

Aftertreatment Fuel Injector (AFI) Air Purge System, Kit Installation Instructions

M-258-005

(February 2009)

Valid for

All CXU, CHU and GU with an MP7 Engine and USA-07 Emissions

Case description

Effective November 11, 2008, a continuous air purge system was implemented into production on vehicles equipped with a catalyzed Diesel Particulate Filter (DPF). This system provides a constant stream of air through the nozzle tip to completely purge any residual fuel from the nozzle following a DPF regeneration. A retrofit kit (kit part number 85116273) is available through the MACK Parts System for installation on vehicles manufactured prior to the above implementation date. This bulletin outlines the air purge installation instructions on MACK CXU, CHU and GU model chassis equipped with a US07 emission compliant MP7 engine.

Parts

The AFI air purge system kit includes the following components:

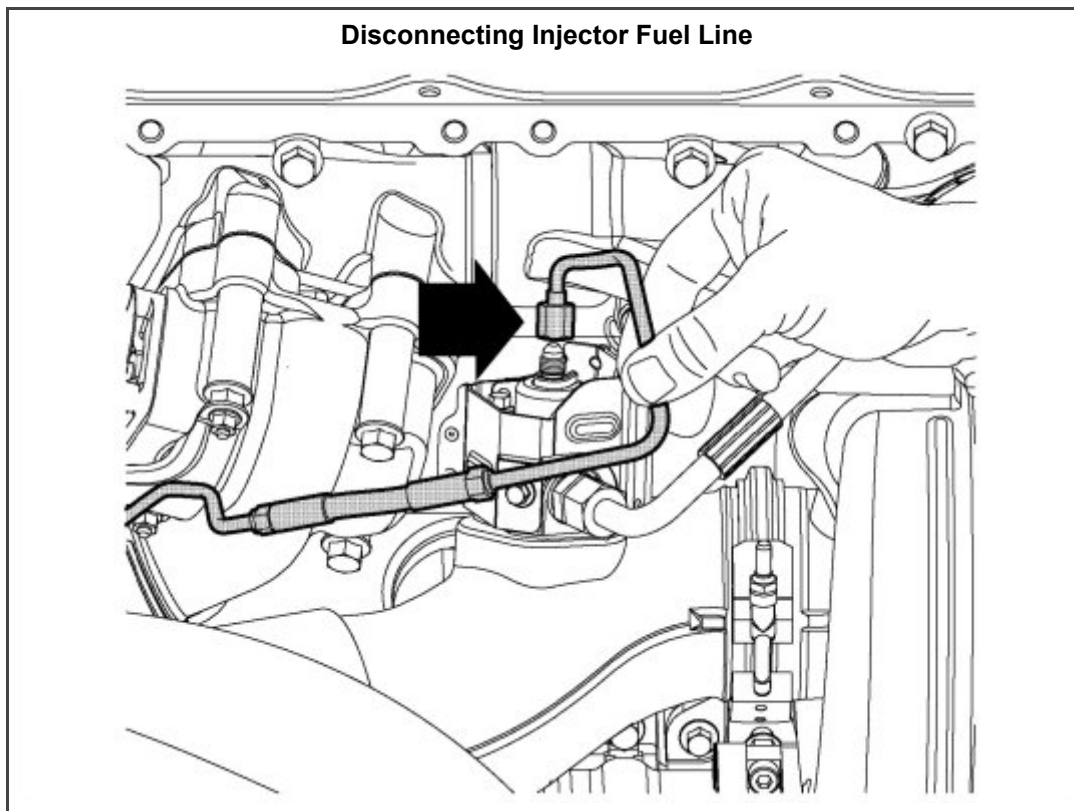
Quantity	Part Number	Description
1	21243502	Pressure regulator, 30 psi
*	85115880	Tubing, white, 1/4 inch
*	85115881	Tubing, tan, 1/4 inch
2	8397771	Fitting, 90-degree elbow, 1/4 inch NPT x 1/4 inch push-to-connect
1	21266886	In-line filter
2	965177	Screw, M6 x 1.0 x 50 mm long
2	949278	Lock nut, M6 x 1.0
1	21276540	Air line (hard pipe)
1	21249090	Check valve, single
1	21250229	Bracket, air regulator mounting
1	8397804	T-fitting
1	21226456	Two-way check valve
3	20960413	P-clamp
1	20960416	P-clamp
5	969538	Screw, M10 x 1.5 x 16 mm long
3	946441	Screw, M10 x 1.5 x 20 mm long
1	965571	Bracket, Air Line
16	980464	Tie wrap
1	20885496	Tie wrap
1	85115784	Kit, AFI gasket

1	21276538	Fuel hard line
2	21021846	Gasket, exhaust pipe

In addition to the parts listed above, three additional P-clamps (part No. 942400) will be required.

KIT INSTALLATION

1. Apply the parking brake and place the shift lever in neutral.
2. Remove all cables from ground (negative) battery terminals to prevent electric shock.
3. Remove the air filter housing and fresh air pipe.
4. Drain the air system.
5. Remove the engine cover from the cab.
6. Remove the exhaust pipe and flex from the diffuser.
7. Disconnect the aftertreatment injector fuel supply line. Collect any residual fuel that may be in the fuel line in a suitable container.

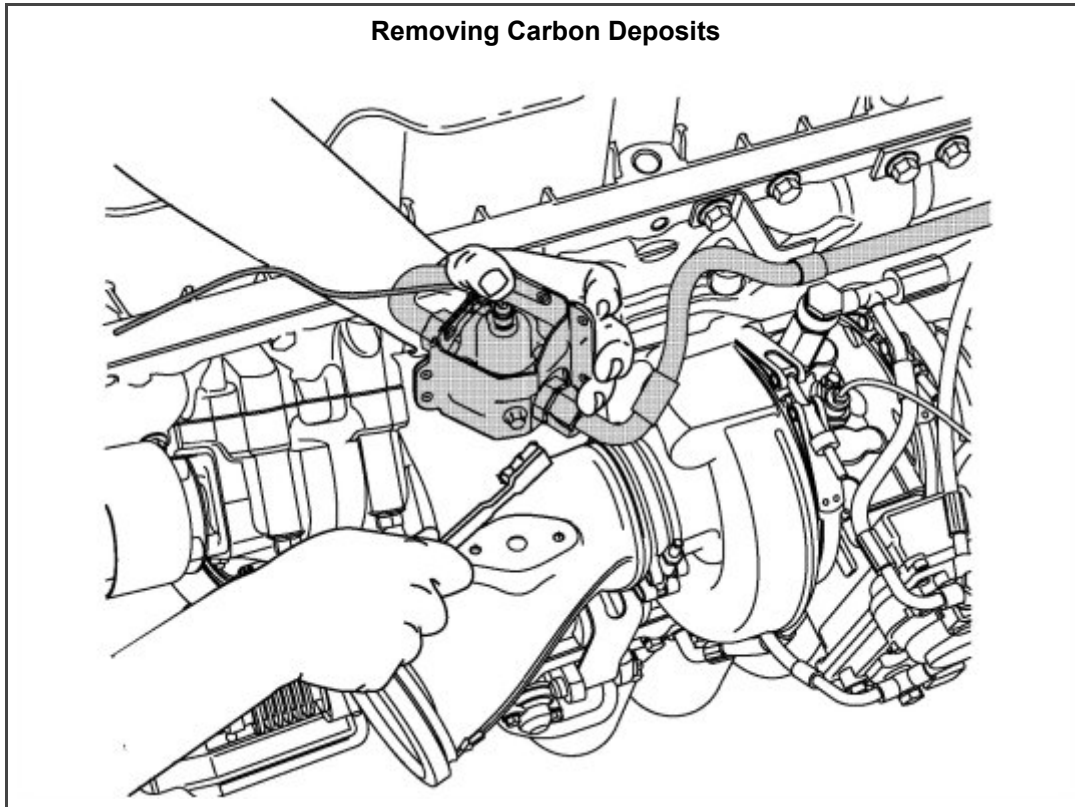


8. Remove the hot side fuel line from the engine.
 9. Remove and discard the aftertreatment fuel injector mounting bolts and spacers. Remove the injector from the diffuser pipe (which attaches to the turbocharger outlet).
- Note: The coolant lines and coolant do not need to be removed for AFI cleaning.*
10. Cover the hole in the diffuser pipe to prevent dirt and cleaning solution from entering the exhaust system.
 11. Remove and discard the high-temperature gasket and steel plate gasket from the bottom of the injector.
 12. Turn the AFI body to allow the injector tip to be sprayed with carburettor cleaning solution. Brush the injector tip with a stiff bristled nylon "tooth" brush. Repeat two or three times.

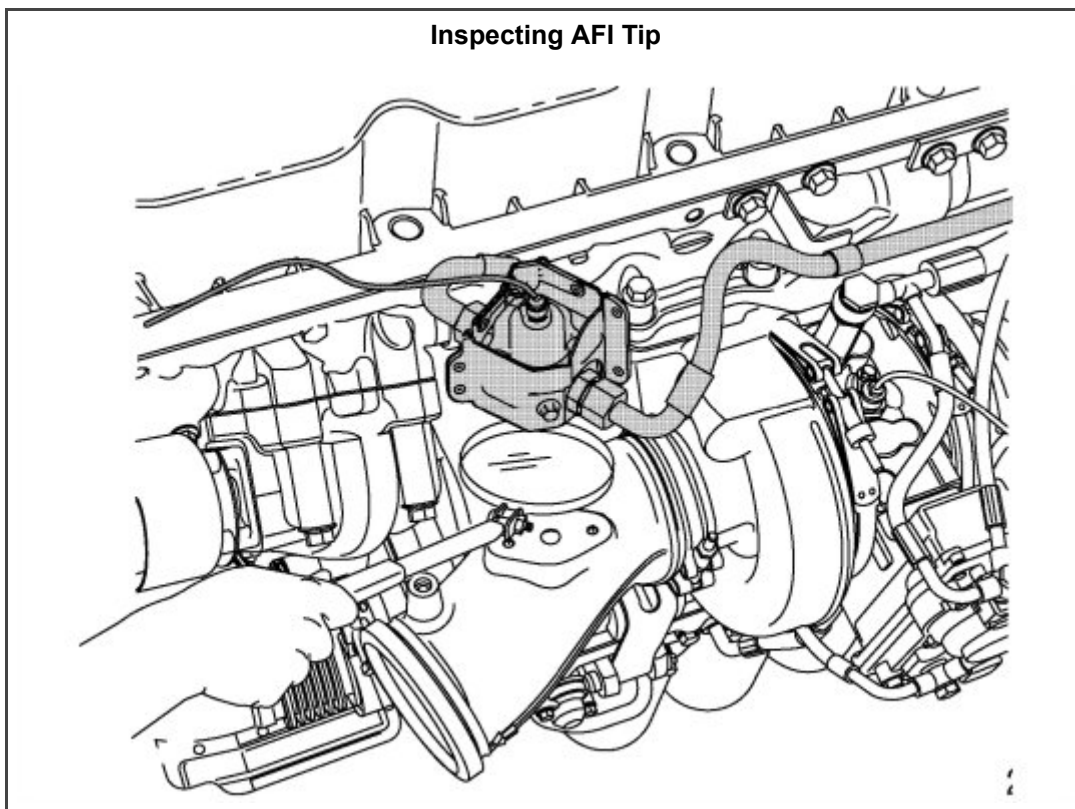
Caution

Only high quality carburettor cleaner should be used to clean the injector. Other cleaners, such as brake cleaner products, do not work and may contain chlorine, which could damage the catalyst if they enter the exhaust system.

Only use a nylon brush to clean the injector tip. Do not use a brass or steel brush. Damage to the injector tip may result.



13. Inspect the injector tip. Use a mirror if a clear view of the tip is not possible.



14. Install the new high-temperature gasket and steel plate gasket, which are included in the AFI mounting kit (part number 85115784) onto the bottom of the AFI.

15. Position the AFI onto the diffuser pipe and hand-tighten the mounting bolts.

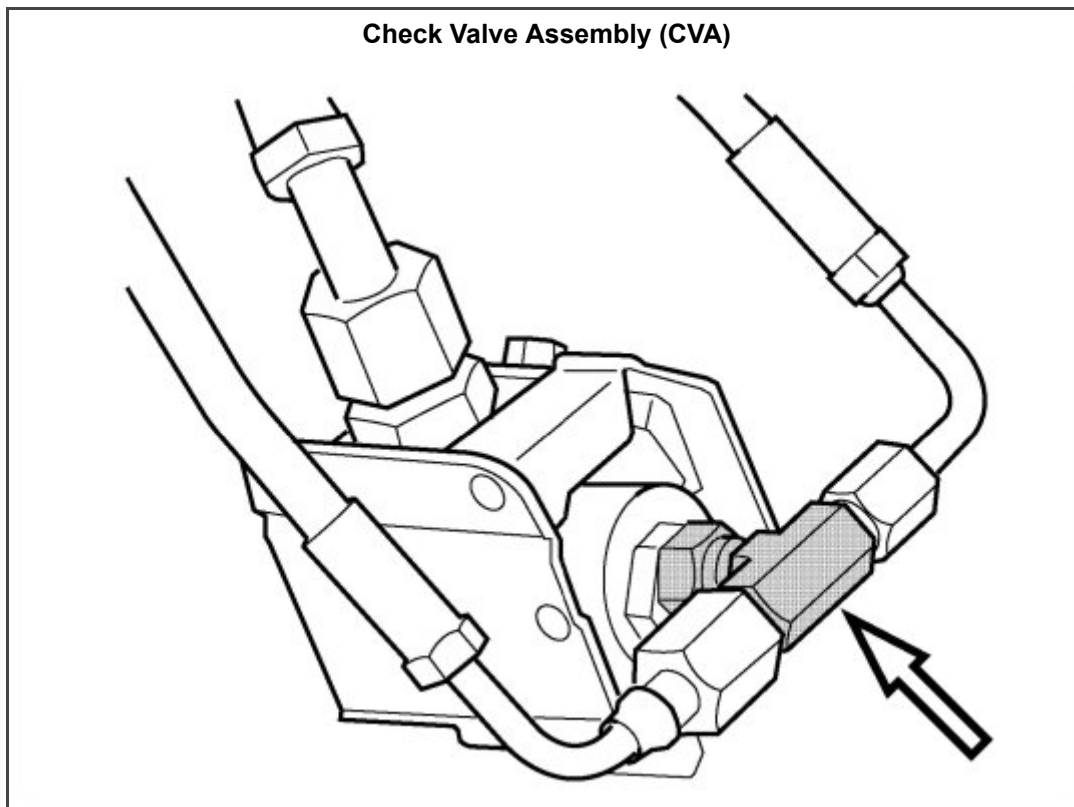
16. Using the flow test tool (tool No. 88890112) and Premium Tech Tool, test the AFI flow as follows:

- a. In **Guided Diagnostics**, go to the Symptoms tab and select “Exhaust Aftertreatment/Service regeneration failure.”
- b. Under the Fault Code and Symptom Analysis tab, select “Exhaust Aftertreatment, Symptom diagnostics.”
- c. Under the Diagnostic Analysis tab, select “Service regeneration failure.”
- d. Under the Diagnostic tab, select “Aftertreatment fuel system check.”
- e. Select “Aftertreatment Fuel Injector check.”
- f. Select “Aftertreatment Fuel Injector Flow check.”

 **Caution**

If the AFI does not pass the flow test, replace with a new AFI.

17. Remove the existing mounting bolts from the AFI, and then apply Permatex® high-temperature nickel-graphite anti-seize compound (part number 5166–77124) to the threads of the new injector mounting bolts included in the AFI mounting kit (part number 85115784).
18. Using the new mounting bolts, install the AFI to the diffuser and tighten to $14 \pm 0.5 \text{ N}\cdot\text{m}$ ($125 \pm 4.5 \text{ in}\cdot\text{lb}$).
19. Install the one-way check valve (part number 21249090) on the air line hard pipe (part number 21276540).
20. Position the air line hard pipe around the back of the engine.
21. Position the new fuel line (part No. 21276538) around the back of the engine.
22. Install the two-way check valve (part No. 21226456) on the AFI.

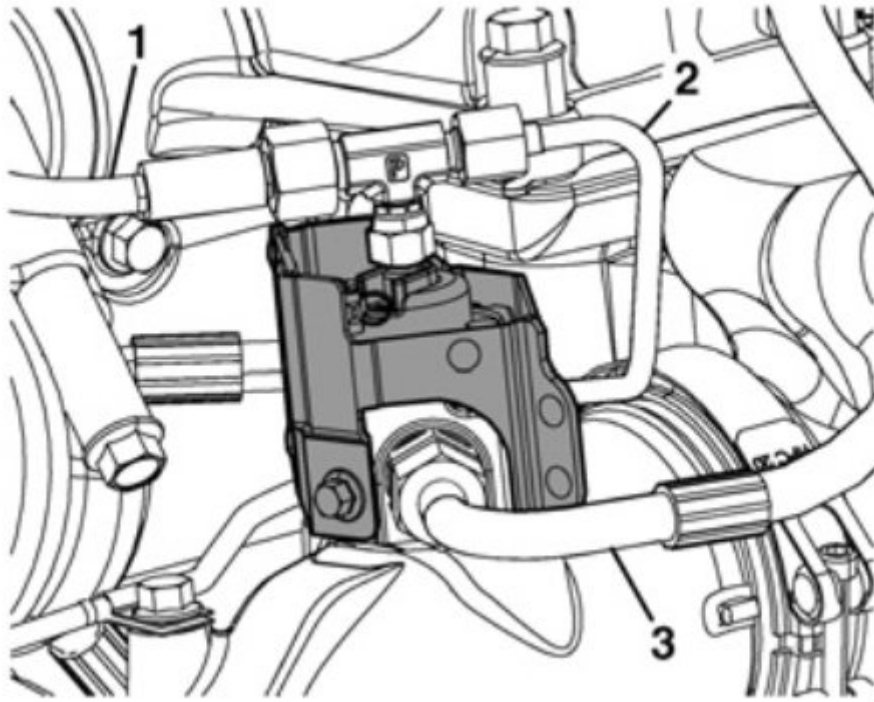


23. Connect the fuel line and air line to the two-way check valve. Hand-tighten the fittings.

 **Caution**

Do not kink the fuel and coolant lines. Kinking the lines may result in leakage.

AFI Connections



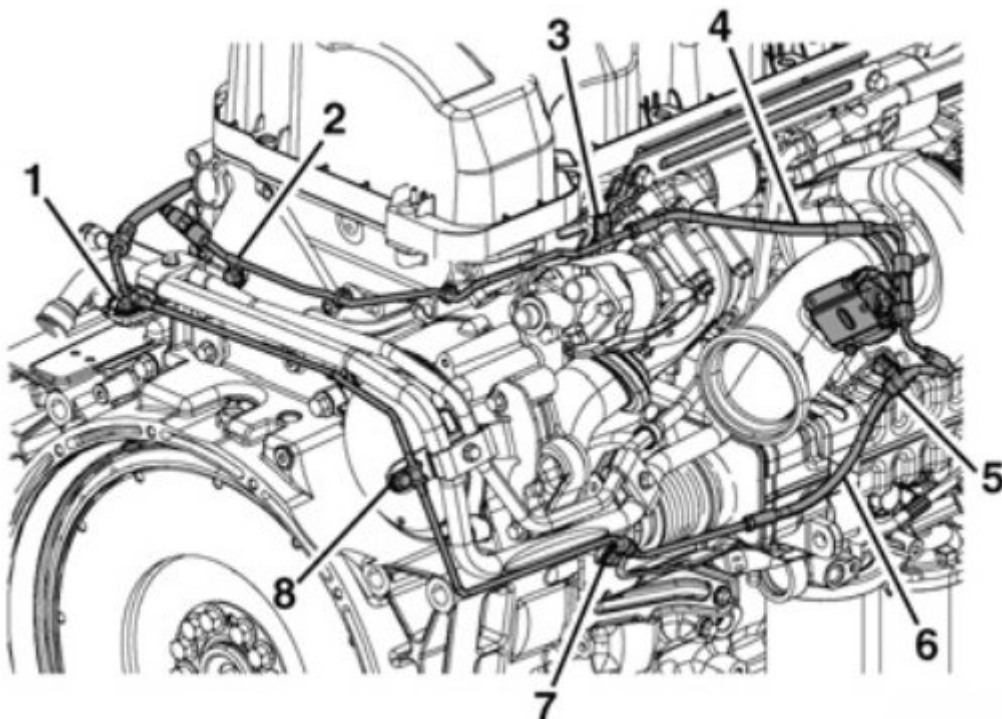
1. Air Line

3. Coolant Line

2. Fuel Line

24. Install the air line mounting bracket, P-clamps, screws and nuts to secure the air line. Use dual cable ties with spacers (part number 20885496) to secure the air line at the rear of the cylinder head.

Fuel and Air Line Routing



1. P-Clamp 20960413 and Screw 969538

5. P-Clamp 20960416 and Screw 969538

2. P-Clamp 942400 and Screw 969538

6. Fuel Line Hard Pipe 21276538

3. Bracket 965571 and Screw 946441 with Loctite 242; P-Clamp 942400 Screw 969538 and Nut 945408

7. P-Clamp 20960413

25. Install the fuel line P-clamps, screws and nuts to secure the fuel line.
26. Connect the fuel line hard pipe to the flexible fuel supply line.
27. If the air dryer desiccant cartridge is not the coalescing-type filter, remove the cartridge and replace with a new coalescing-type cartridge.

⚠ Caution

It is mandatory to use a coalescing air dryer filter with the AFI air purge system. If a coalescing filter is not used, damage to components can result.

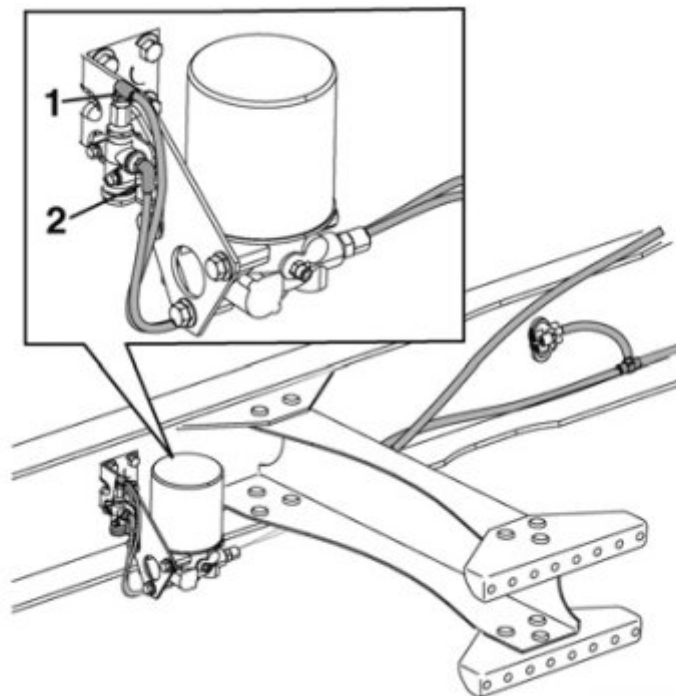
Oil coalescing desiccant cartridges **MUST** be changed once per year.

Part numbers for the oil coalescing desiccant cartridges for the available air dryer models are as follows:

Air Dryer Model	Oil Coalescing Desiccant Cartridge part number
WABCO 1200	85110799
WABCO 1800	85115361
Bendix AD9	85115878
Bendix AD-IP	85115876

28. Install the in-line air filter (part number 21266886) and two 90° swivel fittings (part number 8397771) in the air pressure regulator (part number 21243502).
29. Mount the air pressure regulator (part number 21243502) to the regulator mounting bracket (part number 21250229) using screws (part number 965177) and lock nuts (part number 949278).
30. Install the air regulator on the air dryer mounting bracket.

Air Lines at Pressure Regulator and Tee Fitting

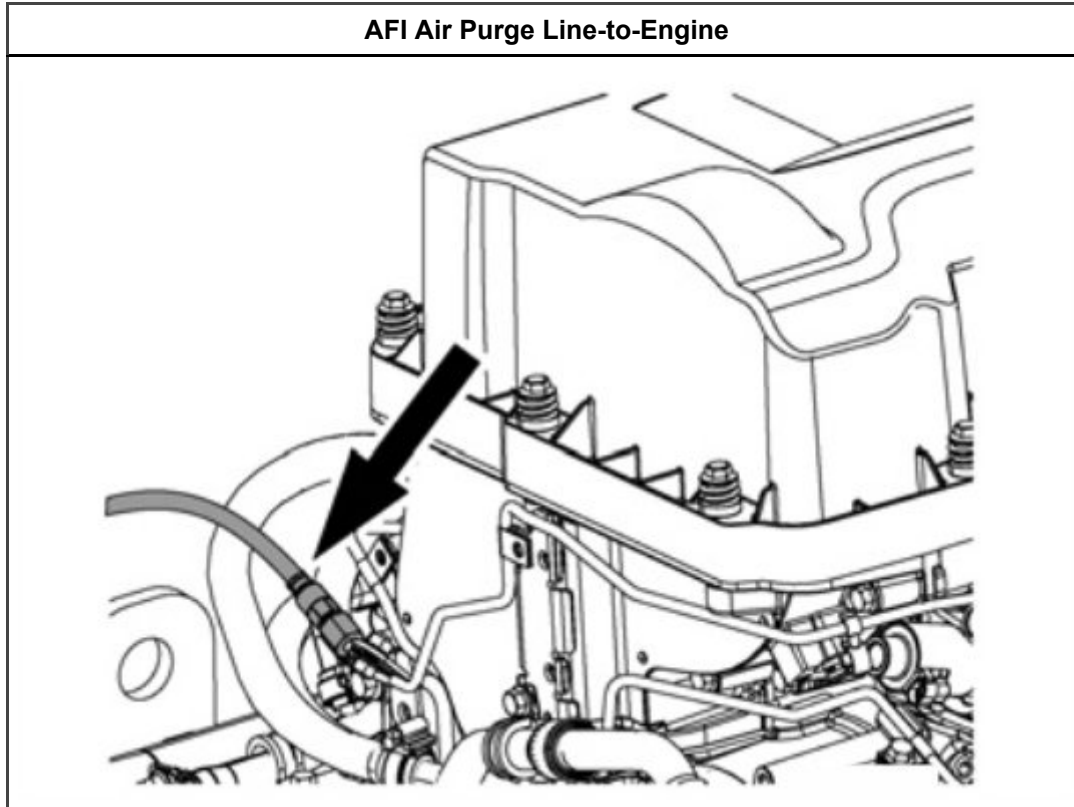


1. Supply Fitting

2. Delivery Fitting

31. Locate and cut the air line that supplies the discharge recirculation valve at the frame-mounted pressure protection manifold, and then install a tee fitting (part number 8397804).
32. Connect a length of the tan flexible air line (part number 85115881) between the tee fitting and the air regulator supply port.
33. Connect a length of white flexible air line (part number 85115880) between the air regulator delivery port and the air line hard pipe on the engine.

Note: Removal of the center floor panel from the cab may allow easier access when routing the air line under the cab.



34. Secure the flexible air lines with tie wraps (part number 980464).
 35. Using two new gaskets (part number 21021846), install the exhaust pipe and flex to the diffuser.
 36. Tighten the two-way check valve on the AFI and the air and fuel line fittings to the following specifications:
 - Two-way check valve: 15 N•m (135 in-lb)
 - Fuel line: 15 N•m (135 in-lb)
 - Air line: 27 N•m (235 in-lb)
 37. Install the air filter housing and fresh air pipe.
 38. Reinstall the cab center floor panel if it had been removed to aid in routing the air line under the cab.
 39. Install all previously removed cables to the ground (negative) battery terminals.
 40. Start the engine and build air pressure to operating pressure. Check the air and fuel systems for leaks and proper operation.
 41. Install the engine cover.
 42. Use VCADS/Tech Tool to upload the software accessory kit for the AFI upgrade (part number 85115992), and then perform the MID128 EECU reprogramming.
- Note: There is no charge for the EECU download if the accessory kit is uploaded before the MID128 EECU reprogramming.*
43. Use VCADS/Tech Tool to reset AFI adaptive factor and clear all codes.
 44. To verify proper function of the air purge system, use VCADS/Tech Tool to perform a partial service regeneration. During the service regeneration, monitor the Inlet Temperature and Aftertreatment Catalyst Temperature (using the Diesel Particulate Filter Regeneration operation). When the temperatures reach approximately 260°C (500°F), stop the service regeneration.
 45. When the DPF reaches the proper temperature (260°C [500°F]), the Aftertreatment Injector Status should indicate 100% duty cycle, and the status should say "Air-Purging."

For additional information concerning the system, or if the system does not seem to be functioning properly, refer to **Guided Diagnostics**. This information can be accessed in the following manner:

- a. In **Guided Diagnostics** go to the Symptoms tab and select “Aftertreatment/Service regeneration failure.”
- b. Under the Fault Code and Symptom Analysis tab, select “Exhaust Aftertreatment, Symptom diagnostics.”
- c. Under the Diagnostics Analysis tab, select “Service regeneration failure.”
- d. Under the Diagnostics tab, select “Aftertreatment fuel system check.”
- e. If asked whether or not the vehicle is equipped with an AFI air purge system, Enable AFI air purge, select “yes.”
- f. Select “Aftertreatment Air Purge System Check.”
- g. Select “AFI Air Purge System, Function check” to test the system.

46. After shutdown, replenish fluids as necessary.

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Technical Service

Mack Trucks, Inc. engages in a continuous program of testing and evaluating to provide the best possible product. Mack Trucks, Inc., however, is not committed to, or liable for updating existing chassis.