

Technical Service Information

NAVISTAR®

TSI-13-12-08

Date: October 2013
Subject File: Engine

Subject: Aftertreatment Fuel Injector (AFTFI) Removal and Installation

Model: PayStar®

Model: ProStar®

Model: TranStar®

Model: WorkStar®

Engine Family: N13 with SCR (EPA 10) with HD-OBD

DESCRIPTION

This procedure provides the steps necessary to remove and install the AFTFI for the N13 with SCR (EPA 10) with HD-OBD.

PARTS INFORMATION

Table 1. Tools Information.

Description	Tool Number / Type
Navistar Coolant Management Tool	KL5007NAV
Air and Fuel Cap and Plug Kit	ZTSE4891
AFTFI Coolant Hose Sealing Plugs	12-559-01-02

REMOVAL



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 personal injury and / or death.



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.

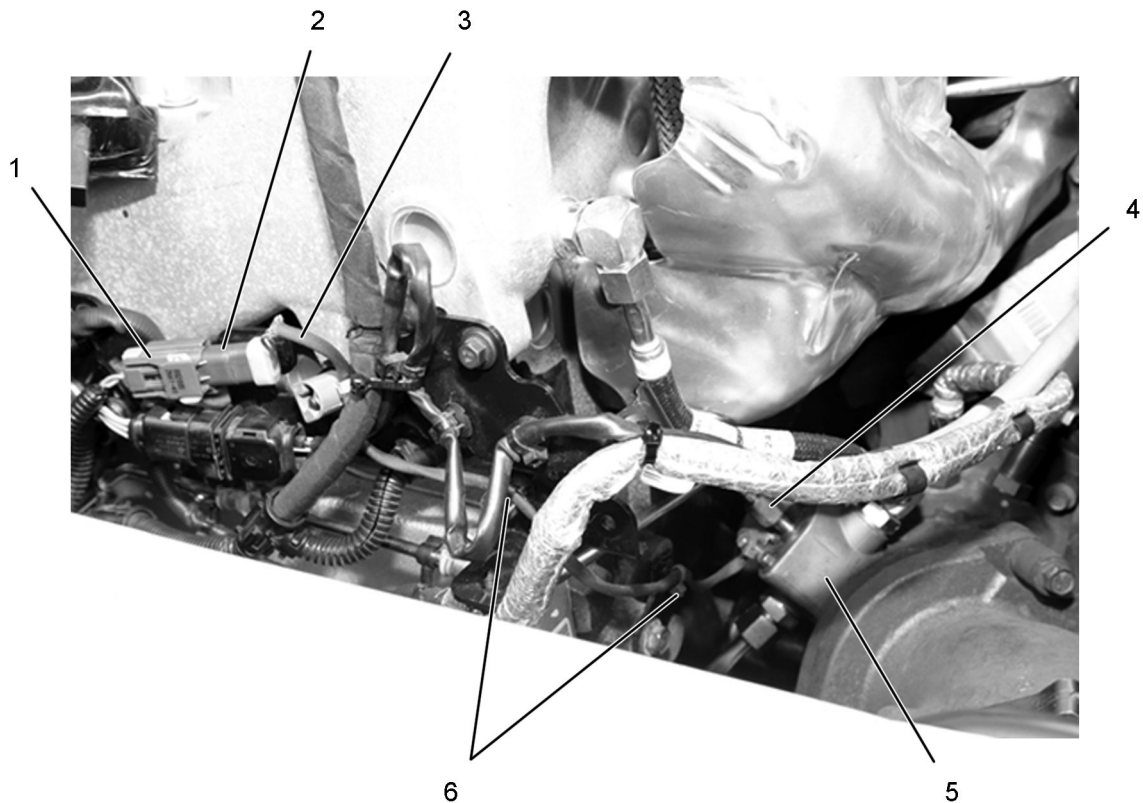
1. Bring truck into shop and park on flat surface.
2. Shift transmission to Park or Neutral, set parking brake, and install wheel chocks.
3. Unlatch and open hood.
4. Remove battery box cover.
5. Disconnect negative battery cable(s).
6. Drain both air tanks.

REMOVAL (CONT.)

NOTE: For Steps 7 through 14 refer to one of the following manuals:

- For PayStar® refer to 0000002321 Cab Service Manual (5000i and 9000i Conventional) PayStar® (5500i, 5600i, 5900i) and 9000 Series (9100i, 9200i, 9400i, 9900i, 9900ix), Revision 1, (formerly S16021).
 - For ProStar® refer to 0000002323 Cab: Day Cab and Sleeper Cab Service Manual for LoneStar® and ProStar® (Formerly S16044).
 - For TranStar® and WorkStar® refer to 0000002324 Cab Service Manual for TranStar® and WorkStar® (Formerly S16052).
7. Remove both front seats.
 8. Remove left- and right-side kick panels.
 9. Remove steering column trim panel.
 10. Remove left- and right-side scuff plates.
 11. Disconnect air lines and remove gearshift lever.
 12. Remove floor mat.
 13. If equipped, remove cup holder.
 14. Remove engine cover.
 15. Install KL5007NAV Coolant Management Tool.

REMOVAL (CONT.)



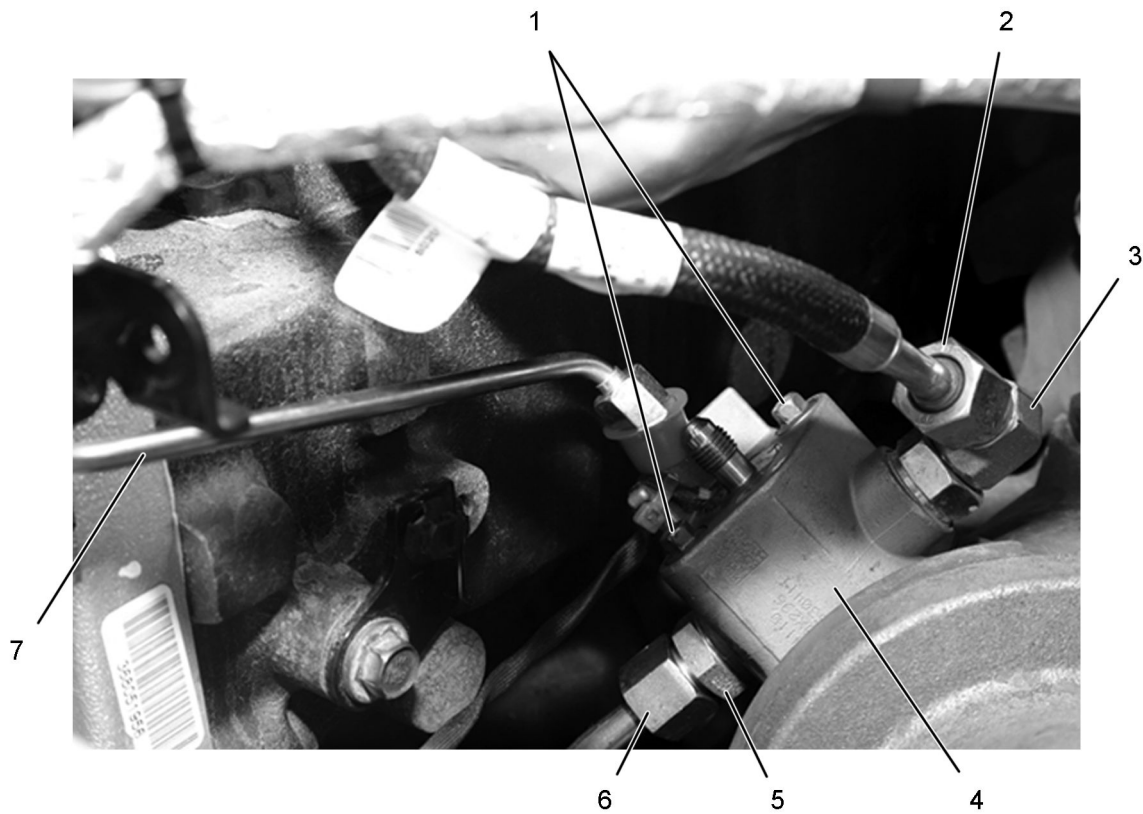
0000060593

Figure 1. Aftertreatment Fuel Injector (AFTFI) Wiring.

1. Engine harness connector
2. AFTFI harness connector
3. AFTFI harness
4. AFTFI fuel supply line
5. AFTFI
6. Cable tie strap (as required)

16. Disconnect engine harness connector (Figure 1, Item 1) from AFTFI harness connector (Figure 1, Item 2).
17. Remove AFTFI harness connector (Figure 1, Item 2) from bracket.
18. Cut cable tie straps (Figure 1, Item 6) as required from AFTFI harness (Figure 1, Item 3).
19. Disconnect AFTFI fuel supply line (Figure 1, Item 4) from AFTFI (Figure 1, Item 5).
20. Install cap from Air and Fuel Cap and Plug Kit ZTSE4891 onto fuel supply line (Figure 1, Item 4) to avoid contamination.
21. Apply vacuum to cooling system per [KL5007NAV Coolant Management Tool Instructions](#).

REMOVAL (CONT.)



0000060594

Figure 2. AFTFI.

1. M6 X 60 (2)
2. Coolant supply hose
3. Elbow fitting
4. AFTFI
5. Straight fitting
6. Coolant return hose
7. AFTFI fuel supply line

REMOVAL (CONT.)

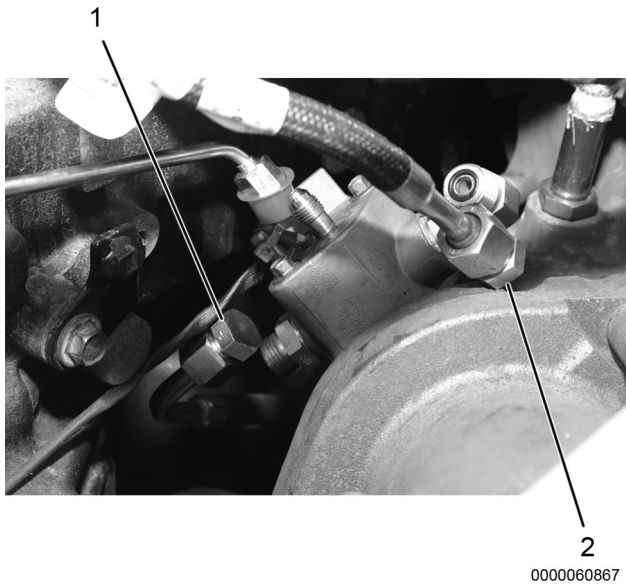
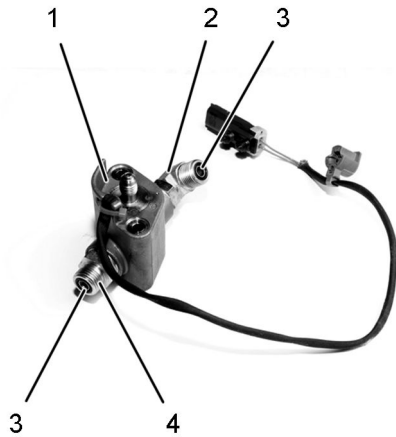


Figure 3. AFTFI Coolant Hoses.

1. AFTFI coolant return hose sealing plug
2. AFTFI coolant supply hose sealing plug

22. Disconnect coolant supply hose (Figure 2, Item 2) from elbow fitting (Figure 2, Item 3).
23. Install AFTFI Coolant Hose Sealing Plug 12-559-01-02 (Figure 3, Item 2) into coolant supply hose and tighten to 18 lb-ft (24 N·m).
24. Disconnect coolant return hose (Figure 2, Item 6) from straight fitting (Figure 2, Item 5).
25. Install AFTFI coolant hose sealing plug (Figure 3, Item 1) into coolant return hose and tighten to 18 lb-ft (24 N·m).
26. Remove two M6 X 60 bolts (Figure 2, Item 1), AFTFI (Figure 2, Item 4), ceramic insulator, and metal gasket from turbocharger exhaust outlet housing. Discard M6 X 60 bolts, ceramic insulator, and metal gasket.

REMOVAL (CONT.)



0000060595

Figure 4. AFTFI O-rings.

1. AFTFI
 2. Coolant supply elbow fitting
 3. Coolant supply elbow fitting O-ring
 4. Coolant return straight fitting
 5. Coolant return straight fitting O-ring
27. Remove O-ring from coolant supply elbow fitting (Figure 4, Items 3 and 2) on AFTFI (Figure 4, Item 1). Discard O-ring.
28. Remove O-ring from coolant return straight fitting (Figure 4, Items 5 and 4) on AFTFI (Figure 4, Item 1). Discard O-ring.

INSTALLATION

! WARNING: When using solvents, acids, or alkaline cleaning materials, follow the manufacturer's recommendations for use and wear goggles and protective clothing. Failure to do so may result in personal injury and / or death.

! WARNING: Always wear safe eye protection when performing vehicle maintenance. Failure to do so may result in personal injury and / or death.

! WARNING: Do not use compressed air to clean or actuate the injector needle. Doing so may result in personal injury and / or death.

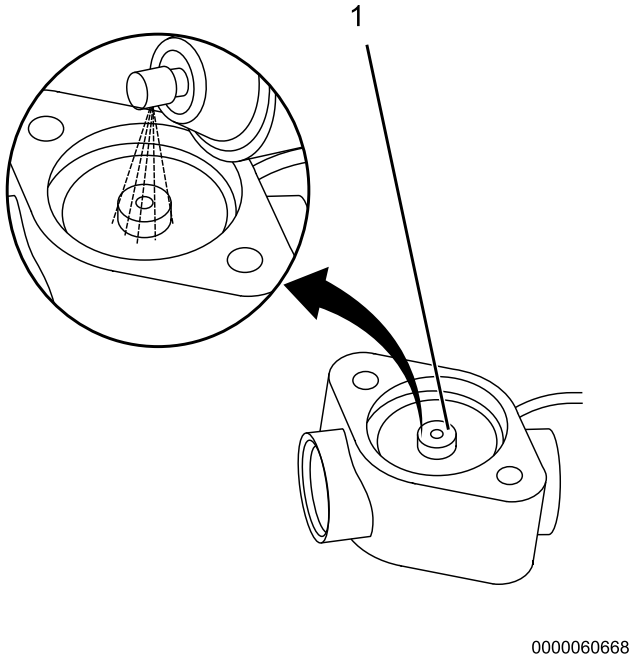


Figure 5. AFTFI Tip.

1. AFTFI tip

1. Inspect Aftertreatment Fuel Injector (AFTFI) tip (Figure 5, Item 1) and AFTFI bore for carbon buildup.

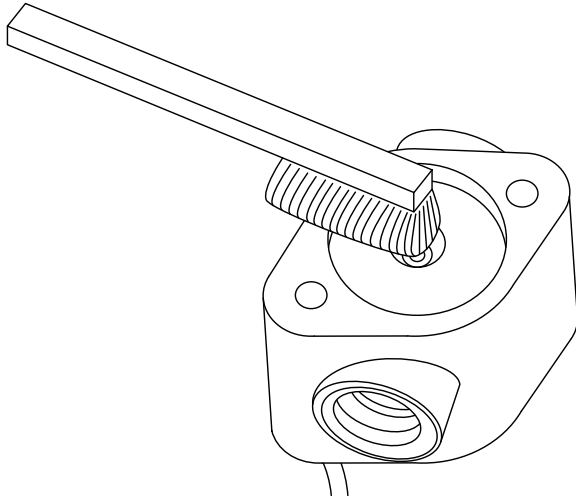
- If carbon buildup is present in bore, clean with screwdriver or punch.

NOTE: Carburetor cleaner is the most effective solvent for cleaning the AFTFI. Do not substitute any other cleaning solvent.

2. Spray AFTFI tip (Figure 5, Item 1) with carburetor cleaner.

INSTALLATION (CONT.)

3. Allow carburetor cleaner to sit for 15 seconds, so that it can penetrate and break down debris in tip area.



0000060670

Figure 6. AFTFI.

CAUTION: Do not use a metallic wire brush, a steel wire wheel, or a fiber brush with damaged bristles to clean the AFTFI tip. Doing so may cause permanent damage to the AFTFI.

4. Using a fiber brush (such as a toothbrush) with undamaged bristles, brush carburetor cleaning fluid onto AFTFI, focusing on AFTFI tip (Figure 6).
5. Repeat spraying and brushing for one minute.
6. Inspect AFTFI tip for cracks or other damage.
 - If AFTFI tip is damaged, replace AFTFI.
7. Clean AFTFI mounting surface on turbocharger exhaust outlet.

INSTALLATION (CONT.)

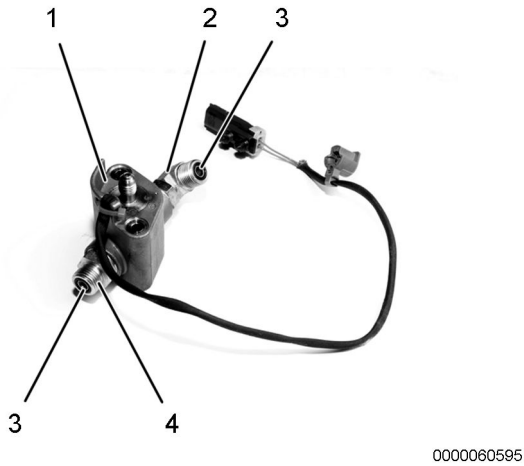


Figure 7. AFTFI O-rings.

1. AFTFI
 2. Coolant supply elbow fitting
 3. Coolant supply elbow fitting O-ring
 4. Coolant return straight fitting
 5. Coolant return straight fitting O-ring
8. Install O-ring into coolant supply elbow fitting (Figure 7, Items 3 and 2) on AFTFI (Figure 7, Item 1).
9. Install O-ring into coolant return straight fitting (Figure 7, Items 5 and 4) on AFTFI (Figure 7, Item 1).

INSTALLATION (CONT.)



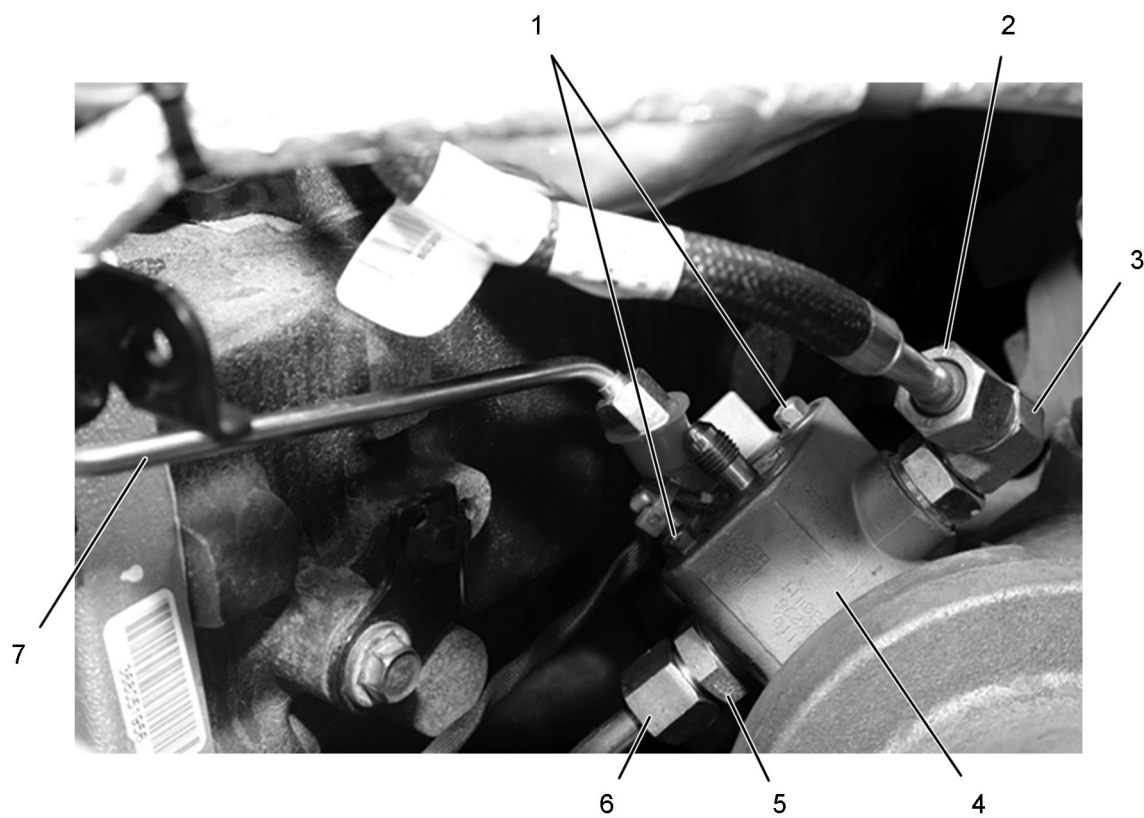
0000060596

Figure 8. Aftertreatment Fuel Injector Ceramic Insulator.

1. Ceramic insulator

10. Install metal AFTFI gasket and ceramic insulator (Figure 8, Item 1) onto turbocharger exhaust outlet housing .

INSTALLATION (CONT.)



0000060594

Figure 9. AFTFI.

1. M6 X 60 bolt (2)
2. Coolant supply hose
3. Elbow fitting
4. AFTFI
5. Straight fitting
6. Coolant return hose
7. AFTFI fuel supply line

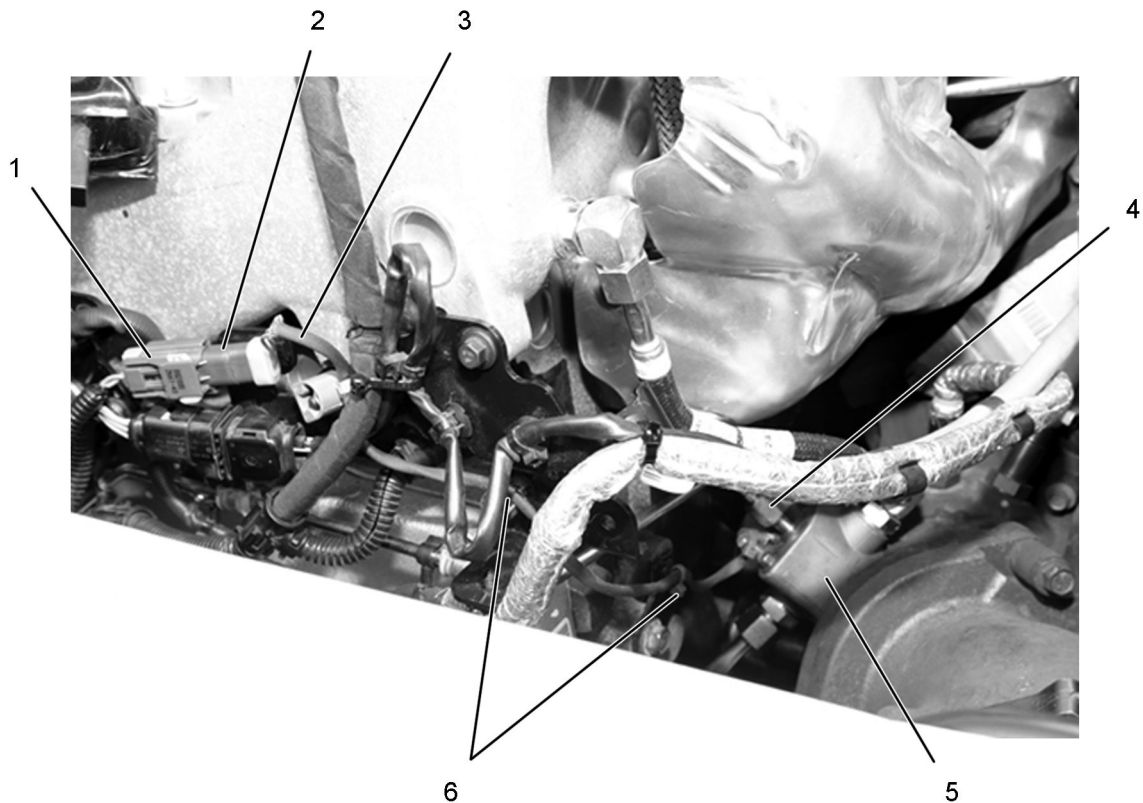
11. Install AFTFI (Figure 9, Item 4) onto turbocharger exhaust outlet housing.
12. Install two M6 X 60 bolts (Figure 9, Item 1) and tighten to 80 lb-in (9 N·m).
13. Remove cap from AFTFI fuel supply line, and connect fuel supply line (Figure 9, Item 7) to AFTFI.
14. Tighten AFTFI fuel supply line fitting nut to 133 lb-in (15 N·m).
15. Apply vacuum to cooling system per [KL5007NAV Coolant Management Tool Instructions](#).

NOTE: When connecting AFTFI coolant return and supply plugs, remove plugs quickly to reduce vacuum and coolant loss.

INSTALLATION (CONT.)

16. Remove AFTFI coolant hose sealing plug from coolant return hose (Figure 9, Item 6), and connect hose to straight fitting (Figure 9, Item 5).
17. Remove AFTFI coolant hose sealing plug from coolant supply hose (Figure 9, Item 2), and connect hose to elbow fitting (Figure 9, Item 3).
18. Tighten AFTFI coolant return hose fitting nut to 18 lb-ft (25 N·m).
19. Tighten AFTFI coolant supply hose fitting nut to 18 lb-ft (25 N·m).

INSTALLATION (CONT.)



0000060593

Figure 10. AFTFI Wiring.

1. Engine harness connector
2. AFTFI harness connector
3. AFTFI harness
4. AFTFI fuel supply line
5. AFTFI
6. Cable tie strap (as required)

20. Route AFTFI harness (Figure 10, Item 3) from AFTFI (Figure 10, Item 5) to engine harness connector (Figure 10, Item 1).

21. Connect AFTFI harness connector (Figure 10, Item 2) to engine harness connector.

22. Install cable tie straps (Figure 10, Item 6) in all previous locations.

INSTALLATION (CONT.)

NOTE: For Steps 23 through 30 refer to one of the following manuals:

- For PayStar® refer to 0000002321 Cab Service Manual (5000i and 9000i Conventional) PayStar® (5500i, 5600i, 5900i) and 9000 Series (9100i, 9200i, 9400i, 9900i, 9900ix), Revision 1, (formerly S16021).
- For ProStar® refer to 0000002323 Cab: Day Cab and Sleeper Cab Service Manual for LoneStar® and ProStar® (Formerly S16044).
- For TranStar® and WorkStar® refer to 0000002324 Cab Service Manual for TranStar® and WorkStar® (Formerly S16052).

23. Install engine cover.
24. If equipped, install cup holder.
25. Install floor mat.
26. Connect air lines and install gearshift lever.
27. Install left- and right-side scuff plates.
28. Install steering column trim panel.
29. Install left- and right-side kick panels.
30. Install both front seats.
31. Connect negative battery cable(s).
32. Install battery box cover.
33. Check coolant level and top off, if needed.
34. Start engine and check proper operation and no fault codes are present.
35. Close and latch hood.
36. Remove wheel chocks.