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## Service Information Bulletin

SUBJECT	DATE
Aftertreatment System	December 2018

### Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0190	GHG17 DD HD	Removal of the 1-BOX™ from the Vehicle	Updated GHG17 HD procedures
		Installation of the 1- BOX™ to the Vehicle	
		Removal of the Diesel Exhaust Fluid Lines	
		Installation of the Diesel Exhaust Fluid Lines	



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## 2 Removal of the 1-BOX™ from the Vehicle

Table 1.

Service Tools Used in the Procedure		
Tool Number	Tool Name	Tool Graphic
Locally Sourced	ATD Lifting Device	 d140702a
W060589003100 or DSN0ATZ17001	ATD Lifting Adapter	 d140701

Remove as follows:

**NOTICE:** To prevent Diesel Exhaust Fluid (DEF) flow issues, take note of the routing of the DEF lines. If removed, they **MUST** be installed according to manufacturer's specifications to avoid DEF flow issues and leaks.

**NOTICE:** Wait at least five minutes after shutting down the engine to disconnect the DEF lines.



**WARNING: PERSONAL INJURY**

To avoid injury, never remove any engine component while the engine is running.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

1. Shut off engine and apply the parking brake, chock the wheels, and perform any other applicable safety steps.



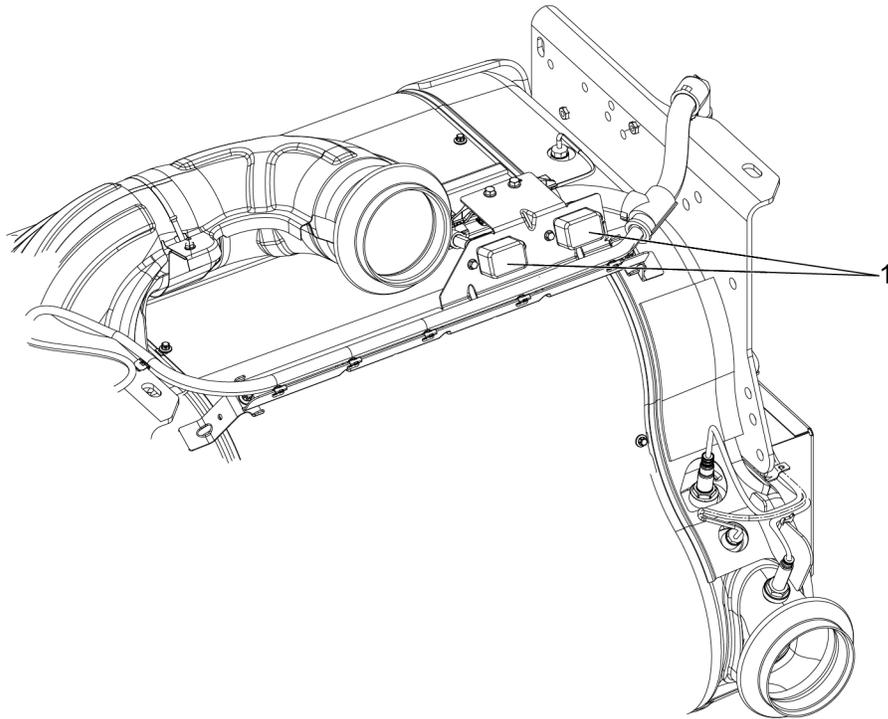
**CAUTION: ELECTRICAL SHOCK**

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

2. Disconnect the batteries. Refer to OEM procedures.
3. If necessary, remove the passenger side fairing. Refer to OEM procedures.
4. Allow the Aftertreatment System (ATS) time to cool.

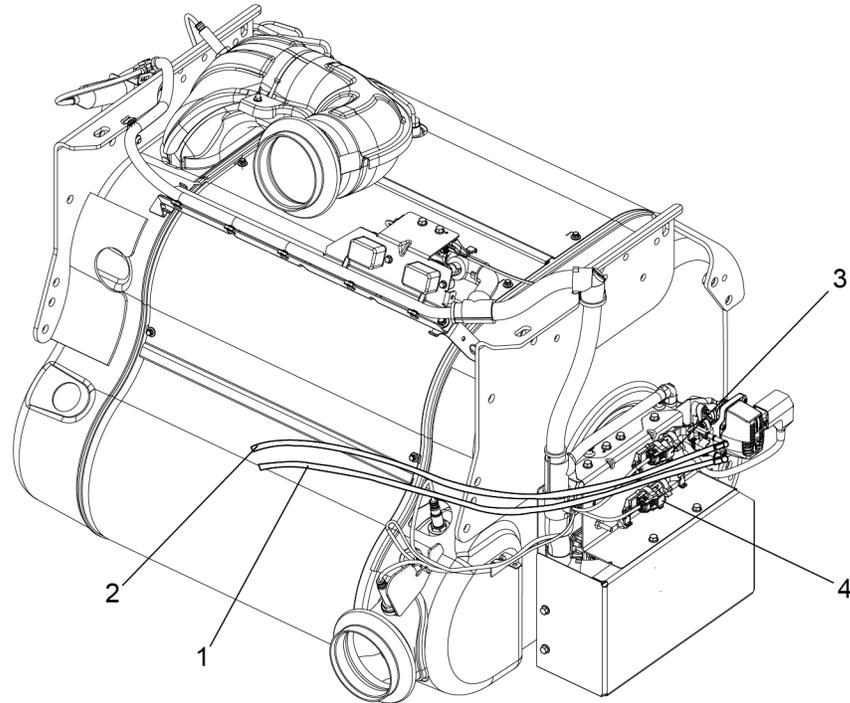
**NOTE:** The exhaust clamps are directional. Record the location of the clamps for installation.

5. Disconnect the exhaust system inlet pipe by loosening the clamp and relocating the inlet pipe away from work area. Discard the gasket.
6. Disconnect both 18-pin electrical connectors (1) by squeezing the sides and pulling each connector away from the mounting bracket.



d140513

7. Disconnect the exhaust system outlet pipe by loosening the clamp and relocating the outlet pipe away from work area. Discard the gasket.
8. Note the location and orientation of the DEF pressure electrical connectors and disconnect the DEF pressure (3) and return (4) line heater electrical connectors at the DEF dosing unit.



d140529

**NOTICE:** To disconnect a DEF line, push the line coupling in towards the male connector to move the holding clip to the unlocked position. Then compress the prongs of the holding clip and pull the line off of the male connector. Failure to properly remove a DEF line can result in damage to a line coupling or DEF port.

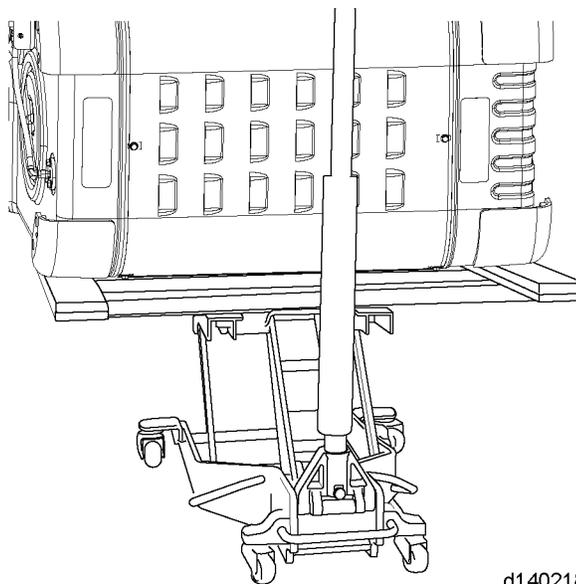
9. Note the location and orientation of the DEF lines and disconnect the DEF pressure (2) and return line (1) from the DEF dosing unit.
10. Disconnect the DEF line mounting bracket nut from the 1-BOX™.



**WARNING: PERSONAL INJURY**

To avoid injury when removing or installing a heavy engine component, ensure the component is properly supported and securely attached to an adequate lifting device to prevent the component from falling.

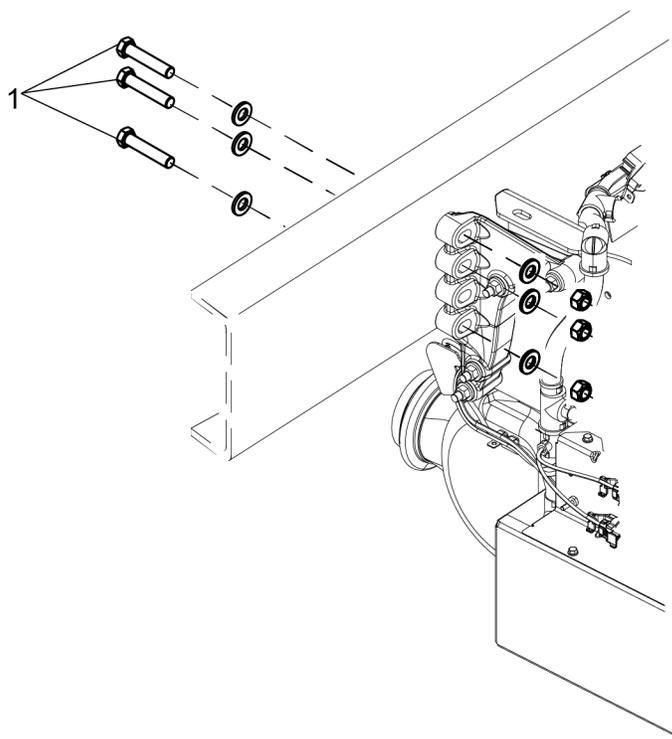
11. Using the ATD lifting device W060589003100 along with the lifting jack TLZ-00785, lightly position the lifting device under the 1-BOX so that the lifting bars are under the outer tanks without enough force to lift the 1-BOX or the vehicle. Attach the safety strap to the lifting device.



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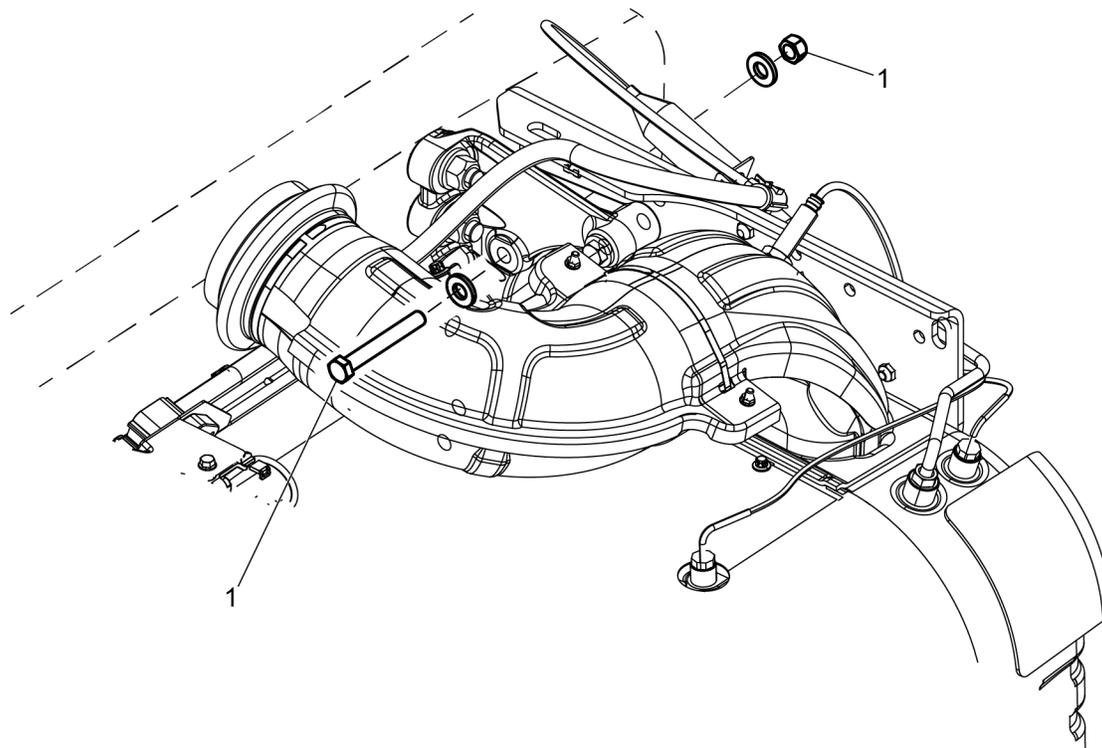
**NOTICE:** The front mounting bracket **MUST** stay attached to the frame; failure to do so can result in damage to the 1-BOX.

12. Remove the three bolts (1) and nuts attaching the 1-BOX rear mounting bracket to the vehicle frame rail.



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13. Remove the four bolts and nuts (1) attaching the 1-BOX to the front mounting bracket. **DO NOT** remove the three bolts attaching the front mounting bracket to the frame.



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14. Using tool W060589003100, carefully lower the 1-BOX away from the vehicle ensuring that all exhaust, air, and electrical harness connections have been disconnected and that the 1-BOX is free from the vehicle.

### 3 Installation of the 1-BOX™ to the Vehicle

Table 2.

Service Tools Used in the Procedure		
Tool Number	Tool Name	Tool Graphic
Locally Sourced	ATD Lifting Device	 d140702a
W060589003100 or DSN0ATZ17001	ATD Lifting Adapter	 d140701

Installation as follows:

If the 1-BOX™ is being replaced with a new 1-BOX, perform the following. If not, Go to step 4.

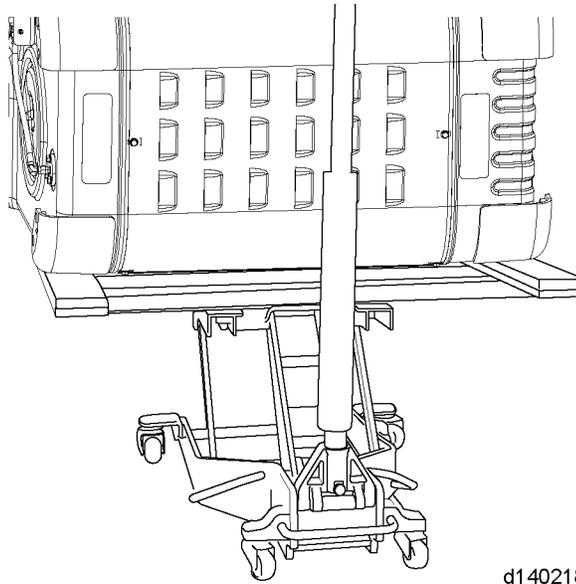
1. Transfer rear mounting bracket over to the new Aftertreatment Device (ATD) and hand tighten the bolts.
2. Transfer all parts over to new ATD.
  - ATS Harness Bridge and Harness
  - Front Sensor Bracket
  - Temperature, Pressure, NOx and Soot Sensors
  - Diesel Exhaust Fluid Dosing Unit
  - Aftertreatment Control Module (ACM) and Cover
  - Diesel Particulate Filters
  - Pressure Sensor Tube
  - 1-BOX heat shields
3. Clean the gasket surfaces and install new gaskets onto the 1-BOX™ exhaust inlet and outlet.



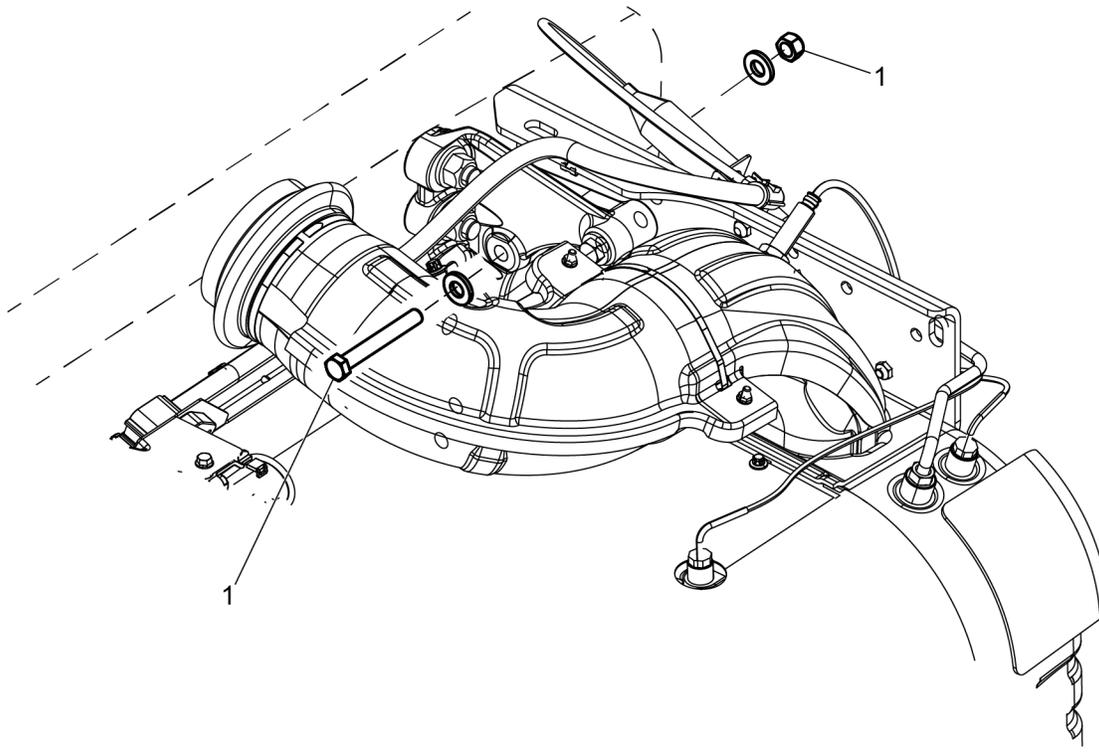
**WARNING: PERSONAL INJURY**

To avoid injury when removing or installing a heavy engine component, ensure the component is properly supported and securely attached to an adequate lifting device to prevent the component from falling.

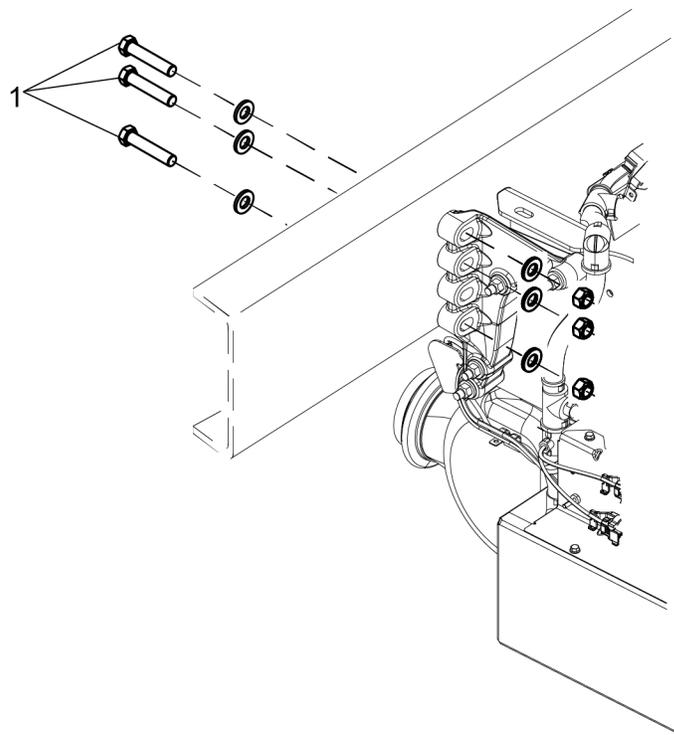
4. Using ATD lifting device W060589003100, carefully raise the 1-BOX to the vehicle frame and align the 1-BOX mounting brackets to the holes in the vehicle frame.



5. Install the four bolts and nuts (1) on the front mounting bracket, attaching the 1-BOX to the front mounting bracket. Hand-tighten the bolts.

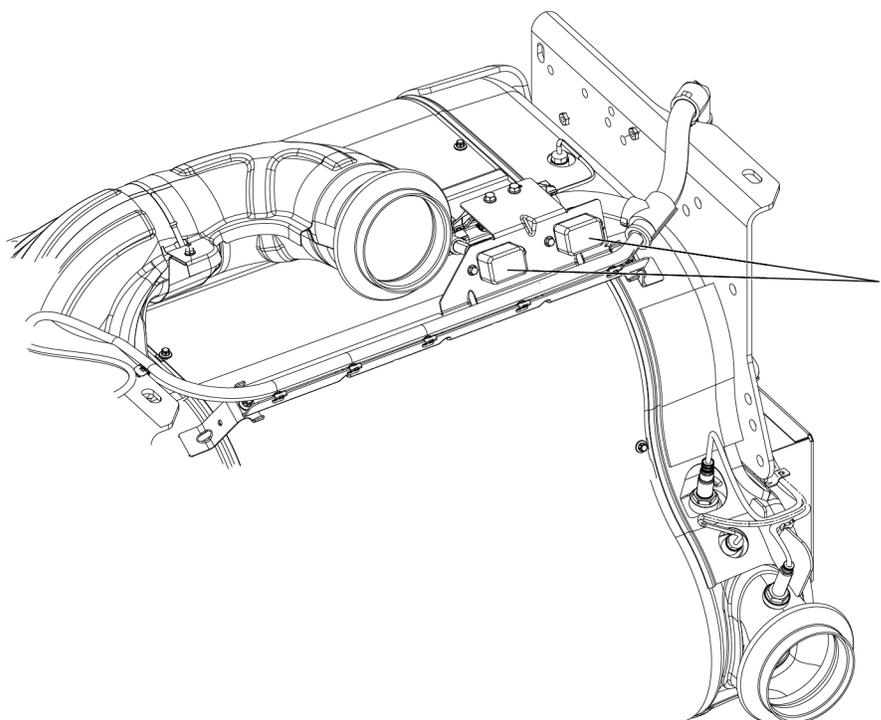


6. Install the three bolts (1) and nuts attaching the rear mounting bracket to the vehicle frame. Torque to 174 N·m (128 lb·ft).



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7. Torque the front side mounting bracket bolts and nuts to 87 N·m (64 lb·ft).
8. Connect both 18-pin electrical connectors (1).

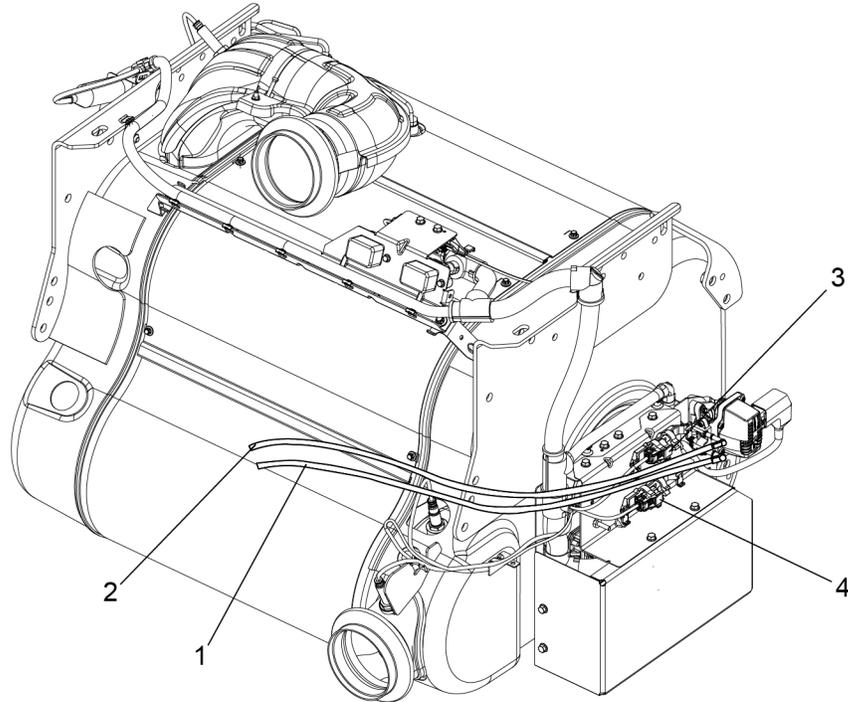


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**NOTICE:** To connect a Diesel Exhaust Fluid (DEF) line, push the line coupling onto the DEF port male connector, then pull back gently on the coupling to engage the holding clip in the locked position.

9. Ensure that the DEF pressure and return lines are routed correctly under the frame rail of the vehicle.

10. Connect the DEF pressure (2) and return lines (1) to the DEF dosing unit.



d140529

11. Connect the DEF pressure (3) and return line (4) heater electrical connectors at the DEF dosing unit.
12. Attach the DEF line mounting strap and nut to the 1-BOX.

**NOTE:** The exhaust system outlet pipe clamps are directional; verify correct installation.

13. Connect the exhaust system outlet pipe by installing the clamp. Torque to 9-10 N·m (79-88 lb·in.).
14. Connect the exhaust system inlet pipe by installing the clamp. Torque to 9-10 N·m (79-88 lb·in.).



**CAUTION: ELECTRICAL SHOCK**

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

15. Connect the batteries. Refer to OEM procedures.
16. Check for any leaks.
17. If removed, install the passenger side fairing. Refer to OEM procedures.

## 4 Removal of the Diesel Exhaust Fluid Lines

Remove as follows:



**WARNING: PERSONAL INJURY**

To avoid injury, never remove any engine component while the engine is running.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

**NOTICE:** When required, discard fluids in accordance with Environmental Protection Agency (EPA) regulations.

1. Shut off engine and apply the parking brake, chock the wheels, and perform any other applicable safety steps.



**WARNING: PERSONAL INJURY**

To avoid injury, never remove any engine component while the engine is running.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

2. Disconnect the batteries. Refer to Original Equipment Manufacturer (OEM) procedures.



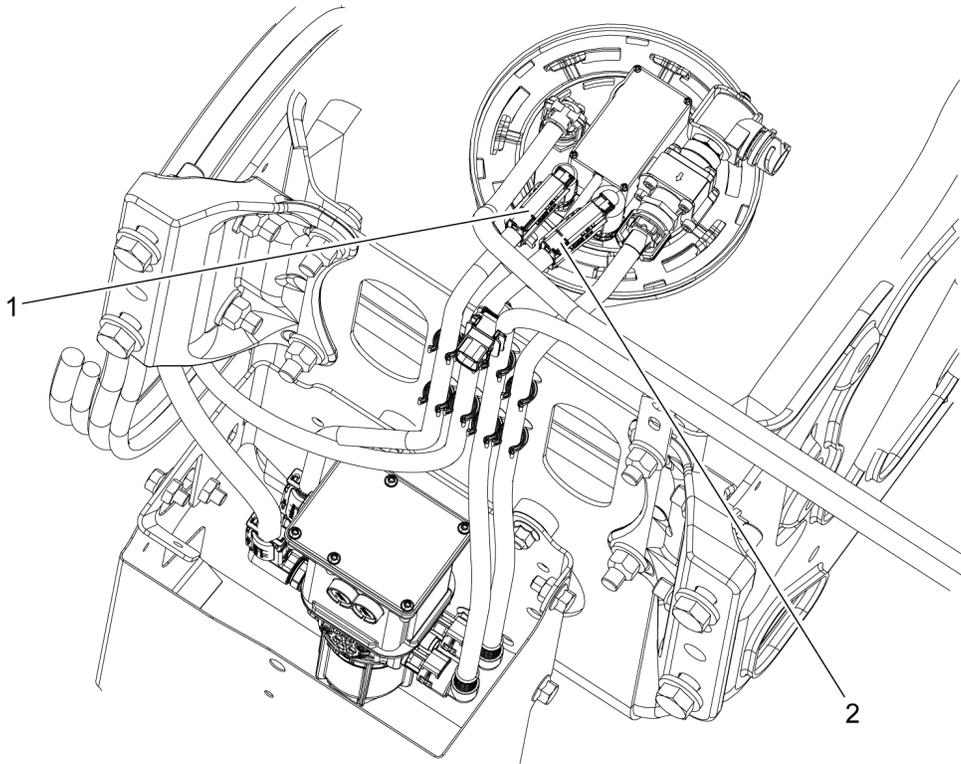
**CAUTION: ELECTRICAL SHOCK**

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

3. If necessary, remove the side fairing. Refer to OEM procedures.
4. Place drain pans underneath the Diesel Exhaust Fluid (DEF) pump to catch any draining fluids.

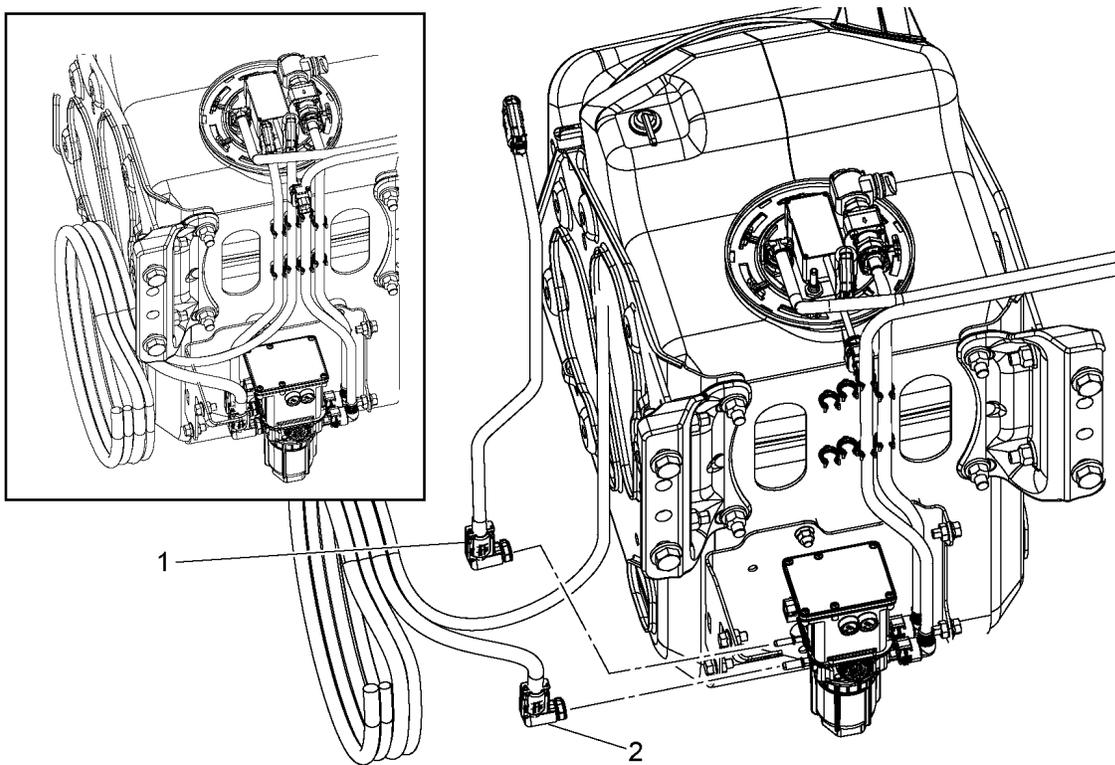
**NOTICE:** To disconnect a DEF line, push the line coupling in towards the male connector to move the holding clip to the unlocked position, then compress the prongs of the holding clip and pull the line off of the male connector. Failure to properly remove a DEF line can result in damage to a line coupling or DEF port.

5. Disconnect the DEF line heater wiring harnesses at the tank and the pump.
6. Note the location and orientation of the DEF lines and disconnect the DEF suction line (1) and the DEF return line (2) at the DEF tank header.



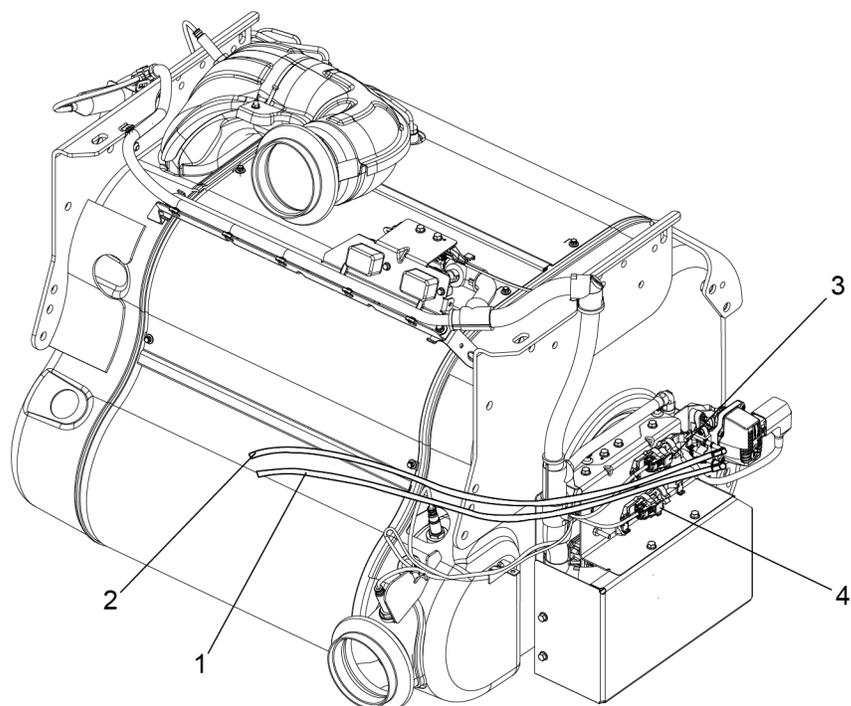
d140382d

7. Note the location and orientation of the DEF lines and disconnect the DEF suction line (1) and the DEF pressure line (2) at the DEF pump.



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8. Note the location and orientation of the DEF pressure electrical connectors and disconnect the DEF pressure (3) and return line (4) heater electrical connectors at the DEF dosing unit and remove from the mounting bracket.



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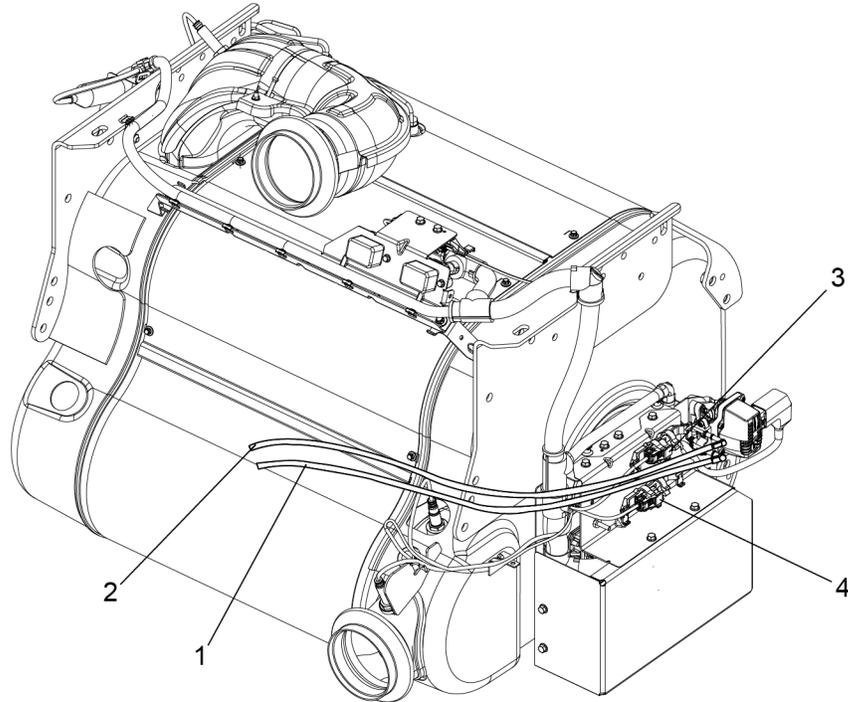
9. Disconnect the DEF pressure line (2) and the DEF return line (1) from the DEF dosing unit.
10. Remove all DEF line mounting points.

## 5 Installation of the Diesel Exhaust Fluid Lines

Install as follows:

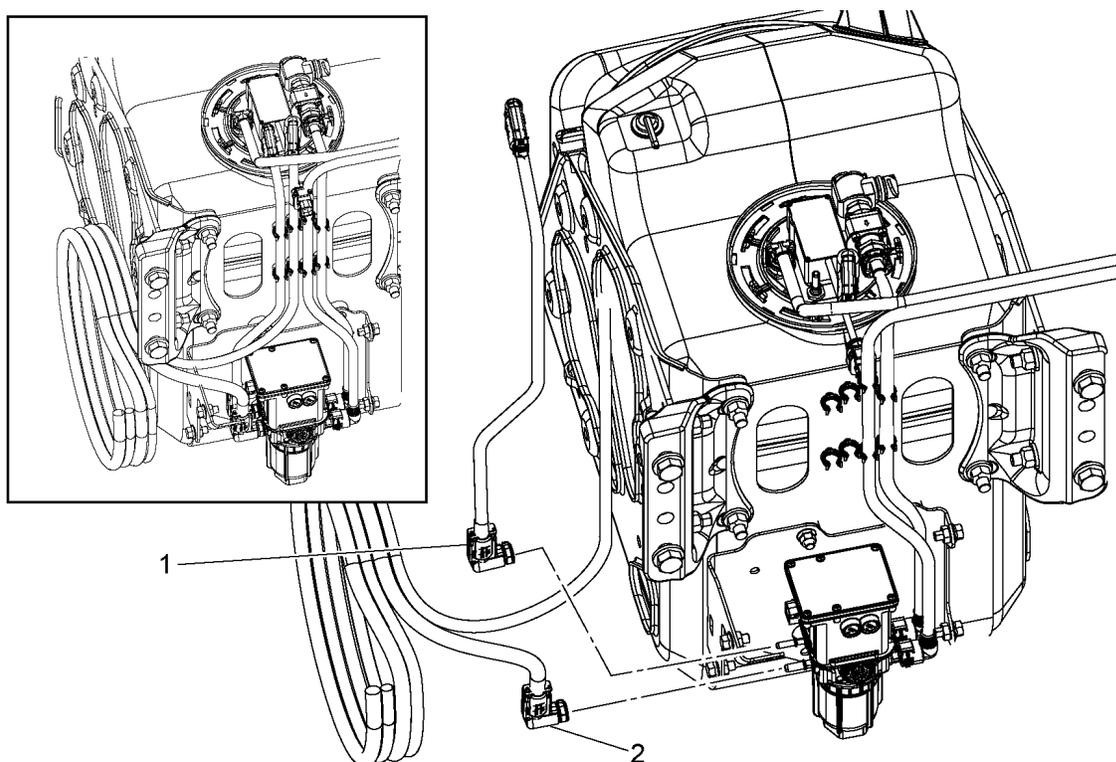
**NOTICE:** To connect a Diesel Exhaust Fluid (DEF) line, push the line coupling onto the DEF port male connector, then pull back gently on the coupling to engage the holding clip in the locked position.

1. Ensure the new DEF lines are undamaged and free of dirt and debris.
2. Remove any white DEF crystals from the DEF ports on the tank header, DEF pump, and dosing unit.
3. Connect the new DEF pressure line (2) and the new DEF return line (1) to the DEF dosing unit.



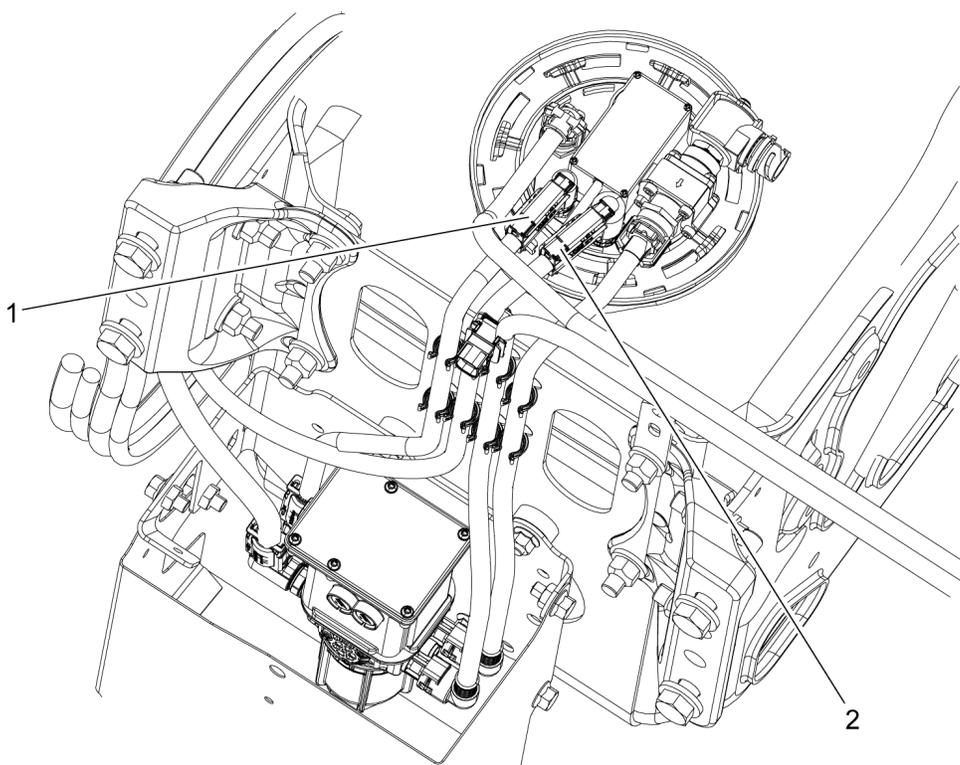
d140529

4. Connect the DEF pressure (3) and return (4) line heater electrical connectors at the DEF dosing unit and install into the mounting brackets.
5. Connect the DEF suction line (1) and the DEF pressure line (2) to the DEF pump. The larger diameter line goes onto the pressure side of the pump.



d140223b

6. Connect the DEF suction line (1) and DEF return line (2) to the DEF tank header.



d140382d

7. Connect the DEF line heater wiring harnesses at the tank and DEF pump.  
 8. Install all removed DEF line mounting points, making sure the DEF lines are properly secure.



**CAUTION: ELECTRICAL SHOCK**

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

9. Connect the batteries. Refer to Original Equipment Manufacturer (OEM) procedures.

**NOTE:** Opening the DEF system can cause DEF from the lines to drain back to the DEF tank. Performing an ADS Priming Function will prime the DEF system and restore proper system operation.

10. Using DiagnosticLink<sup>®</sup>, perform an ADS Priming Function to prime the DEF system and check for leaks.
11. If removed, install the side fairing. Refer to OEM procedures.