-12905-8	Replace EGR Inlet Tubes and EGR Valve – TransStar® with Premium interior	3.4 hr

ADMINISTRATIVE PROCEDURE

Expense is to be charged to Warranty. Claims are to be submitted in the normal manner, making reference to Authorized Field Change Number G-12905.

It is important that the coding be completed properly to assist in processing the warranty claim. Complete instructions will be found in the Warranty Policy Manual, Section 7.1.8.

As with all claim submissions, items acquired locally must be submitted in the “Other Charges” tab. The cost of any bulk items (bag of cable tie straps, roll of wire, barrel of oil, tube of silicone, etc.) should be prorated for the cost of the individual pieces/amount used during each repair.

To make sure this important improvement is made in a timely manner, all claims for G-12905 activity must be submitted by June 30, 2013 or within the normal warranty period for the vehicle, if after June 30, 2013.