

Engine Front Cover

Base Part Number: Base Part Number: 6C086

Special Tool(s) / General Equipment

Plastic Scraper
Oil Drain Equipment
Hose Clamp Remover/Installer

Materials

Name	Specification
Motorcraft® Silicone Gasket Remover ZC-30-A	-
Motorcraft® Metal Surface Prep Wipes ZC-31-B	-
Motorcraft® Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Motorcraft® Metal Brake Parts Cleaner PM-4-A, PM-4-B	-

Removal

NOTICE: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces, that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist.
Refer to: [Jacking and Lifting - Overview](#) (100-02 Jacking and Lifting, Description and Operation).
2. Release the fuel system pressure.
Refer to: [Fuel System Pressure Release](#) (310-00D Fuel System - General Information - 5.0L 32V Ti-

VCT, General Procedures).

3. Disconnect the battery ground cable.

Refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables) .

4. Drain the engine cooling system.

Refer to: Cooling System Draining, Vacuum Filling and Bleeding (303-03 Engine Cooling - 5.0L 32V Ti-VCT) .

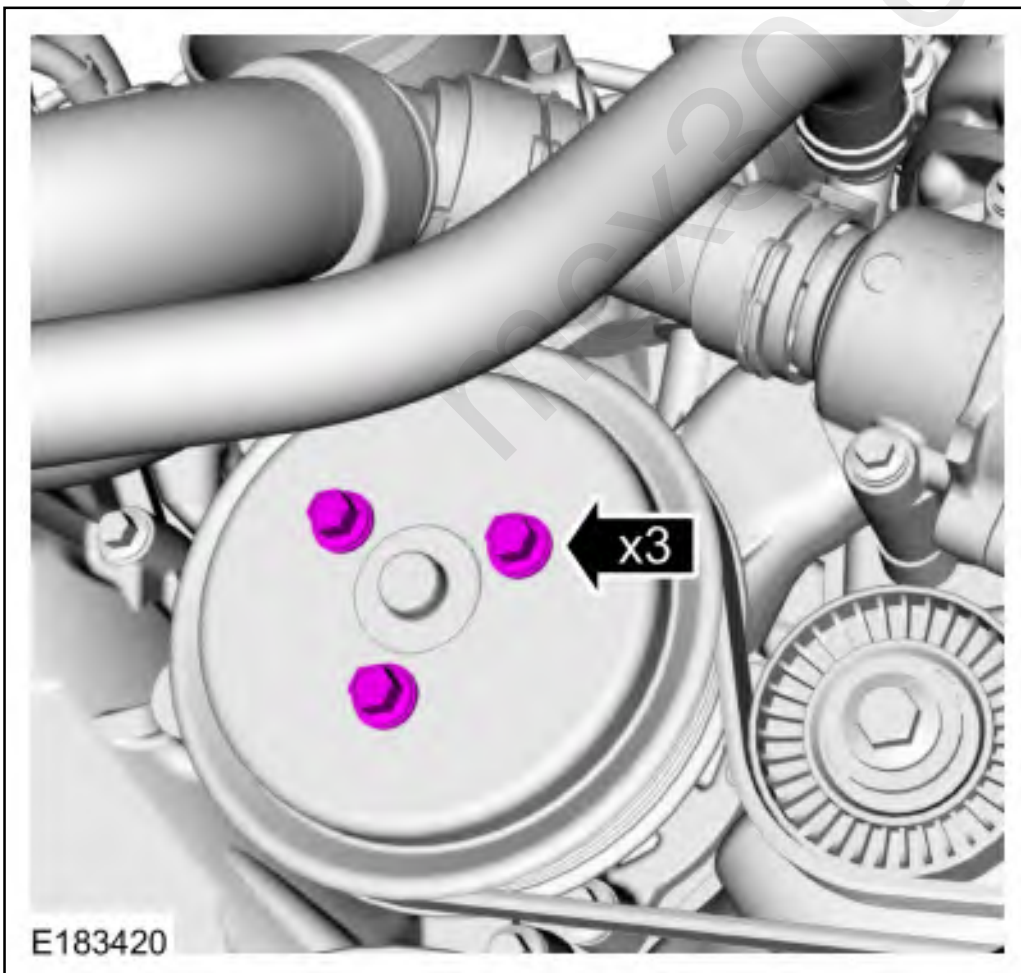
5. Remove the following items:

1. **NOTE:** *It is not necessary to clamp off the degas bottle hose with the cooling system drained.*

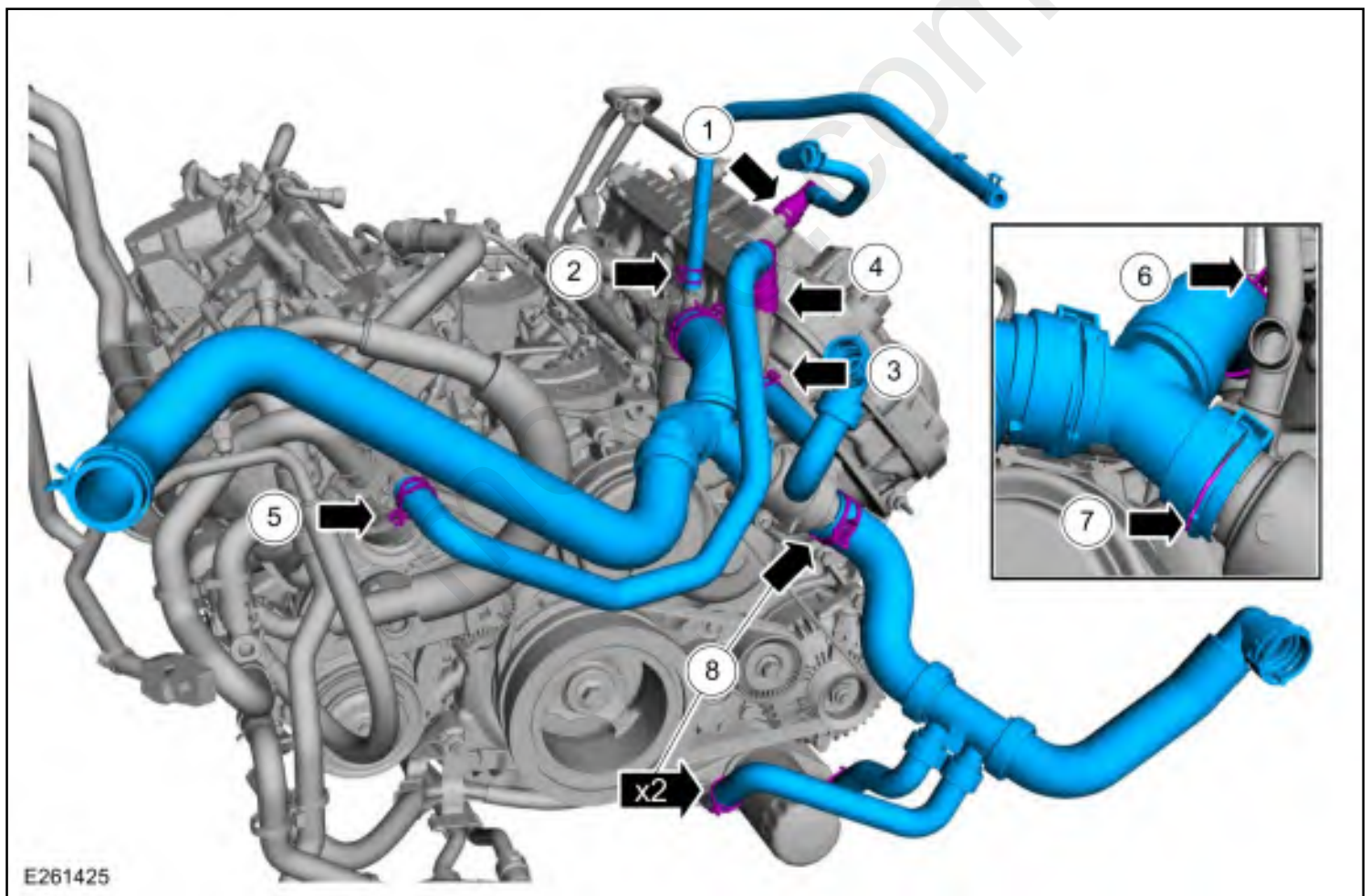
Refer to: [Degas Bottle](#) (303-03D Engine Cooling - 5.0L 32V Ti-VCT, Removal and Installation).

2. Refer to: Cooling Module (303-03 Engine Cooling - 5.0L 32V Ti-VCT) .
3. Refer to: Valve Cover LH (303-01 Engine - 5.0L 32V Ti-VCT) .
4. Refer to: Valve Cover RH (303-01 Engine - 5.0L 32V Ti-VCT) .

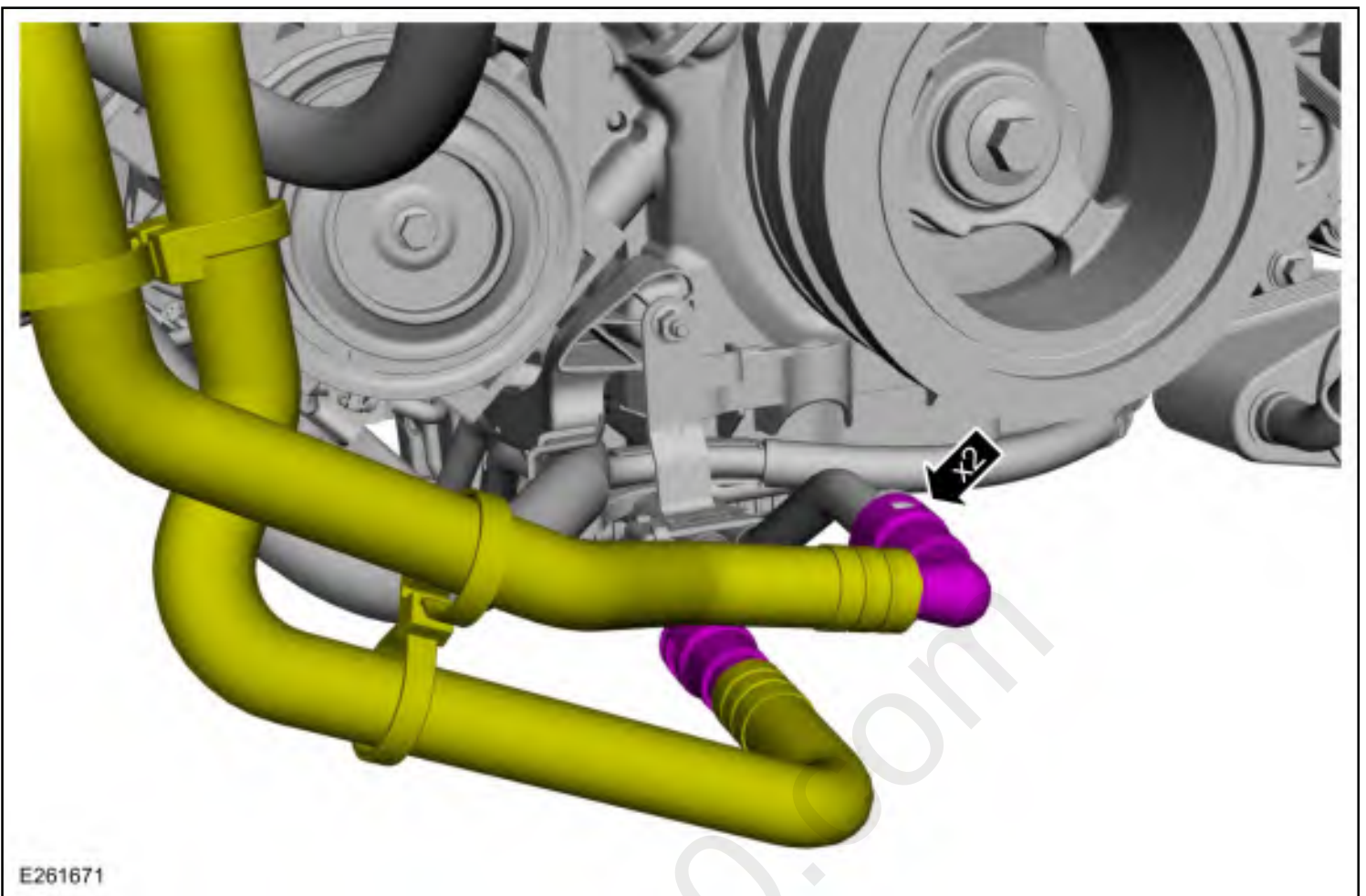
6. Loosen the coolant pump pulley bolts.



1. Disconnect the quick release coupling and remove the crankcase vent tube.
Refer to: [Quick Release Coupling](#) (310-00D Fuel System - General Information - 5.0L 32V Ti-VCT, General Procedures).
2. Release the clamp and remove the coolant hose.
Use the General Equipment: Hose Clamp Remover/Installer
3. Release the clamp and remove the coolant hose.
Use the General Equipment: Hose Clamp Remover/Installer
4. Disconnect the quick release coupling.
5. Release the clamp and remove the coolant hose.
Use the General Equipment: Hose Clamp Remover/Installer
6. Release the clamp and remove the coolant hose.
Use the General Equipment: Hose Clamp Remover/Installer
7. Release the spring clip and remove the coolant bypass T assembly from the engine.
8. Release the clamps and remove the coolant hose assembly.
Use the General Equipment: Hose Clamp Remover/Installer



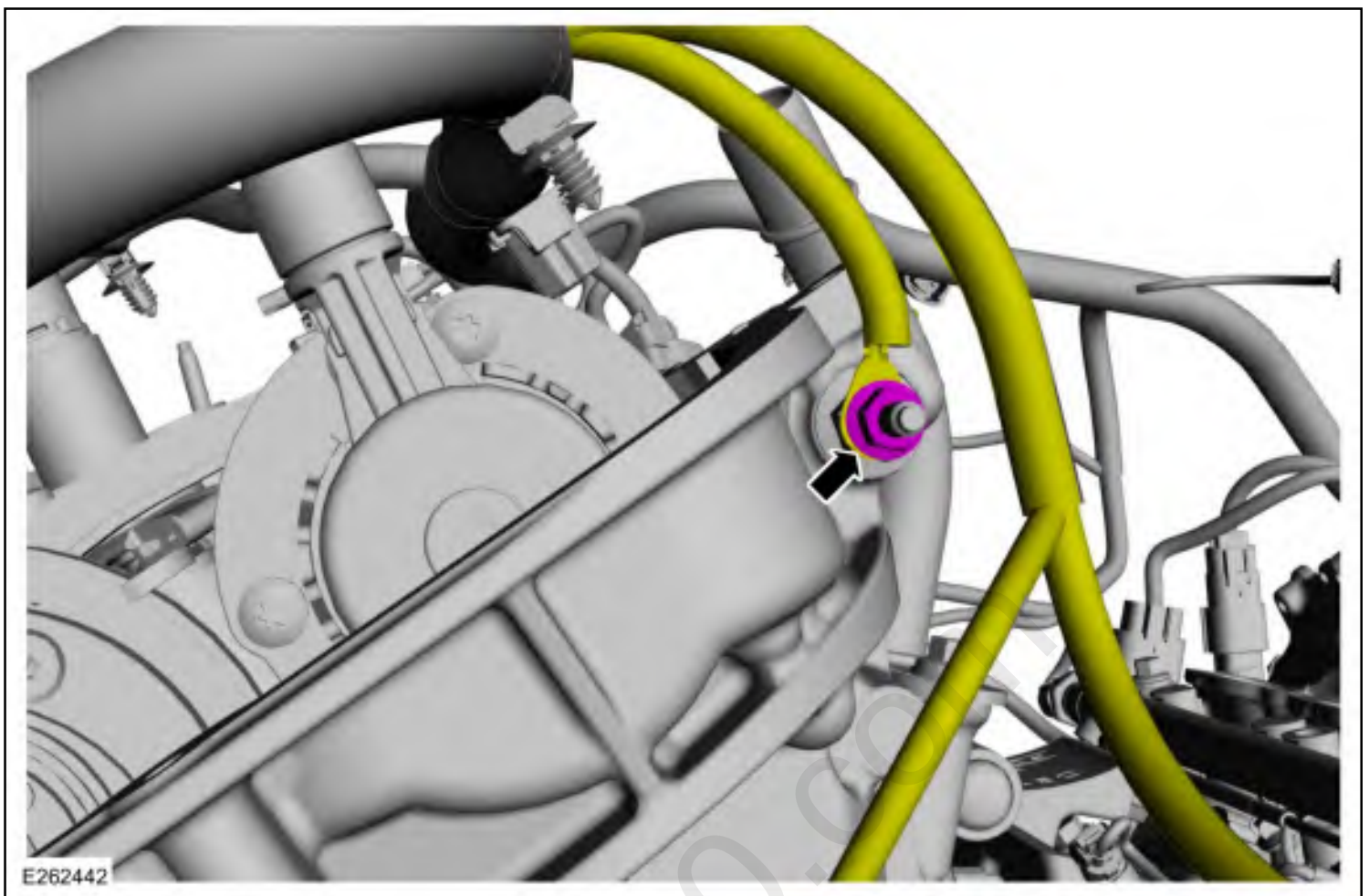
8. Disconnect the coolant hose quick release couplings.



9. Remove the following items:

1. Refer to: Accessory Drive Belt (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
2. Refer to: Air Conditioning (A/C) Compressor Belt (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
3. Refer to: Accessory Drive Belt Tensioner (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
4. Refer to: Air Conditioning (A/C) Compressor Belt Tensioner (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
5. Refer to: [Coolant Pump](#) (303-03D Engine Cooling - 5.0L 32V Ti-VCT, Removal and Installation).
6. Refer to: Crankshaft Front Seal (303-01 Engine - 5.0L 32V Ti-VCT) .

10. Remove the nut and ground wire.

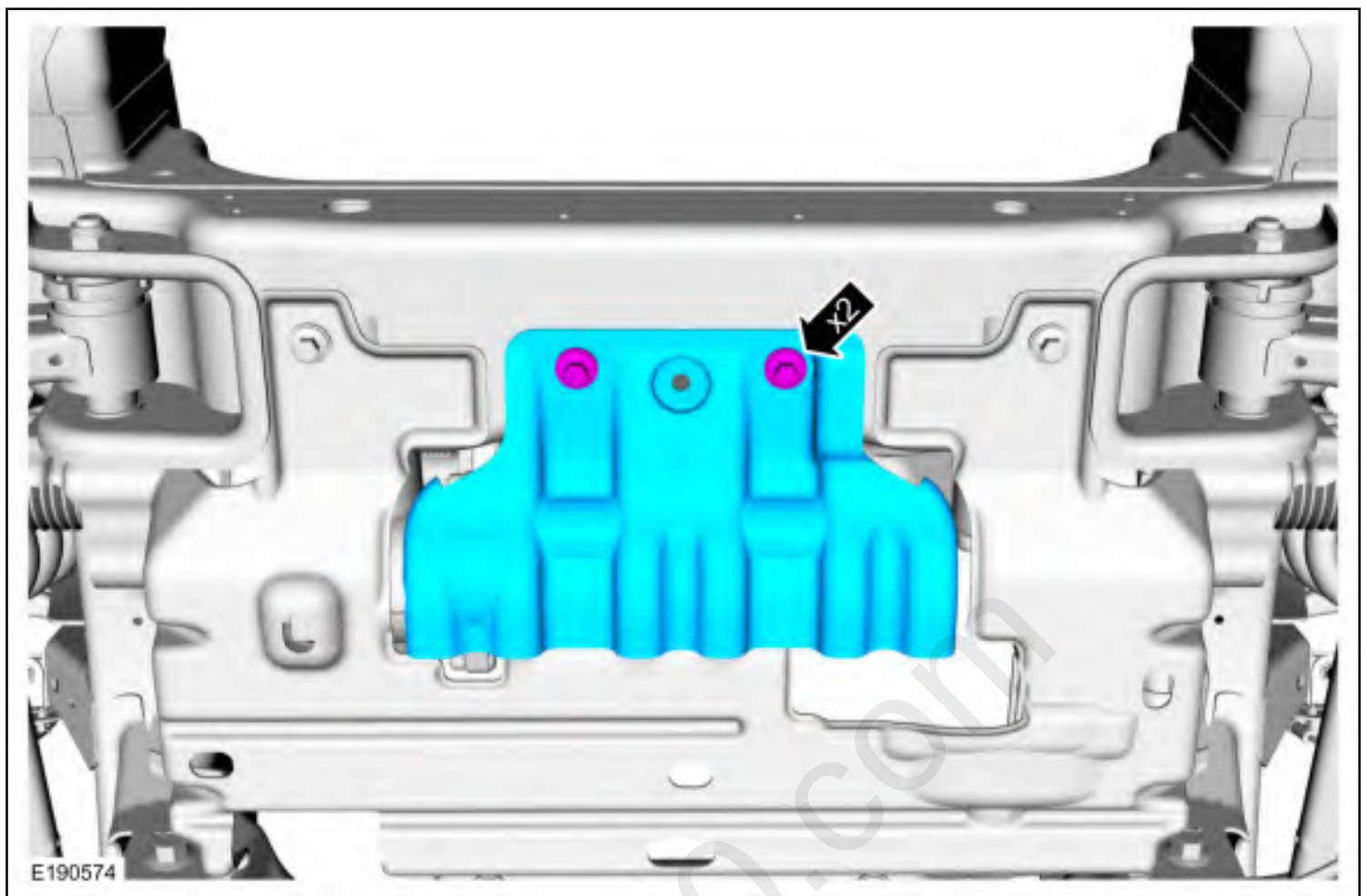


11. Remove the bolts and position the generator aside.



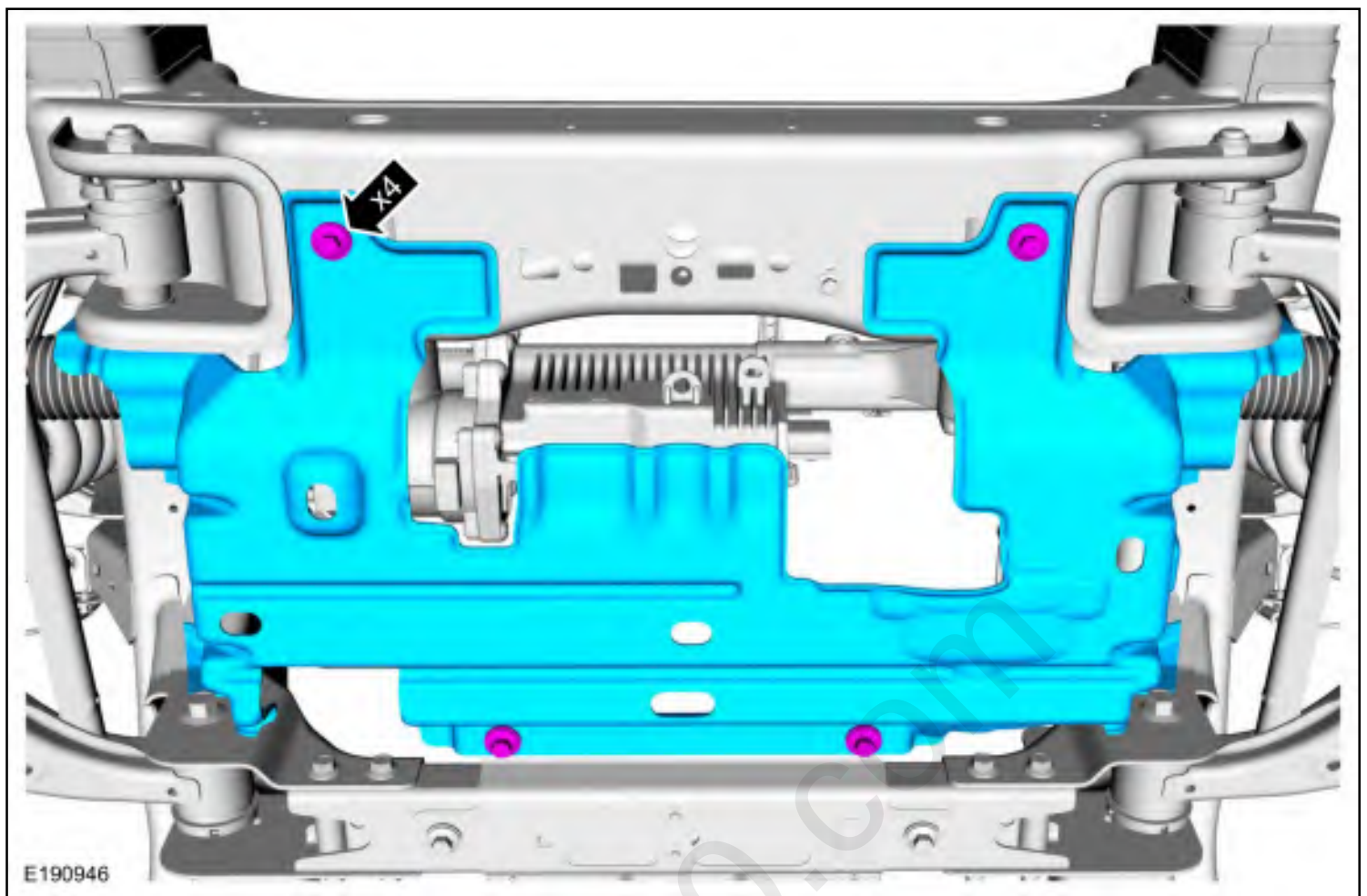
12. **NOTE:** *If equipped.*

Remove the bolts and the skid plate.



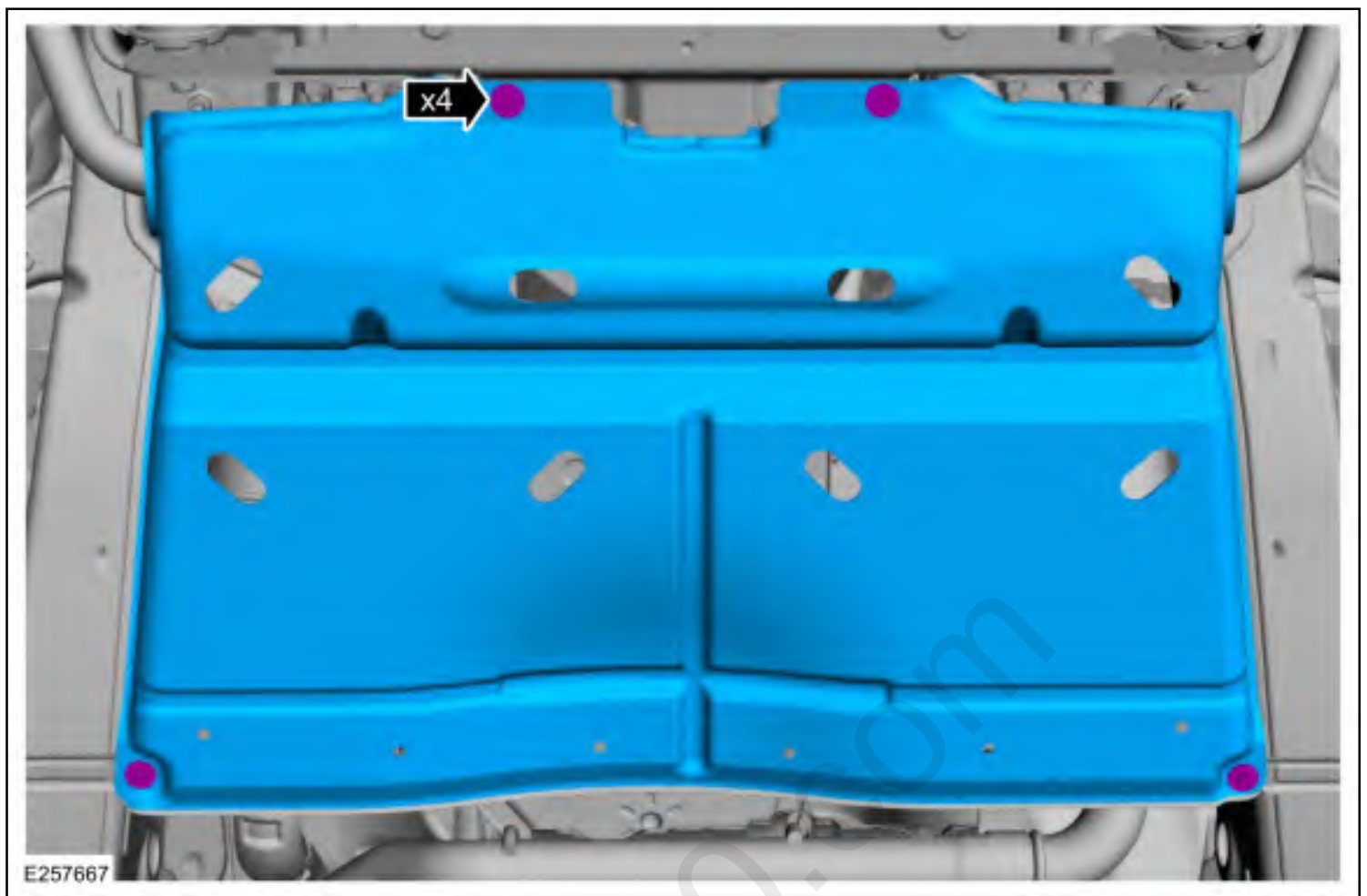
13. **NOTE:** *If equipped.*

Remove the fasteners and the underbody shield.



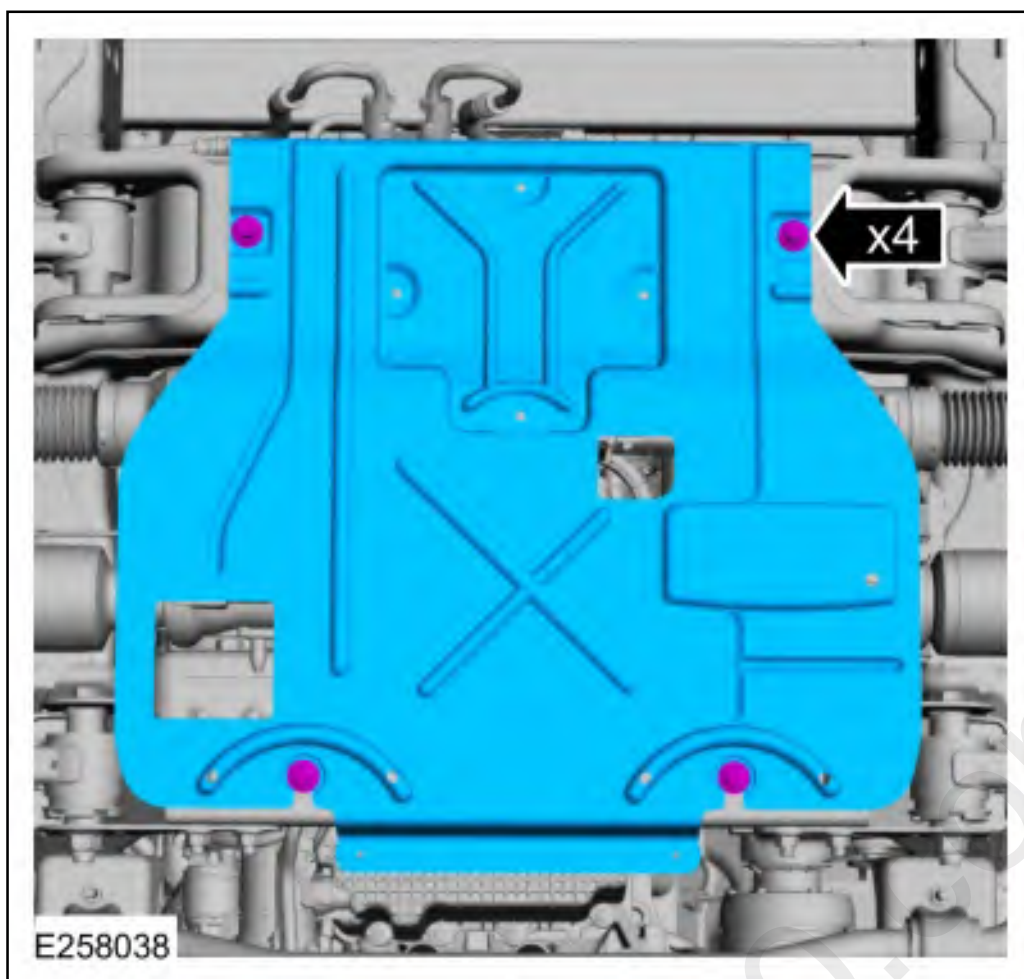
14. **NOTE:** *If equipped.*

Remove the bolts and the underbody shield.

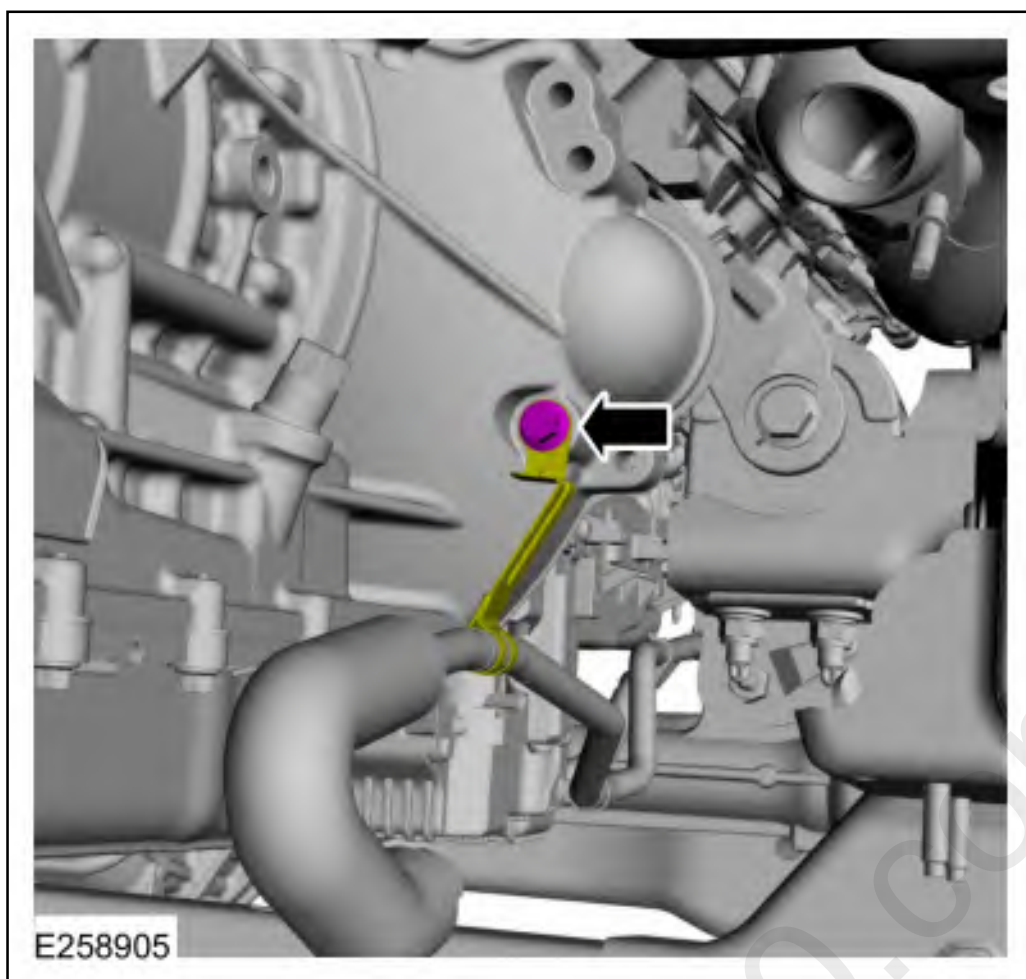


15. **NOTE:** *If equipped.*

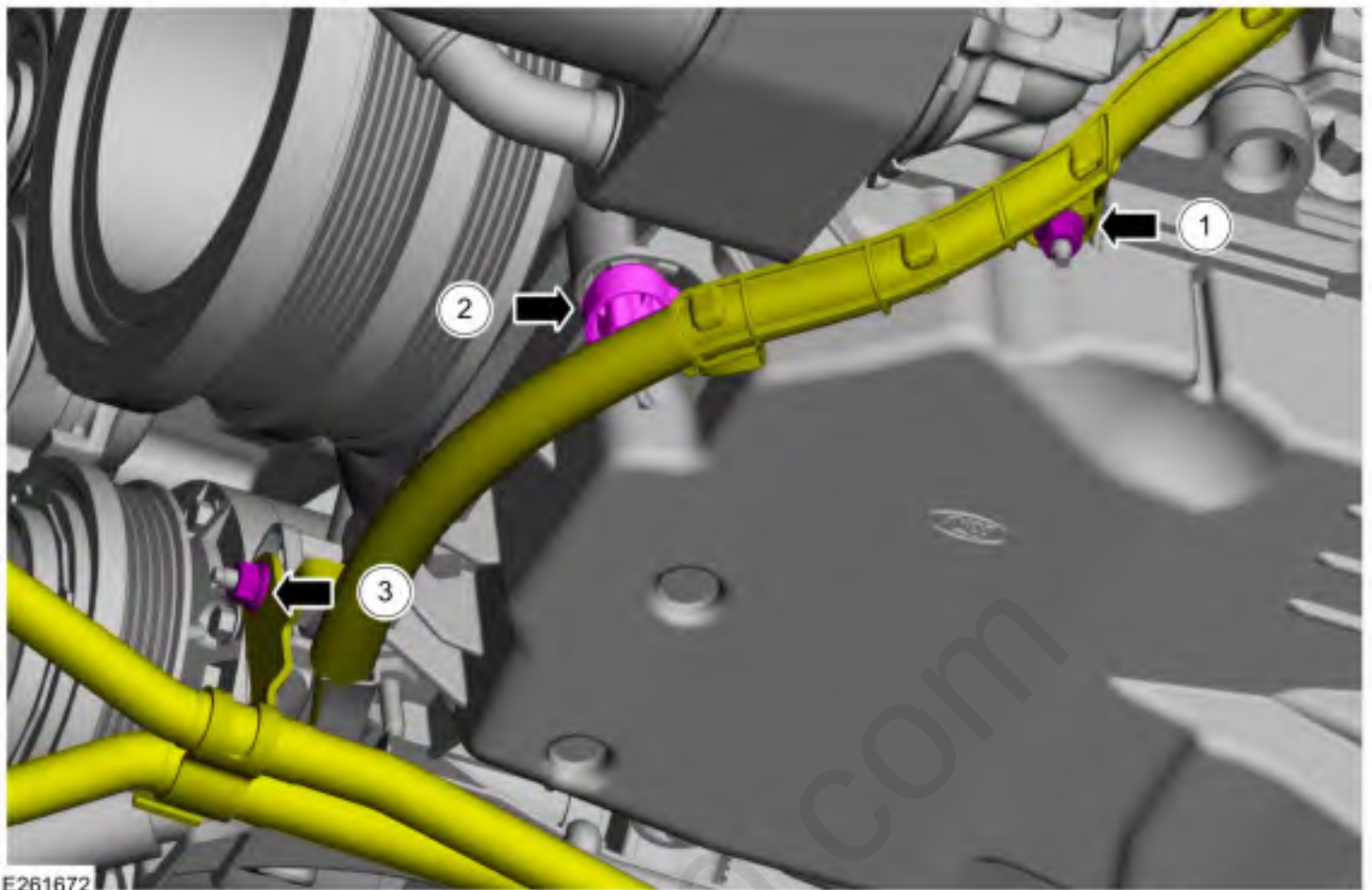
Remove the bolts and the skid plate.



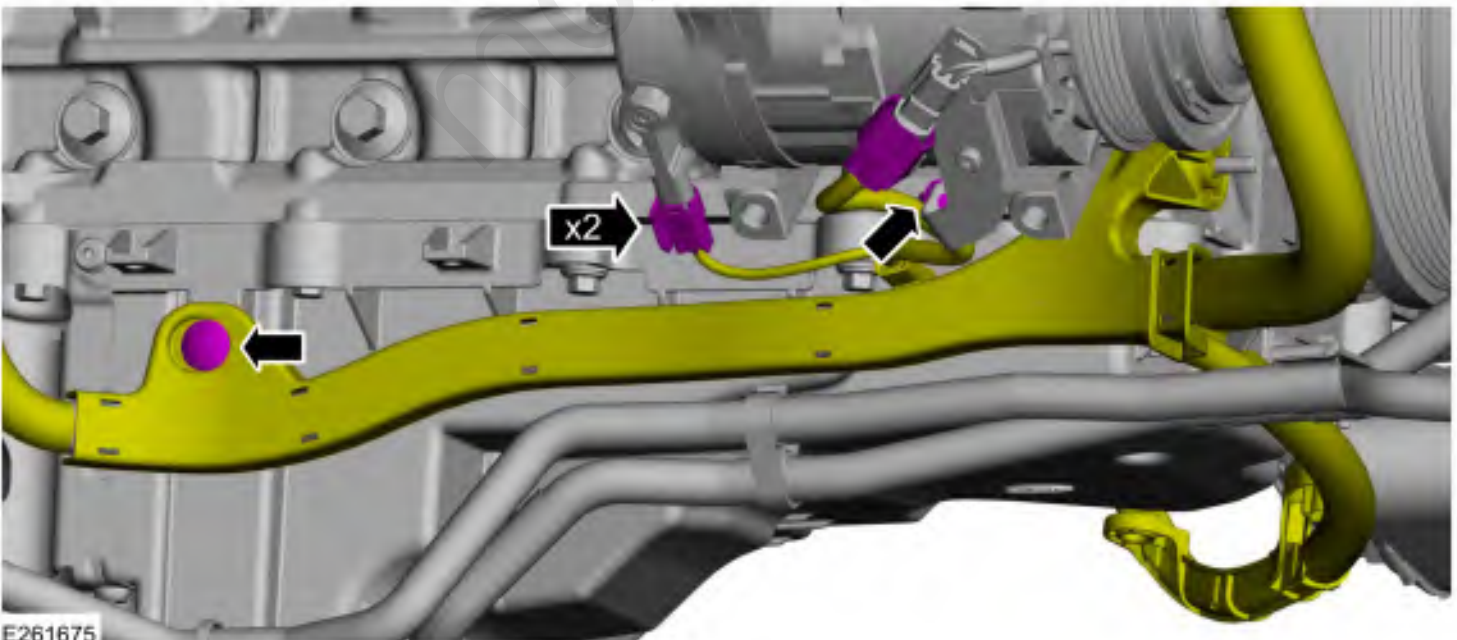
16. Remove the transmission-to-engine bolt and transmission cooler tube support bracket.



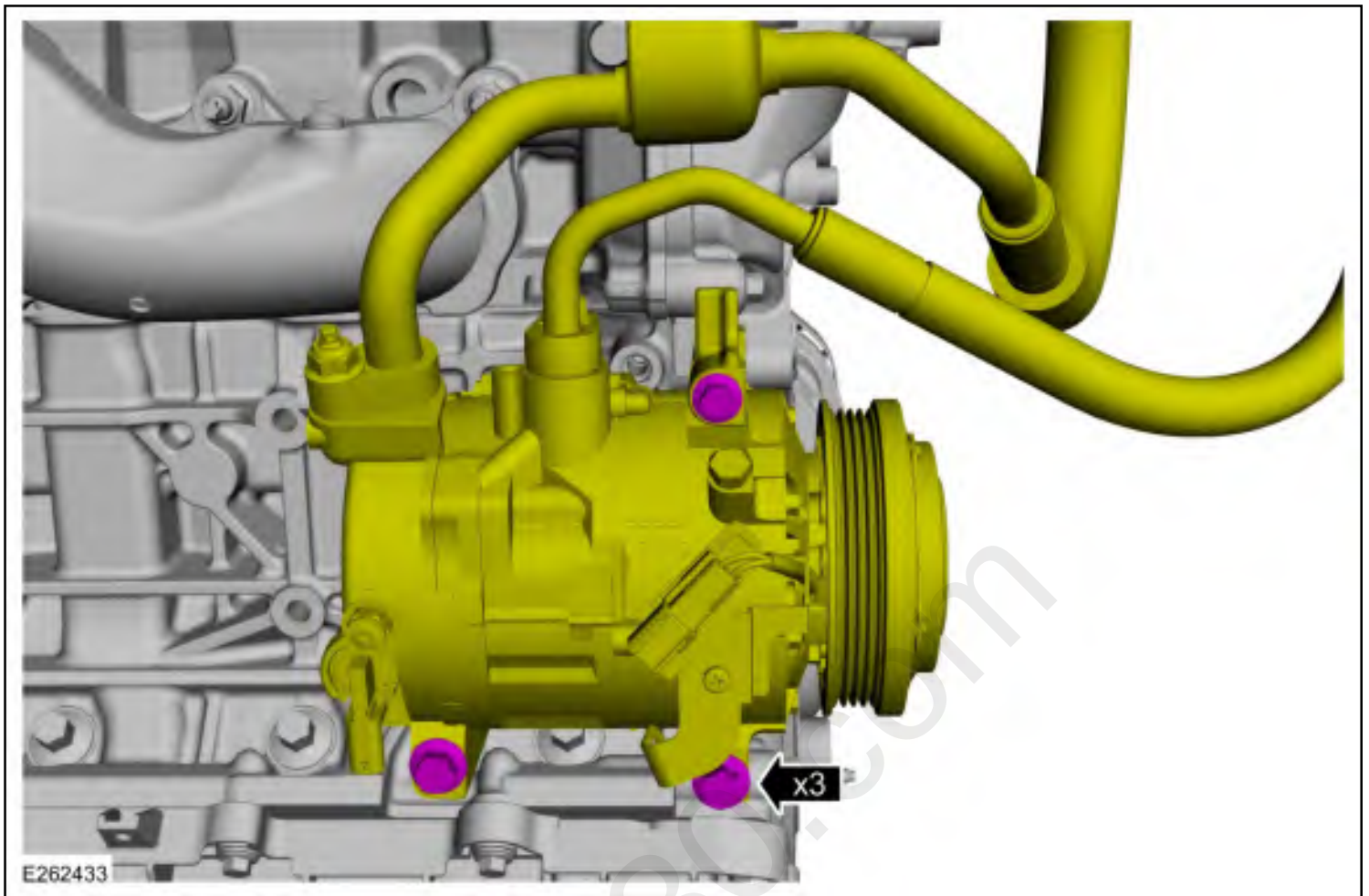
1. Remove the nut.
2. Detach the wiring harness retainer.
3. Remove the nut and position the coolant tube and wiring harness brackets aside.



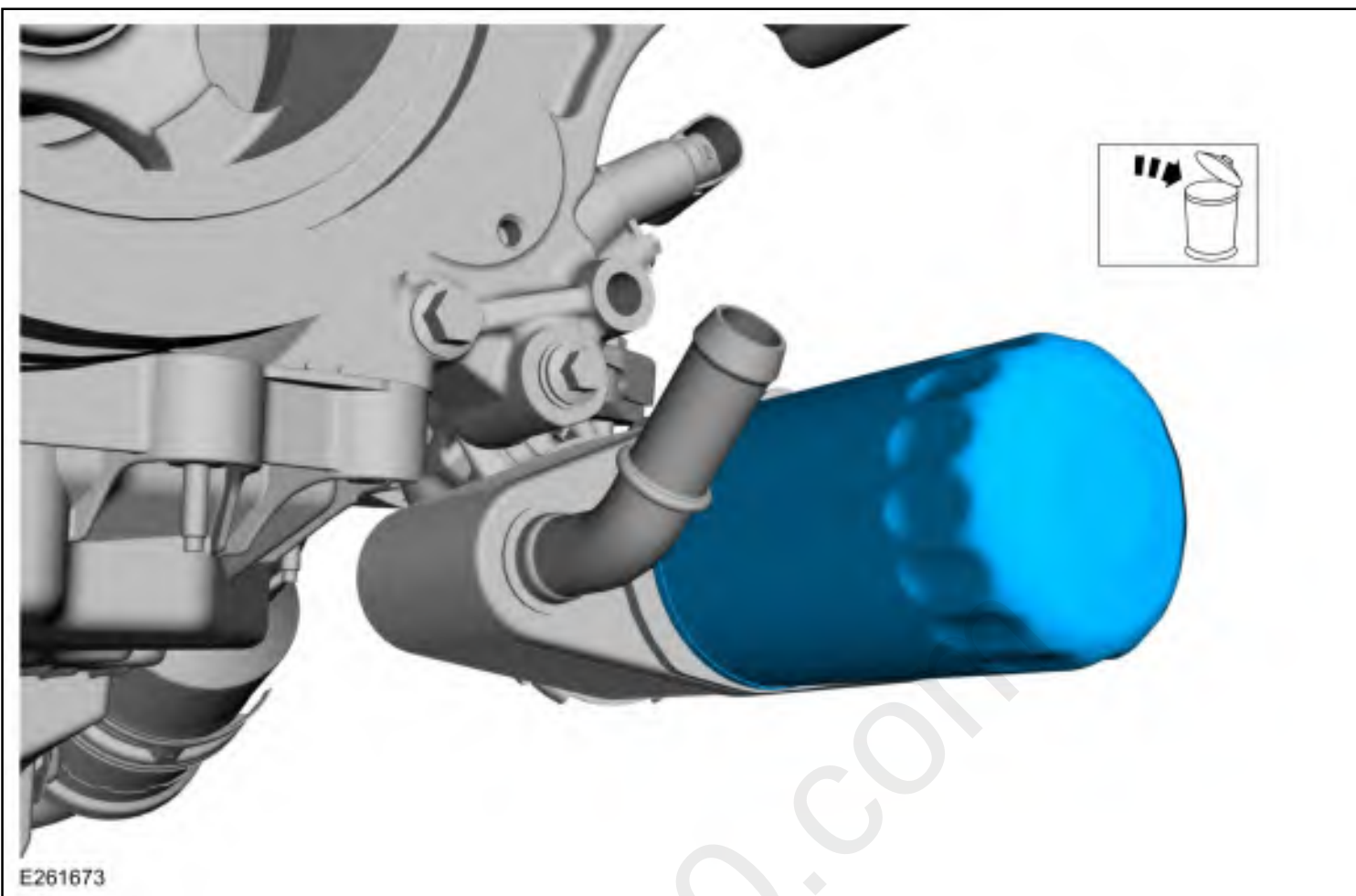
1. Disconnect the A/C compressor electrical connectors.
2. Detach the wiring harness retainers.



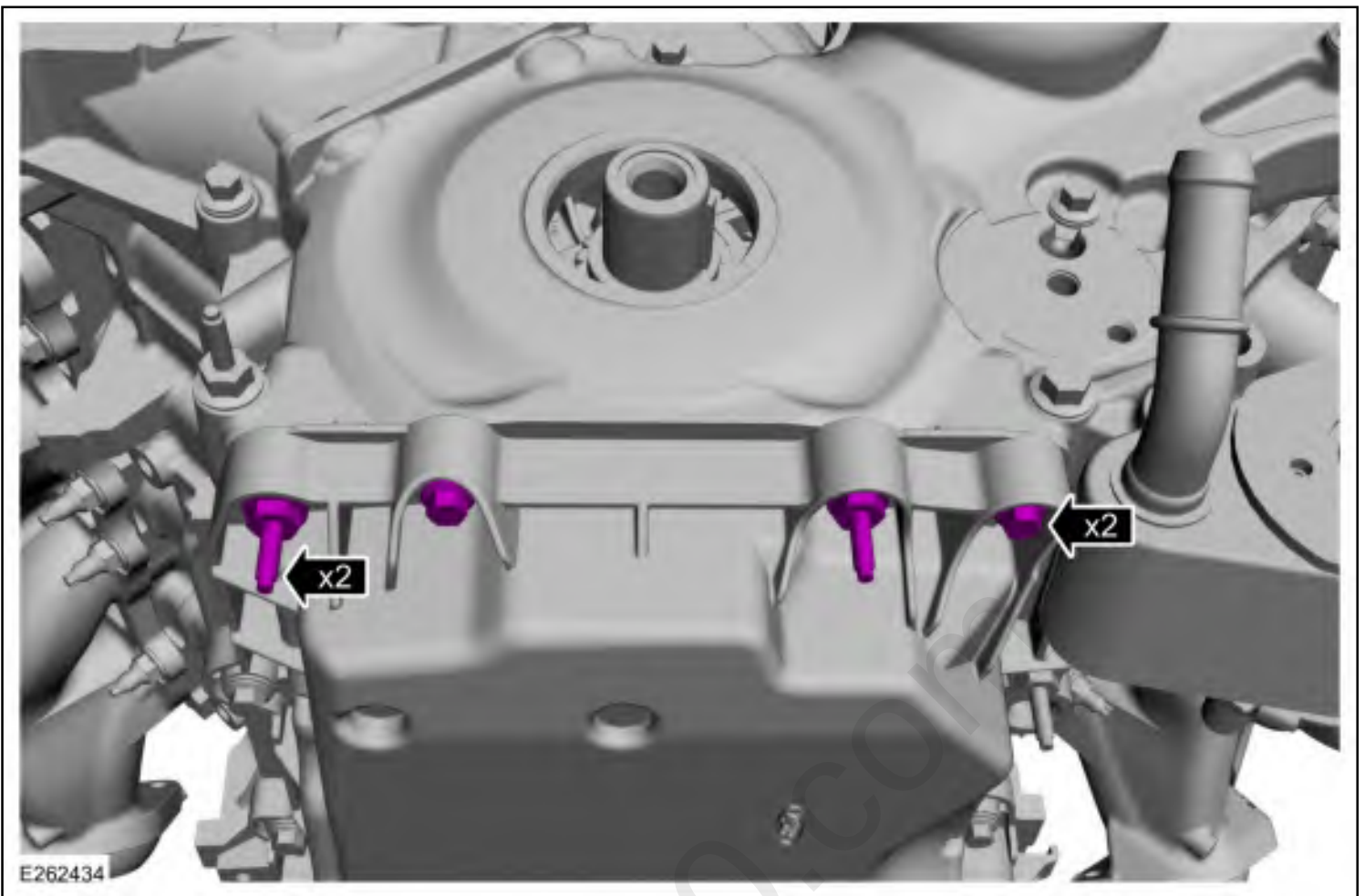
19. Remove the bolts and position the A/C compressor aside.



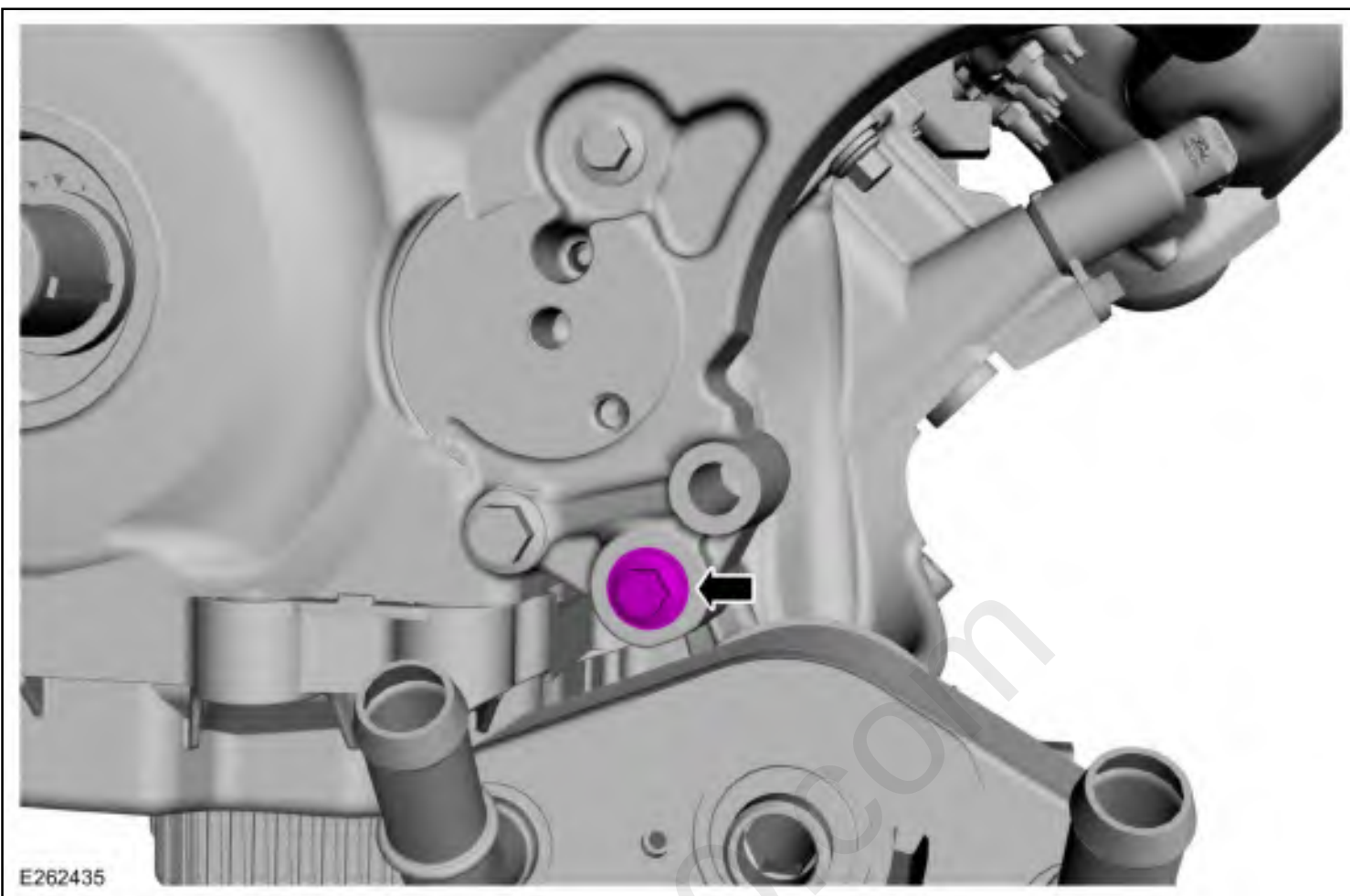
20. Remove and discard the engine oil filter.



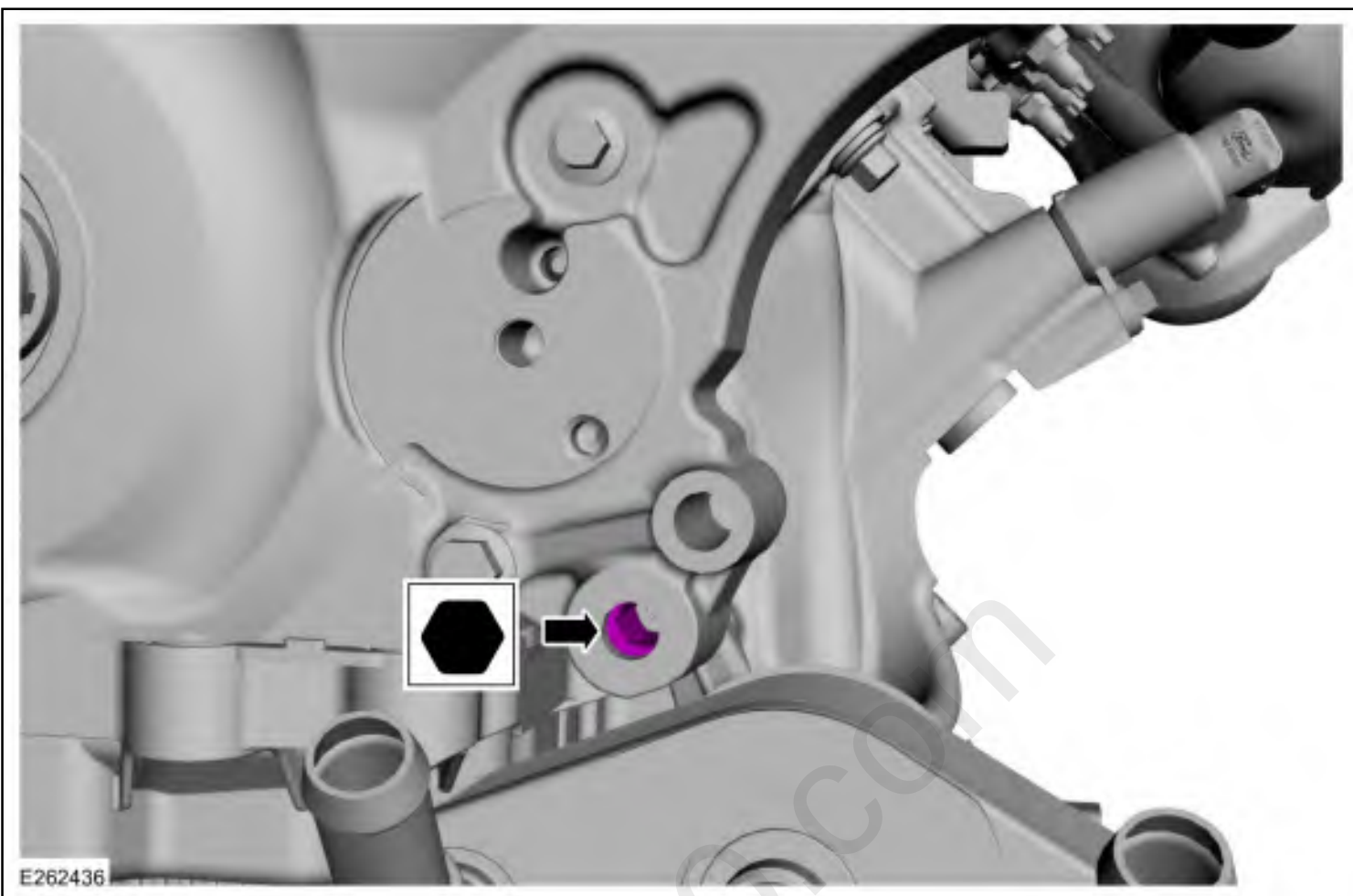
21. Remove the bolts and stud bolts.



22. Remove the engine front cover-to-oil filter adapter bolt.

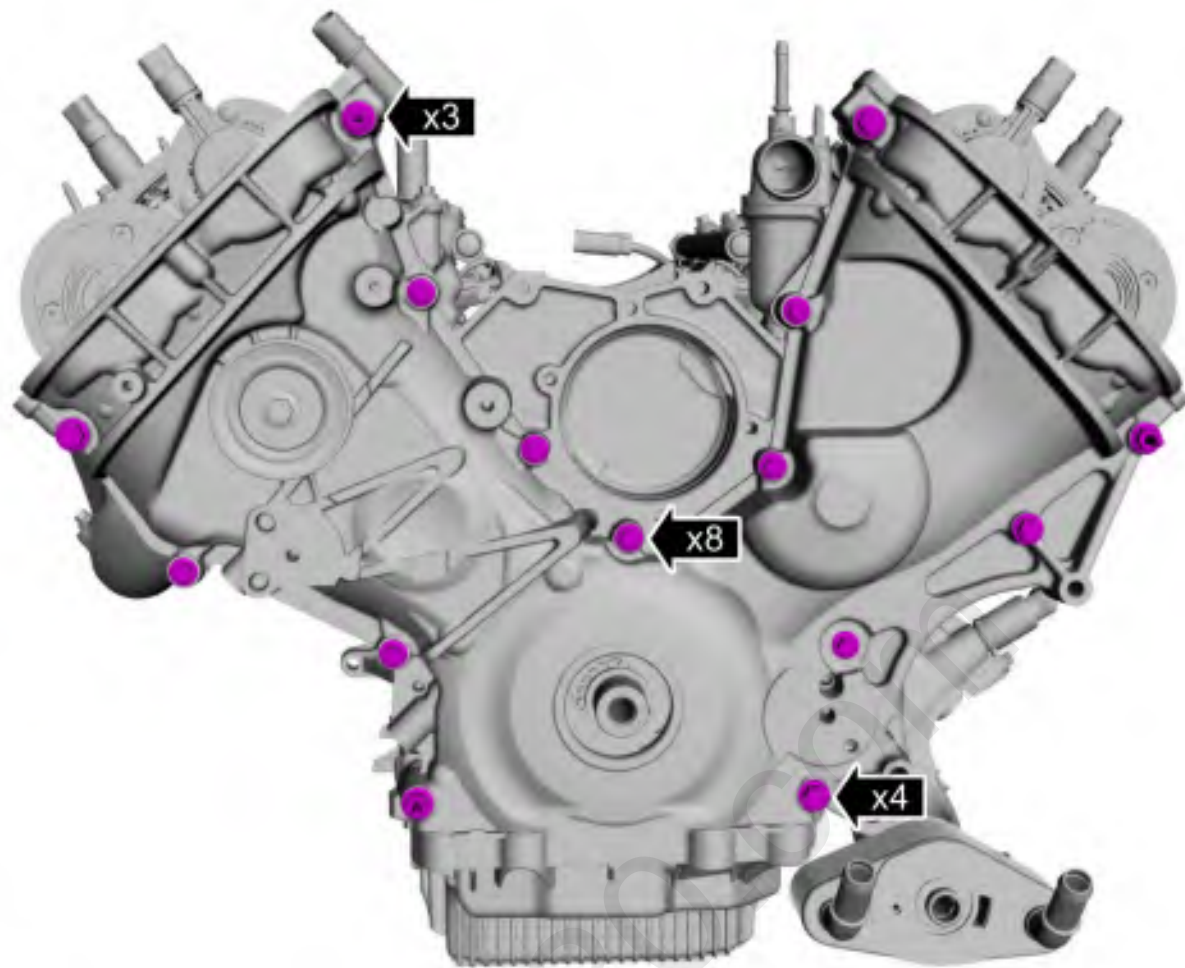


23. Using a 10 mm Hex Bit loosen the engine front cover-to-oil filter adapter jack screw.



24. **NOTE:** *There are 3 different fasteners used, note the location of fasteners for assembly.*

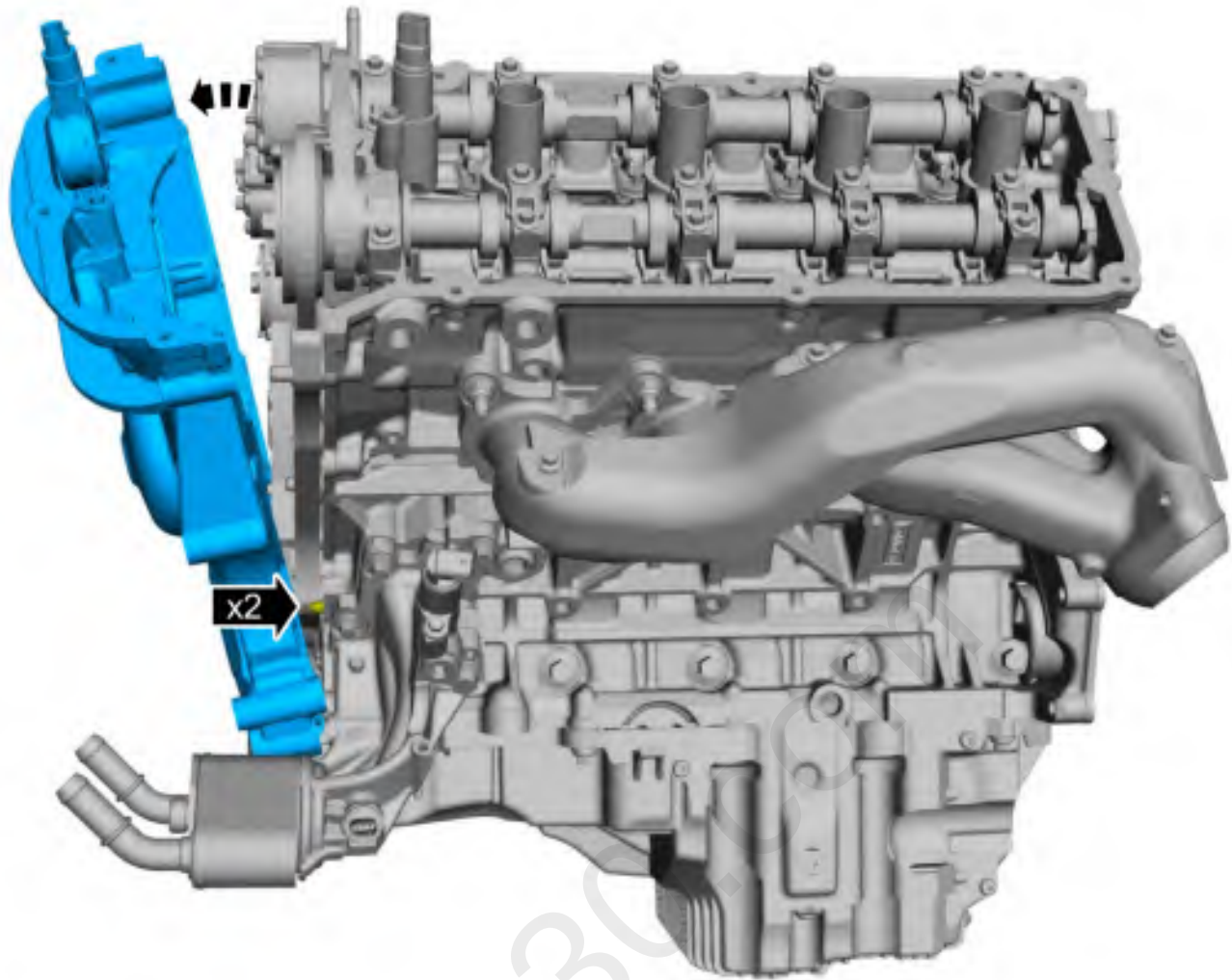
Remove the bolts and stud bolts.



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25. **NOTE:** *Timing drive components removed from view for clarity.*

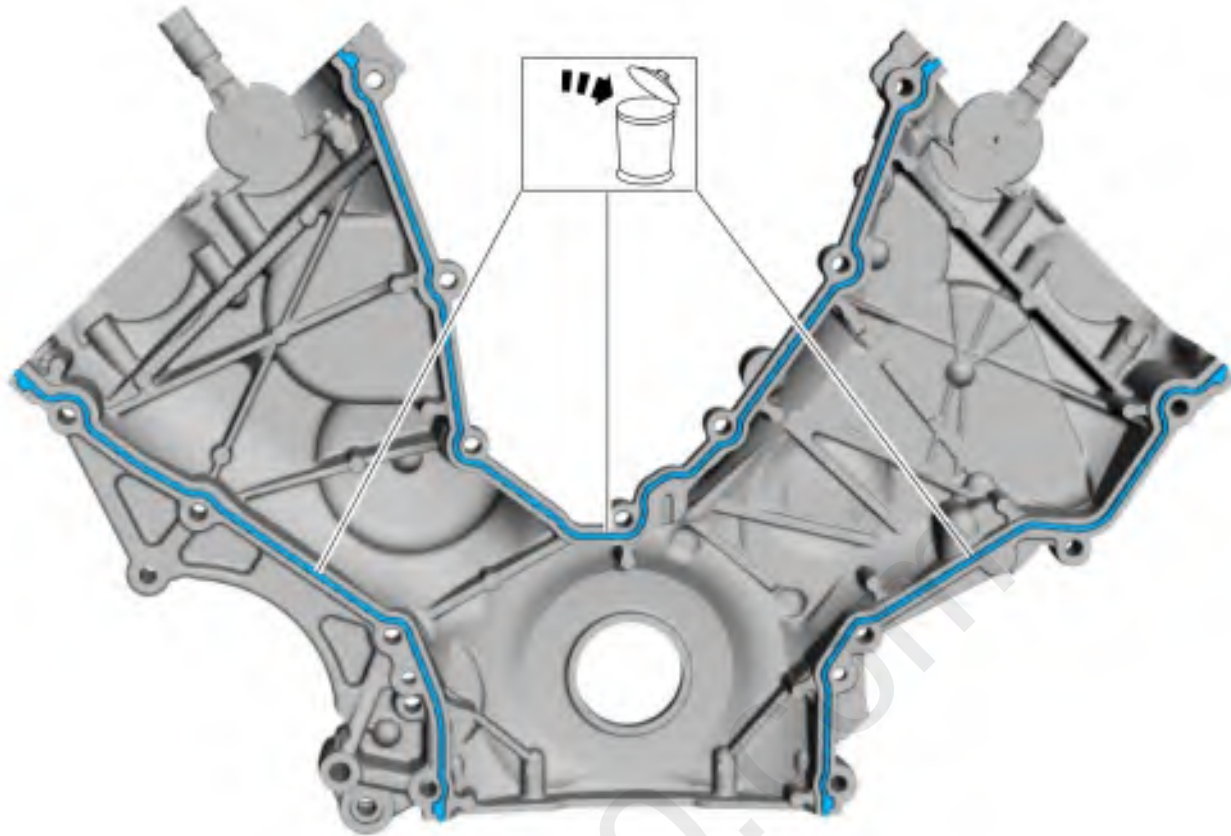
Remove the engine front cover from the front cover-to-cylinder block dowels.



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26. Remove and discard the gaskets.



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27. **NOTICE:** Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of old sealant.

Clean and inspect the mating surface.

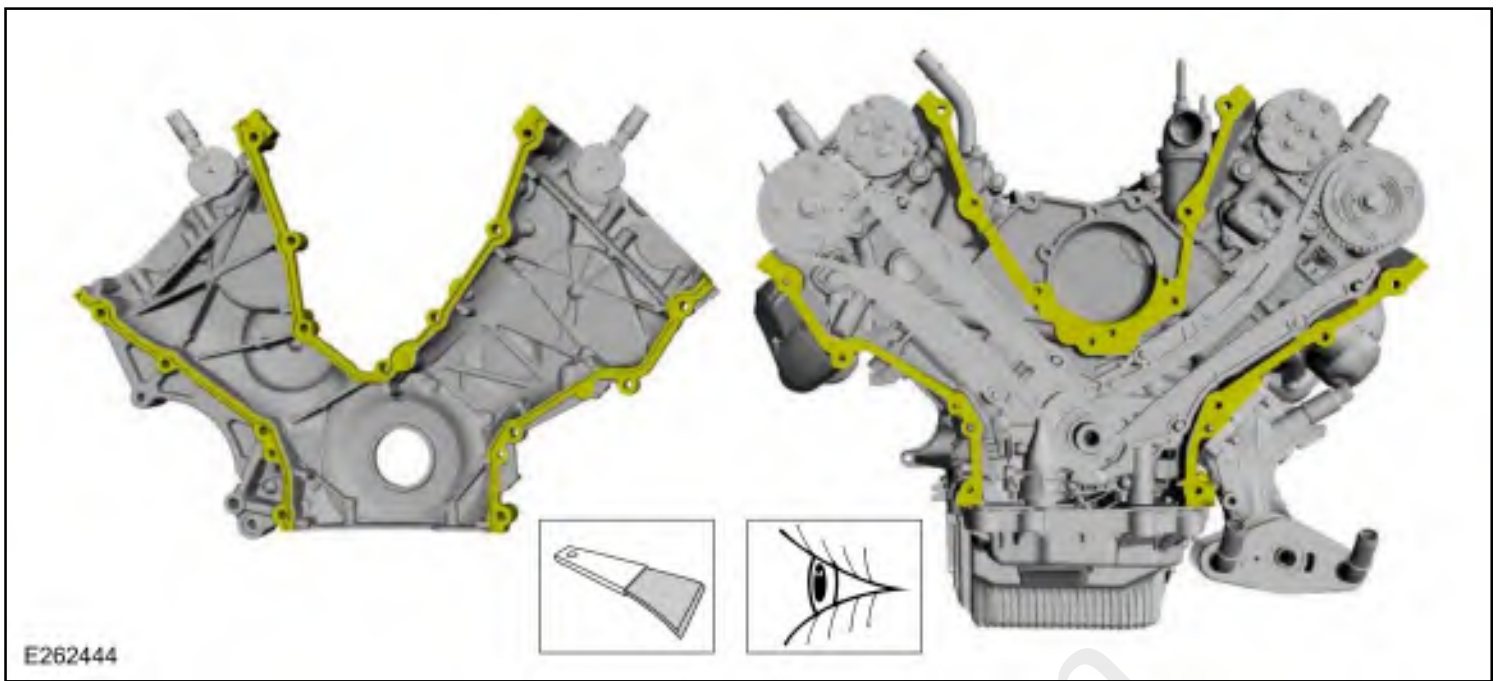
Refer to: [RTV Sealing Surface Cleaning and Preparation](#) (303-00 Engine System - General Information, General Procedures).

Use the General Equipment: Plastic Scraper

Material: Motorcraft® Silicone Gasket Remover / ZC-30-A

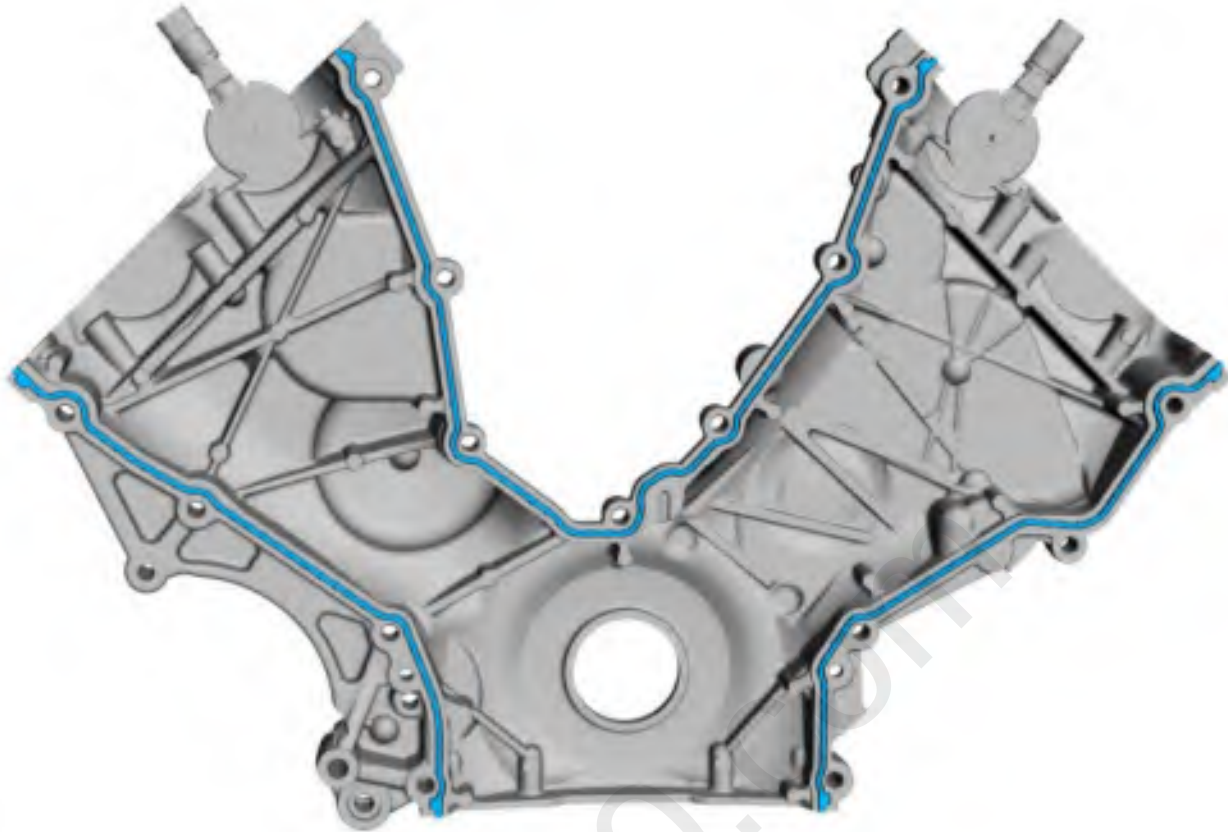
Material: Motorcraft® Metal Brake Parts Cleaner / PM-4-A, PM-4-B

Material: Motorcraft® Metal Surface Prep Wipes / ZC-31-B



Installation

1. Install new gaskets on the engine front cover.



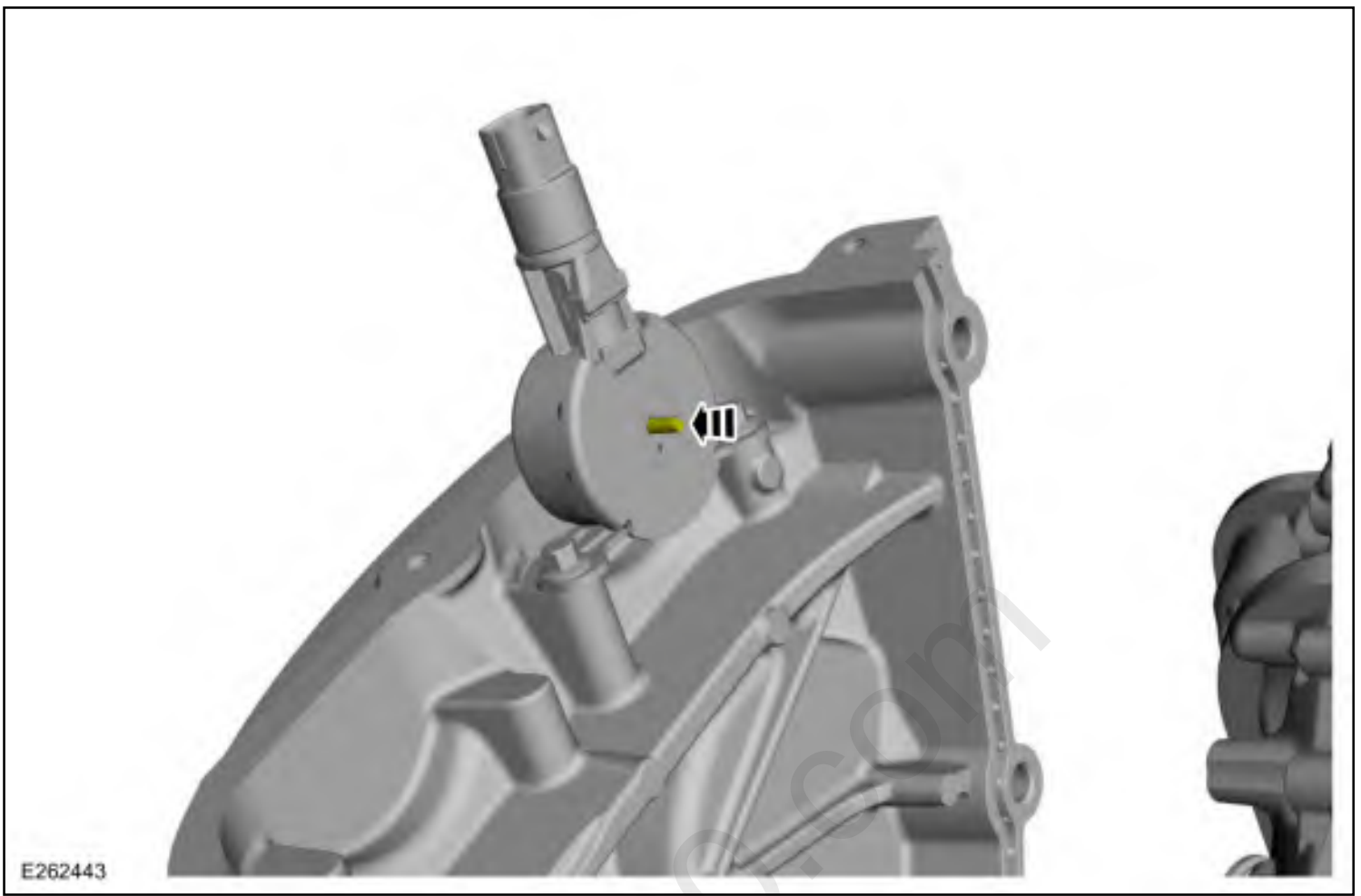
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2. **NOTICE:** The VCT variable force solenoid pins must be fully depressed to avoid interference with the VCT valve tips when installing the engine front cover. Failure to follow these instructions can result in damage to the engine.

NOTE: *RH shown, LH similar.*

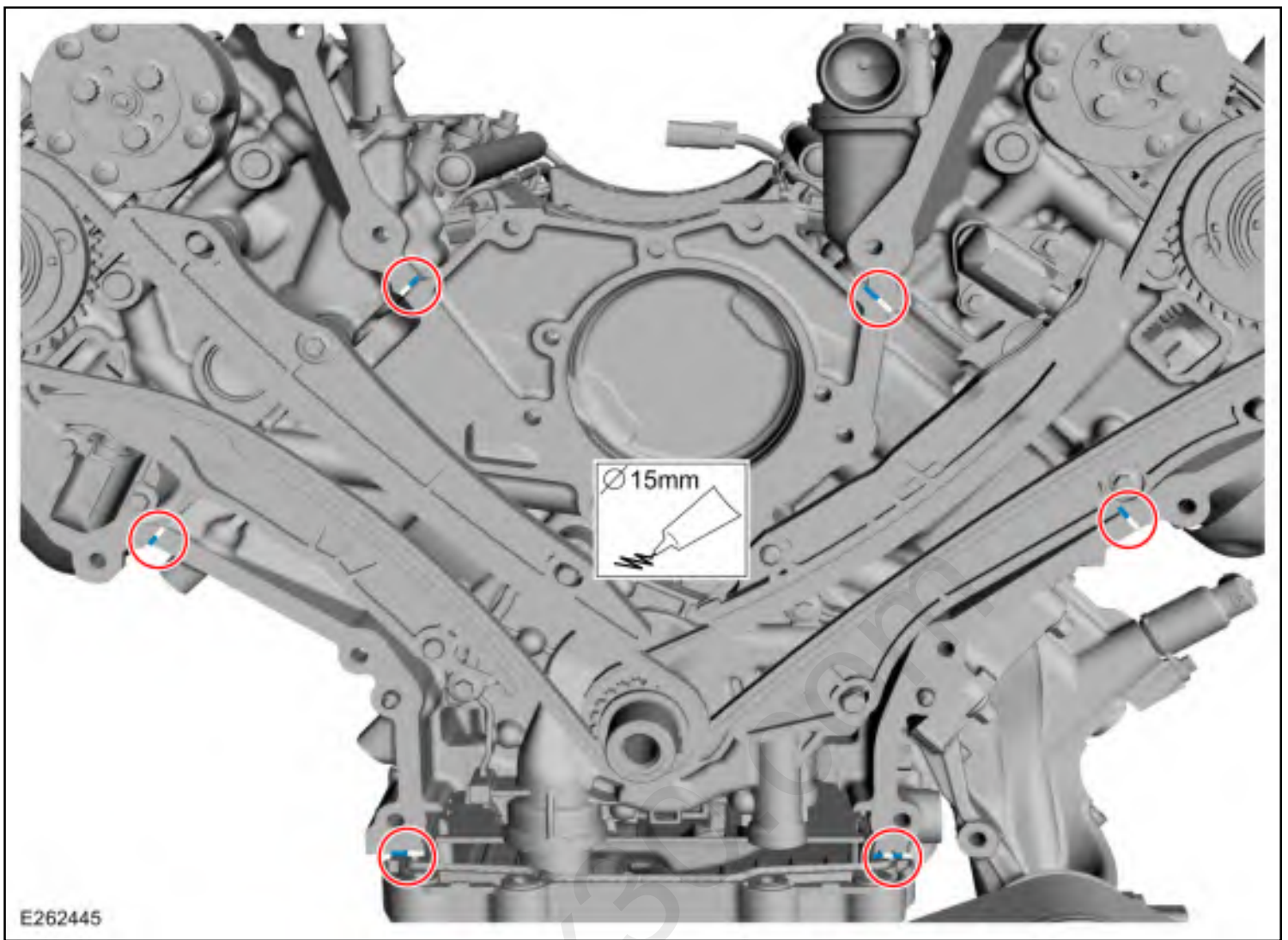
Fully depress the VCT variable force solenoid pins.



3. **NOTICE:** The engine front cover must be installed and all fasteners final tightened within 5 minutes of applying the sealer. If this cannot be accomplished, install the engine front cover and tighten fasteners 6, 7, 8, 9, 10 and 11 to 8 Nm (71 lb-in) within 5 minutes of applying the sealer. All of the fasteners must then be final tightened within 1 hour of applying the sealer. If this time limit is exceeded, all sealant must be removed and the sealing area cleaned. Failure to follow this procedure can cause future oil leakage.

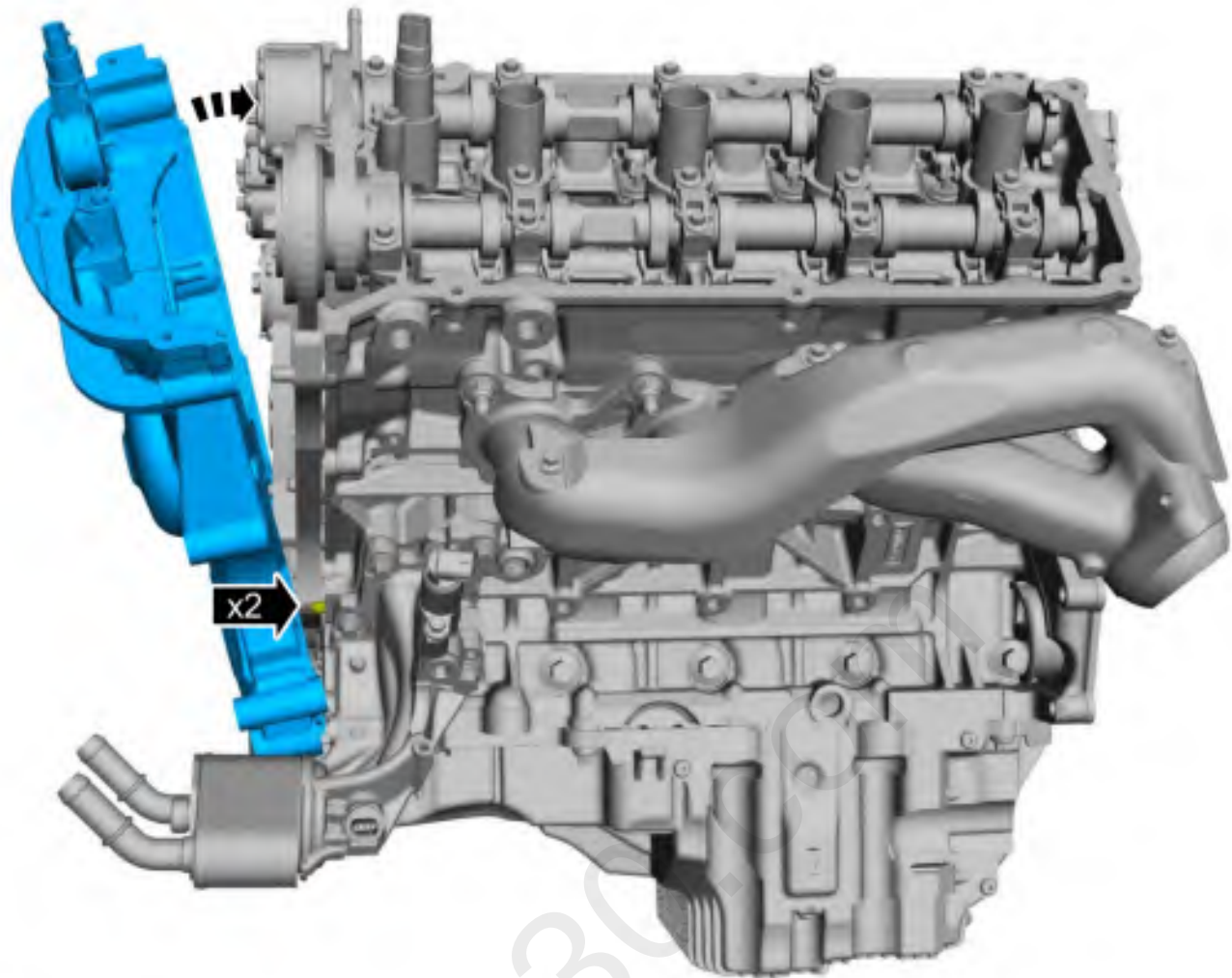
Apply a 15 mm (0.59 in) diameter drop of silicone gasket and sealant to the cylinder head-to-cylinder block joints and the oil pan-to-cylinder block joints.

Material: Motorcraft® Silicone Gasket and Sealant / TA-30 (WSE-M4G323-A4)



4. **NOTE:** Make sure that the engine front cover gaskets are in place on the engine front cover before installation.

Position the engine front cover onto the dowels.

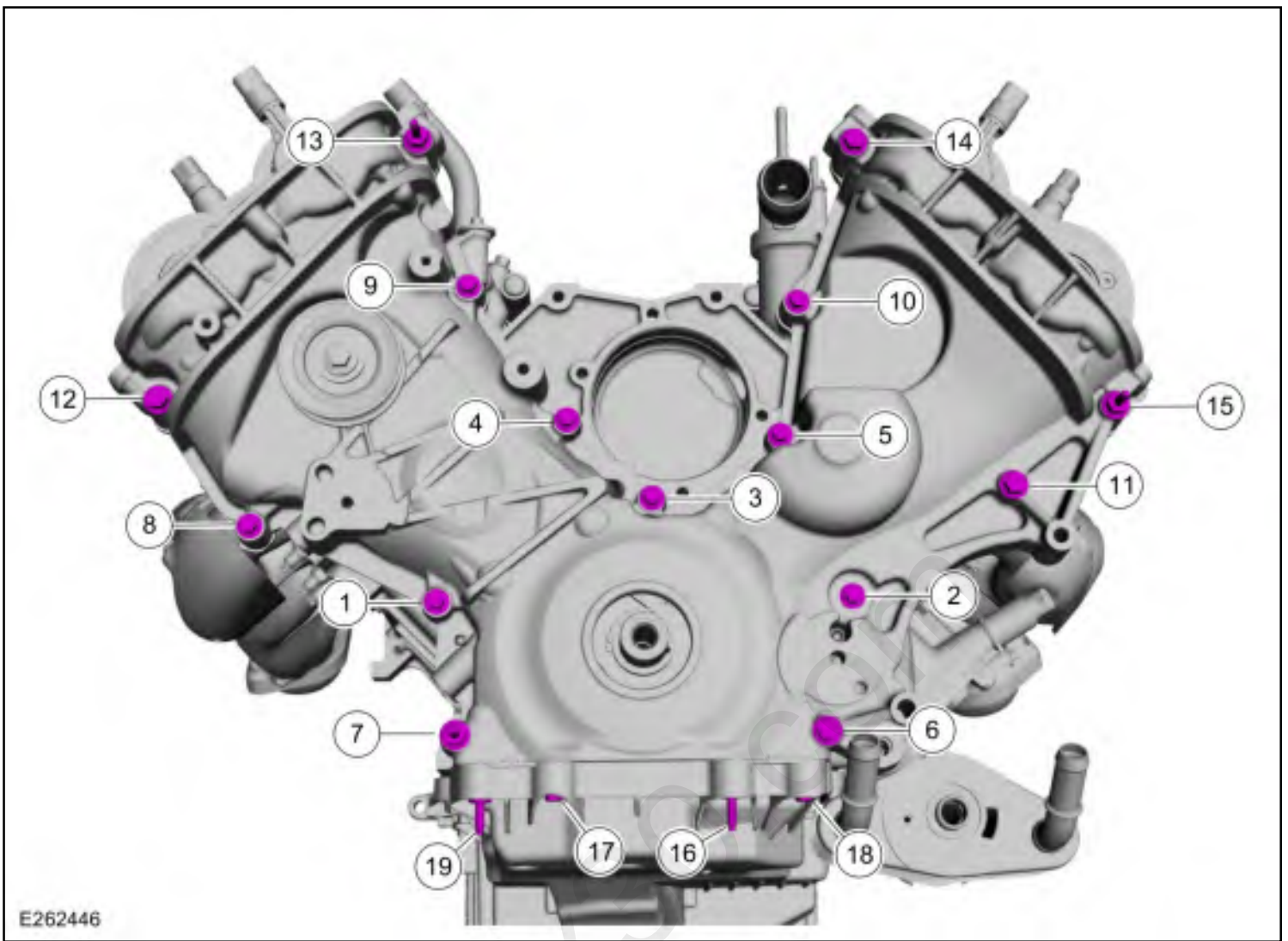


5. **NOTICE:** The engine front cover must be installed and all fasteners final tightened within 5 minutes of applying the sealer. If this cannot be accomplished, install the engine front cover and tighten fasteners 6, 7, 8, 9, 10 and 11 to 8 Nm (71 lb-in) within 5 minutes of applying the sealer. All of the fasteners must then be final tightened within 1 hour of applying the sealer. If this time limit is exceeded, all sealant must be removed and the sealing area cleaned. Failure to follow this procedure can cause future oil leakage.

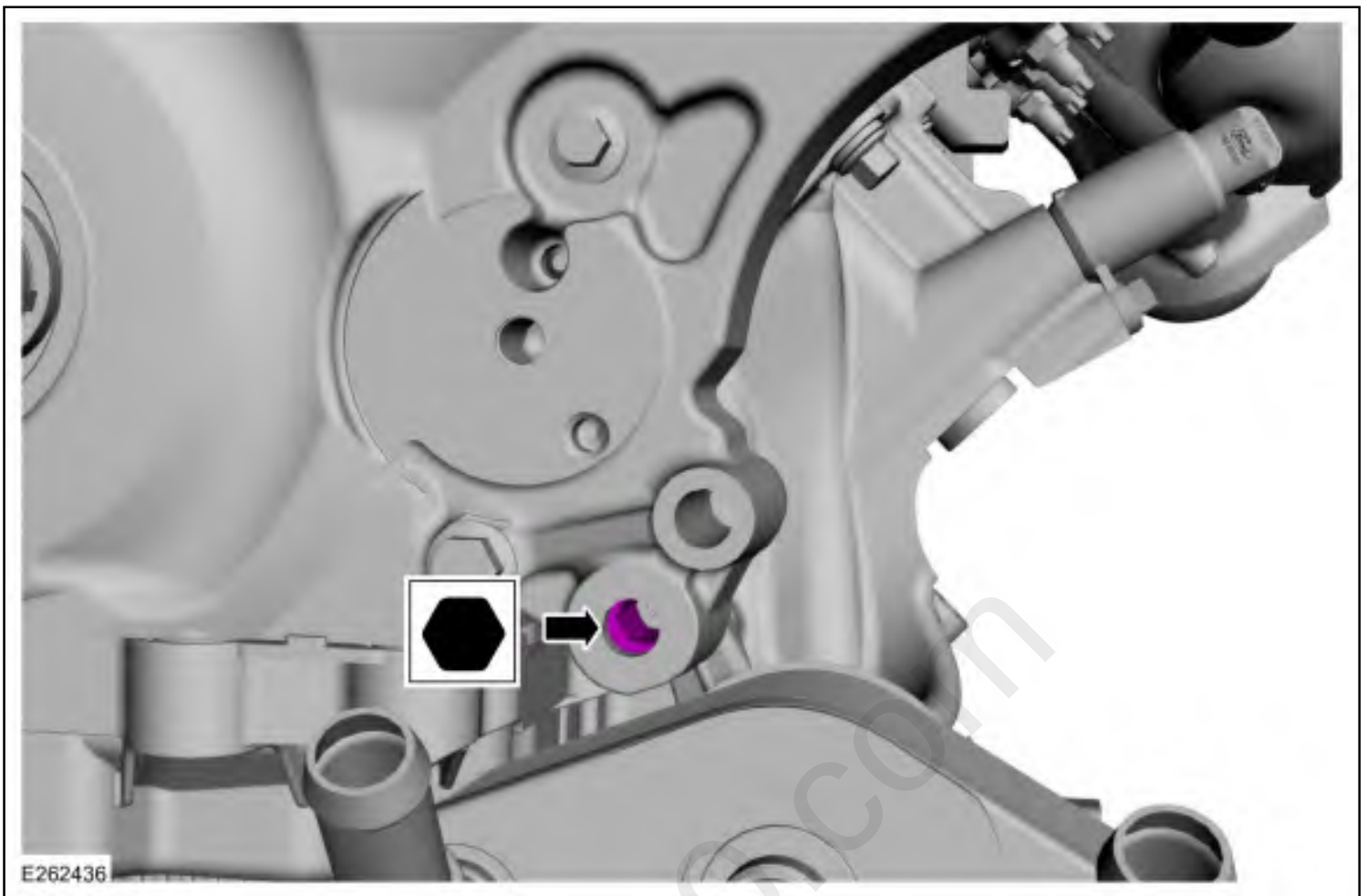
Install the bolts and stud bolts.

Torque:

- Stage 1: Fasteners 1-15 : 18 lb.ft (25 Nm)
- Stage 2: Fasteners 16-19 : 89 lb.in (10 Nm)
- Stage 3: Fasteners 1-15 : 60°
- Stage 4: Fasteners 16-19 : 45°



6. Using a 10 mm Hex Bit, turn the engine front cover-to-oil filter adapter jack screw into contact with the oil filter adapter.
Torque: 44 lb.in (5 Nm)

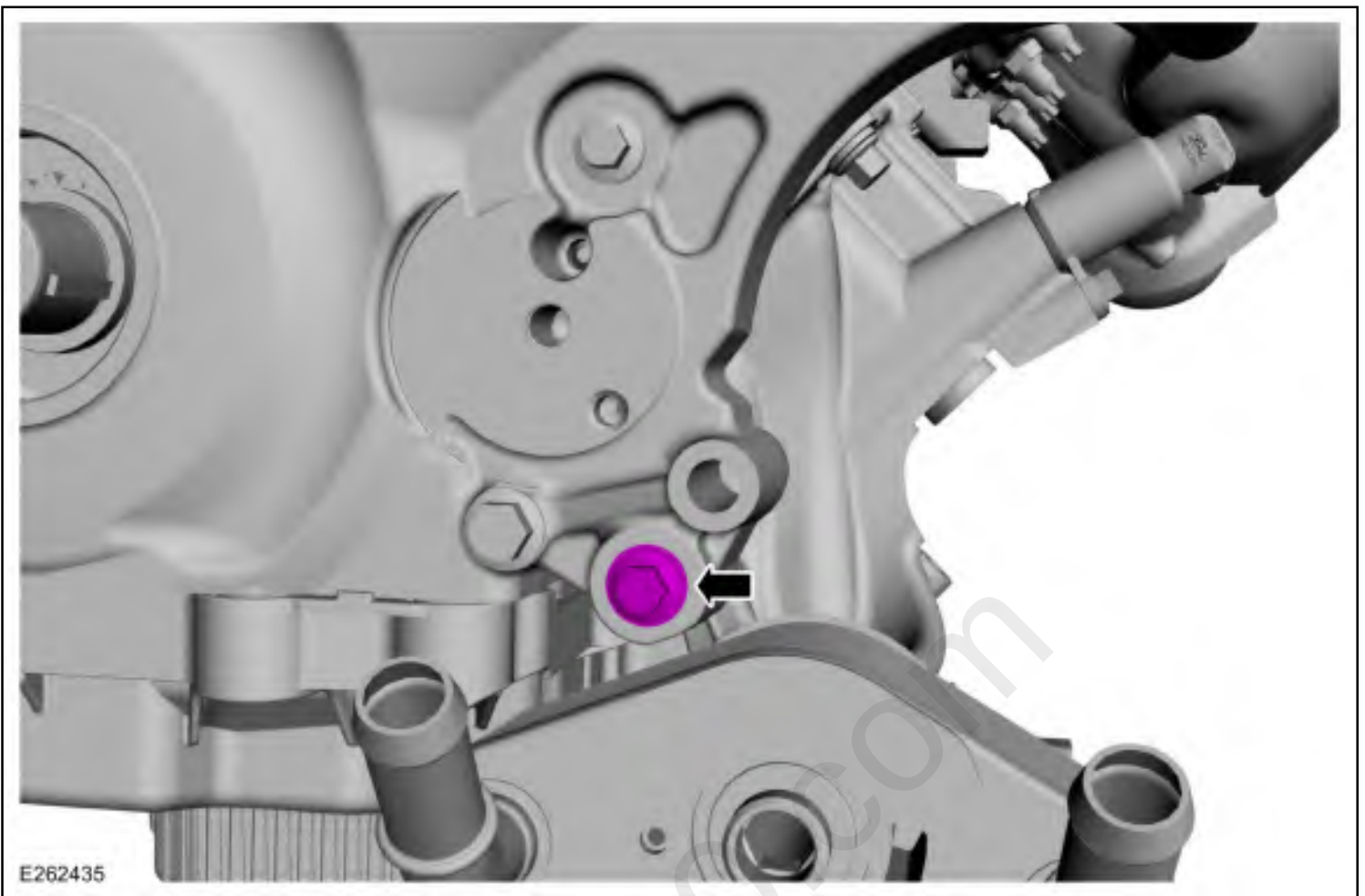


7. Install the engine front cover-to-oil filter adapter bolt.

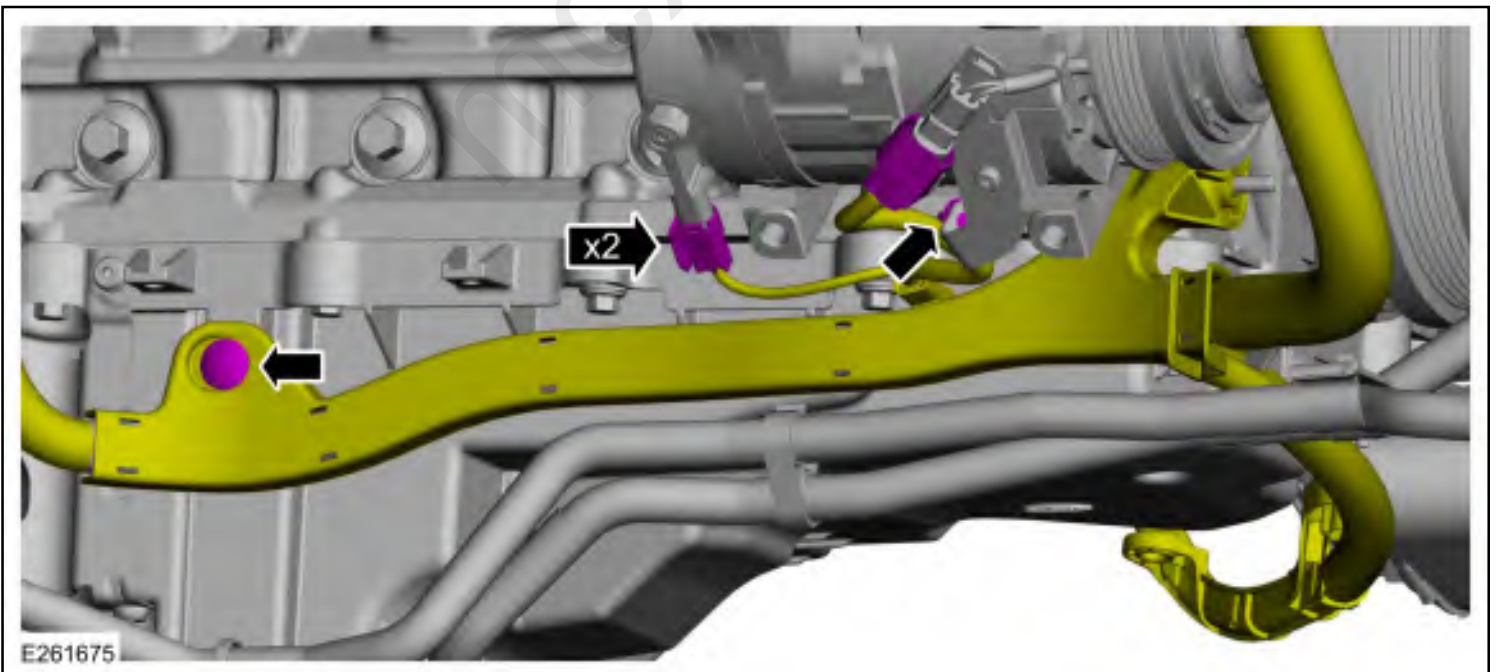
Torque:

Stage 1: 18 lb.ft (25 Nm)

Stage 2: 60°



1. Connect the A/C compressor electrical connectors.
2. Attach the wiring harness retainers.

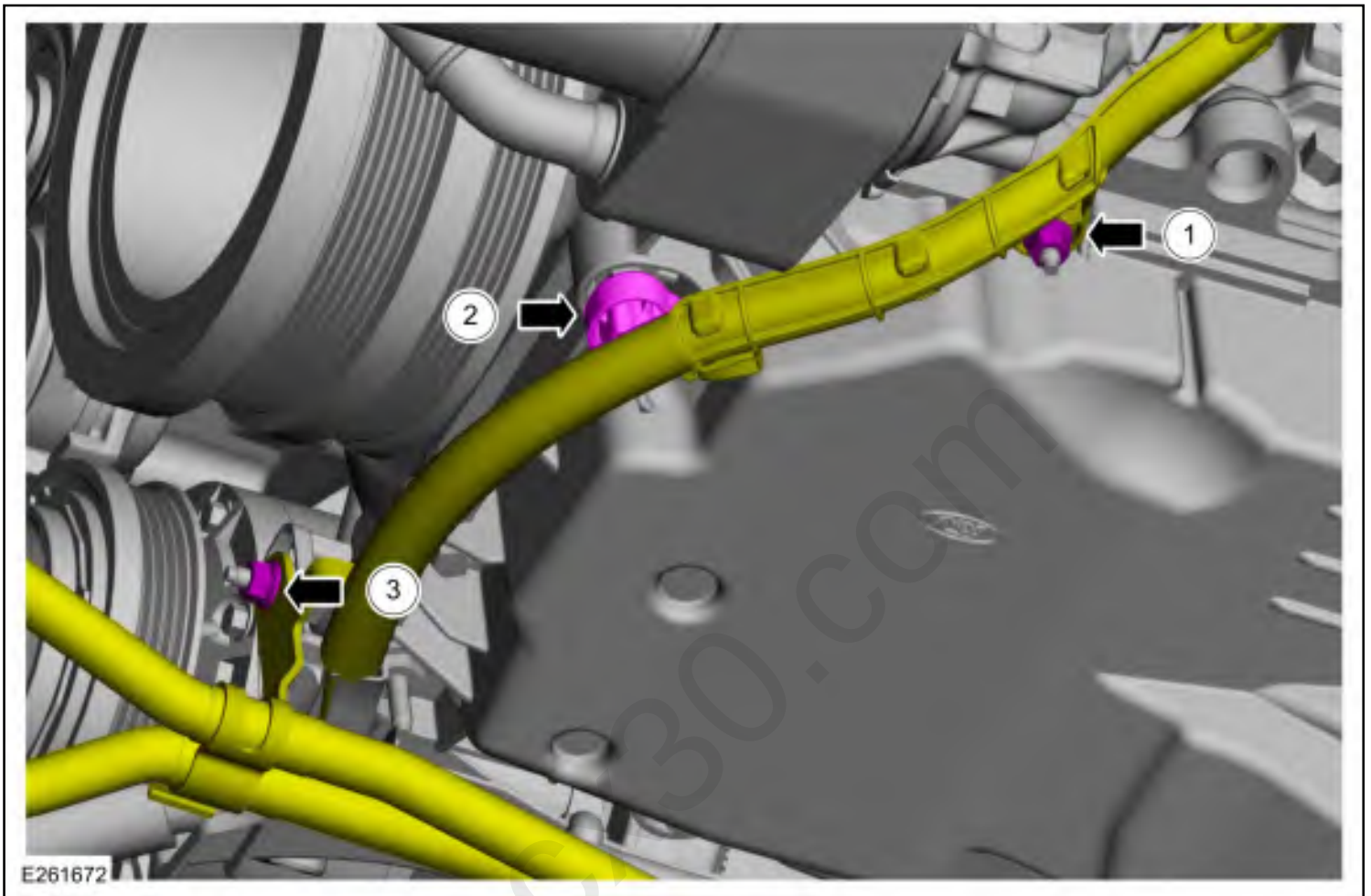


1. Install the nut.

Torque: 106 lb.in (12 Nm)

2. Attach the wiring harness retainer.
3. Position the coolant tube and wiring harness brackets and install the nut.

Torque: 115 lb.in (13 Nm)

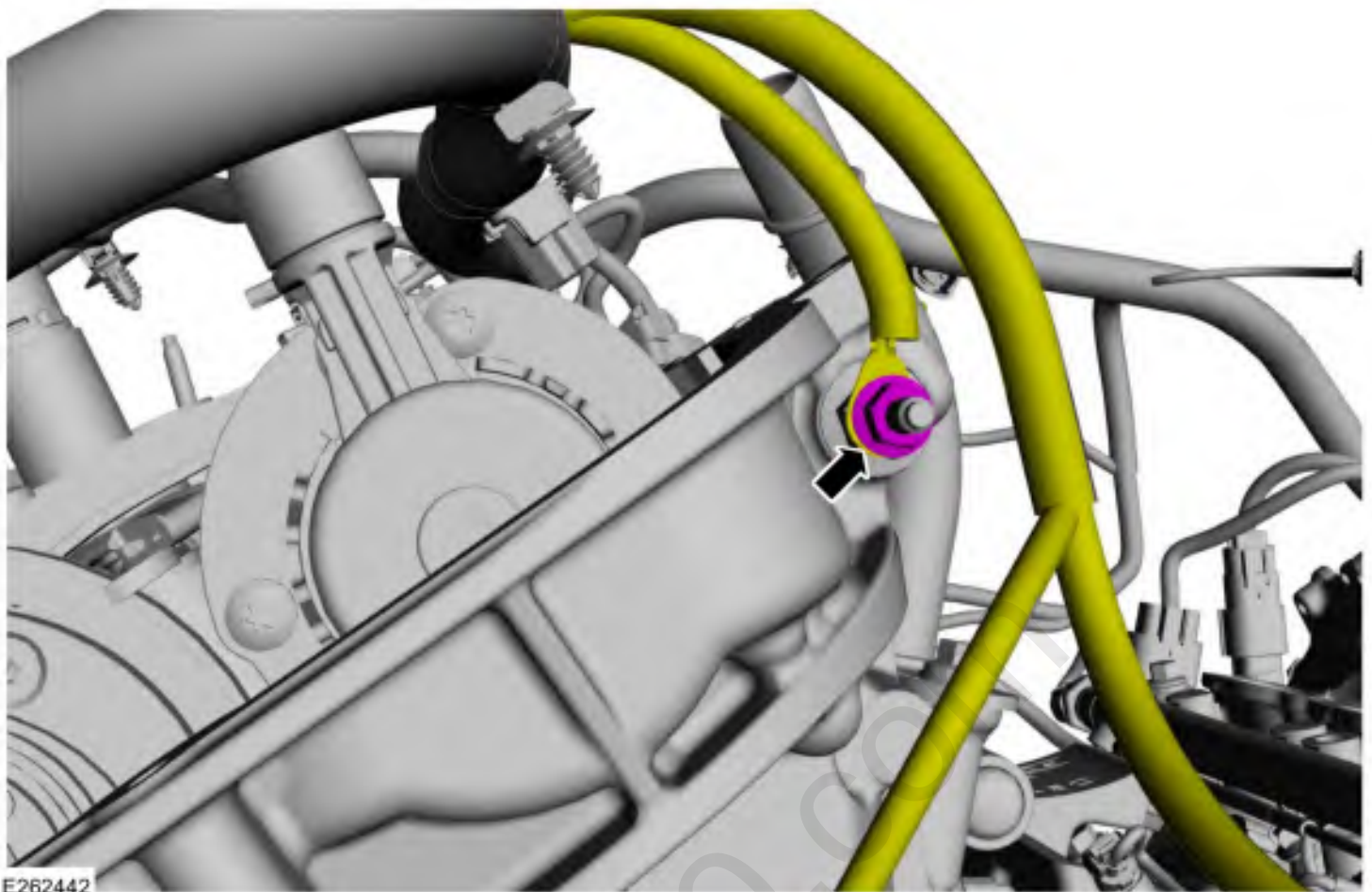


10. Install the generator, the bolt and the nut.

Torque: 35 lb.ft (48 Nm)



11. Install the ground wire and nut.
Torque: 89 lb.in (10 Nm)



12. Install the following items:

1. Refer to: Crankshaft Front Seal (303-01 Engine - 5.0L 32V Ti-VCT) .
2. Refer to: [Coolant Pump](#) (303-03D Engine Cooling - 5.0L 32V Ti-VCT, Removal and Installation).
3. Refer to: Air Conditioning (A/C) Compressor Belt Tensioner (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
4. Refer to: Air Conditioning (A/C) Compressor Belt (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
5. Refer to: Accessory Drive Belt Tensioner (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .
6. Refer to: Accessory Drive Belt (303-05 Accessory Drive - 5.0L 32V Ti-VCT) .

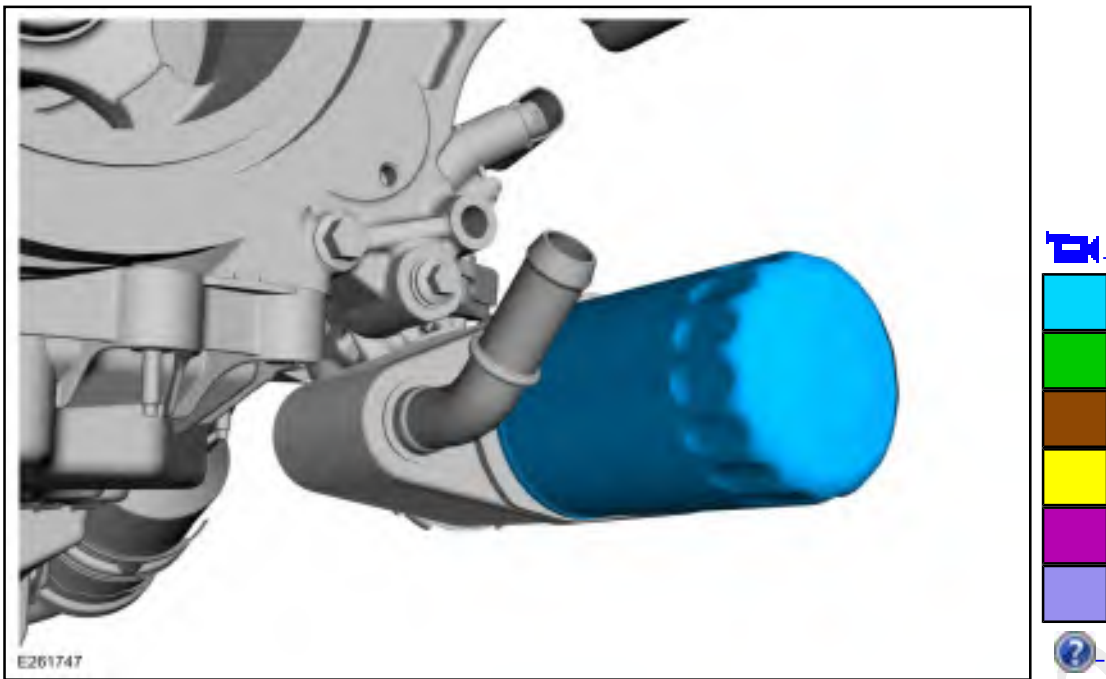
13. **NOTE:** *Do not lubricate the O-ring seal.*

Install a new oil filter.

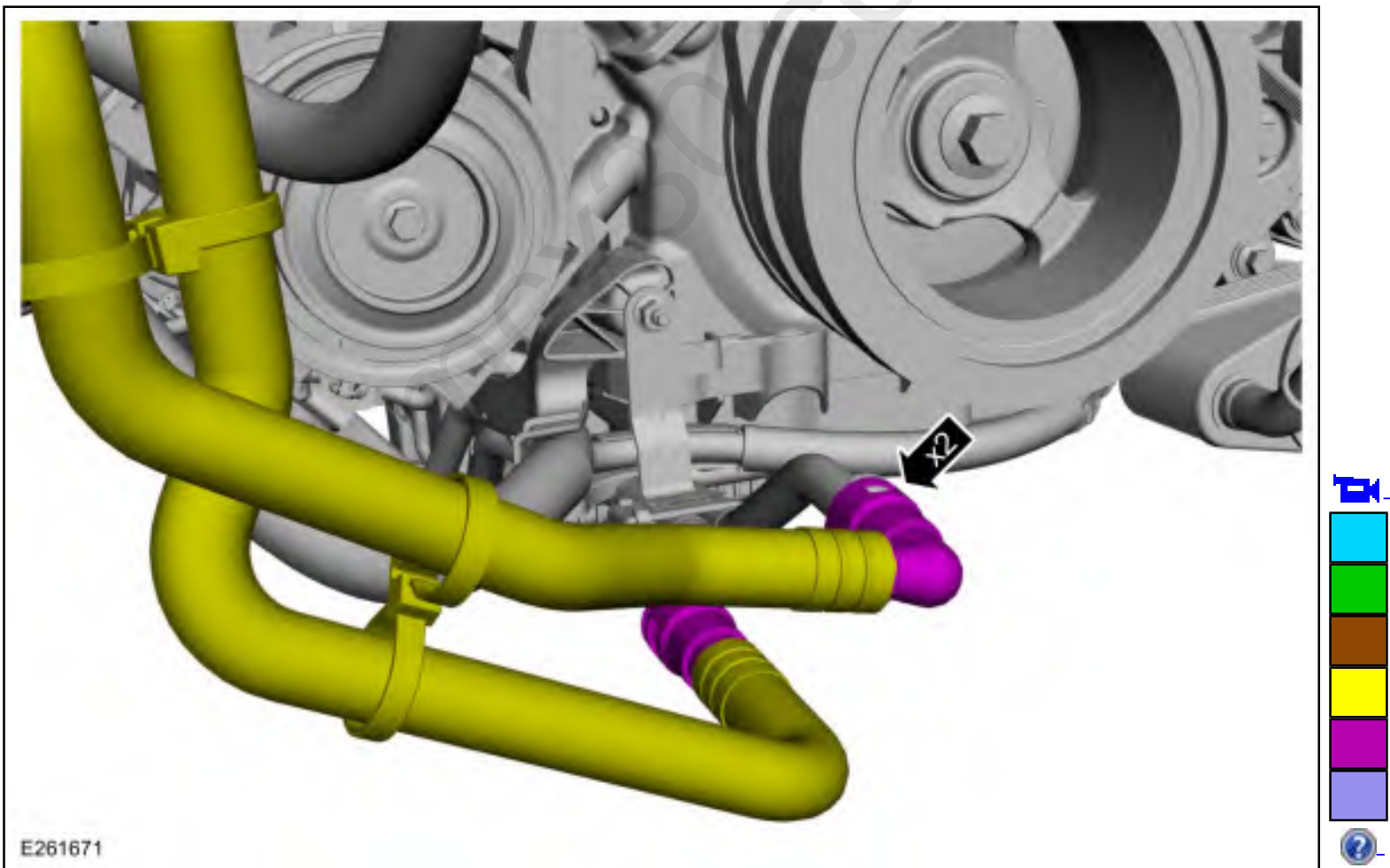
Torque:

Stage 1: 44 lb.in (5 Nm)

Stage 2: 180°



14. Connect the coolant hose quick release couplings.



1. Install the coolant hose assembly and the clamps.

- Use the General Equipment: Hose Clamp Remover/Installer
2. Install the coolant bypass T assembly and engage the spring clip.
 3. Install the coolant hose and clamp.

Use the General Equipment: Hose Clamp Remover/Installer

4. Install the coolant hose and clamp.

Use the General Equipment: Hose Clamp Remover/Installer

5. Connect the quick release coupling.

6. Install the coolant hose and clamp.

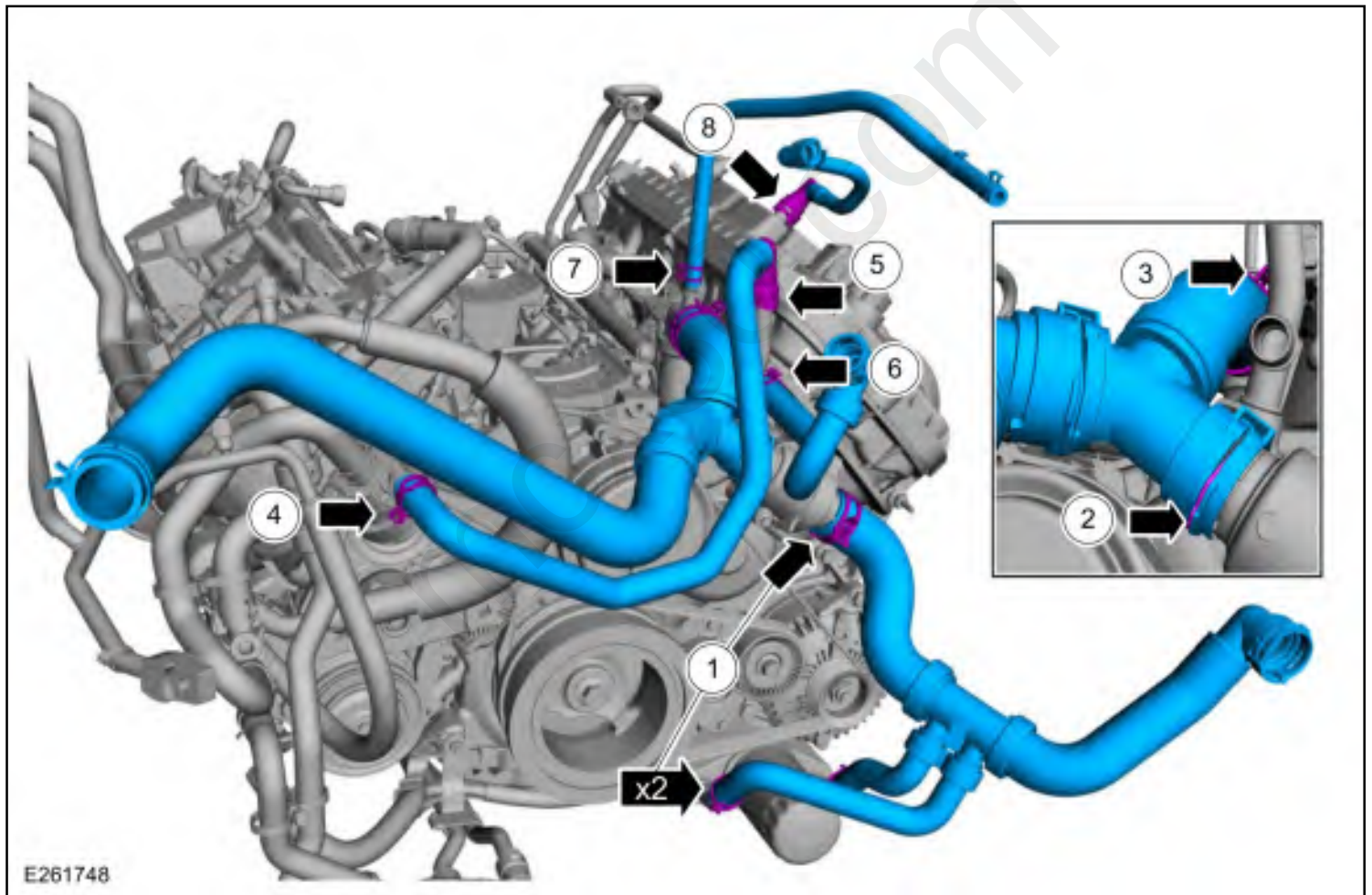
Use the General Equipment: Hose Clamp Remover/Installer

7. Install the coolant hose and clamp.

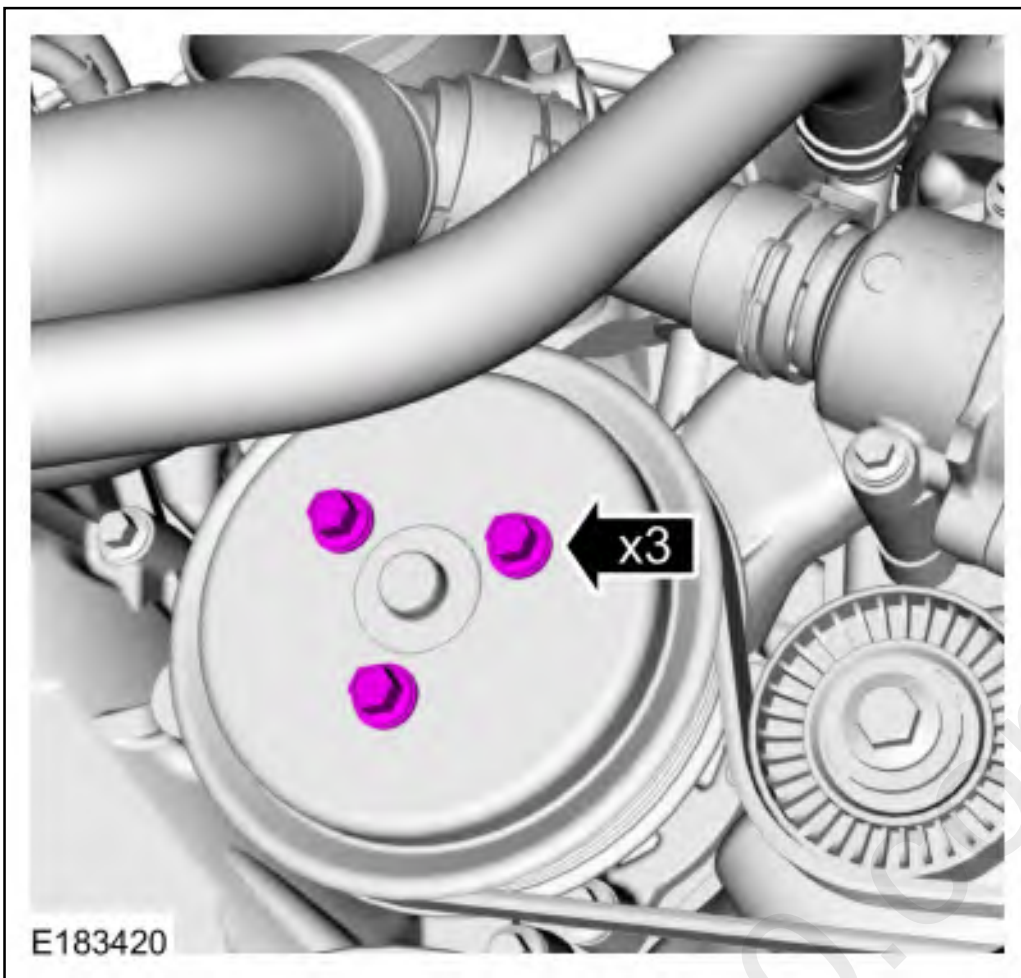
Use the General Equipment: Hose Clamp Remover/Installer

8. Install the crankcase vent tube and connect the quick release coupling.

Refer to: [Quick Release Coupling](#) (310-00D Fuel System - General Information - 5.0L 32V Ti-VCT, General Procedures).



16. Torque: 18 lb.ft (25 Nm)



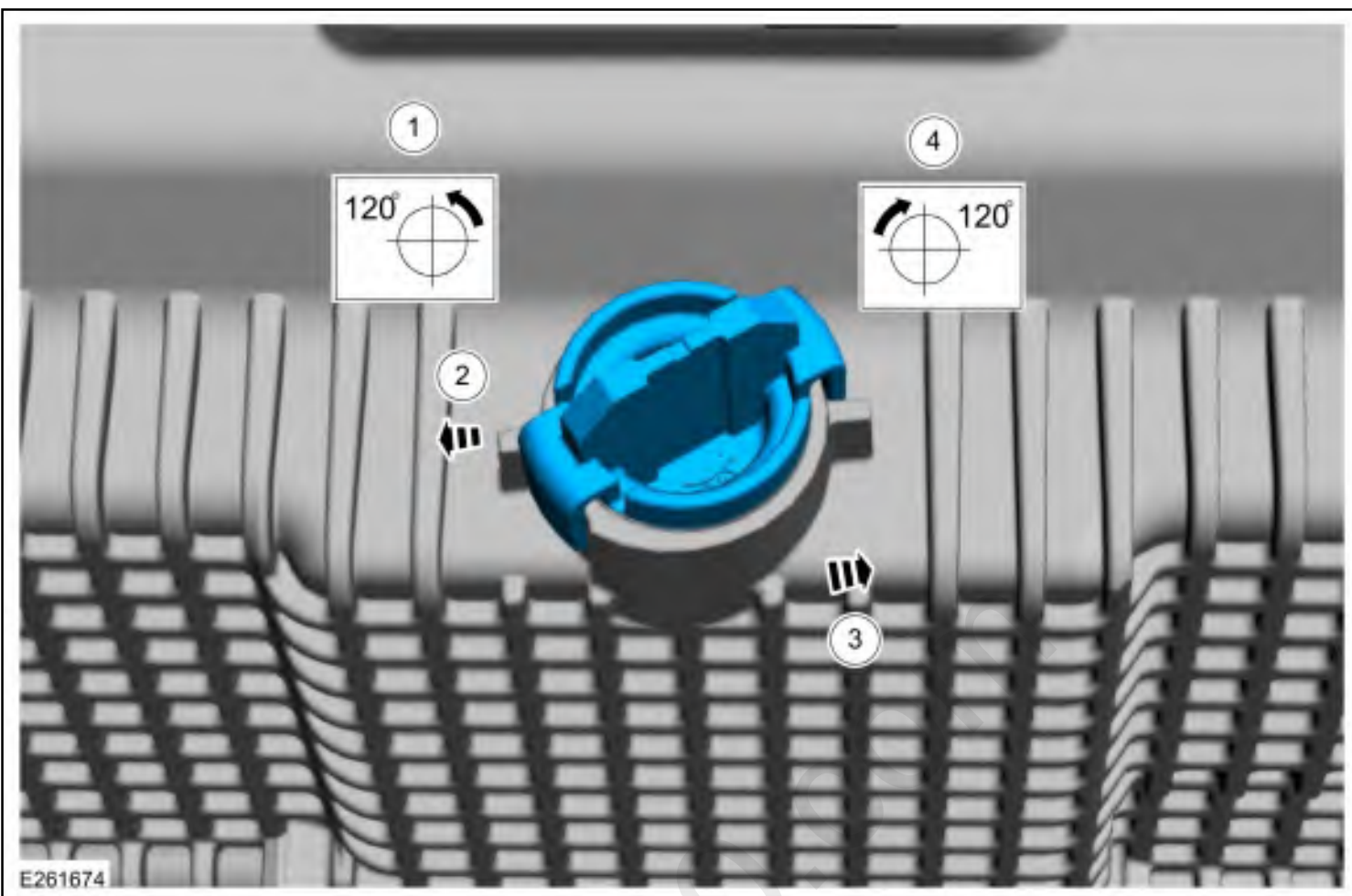
17. Install the following items:

1. Refer to: Valve Cover RH (303-01 Engine - 5.0L 32V Ti-VCT) .
2. Refer to: Valve Cover LH (303-01 Engine - 5.0L 32V Ti-VCT) .
3. Refer to: Cooling Module (303-03 Engine Cooling - 5.0L 32V Ti-VCT) .
4. Refer to: [Degas Bottle](#) (303-03D Engine Cooling - 5.0L 32V Ti-VCT, Removal and Installation).

18. **NOTE:** *The drain plug should be removed and installed by hand, do not use tools.*

1. Turn the oil drain plug by hand counterclockwise 120 degrees.
Use the General Equipment: Oil Drain Equipment
2. Pull the oil drain plug out of the oil pan.
3. After the oil has drained, push the oil drain plug into the oil pan.
4. **NOTICE: Overtightening will damage the oil drain plug and possibly the oil pan.**

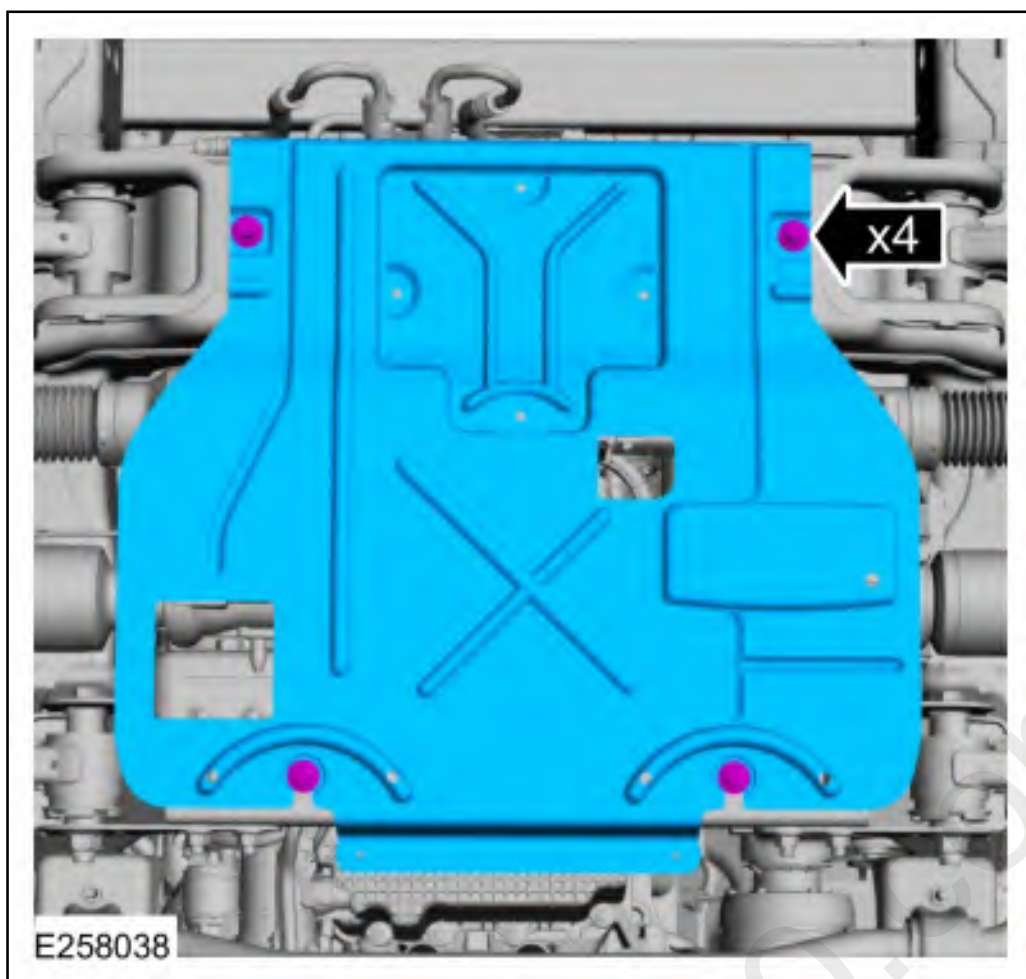
Turn the oil drain plug by hand clockwise 120 degrees.



19. **NOTE:** *If equipped.*

Install the skid plate and bolts.

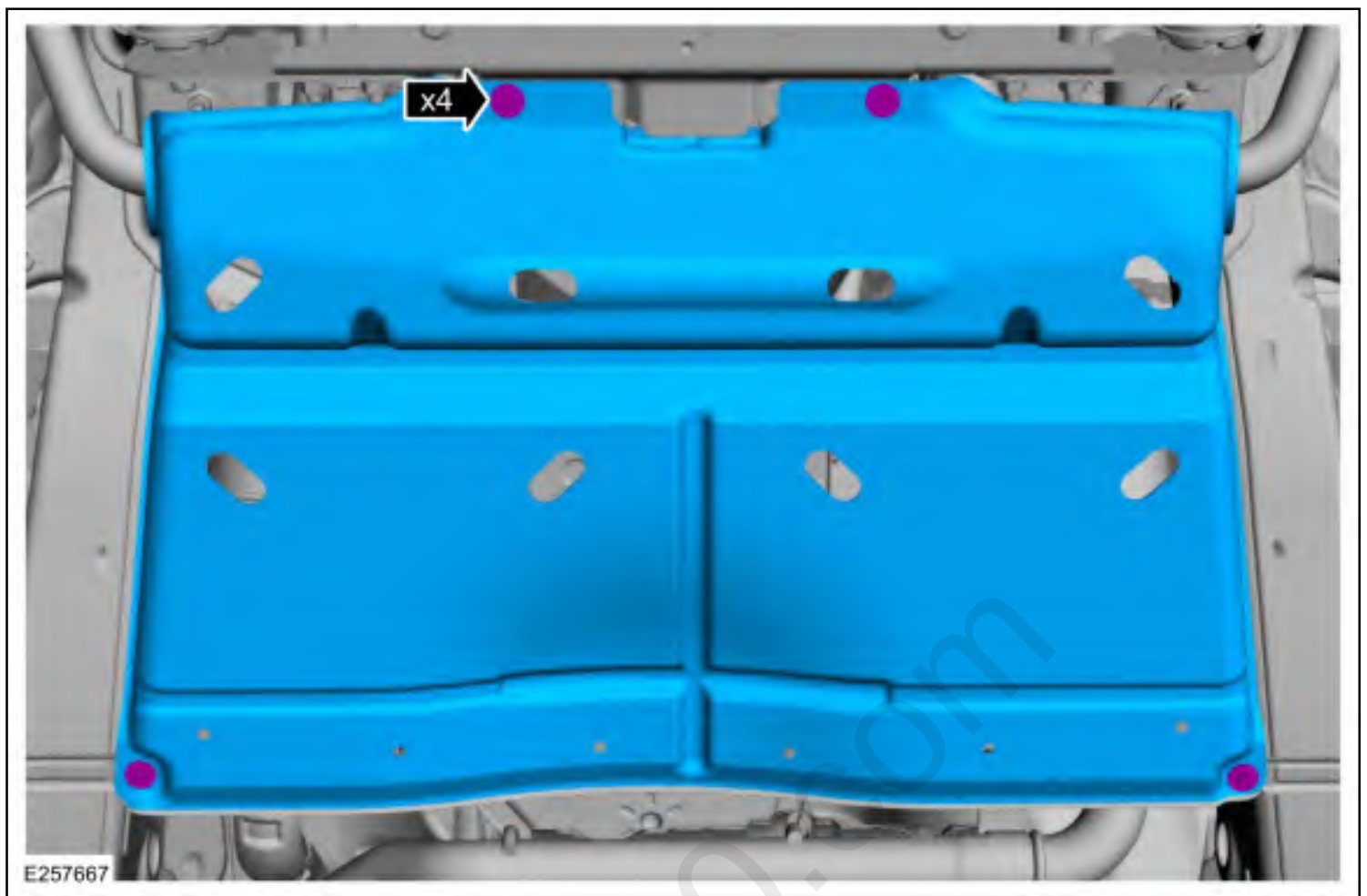
Torque: 30 lb.ft (40 Nm)



20. **NOTE:** *If equipped.*

Install the underbody shield and the bolts.

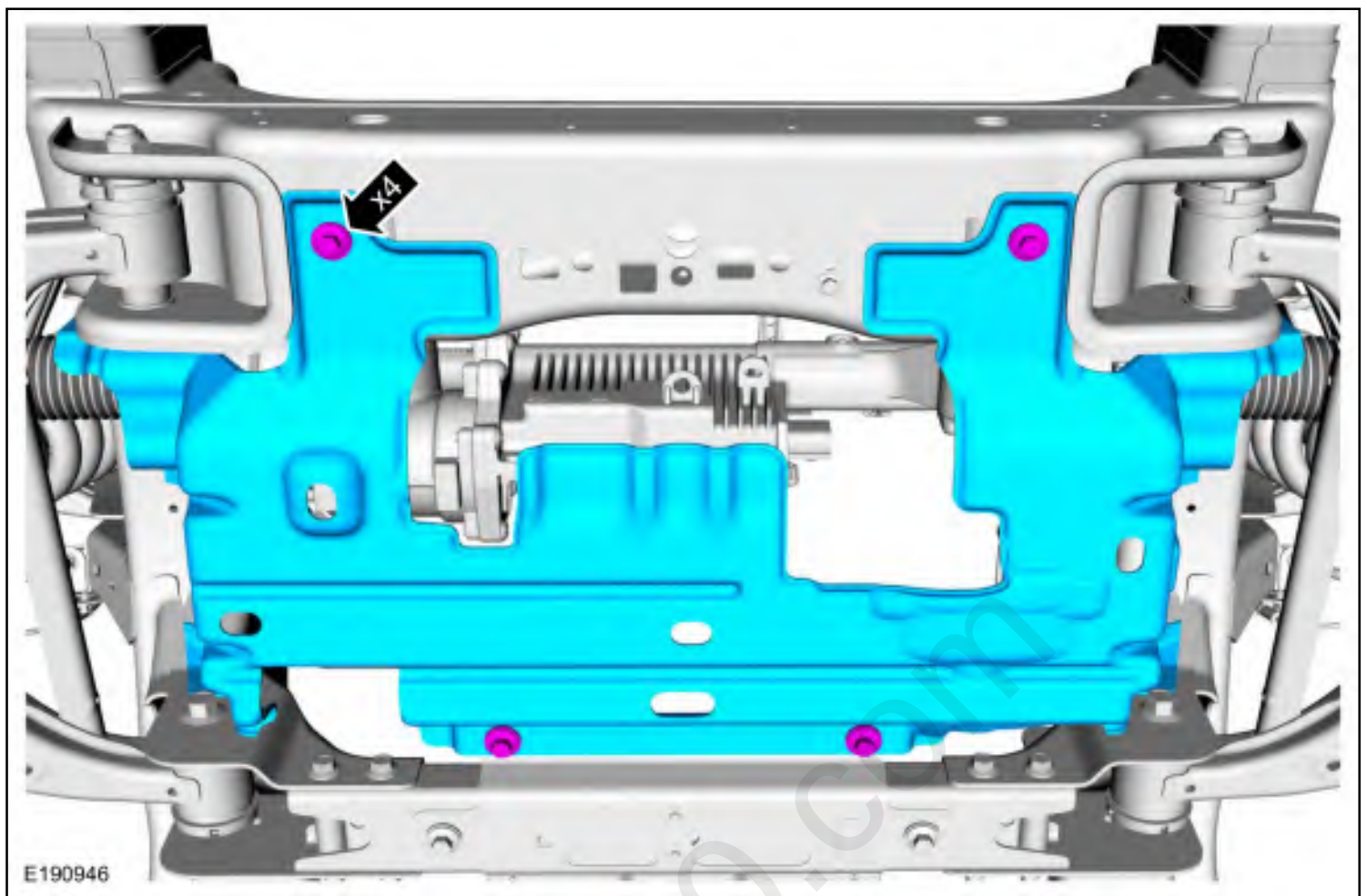
Torque: 71 lb.in (8 Nm)



21. **NOTE:** *If equipped.*

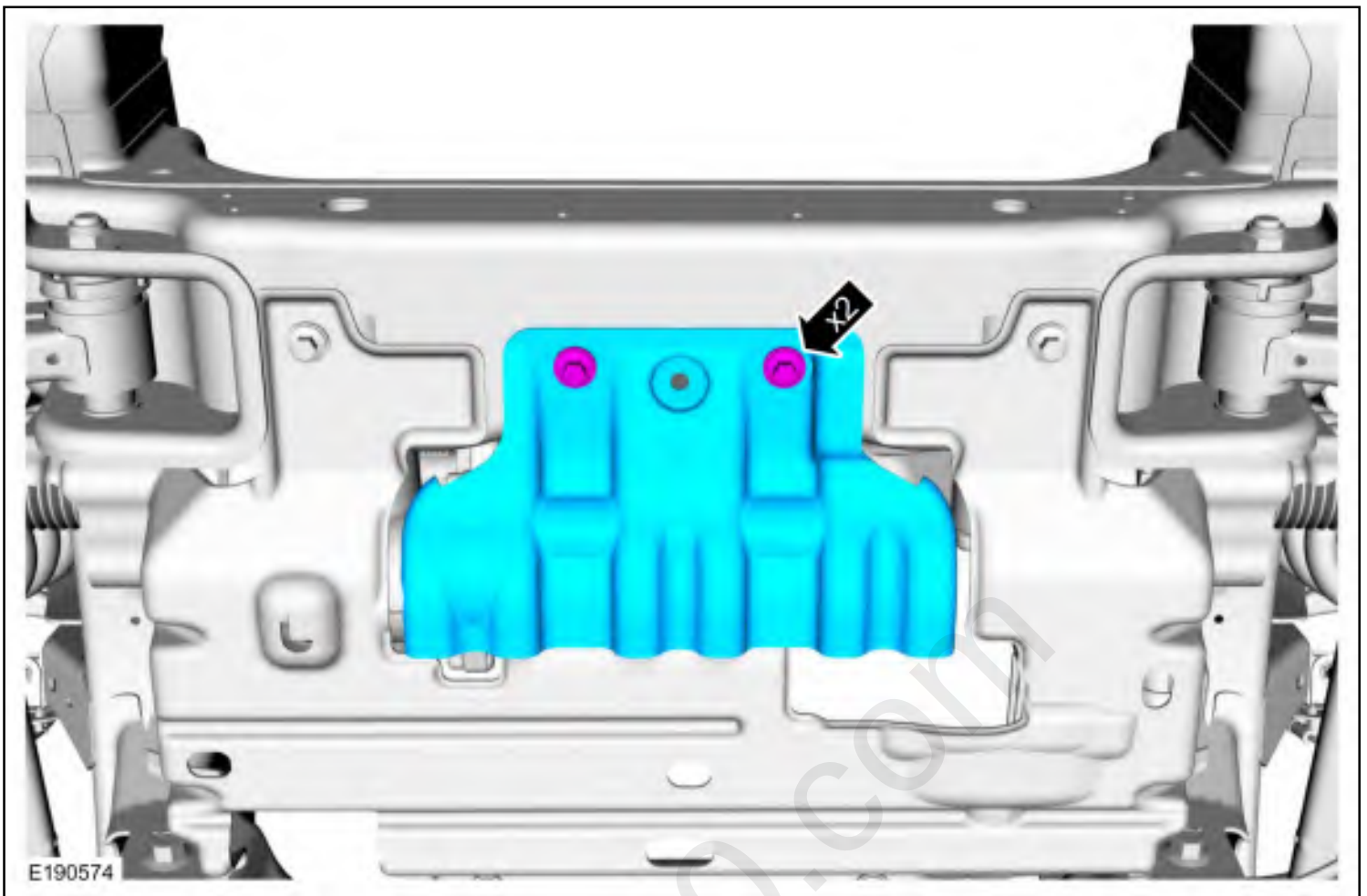
Install the underbody shield and fasteners.

Torque: 30 lb.ft (40 Nm)



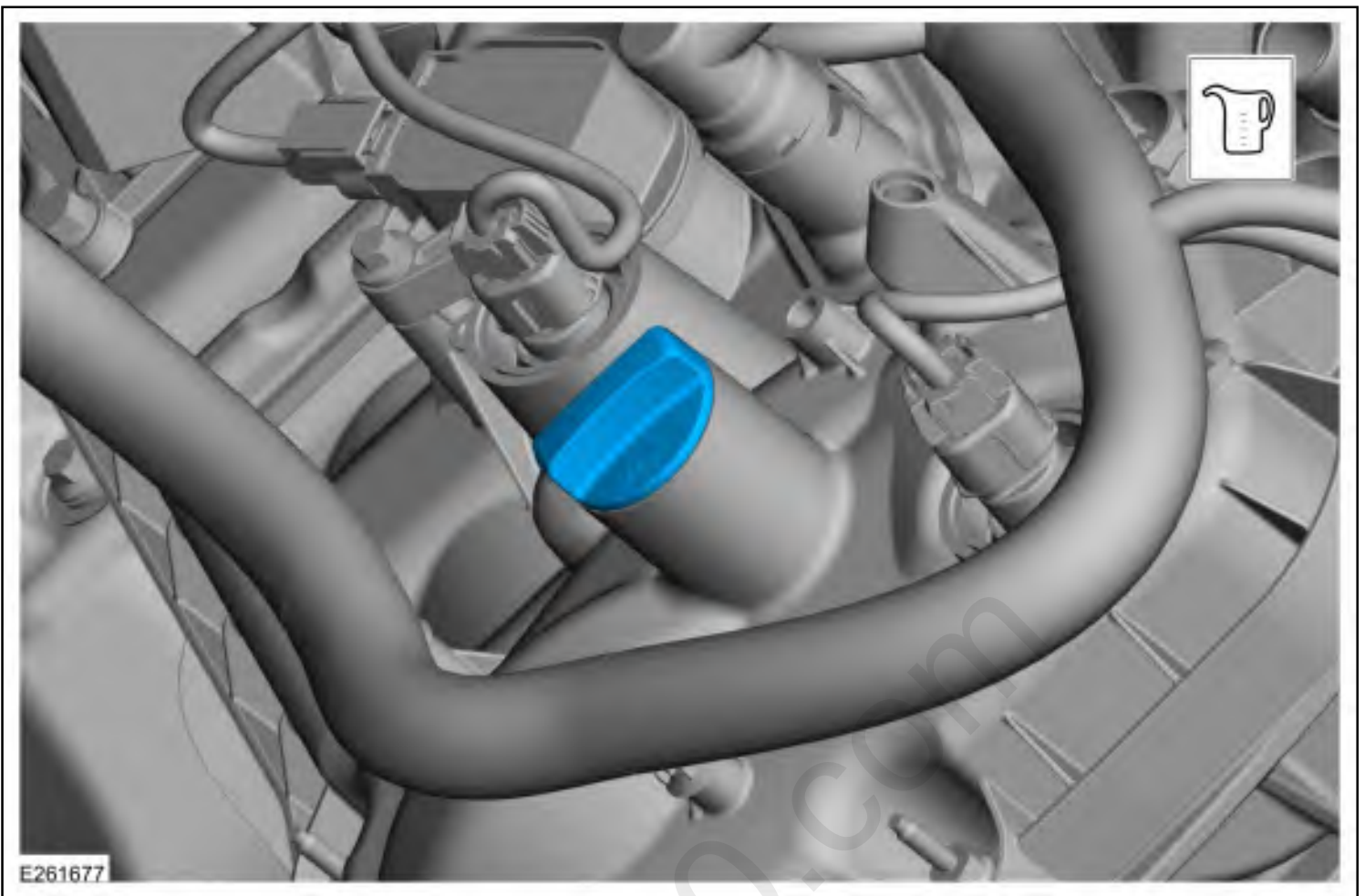
22. **NOTE:** *If equipped.*

Install the skid plate and bolts.
Torque: 30 lb.ft (40 Nm)



23. Fill the engine with clean engine oil.

Refer to: [Specifications](#) (303-01D Engine - 5.0L 32V Ti-VCT, Specifications).



24. Connect the battery ground cable.
Refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables) .
25. Fill and bleed the engine cooling system.
Refer to: Cooling System Draining, Vacuum Filling and Bleeding (303-03 Engine Cooling - 5.0L 32V Ti-VCT) .
26. Use the Powertrain Control Module (PCM) Misfire Monitor Profile Correction routine in the diagnostic scan tool.