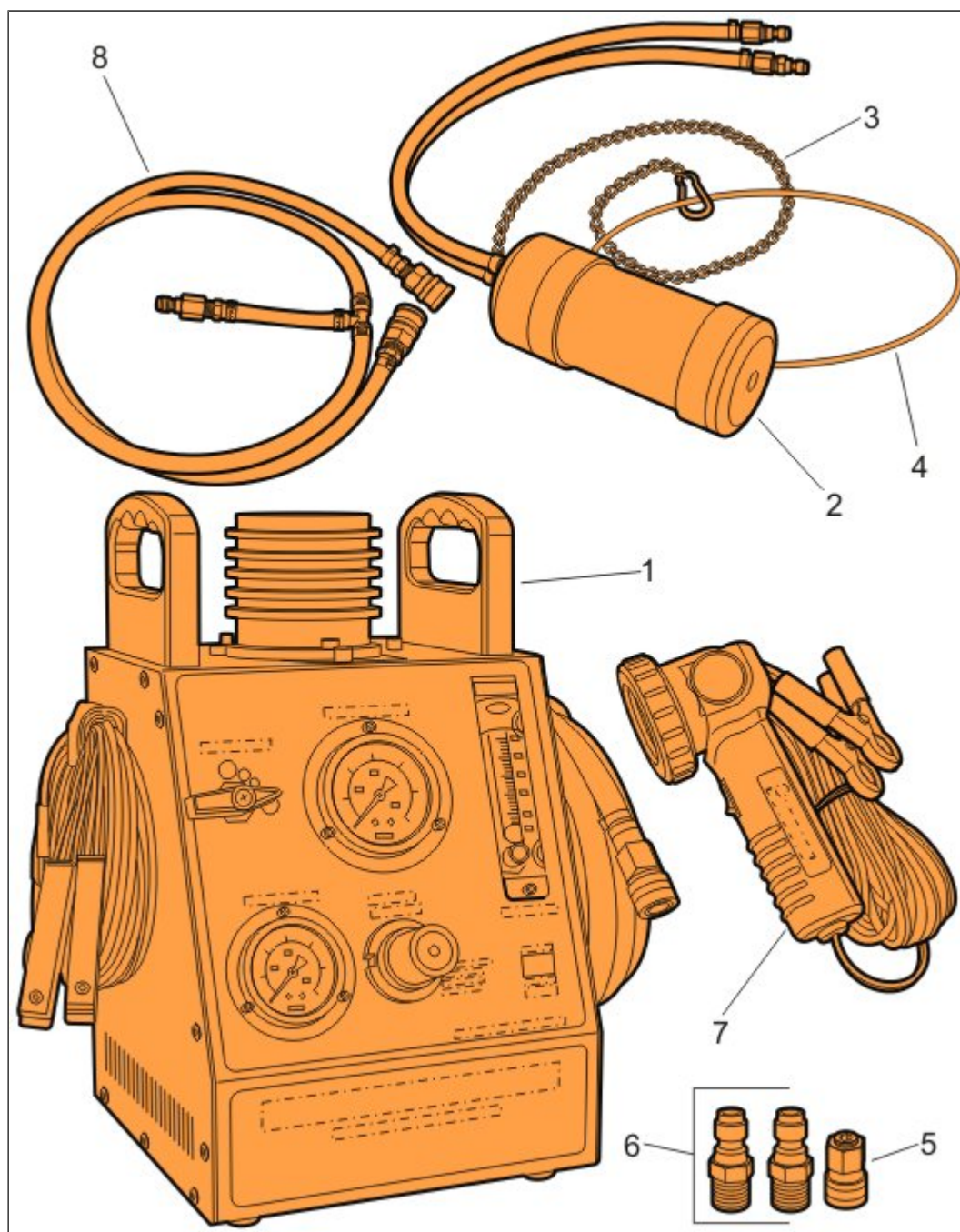


25051-2 Smoke Test for Leak Detection

You must read and understand the precautions and guidelines in Service Information, Function Group 20, "Engine Safety Practices" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.



HD PowerSmoke™ Kit		
Item	Description	QTY
1	PowerSmoke™ Machine	1
2	PowerSmoke™ Seal (with pass through smoke tube)	2
3	Safety Chain	2

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4	Retention Hoop	1
5	Block-Off Plug	1
6	Quick Connect Adaptors	2
7	High Intensity Halogen Inspection Light	1
8	"Y" Tube	1

1

Park the vehicle on a flat and level surface.

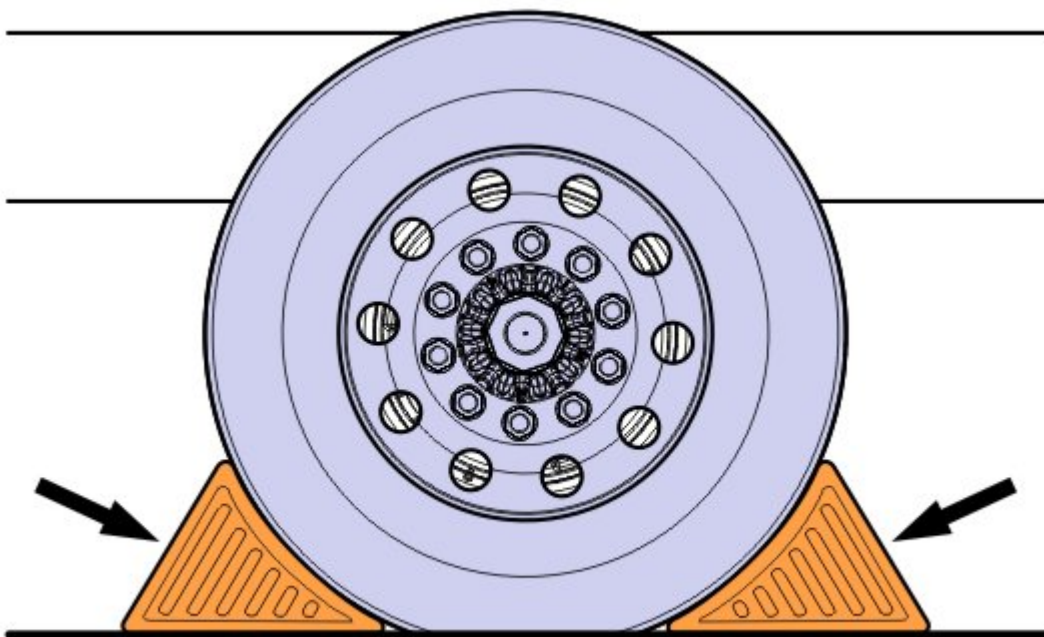
2

Apply the parking brake.

3

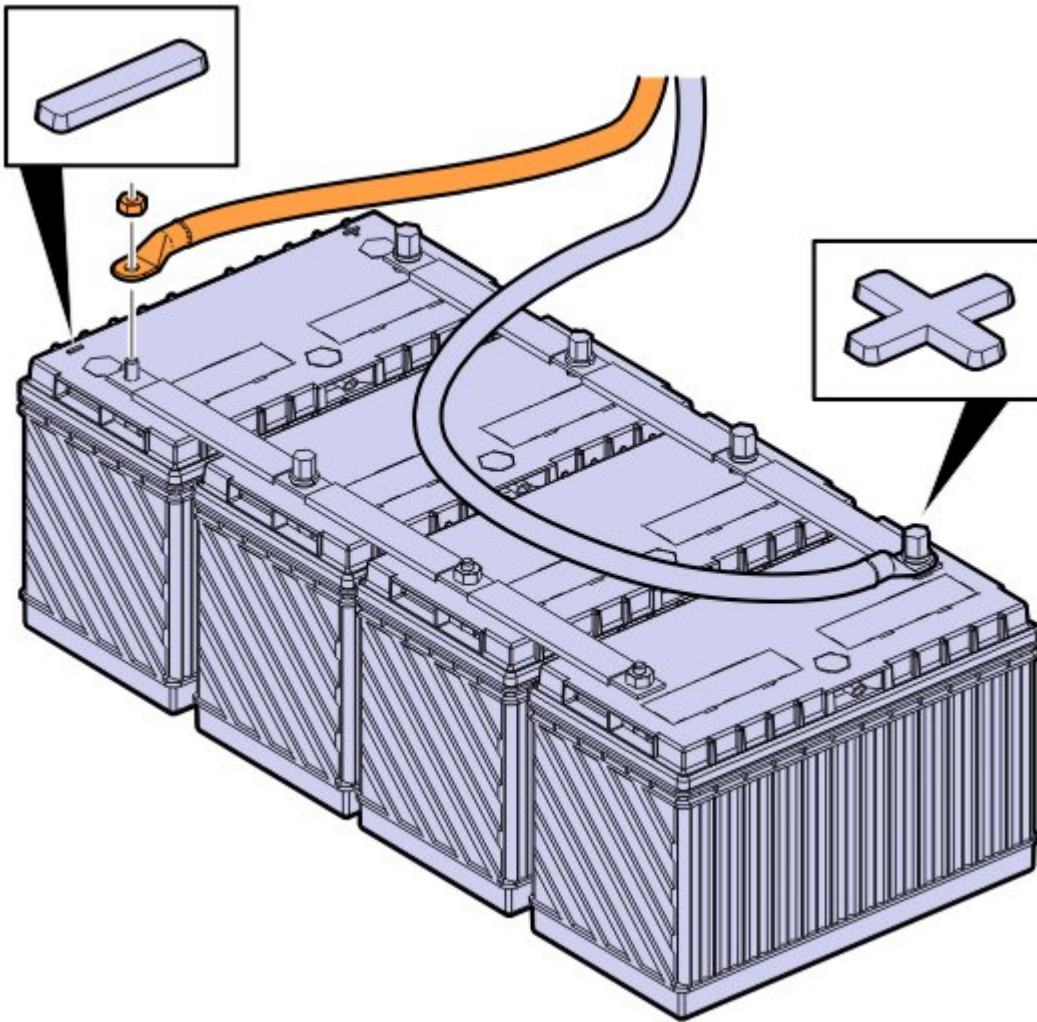
Place the transmission in neutral or park.

4



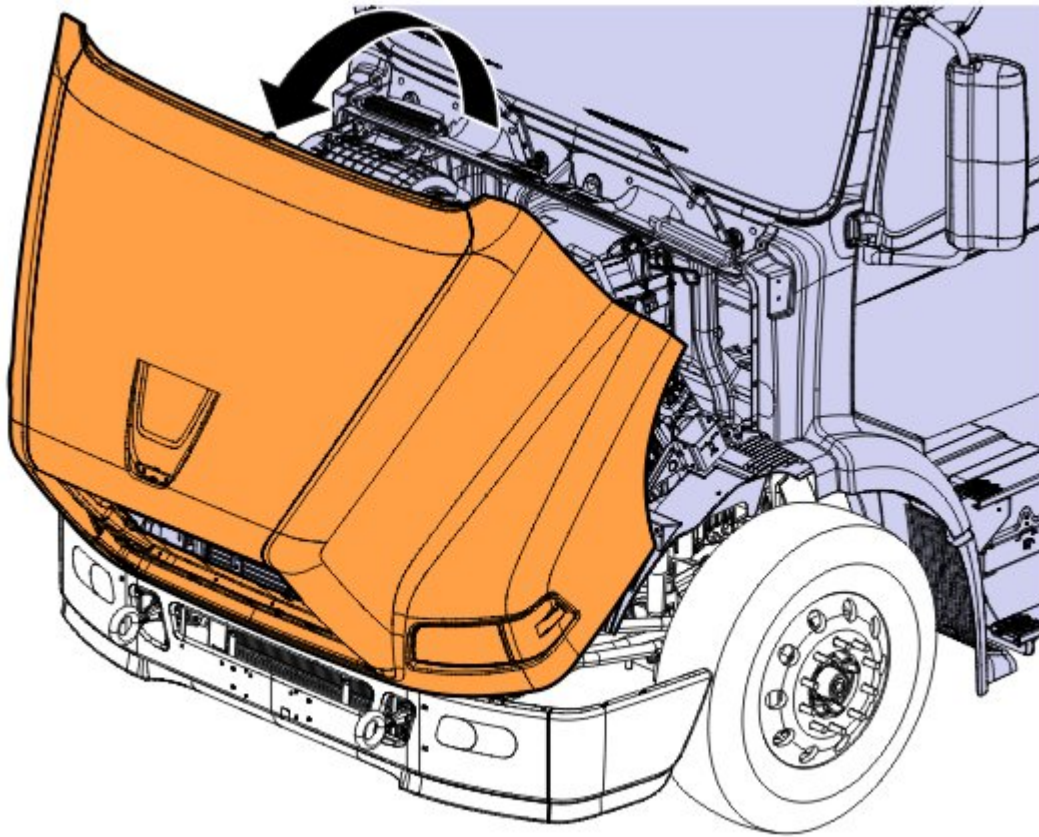
Install the wheel chocks on the rear wheels.

5



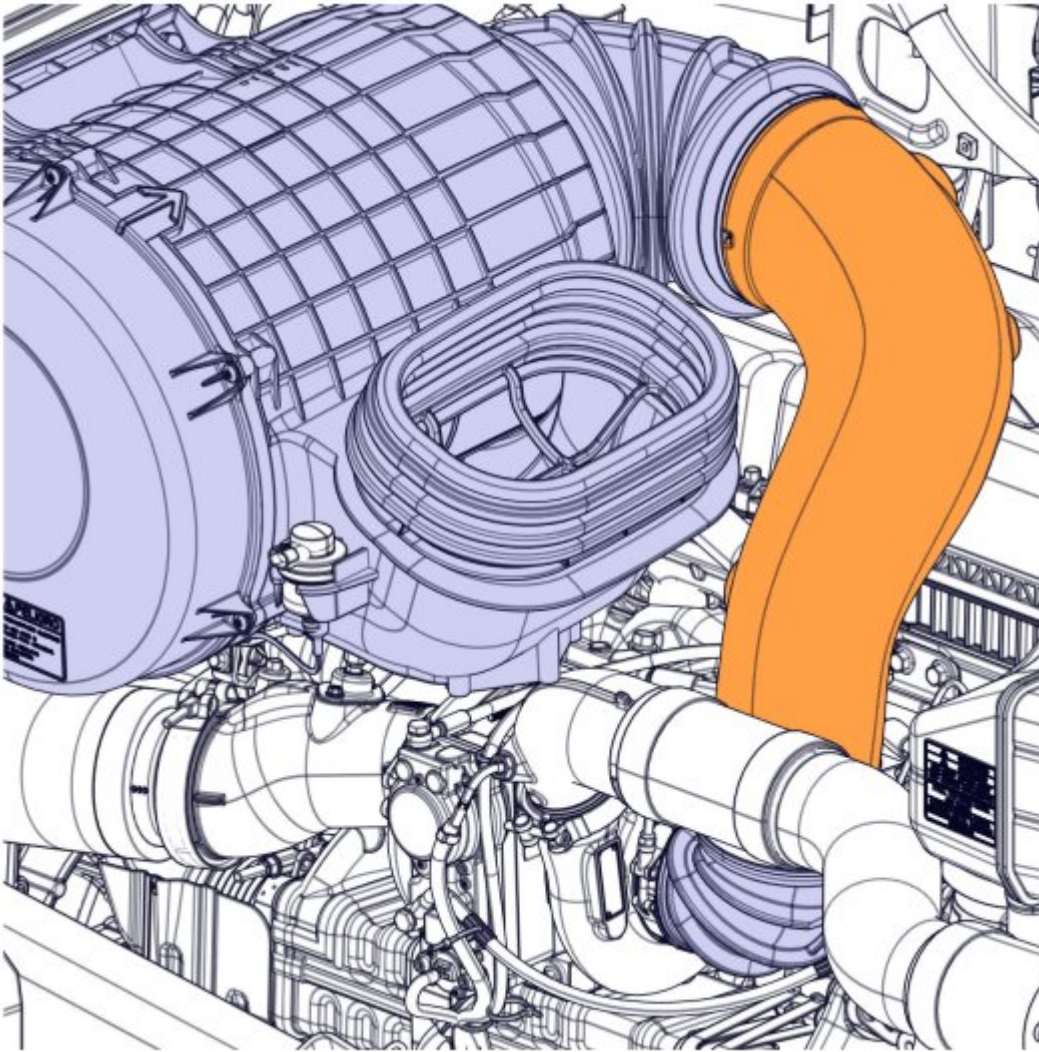
Disconnect the cable from the battery's negative terminal.

6



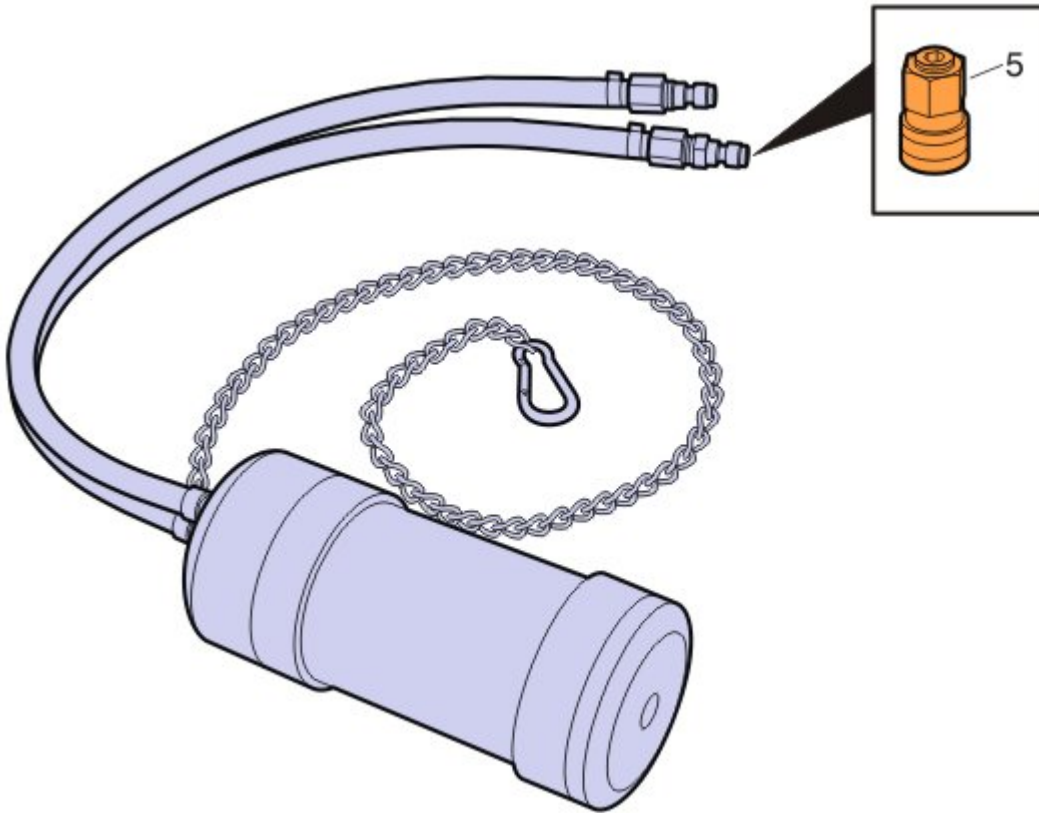
Open the hood.

7



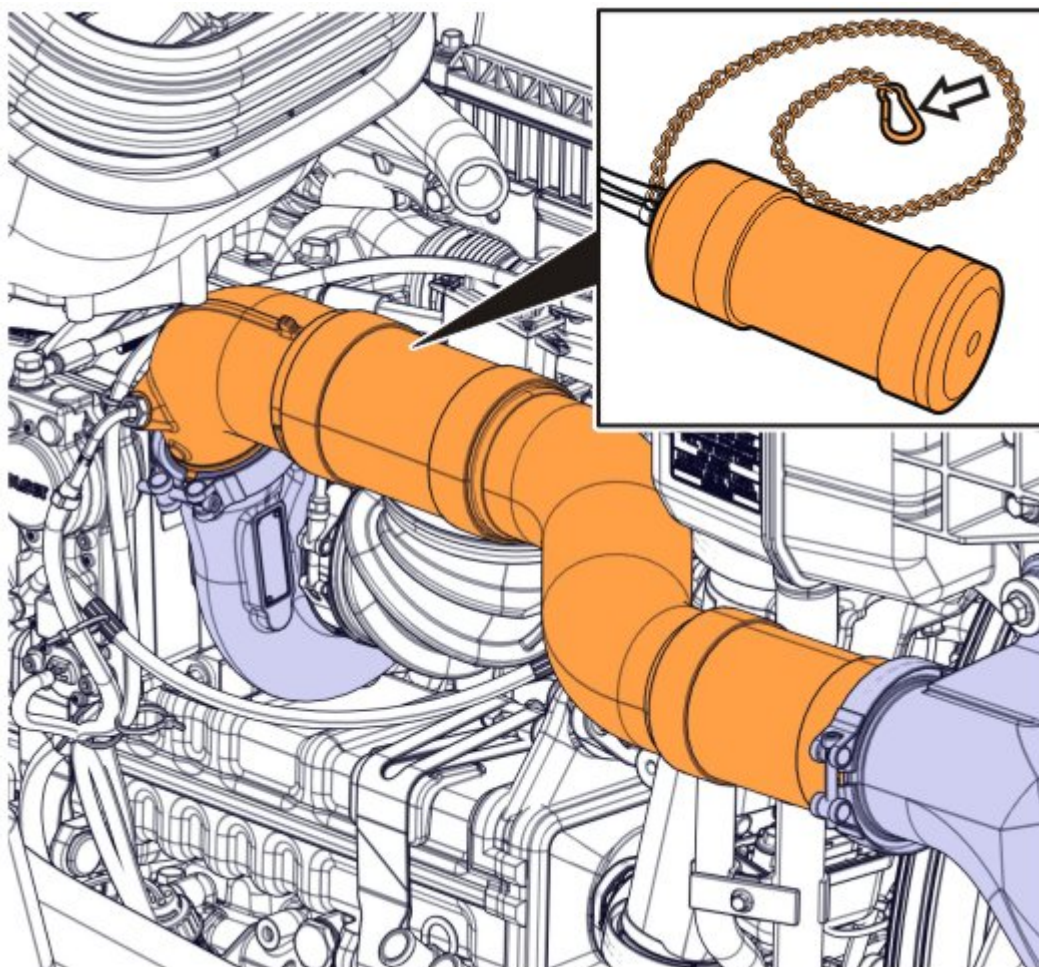
Remove the air intake tube.

8



Install the block off plug (5) onto the air seal pas through smoke tube as shown.

9



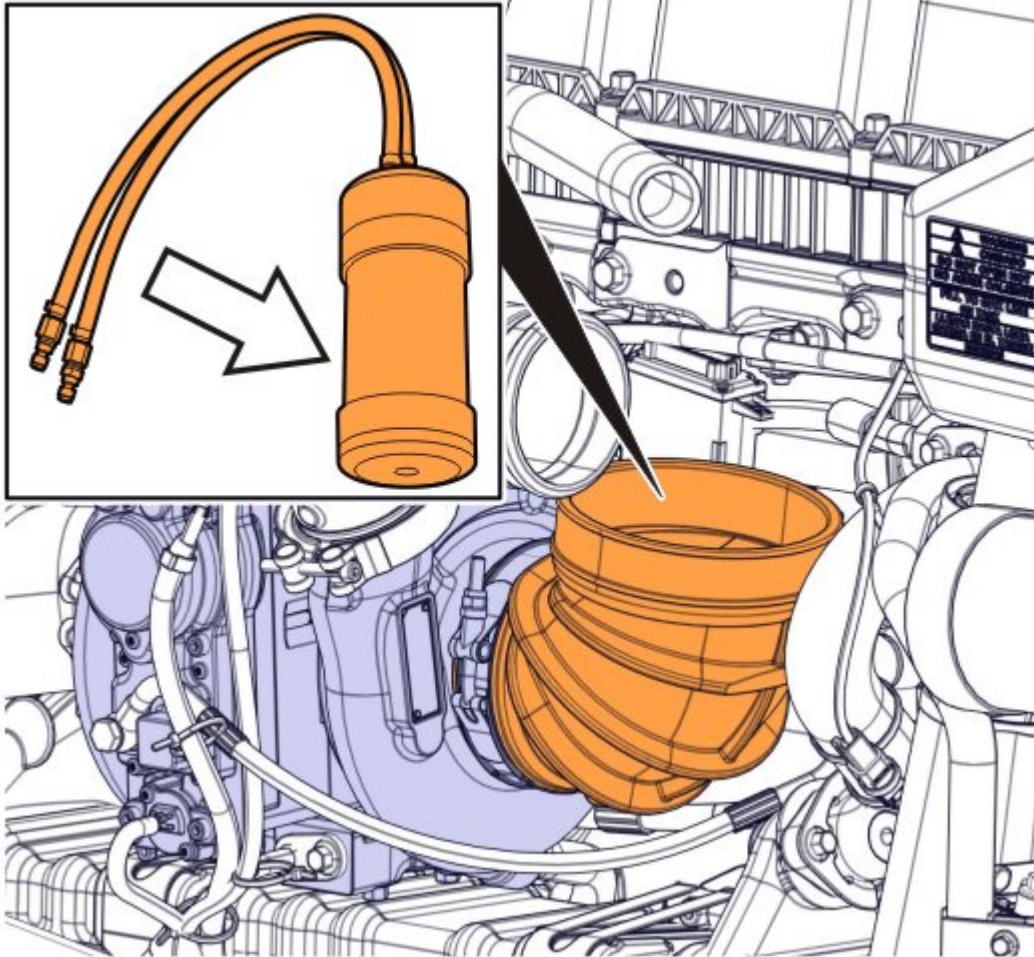
Attach the air seal (2) safety chain (3) to the charge air piping.

10

Insert the air seal into the lower air boot at the engine turbo.

Note: Ensure the clamp on the lower air boot connected to the engine turbo is tight enough to properly seat the air seal.

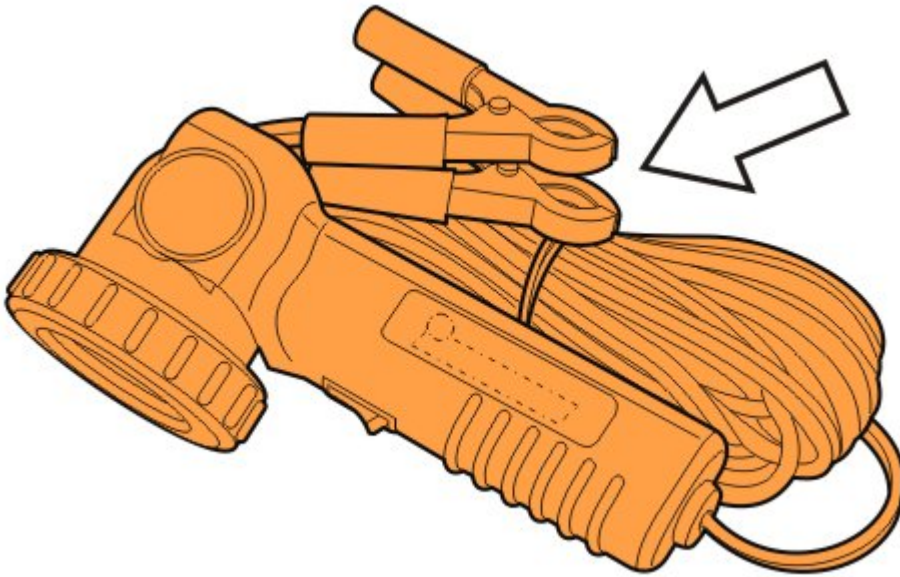
11



Using an air compressor, inflate the air seal until the lower boot is properly sealed off.

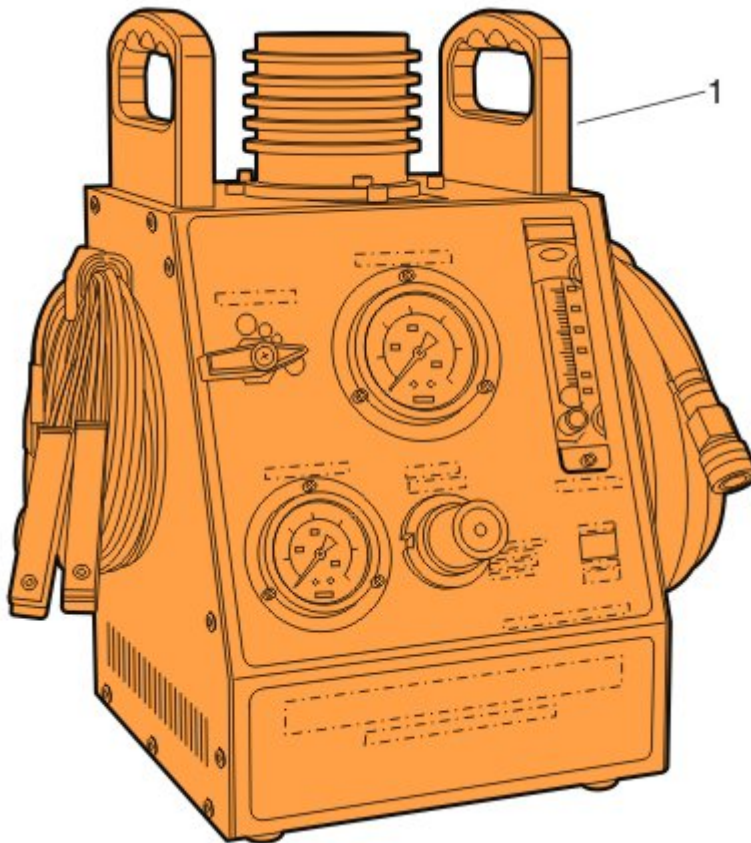
Note: The air seal is equipped with an air supply tube and a pass through smoke tube. Use the air supply tube to inflate the seal.

12



Attach the high intensity flashlight leads to the battery terminals.

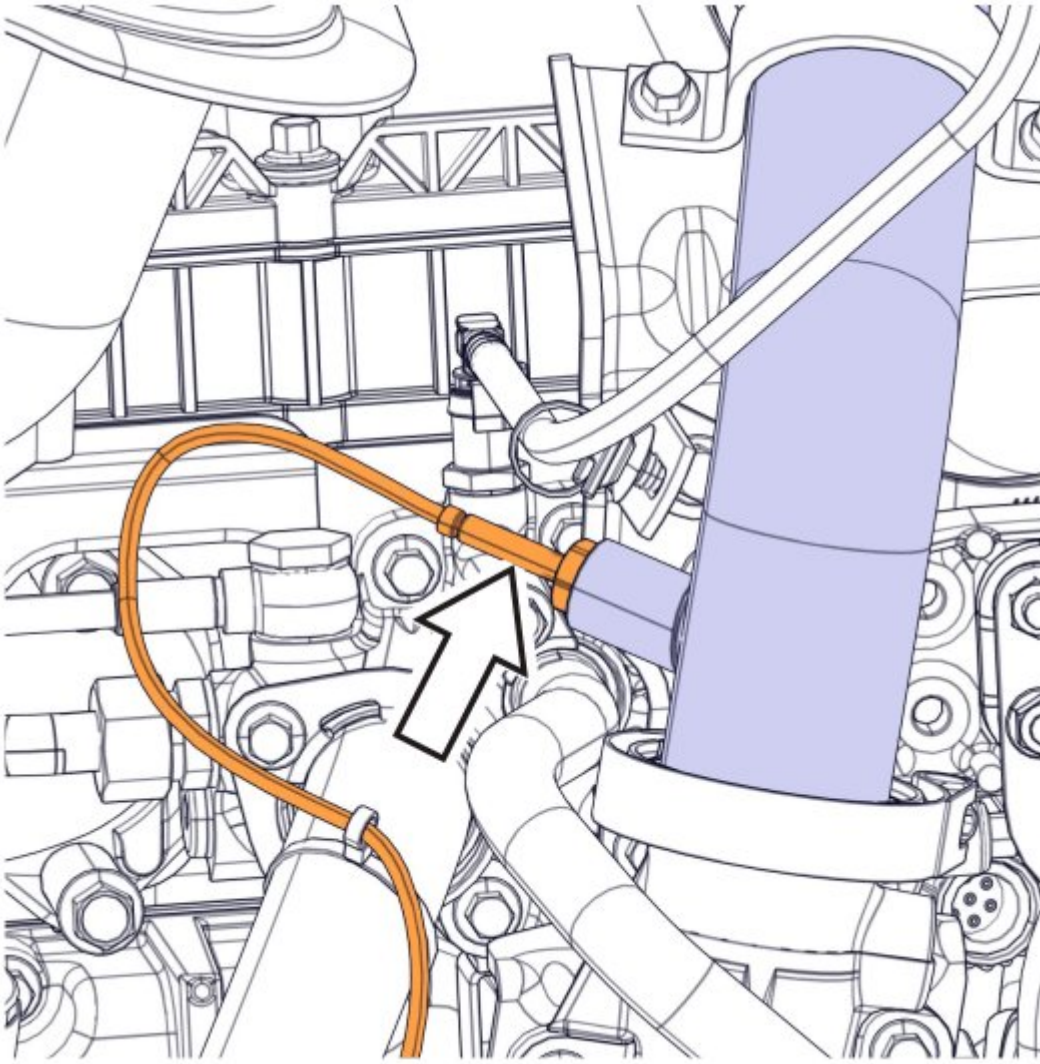
13



Attach the air supply hose to the back of the HD PowerSmoke™ tool (1) and plug the tool into a power supply using the supplied A/C power cord.

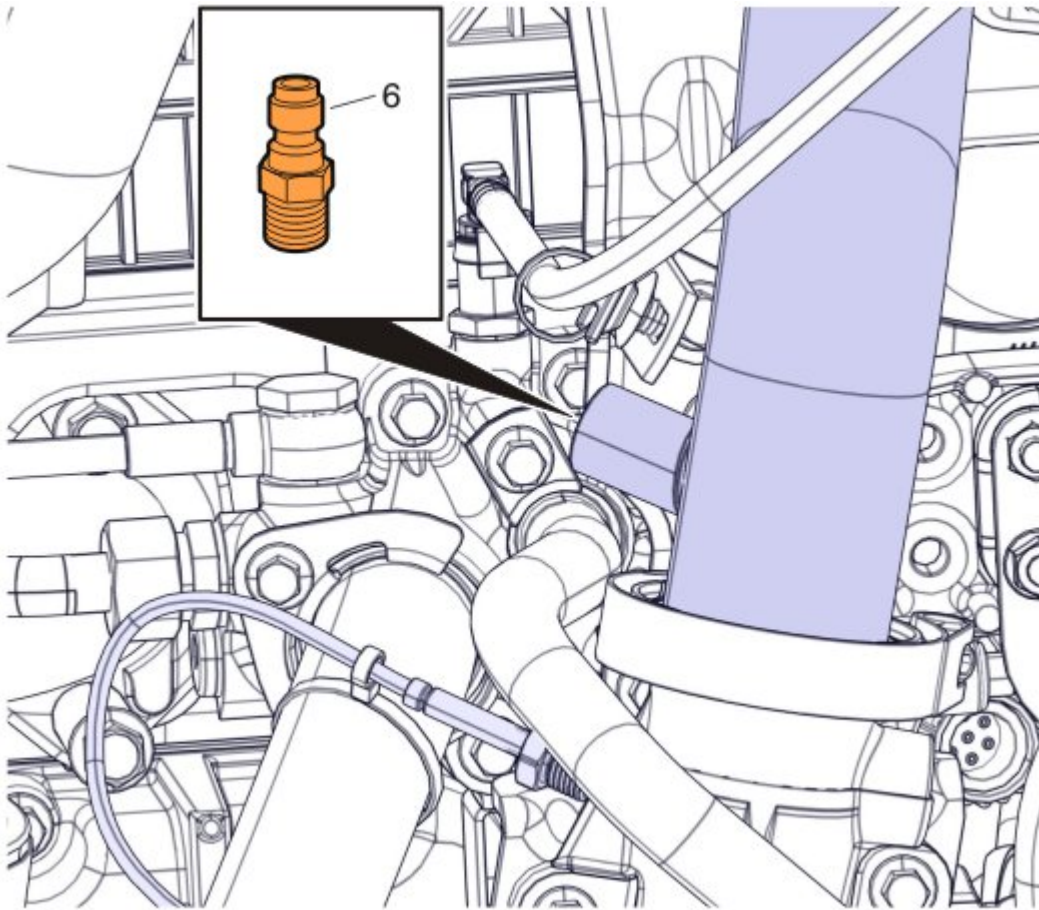
Note: Ensure the polarity is correct or the tool will not operate.

14



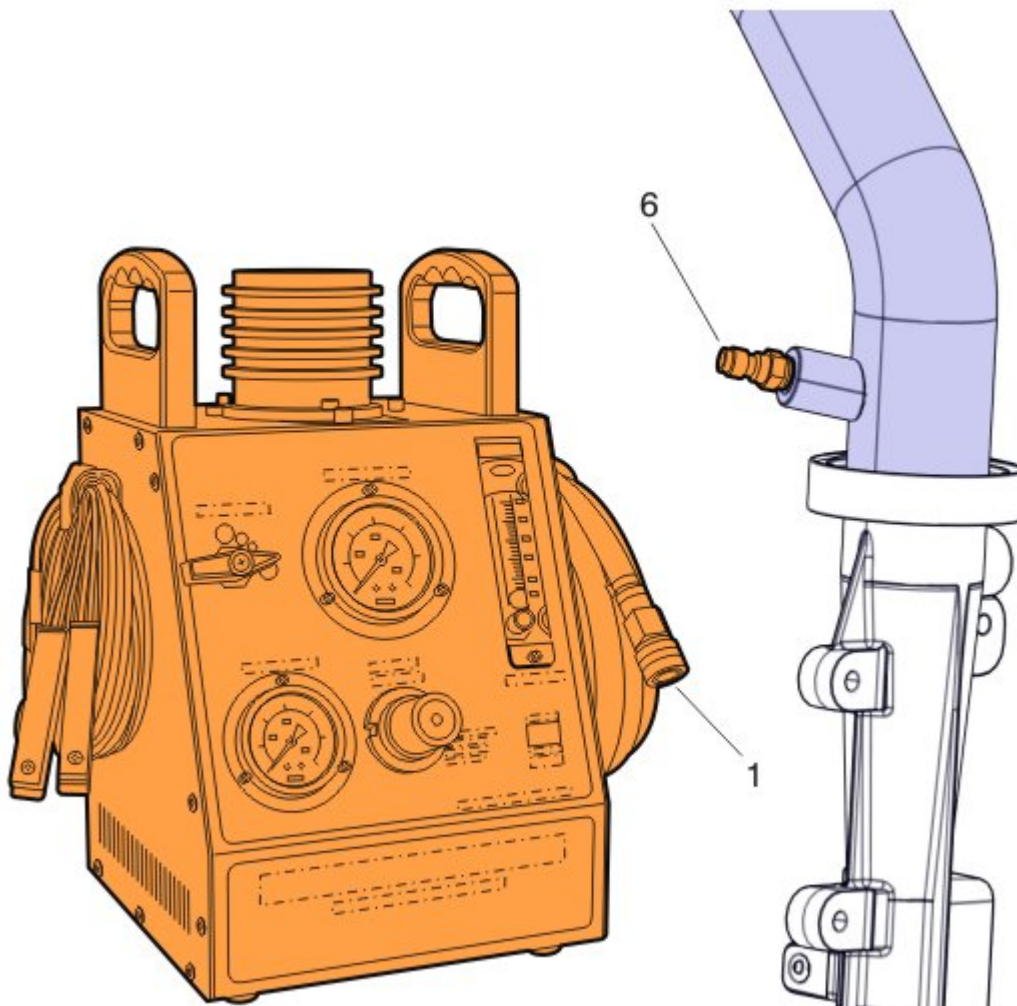
Remove the Exhaust Gas Recirculation (EGR) temperature sensor from the crossover pipe.

15



Install the adapter (6) in the EGR temperature sensor port, and hand tighten the adapter to ensure no leaks are permitted.

16



Attach the HD PowerSmoke™ vapor supply hose (1) to the adapter (6).

17

Activate the PowerSmoke tool. Turn the flow control on. With machine set to 5 PSI, supply vapor to the intake and EGR system to purge system of any fresh air. When vapor is emitted from the connector on the air seal, the system is purged of all fresh air. Install the block off plug onto the air seal at this time.

18

While increasing the pressure as needed, check the intake and EGR system for visible leaks using high intensity flashlight. If no leaks are found within 8 minutes, the system is considered to be leak free.

Note: DO NOT exceed 18 psi during this operation.

19

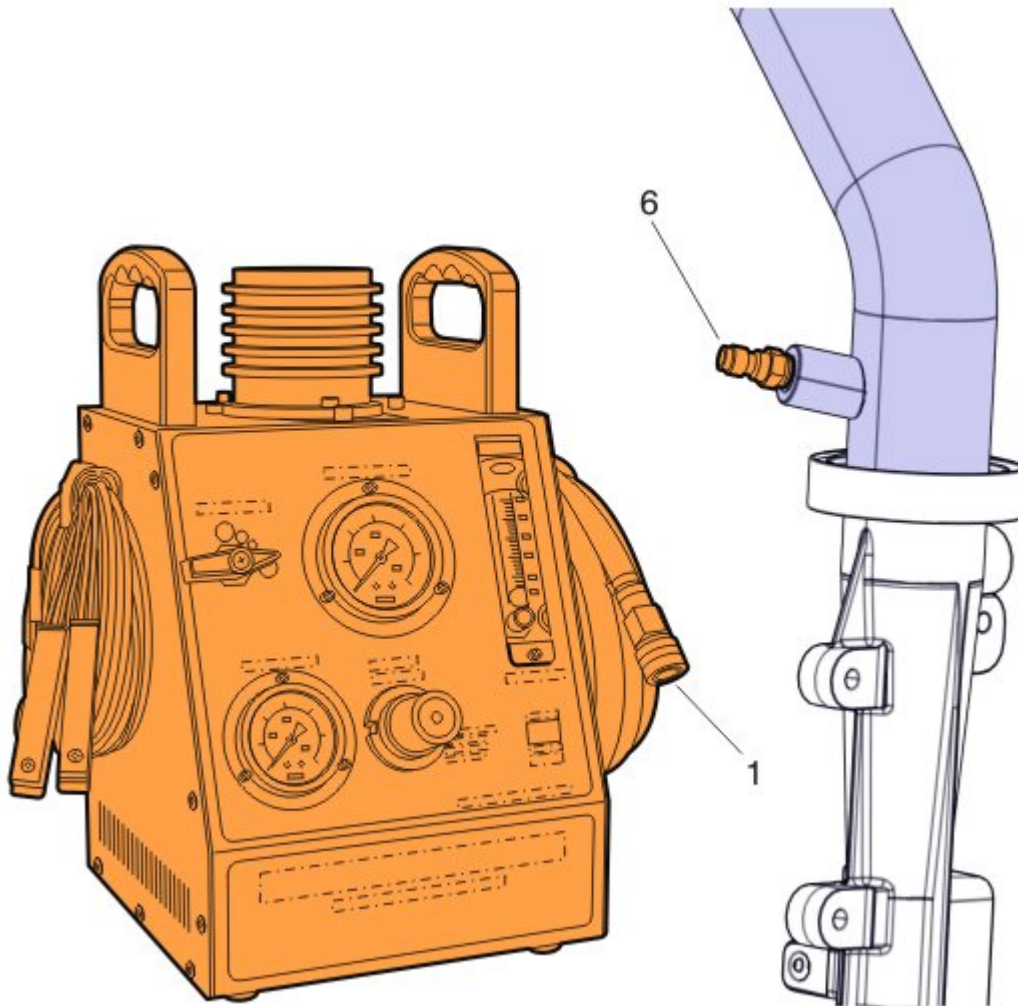
For the remainder of testing, the air seal will be left in the lower air boot.

Note: This begins the exhaust side portion of the leak detection testing.

20

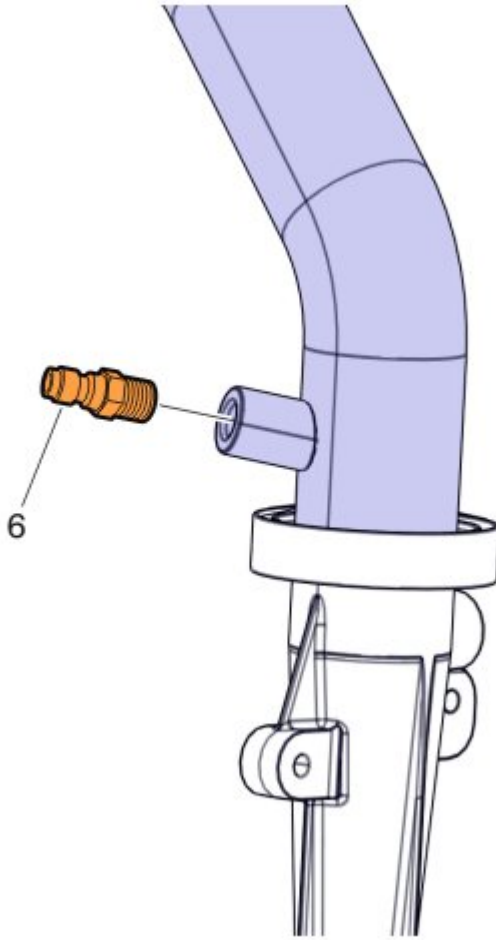
Deactivate the HD PowerSmoke™ tool at this time.

21



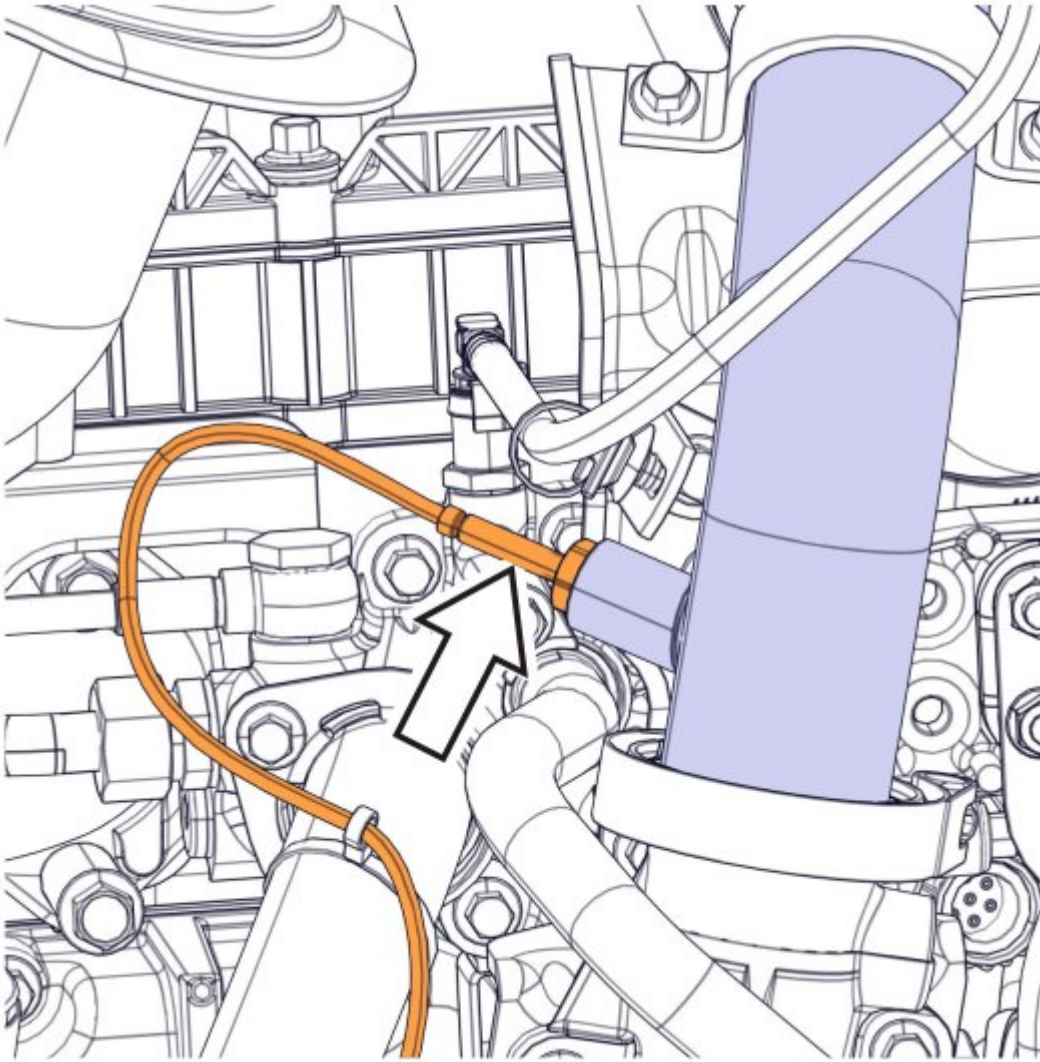
Remove the vapor supply hose (1) from EGR temperature sensor port adapter (6).

22



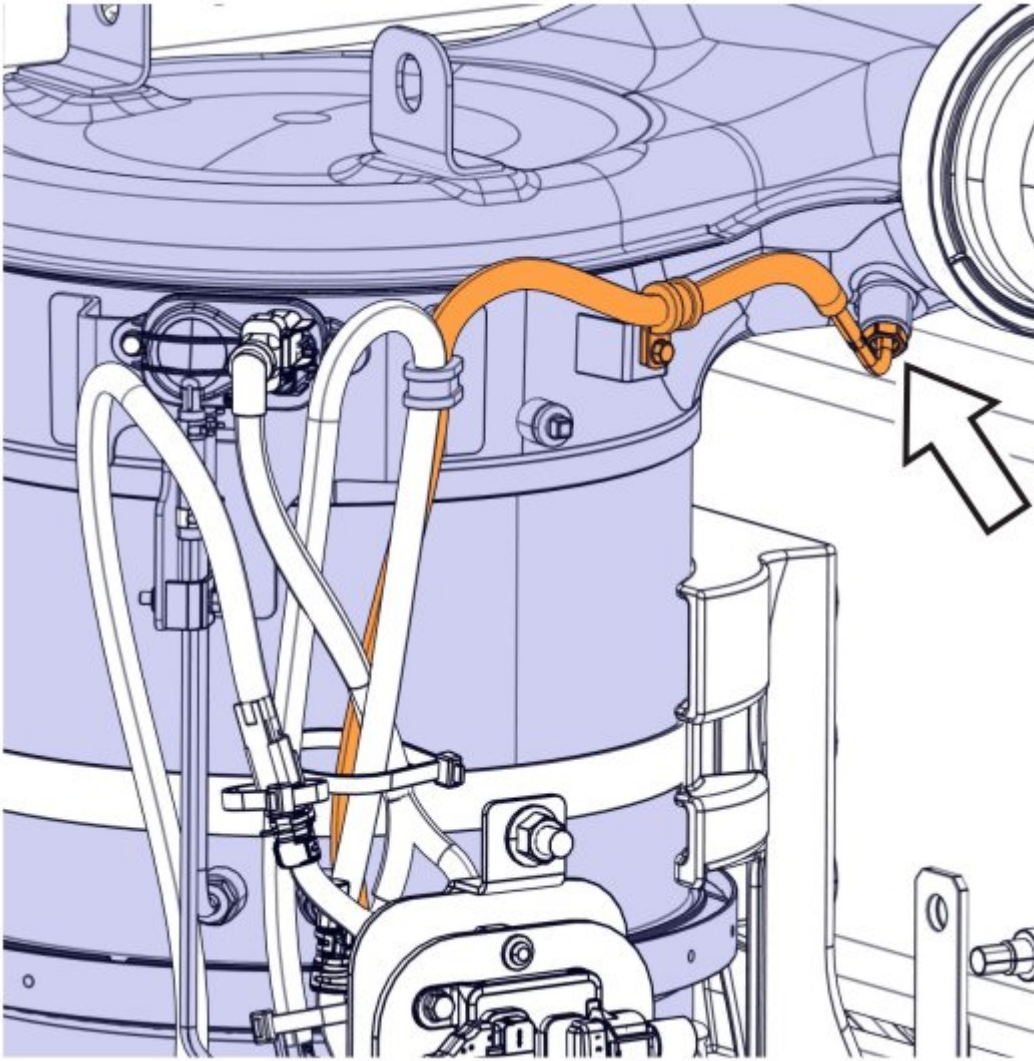
Remove the adapter (6) from the EGR temperature sensor port.

23



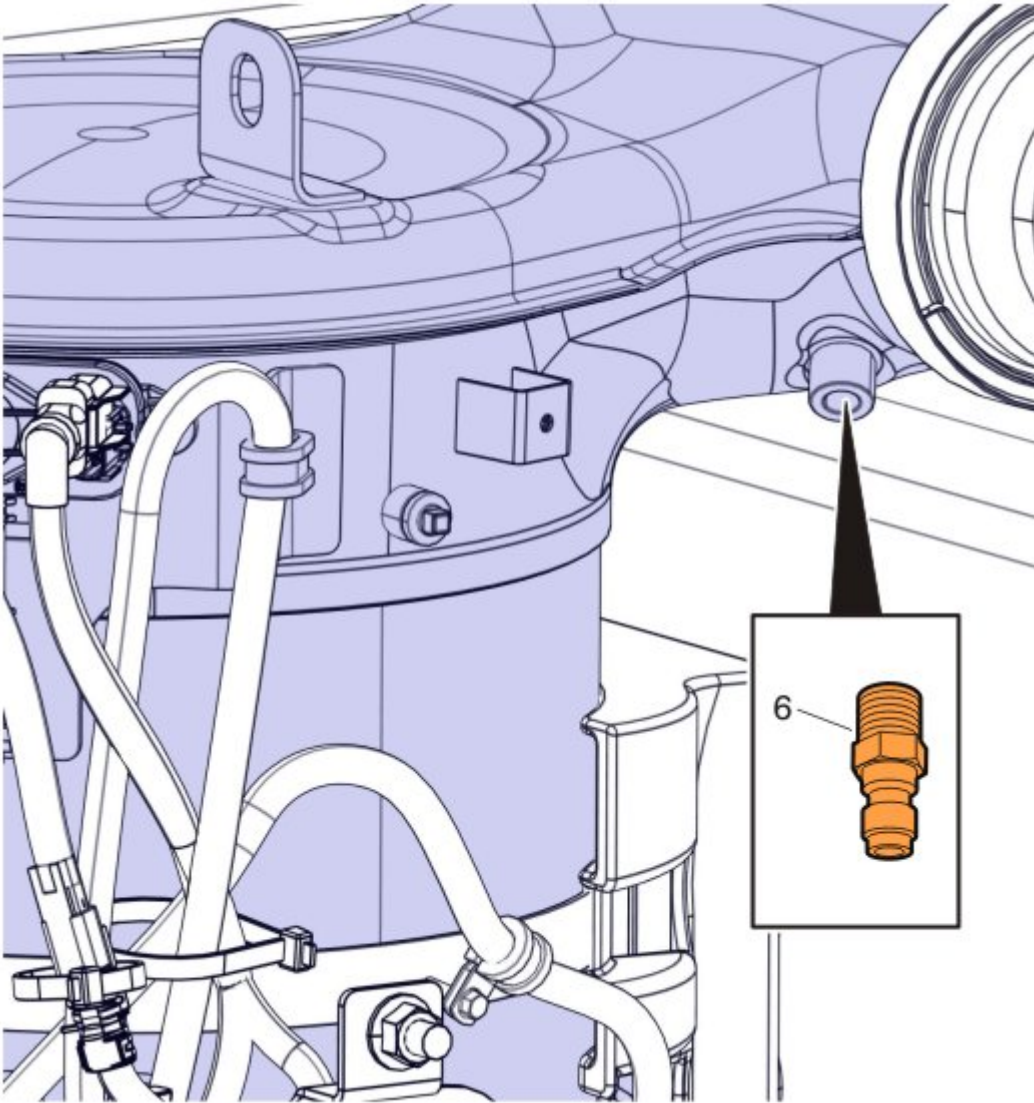
Install the EGR temperature sensor into the port as shown. Tighten the sensor to 45 ± 4.5 Nm (33 ± 3.3 ft-lb).

24



Remove the T1 temperature sensor from the Diesel Particulate Filter (DPF).

25

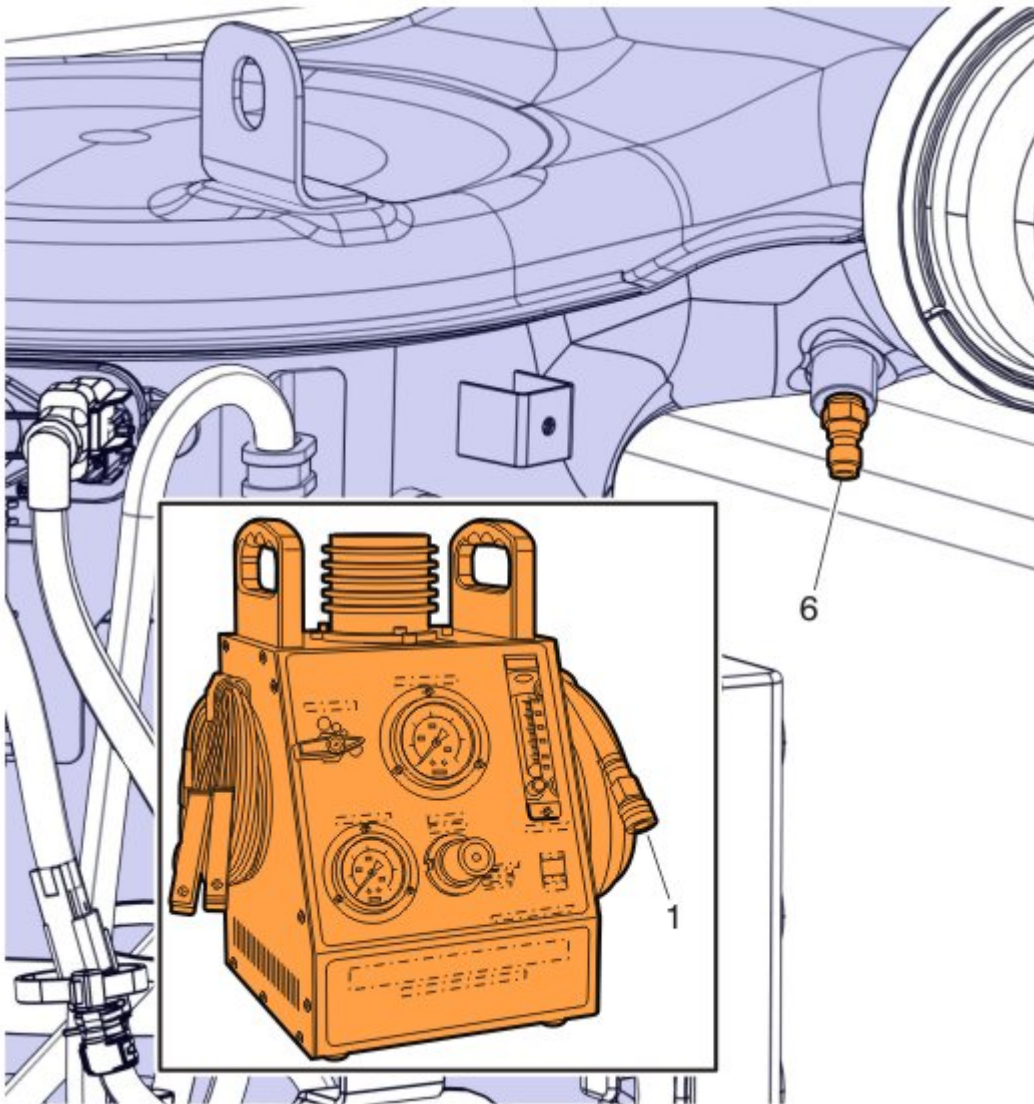


Install the adapter (6) in the T1 port. Hand tighten the adapter to ensure no leaks are permitted.

26

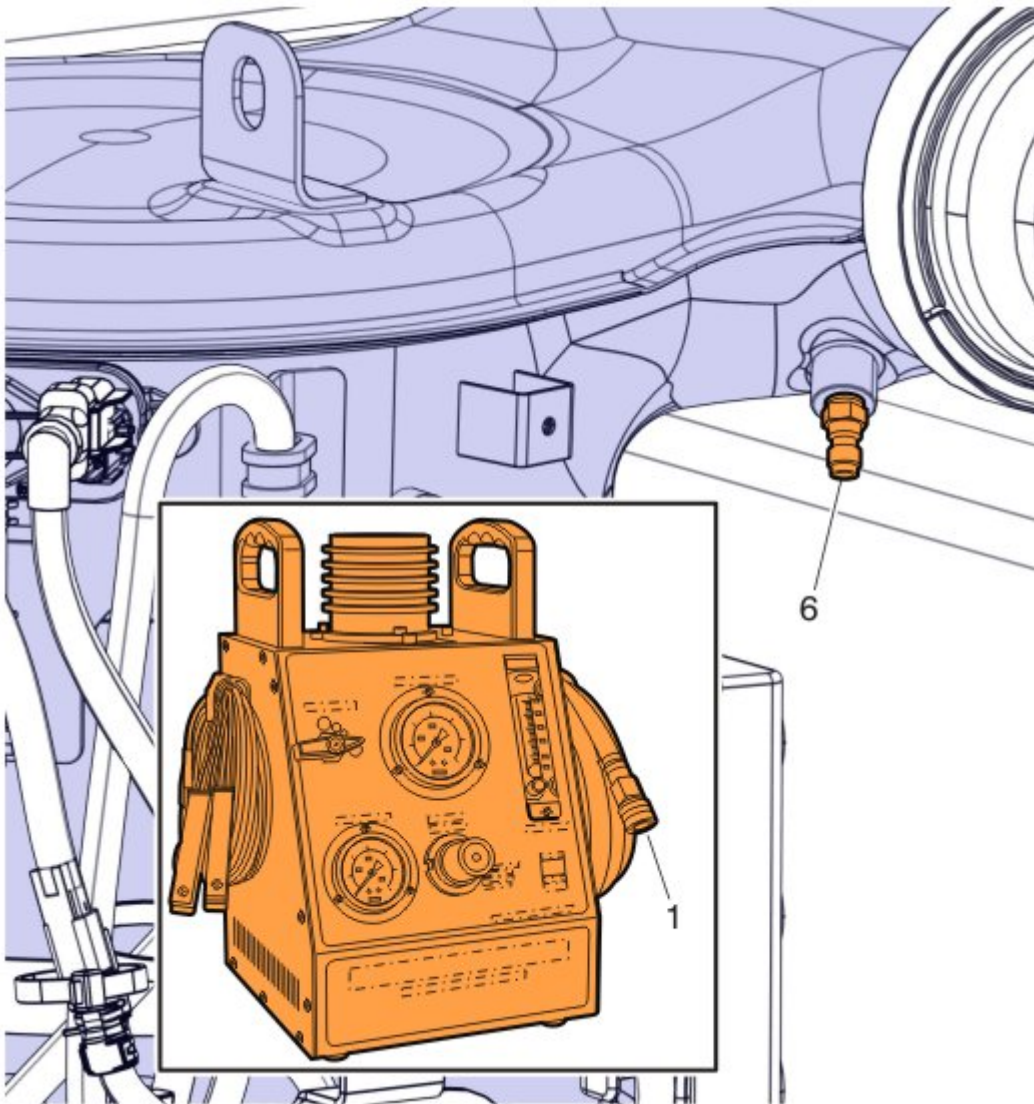
Connect the HD PowerSmoke™ vapor hose (1) to the adapter (6) at the T1 sensor port.

27



Activate the HD PowerSmoke™ tool. Starting at 5 psi, gradually increase the test pressure as needed or up to 10 psi for accurate leak detection. Allow the tool to operate for 8 minutes. If vapor is visible with the high intensity flashlight from the exhaust pipe at the muffler, a cracked DPF is suspected.

28

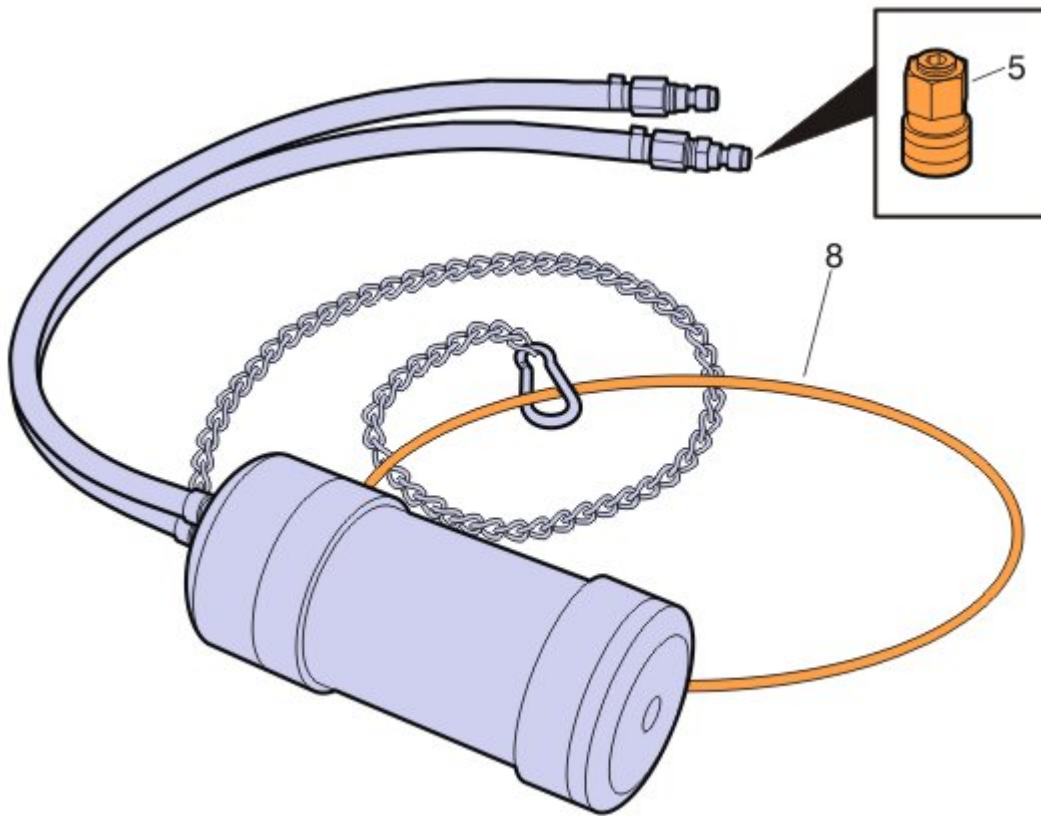


Remove the vapor supply hose from the T1 sensor port.

29

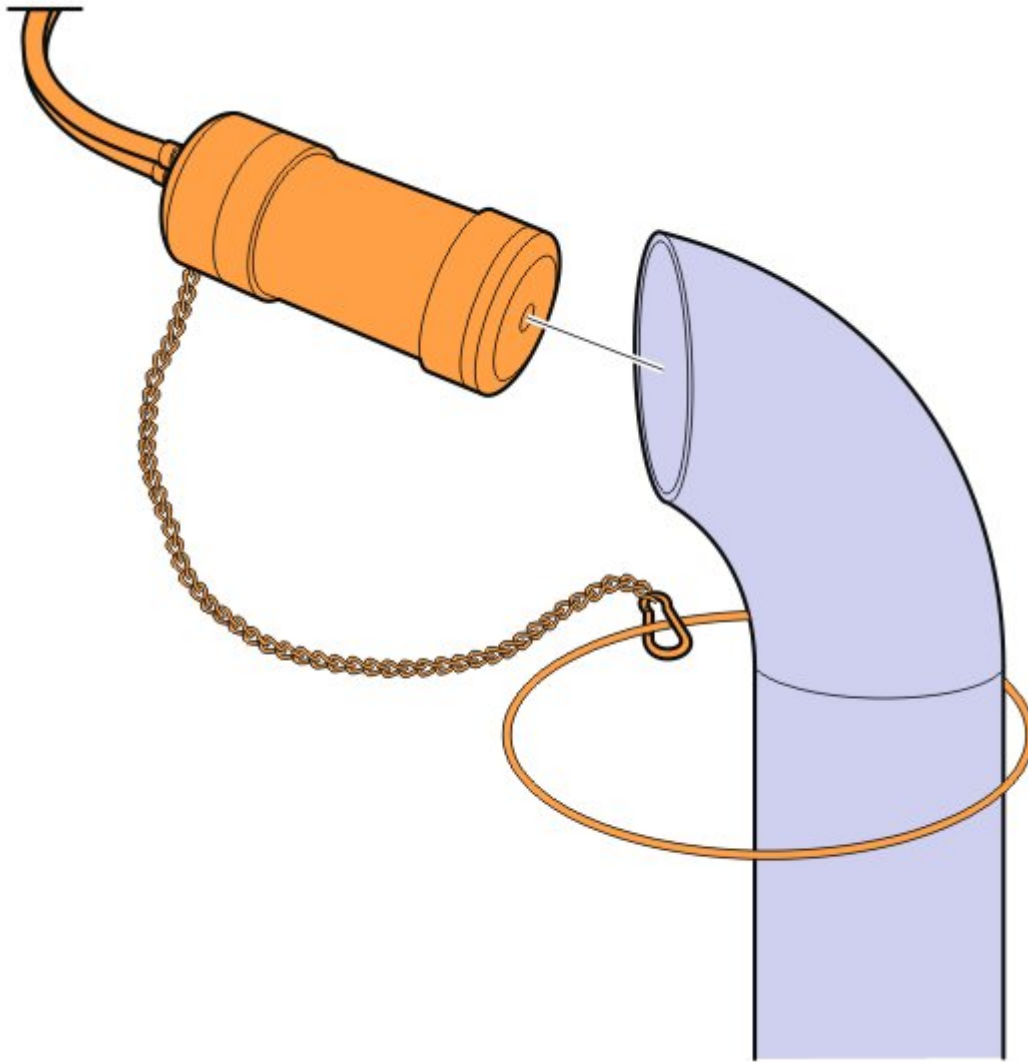
Install the block off plug (5) onto the second air seal pass through smoke tube.

30



Install the exhaust stack retention hoop (8) onto the air seal safety chain.

31

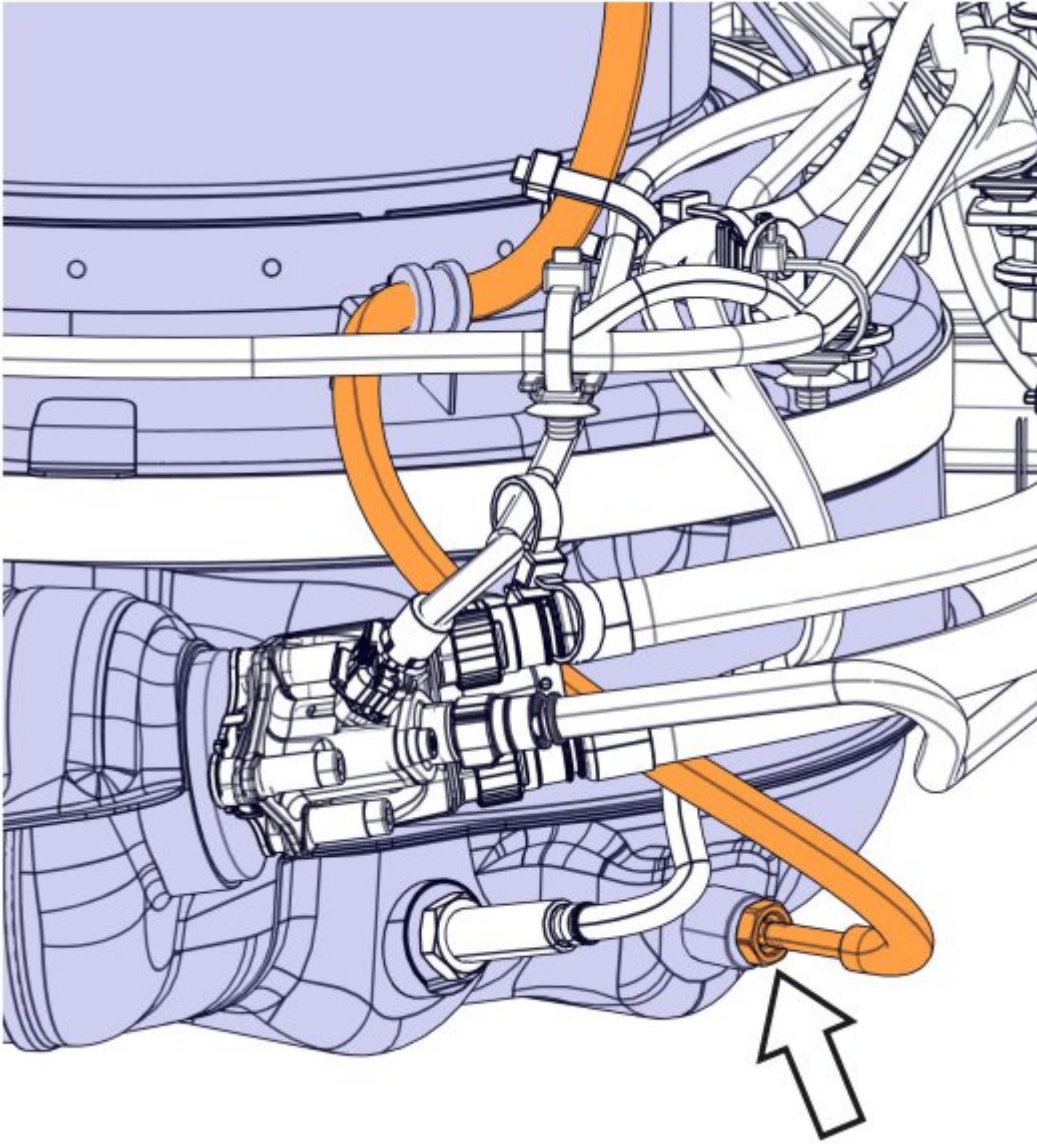


Install the air seal in the exhaust pipe.

32

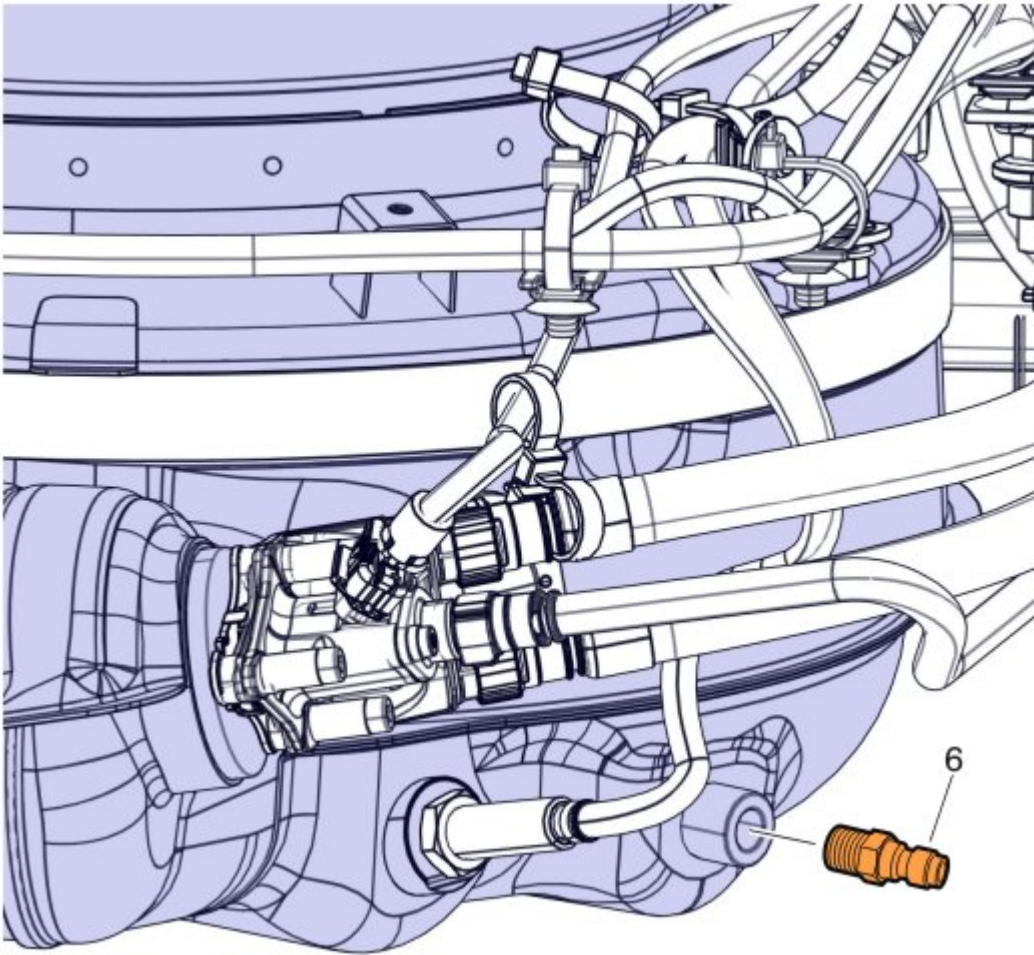
Using an air compressor, inflate the air seal inside exhaust pipe until the air seal is properly seated.

33



Remove the T3 temperature sensor at the DPF outlet.

34



Install the adapter (6) at the T3 port in the DPF outlet. Hand tighten the adapter to ensure no leaks are permitted.

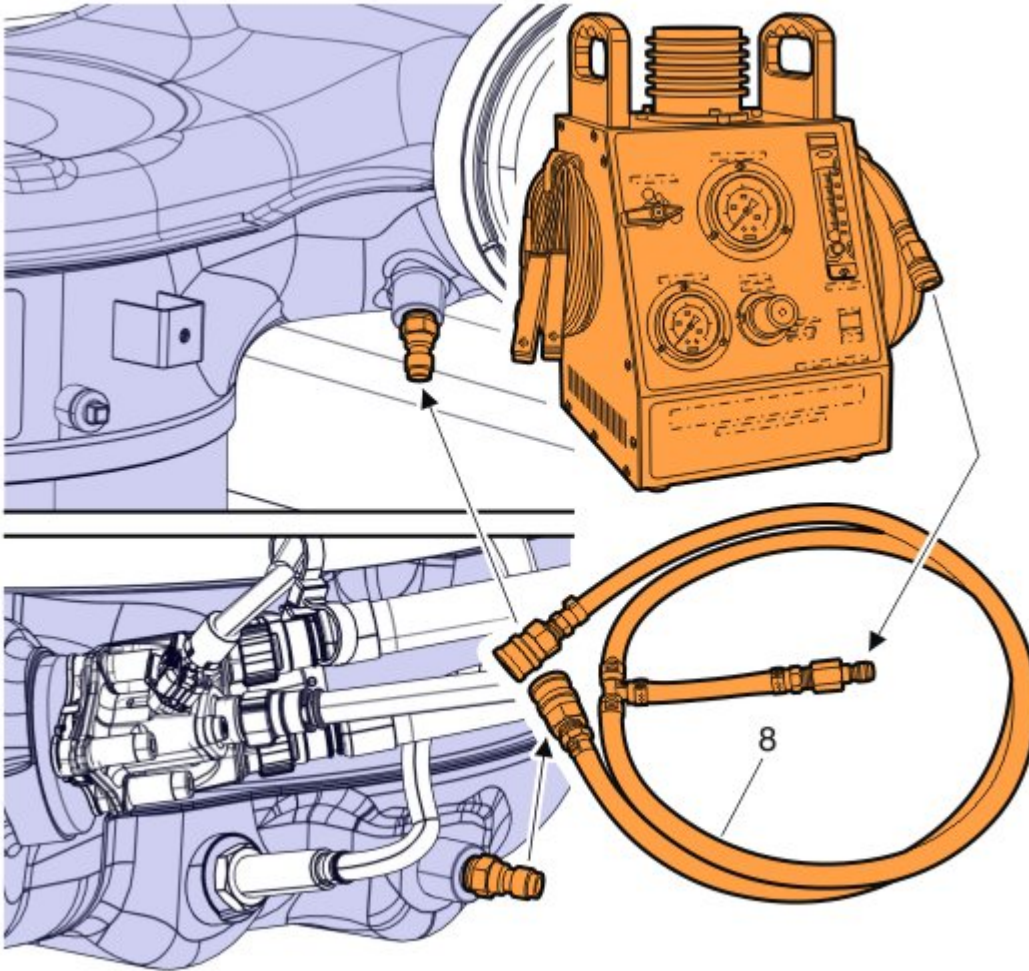
35

Attach the “Y” hose to the adapters at the T1 and T3 ports on the DPF.

36

Connect the HD PowerSmoke™ vapor hose to the “Y” adapter as shown.

37



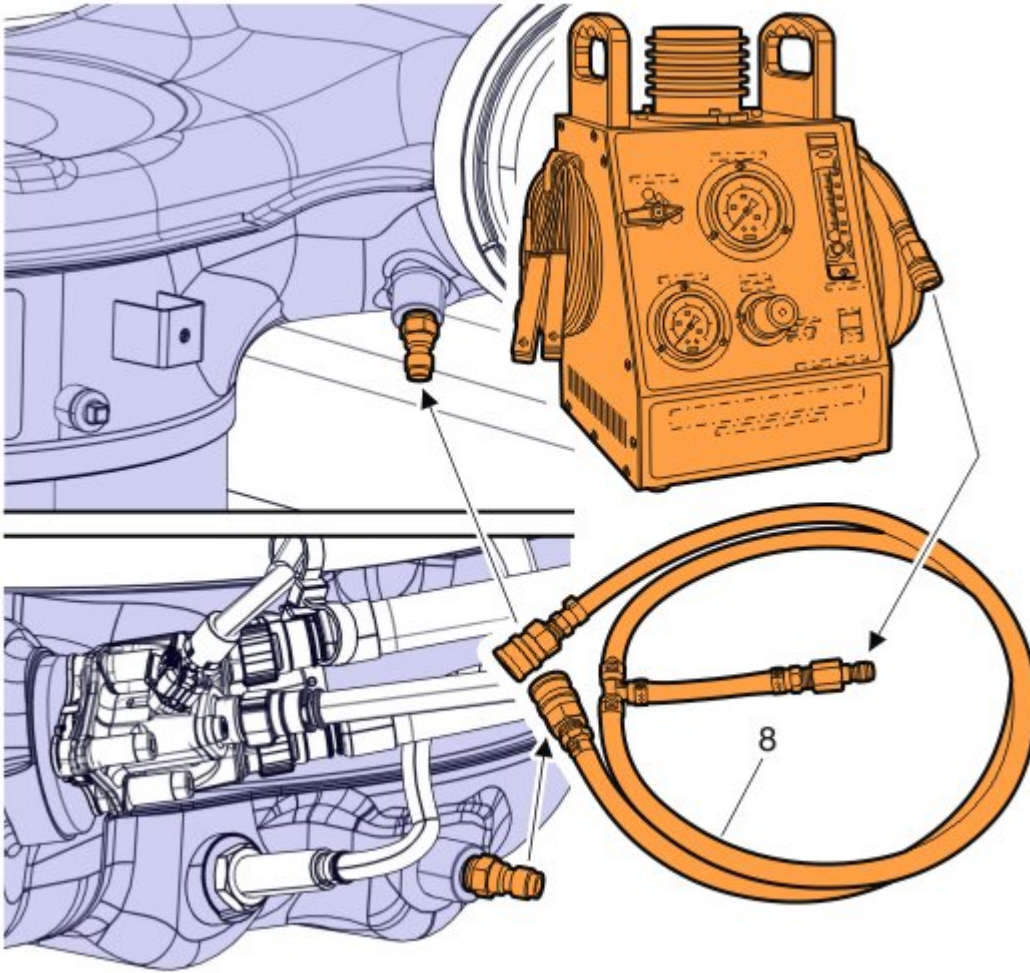
Activate the HD PowerSmoke™ tool Starting at 5 psi, gradually increase test pressure as needed or up to 10 psi for accurate leak detection. Block the Selective Catalyst Reduction (SCR) drain if necessary. Using the high intensity flashlight, check the exhaust system for leakage. If no leaks are found after 8 minutes, system is considered to be leak free.

Note: It is considered normal for vapor to be visible from SCR drain during testing.

38

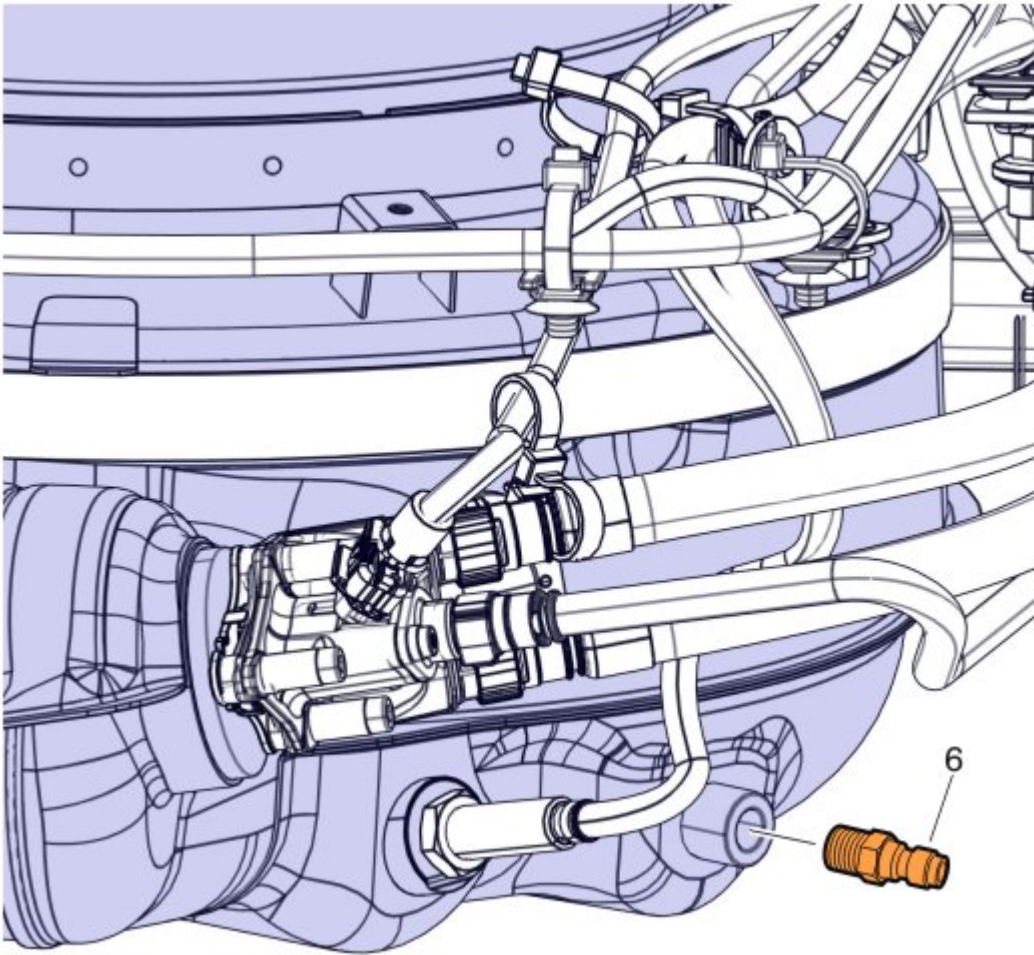
Deactivate the HD PowerSmoke™ tool.

39



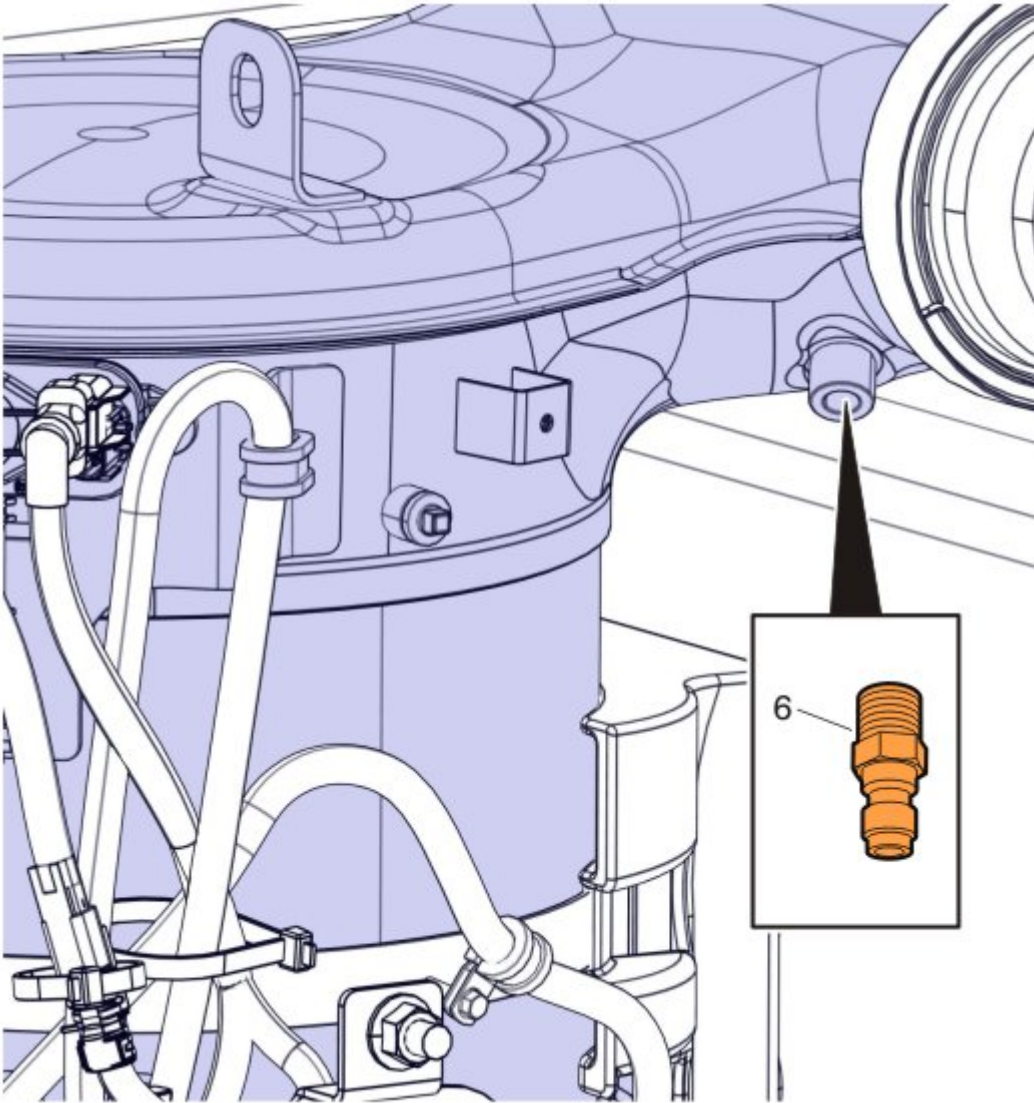
Remove the “Y” hose from the T1 and T3 ports on the DPF. Remove the HD PowerSmoke™ vapor hose from the “Y” adapter as shown.

40



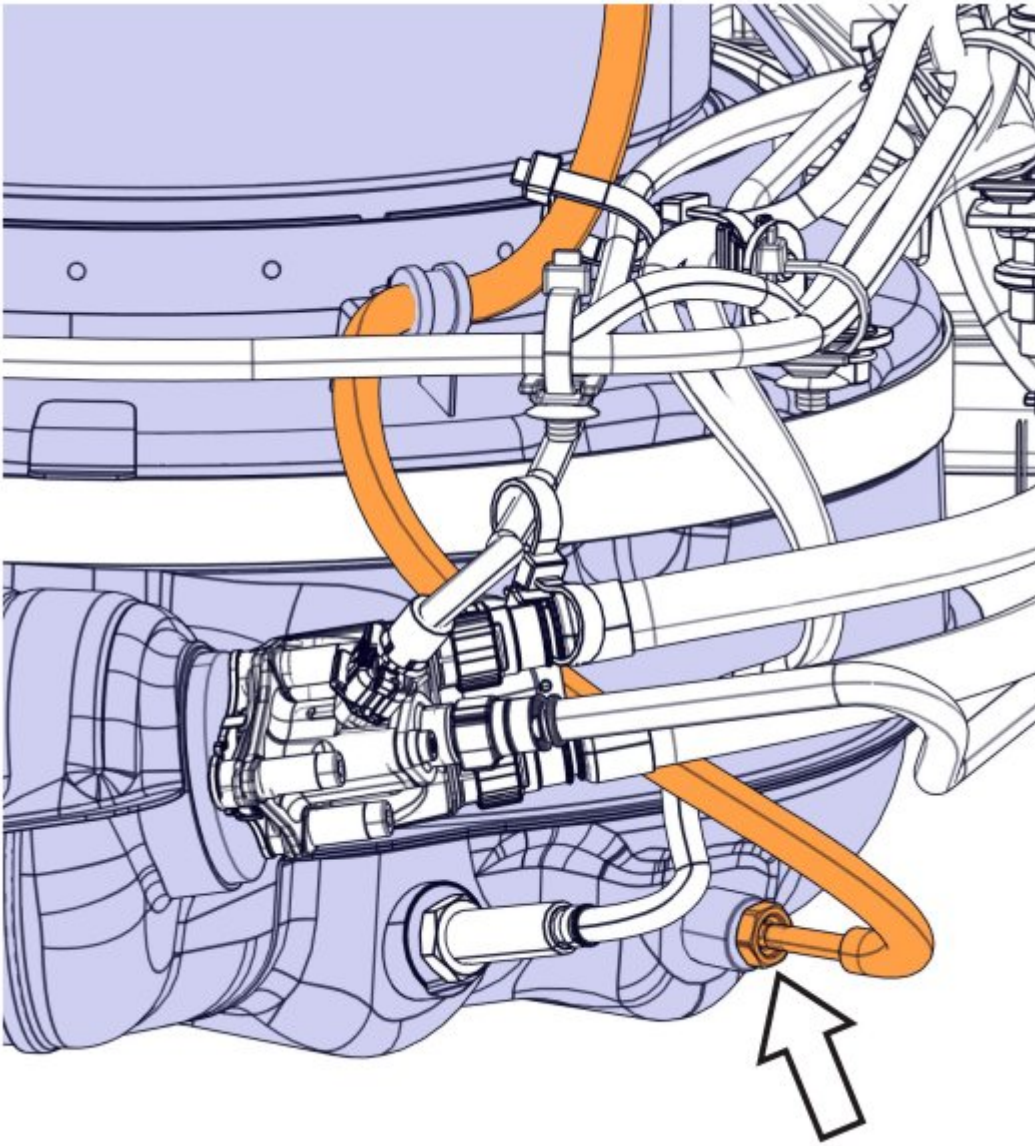
Remove the adapter (6) from the T3 port.

41



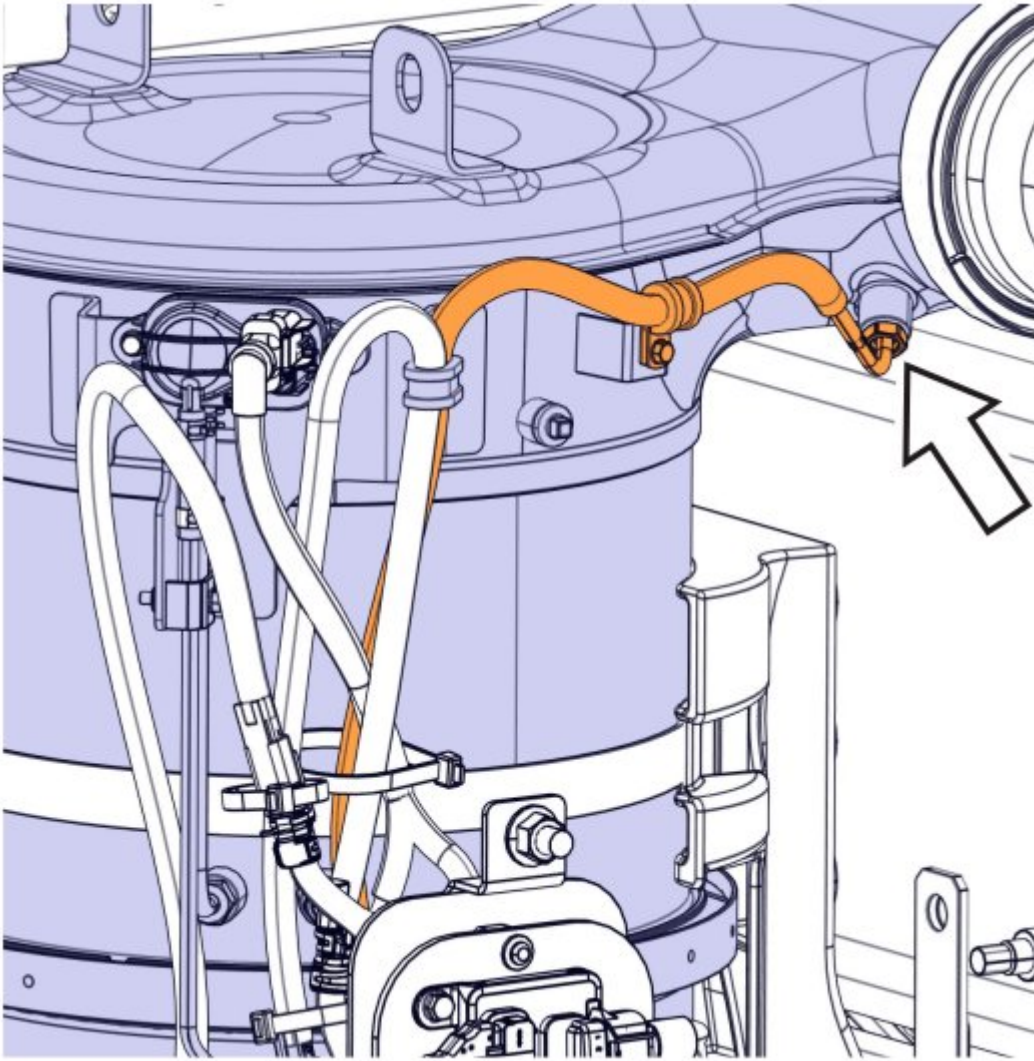
Remove the adapter (6) from the T1 port.

42



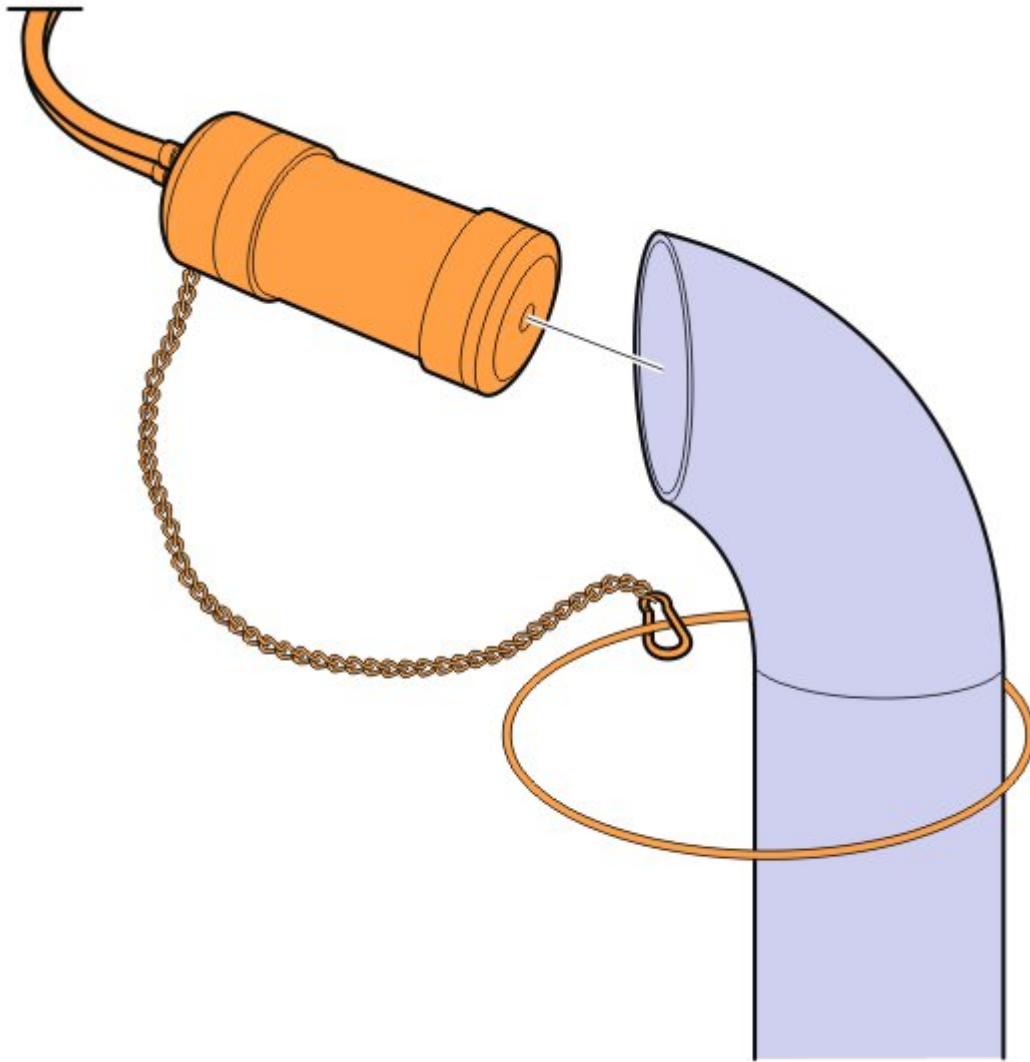
Install the T3 temperature sensor into the port as shown. Tighten the sensor to 45 ± 4.5 Nm (33 ± 3.3 ft-lb).

43



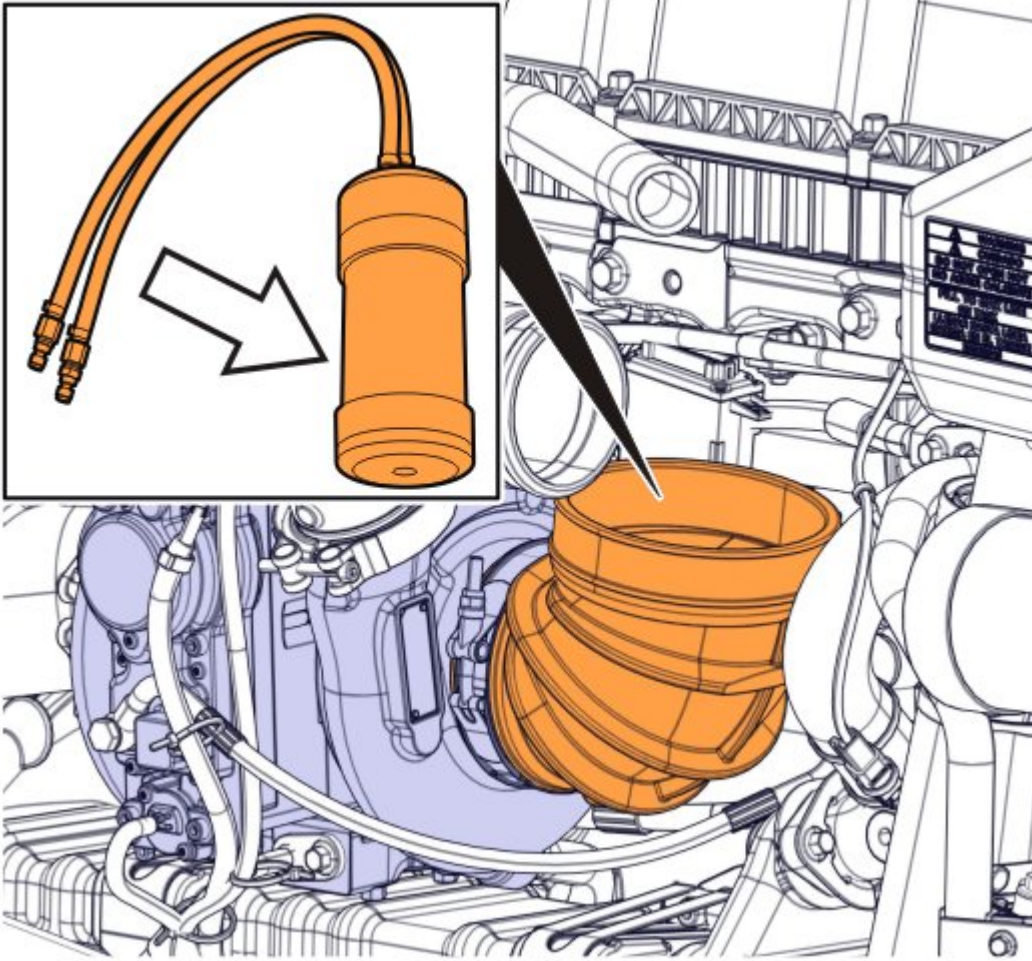
Install the T1 temperature sensor into the port as shown. Tighten the sensor to 45 ± 4.5 Nm (33 ± 3.3 ft-lb).

44



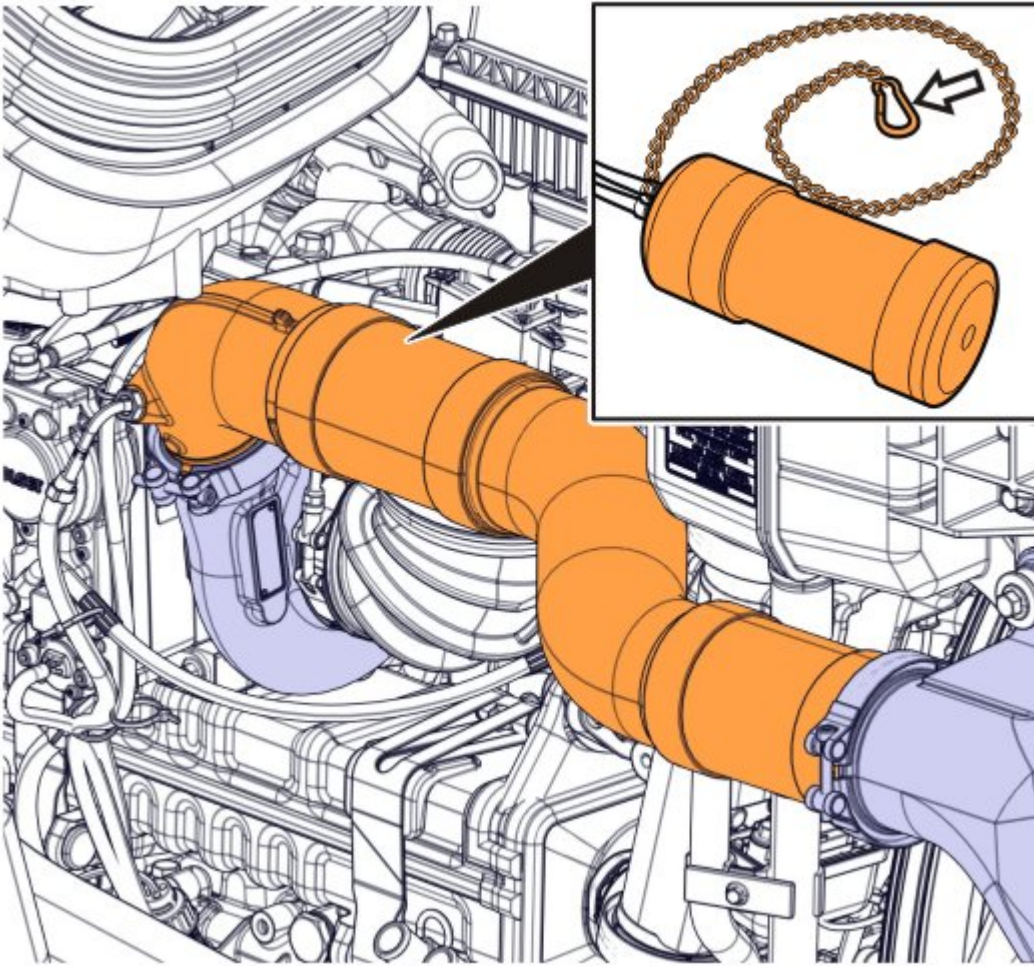
Deflate and remove the air seal from the exhaust pipe.

45



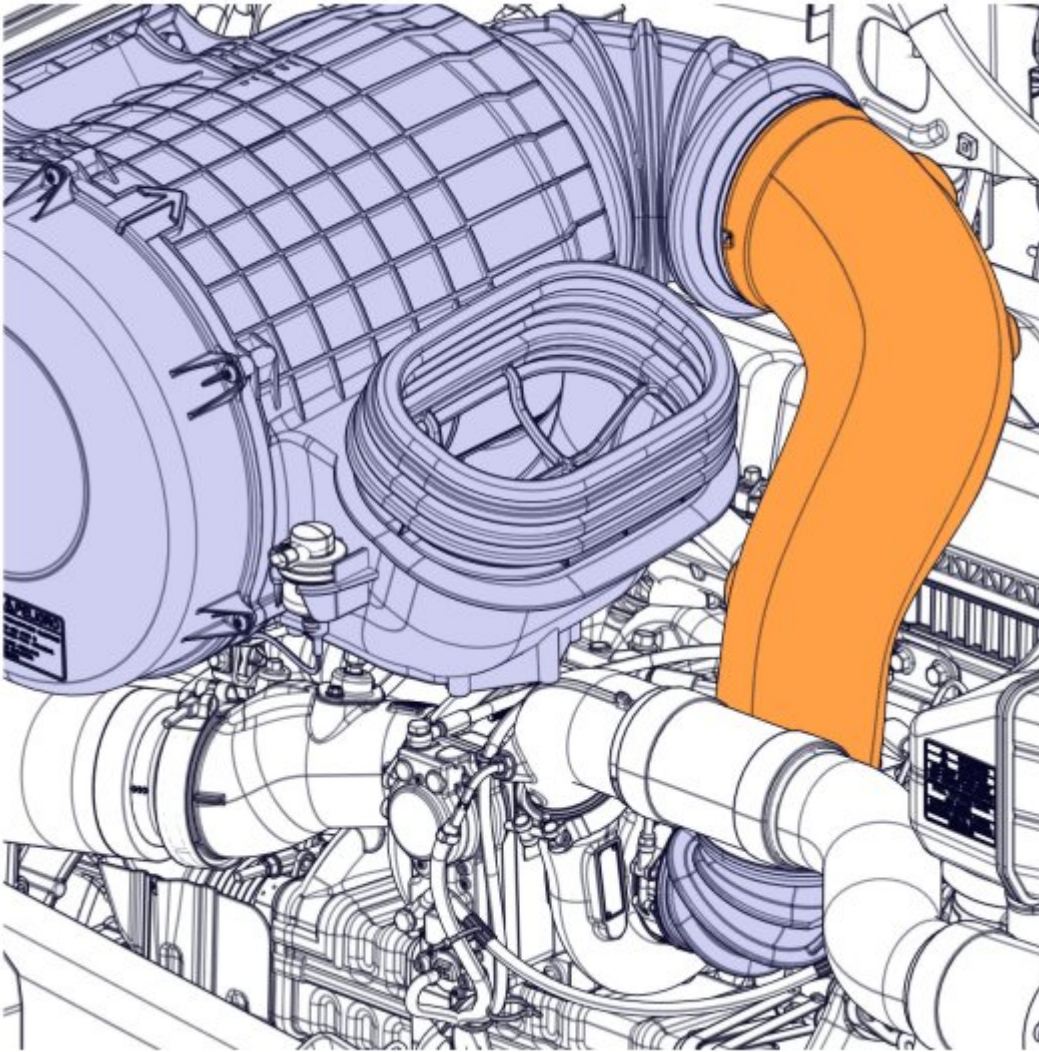
Deflate and remove the air seal from the lower air boot at the engine turbo.

46



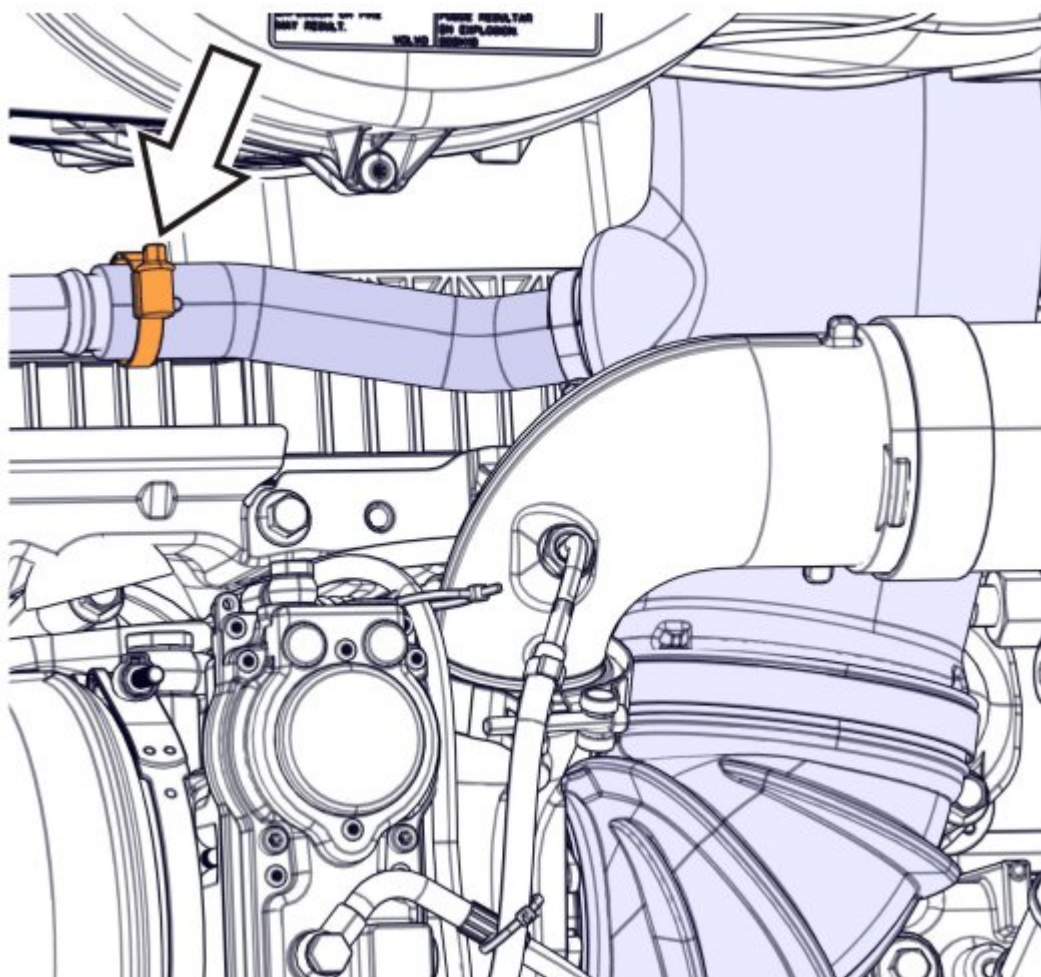
Remove the safety chain from the charge air piping.

47



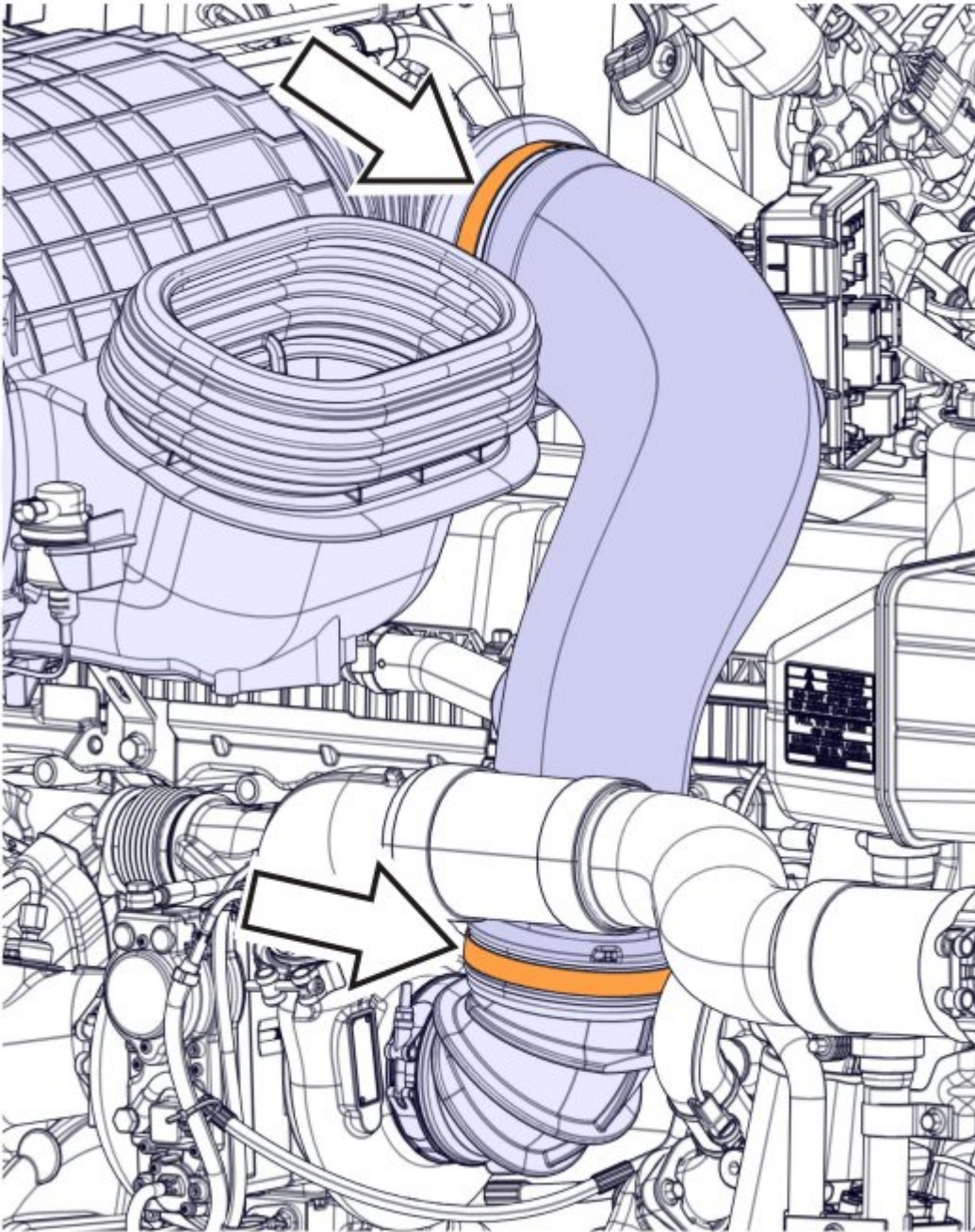
Install the intermediate air intake tube.

48



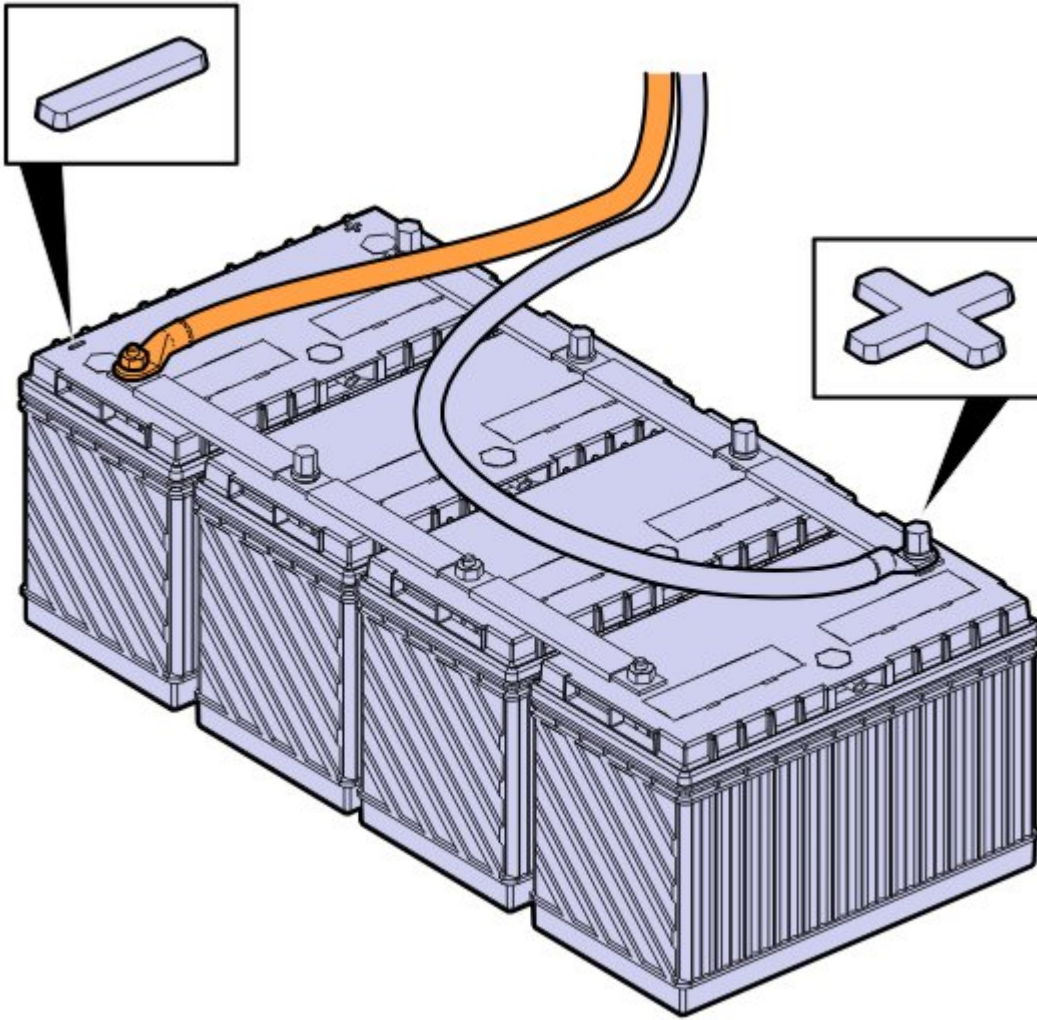
Tighten the air compressor inlet hose clamp to 3.9 ± 0.5 Nm (35 ± 5 in-lb).

49



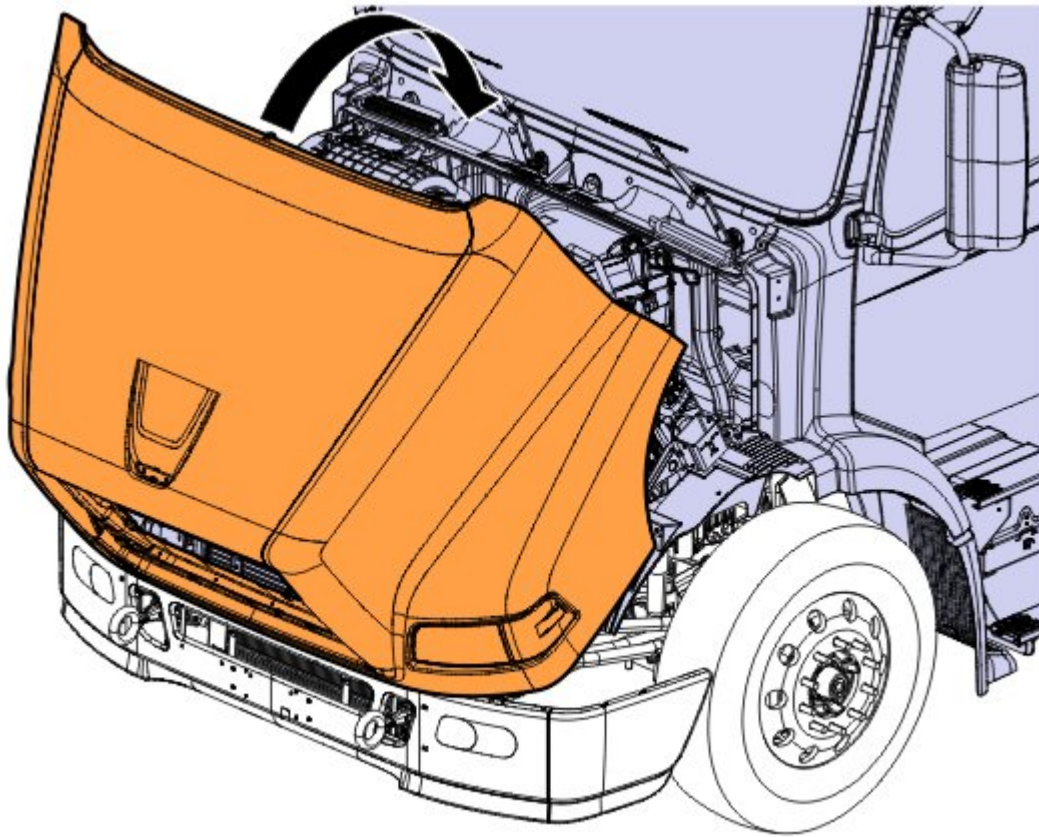
Tighten the intermediate air pipe clamps to 9 ± 1 Nm (80 ± 9 in-lb).

50



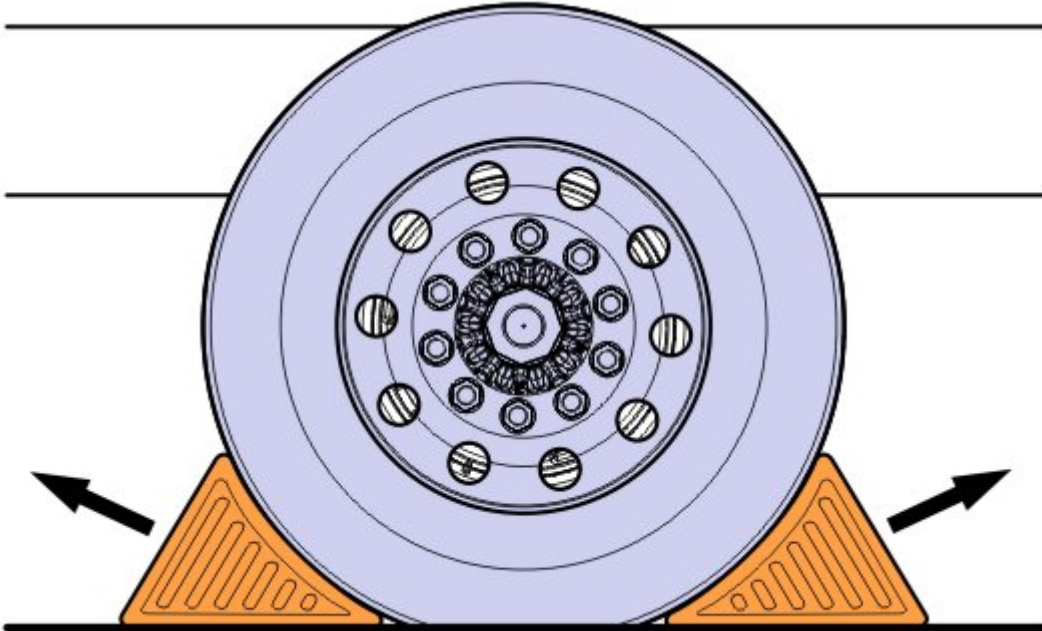
Connect the cable to the battery's negative terminal.

51



Close the hood.

52



Remove the wheel chocks from the rear wheels.