



303-01A Engine - 2.3L EcoBoost (231kW/314PS)  
Removal and Installation

2016 Mustang  
Procedure revision date: 08/21/2016

## Oil Pan

Base Part Number: 6675

### Special Tool(s) / General Equipment

	<a href="#">303-050</a> (T70P-6000) Lifting Bracket, Engine
	<a href="#">303-F072</a> Support Bar, Engine
Plastic Scraper	
Oil Drain Equipment	
Vehicle/Axle Stands	

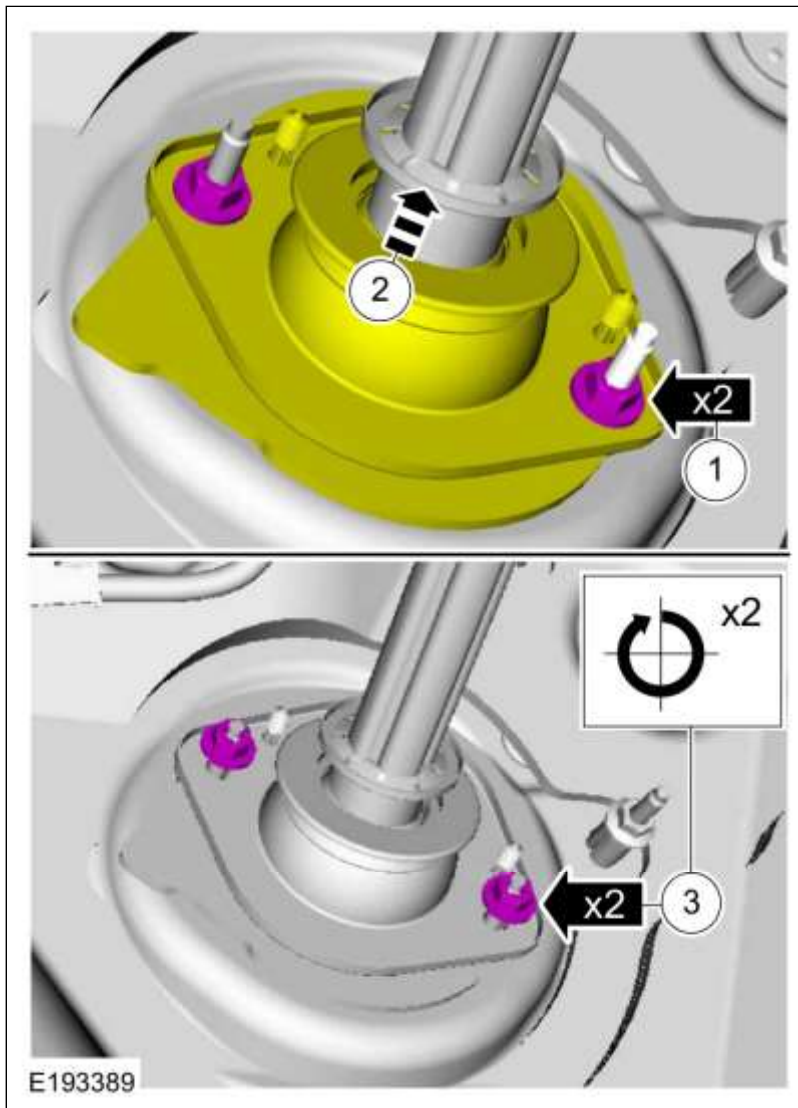
### Materials

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

### Removal

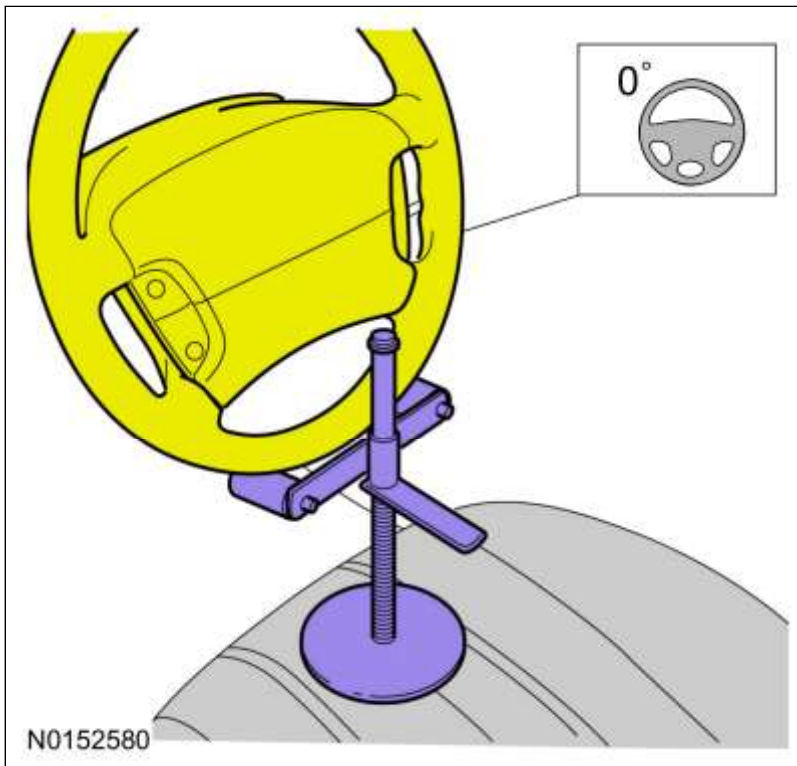
#### 6-Speed Automatic Transmission - 6R80/6-Speed Manual Transmission - MT82

- With the vehicle in NEUTRAL, position it on a hoist.  
Refer to: [Jacking and Lifting - Overview](#) (100-02 Jacking and Lifting, Description and Operation).
- NOTICE: Make sure to minimize damage to sealer foam and avoid pulling apart dash seal brackets from retainer pins. Excessive damage may allow engine noise, fumes, air or water to enter the passenger compartment.**
  - Remove the steering column dash seal nuts.
  - Loosen the dash seal.
  - Hand start the dash seal nuts.

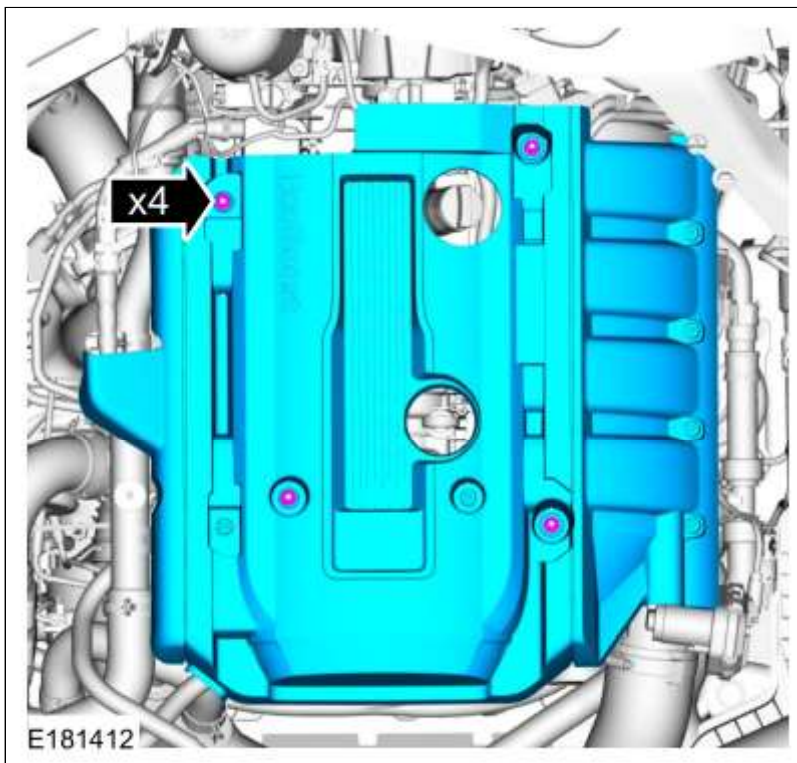


3. Using a holding device, hold the steering wheel in the straight-ahead position.

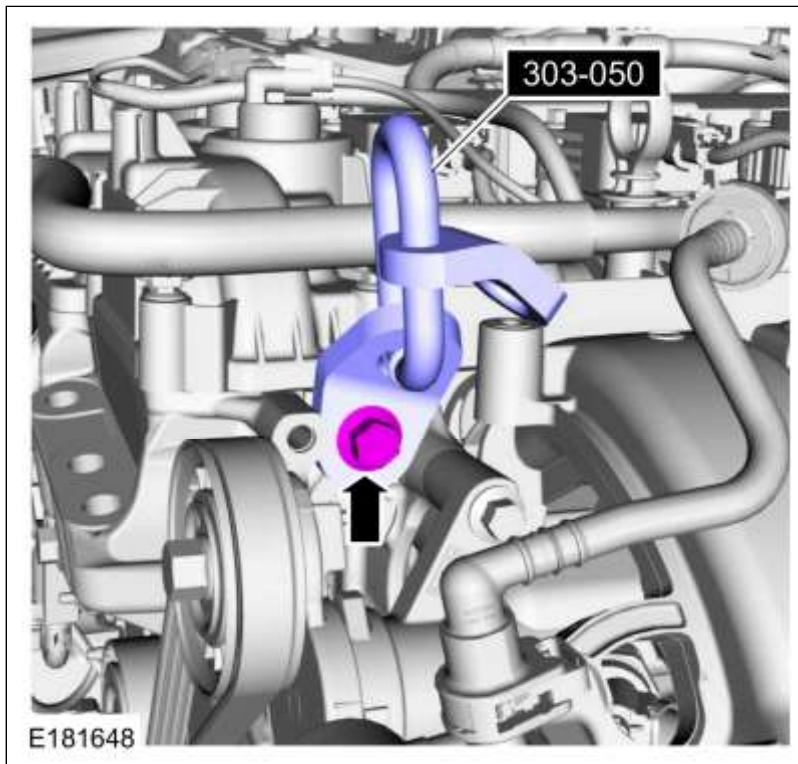




4. Remove the nuts and the engine appearance cover.



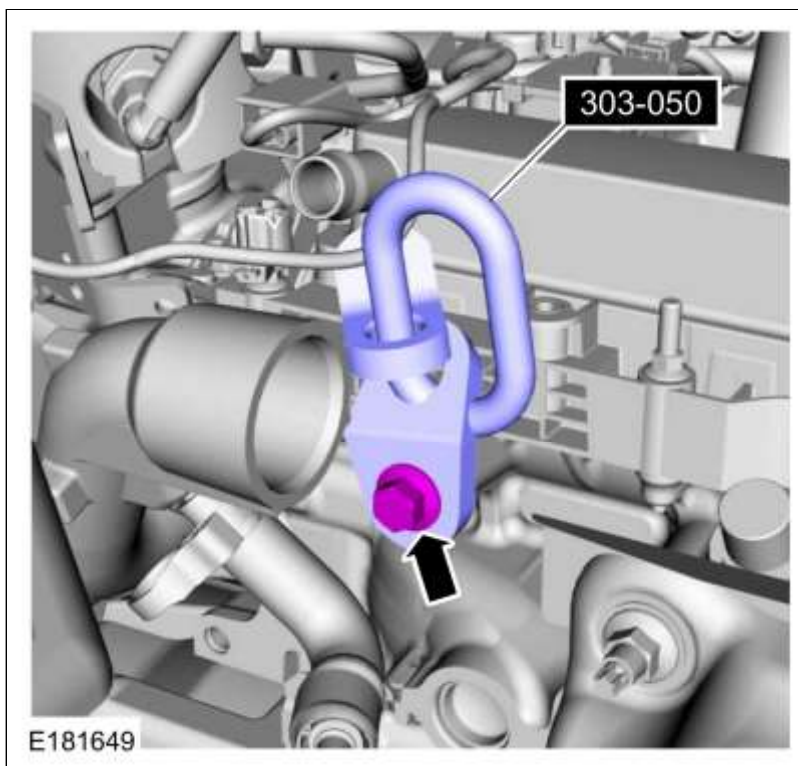
5. Install the special tool on the LH side of the cylinder head.  
Use Special Service Tool: [303-050 \(T70P-6000\) Lifting Bracket, Engine.](#)



6. **NOTE:** Coolant tube removed for clarity.

Install the special tool on the RH side of the cylinder head.

Use Special Service Tool: [303-050 \(T70P-6000\) Lifting Bracket, Engine](#).

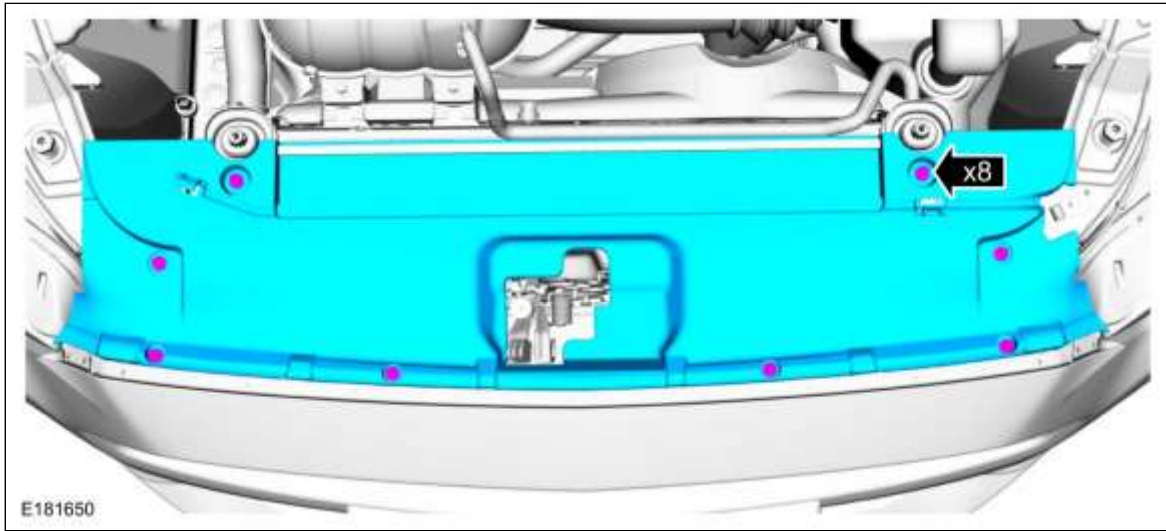


7. Disconnect the battery ground.

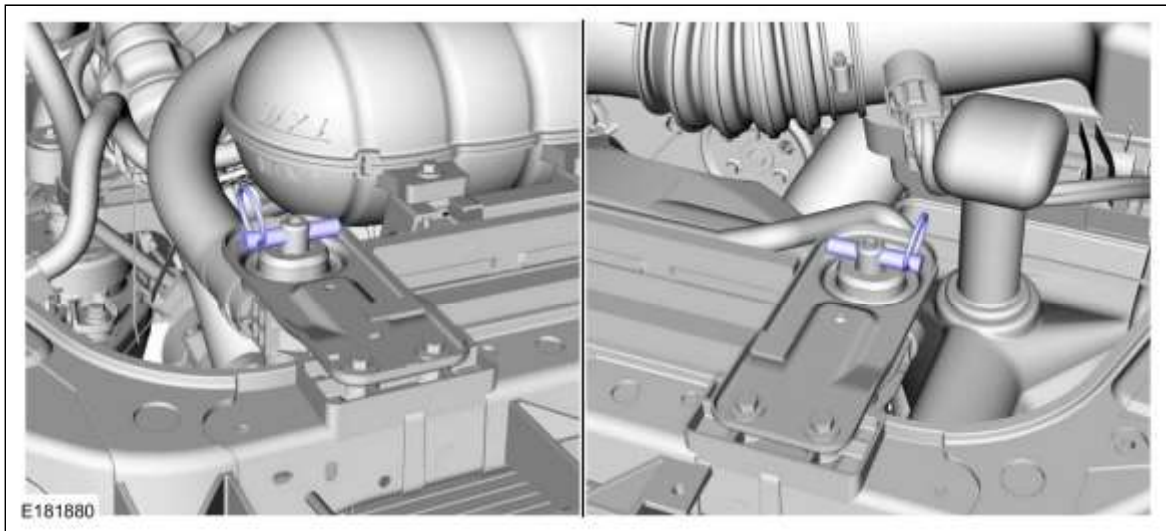
Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

8. Remove the retainers and the radiator top shield.

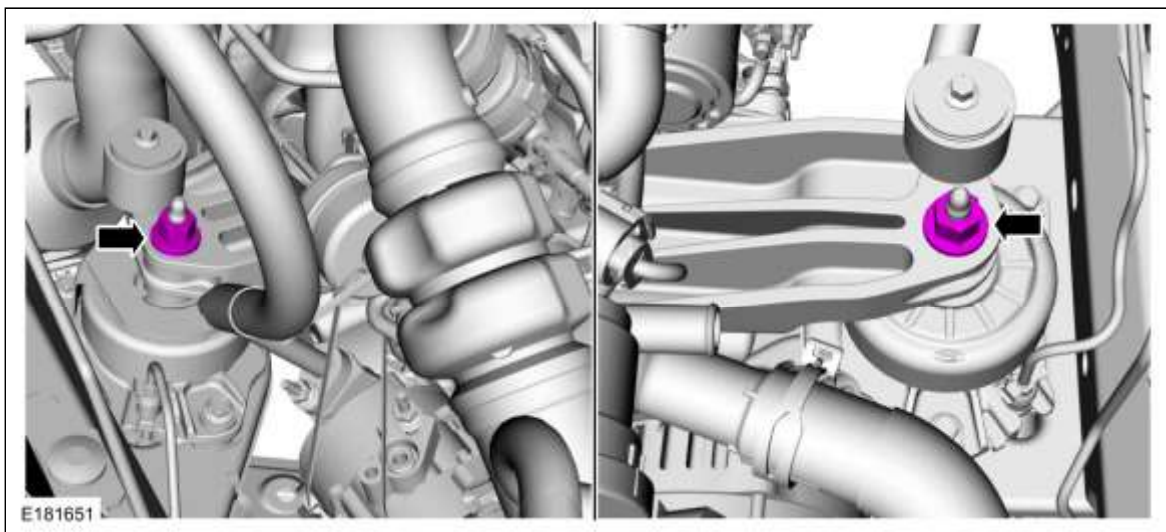




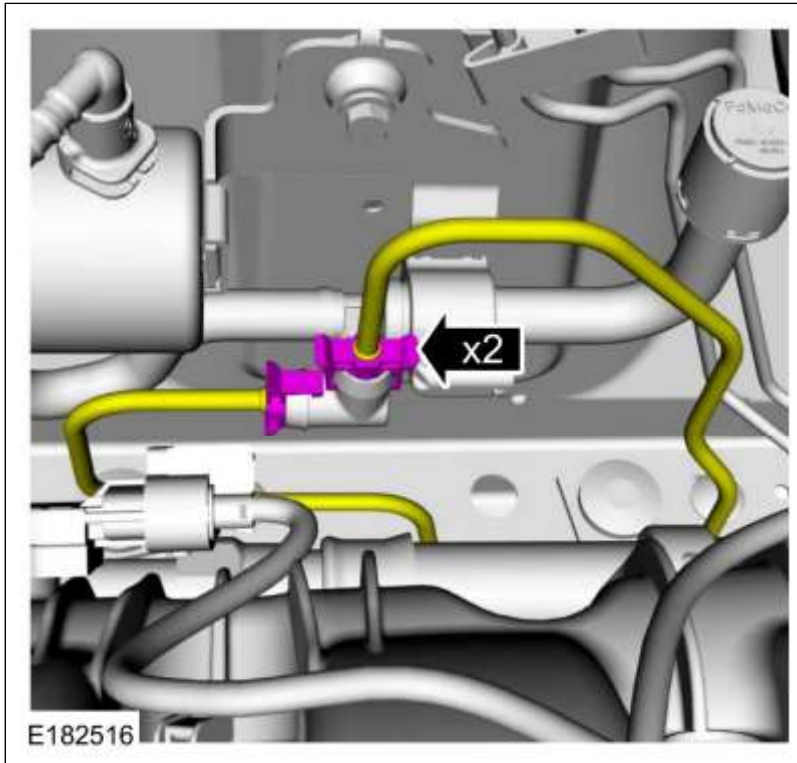
9. Install retaining pins to support cooling module.



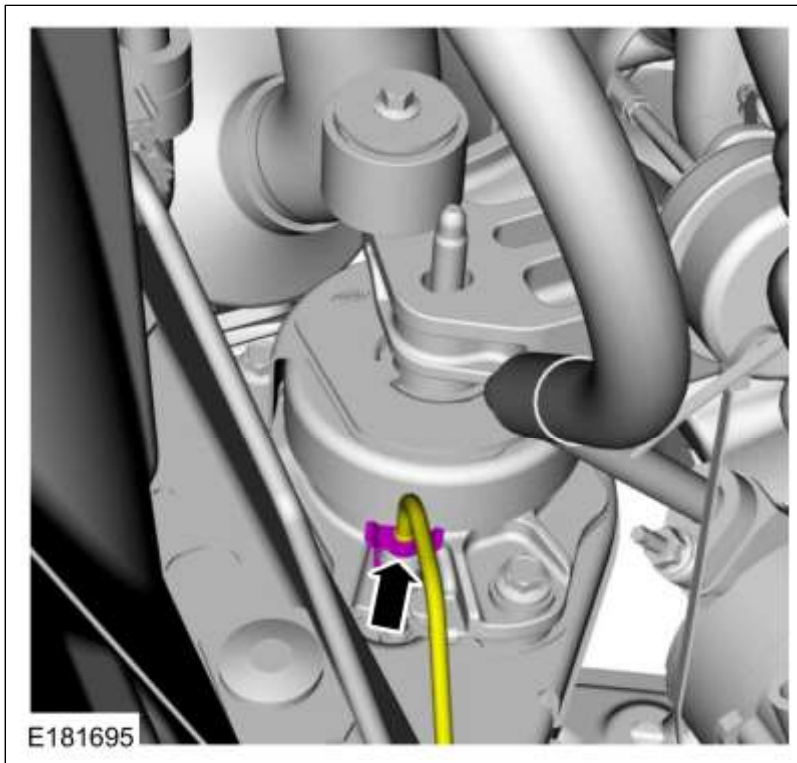
10. Remove the RH and LH engine mount bracket nuts.



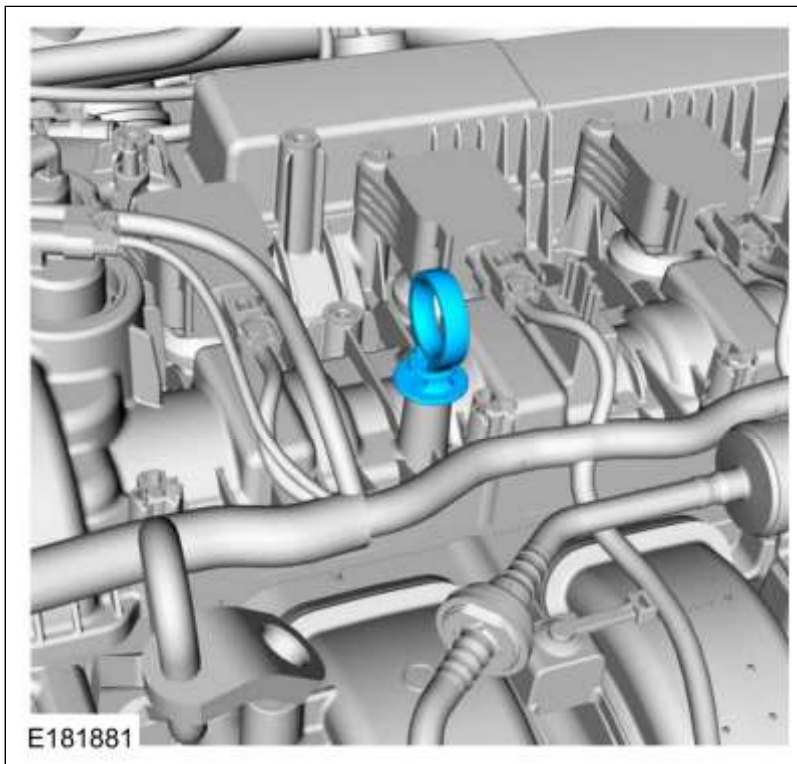
11. Disconnect the vacuum tubes from the engine mount control vacuum reservoir.



12. Disconnect the vacuum tube from the RH engine mount.



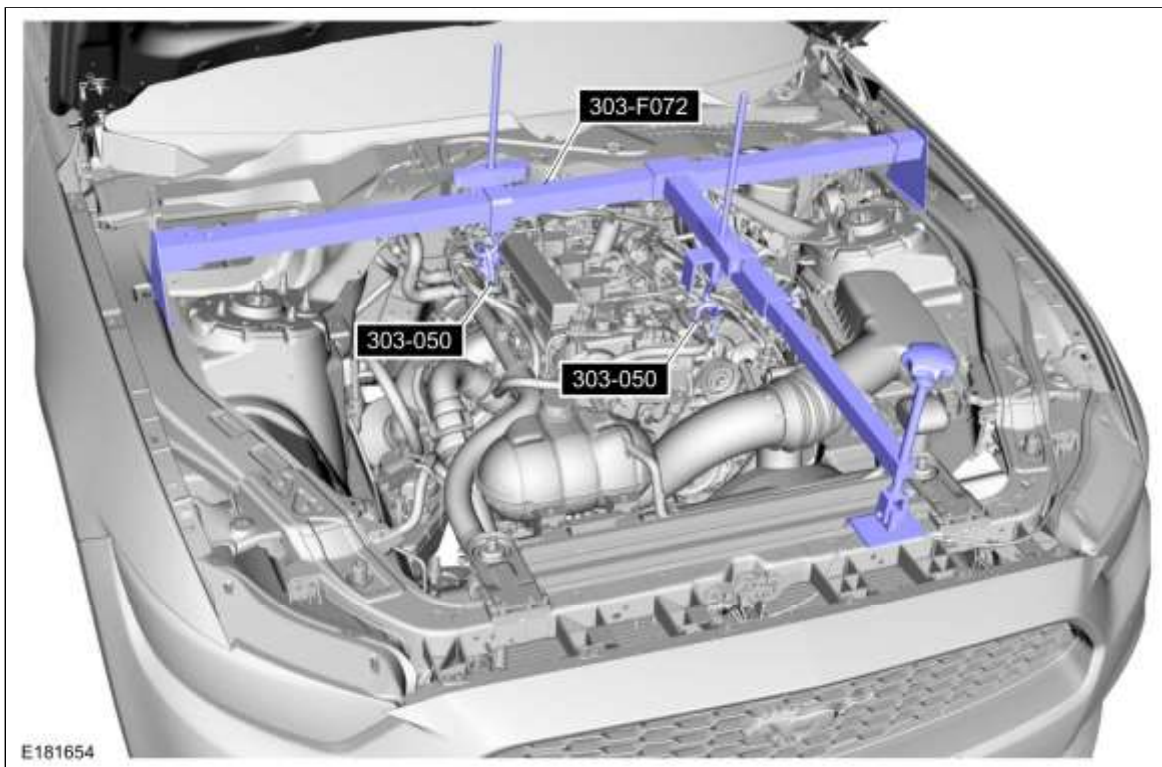
13. Remove the oil level indicator.



14. **NOTICE:** Do not position the legs of the Engine Support Bar on the fenders. Instead, position the legs on the body structure near the suspension strut tower. Failure to follow these instructions may result in body damage.

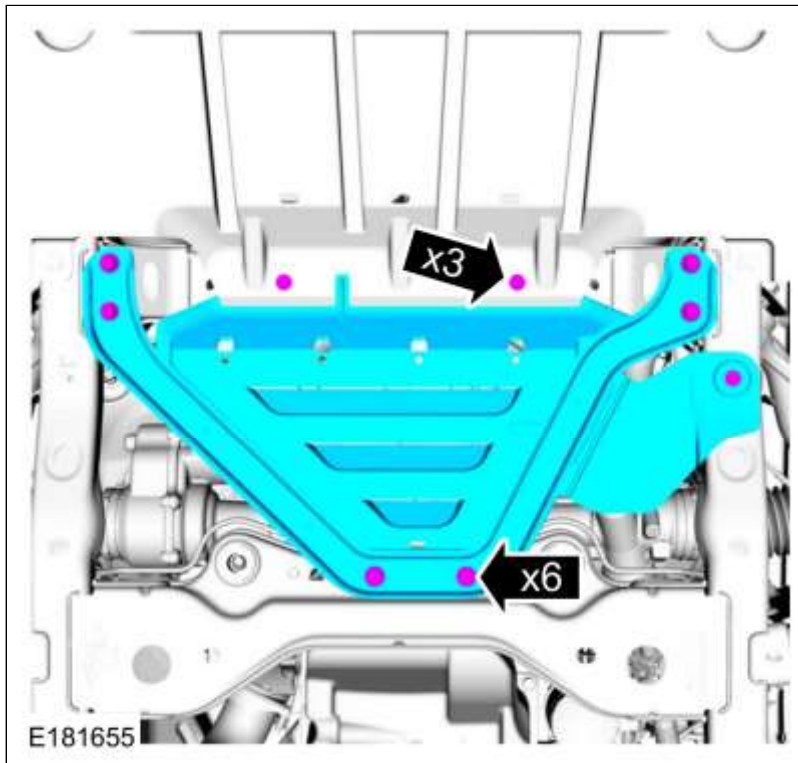
Install the special tool to support the engine.

Install Special Service Tool: [303-F072 Support Bar Engine](#).

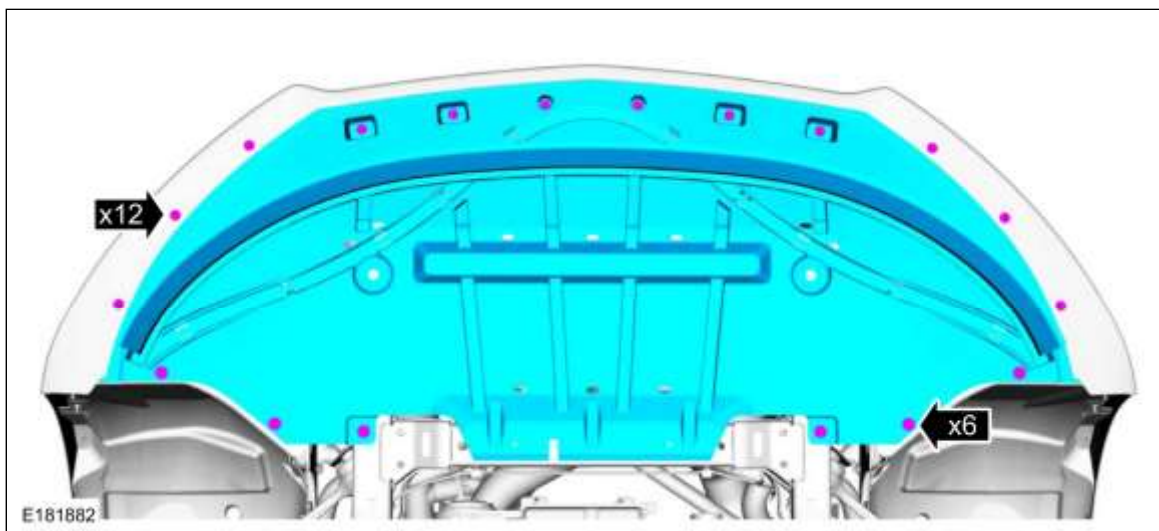


15. Remove the front wheels and tires.  
Refer to: [Wheel and Tire](#) (204-04A Wheels and Tires, Removal and Installation).
16. Remove the screws, bolts and the underbody shield.



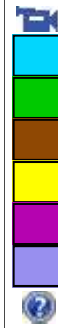
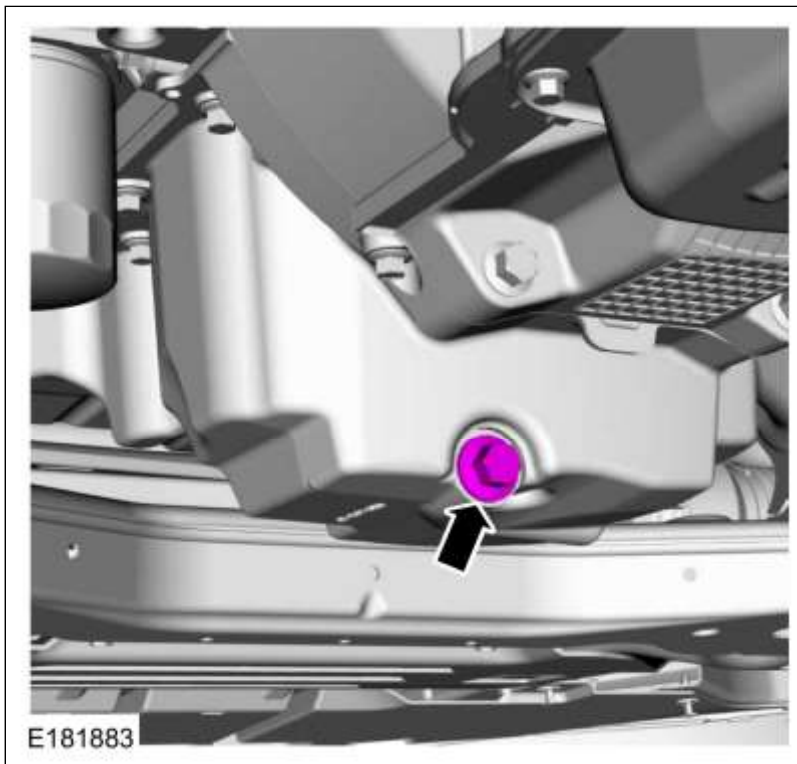


17. Remove the pin-type retainers, bolts and the underbody shield.

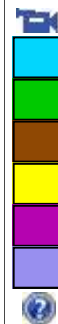
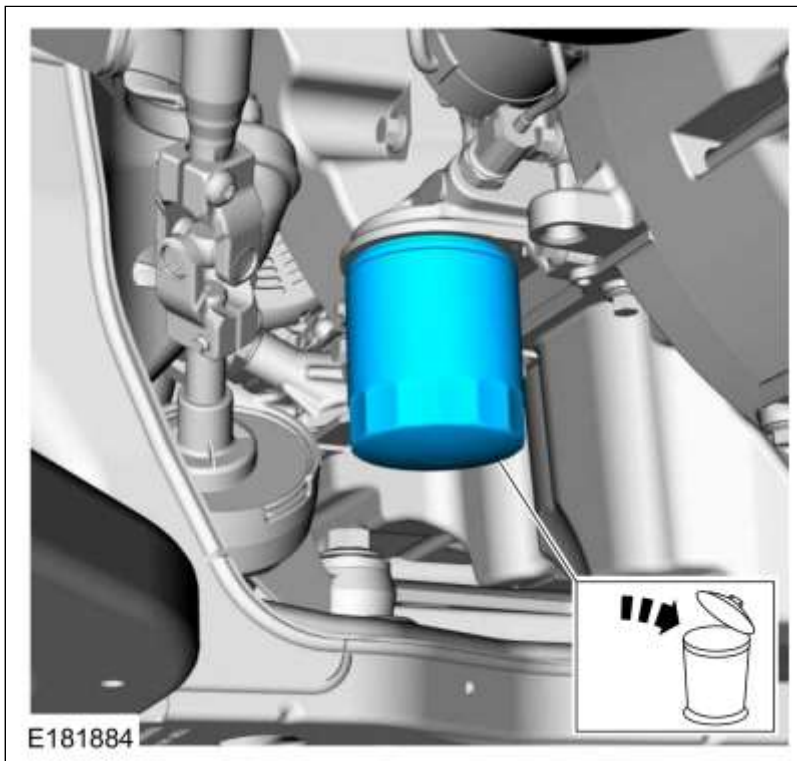


18. Drain engine oil and install drain plug.  
Use the General Equipment: Oil Drain Equipment  
*Torque: 20 lb.ft (27 Nm)*





19. Remove and discard the engine oil filter.  
Use the General Equipment: Oil Drain Equipment



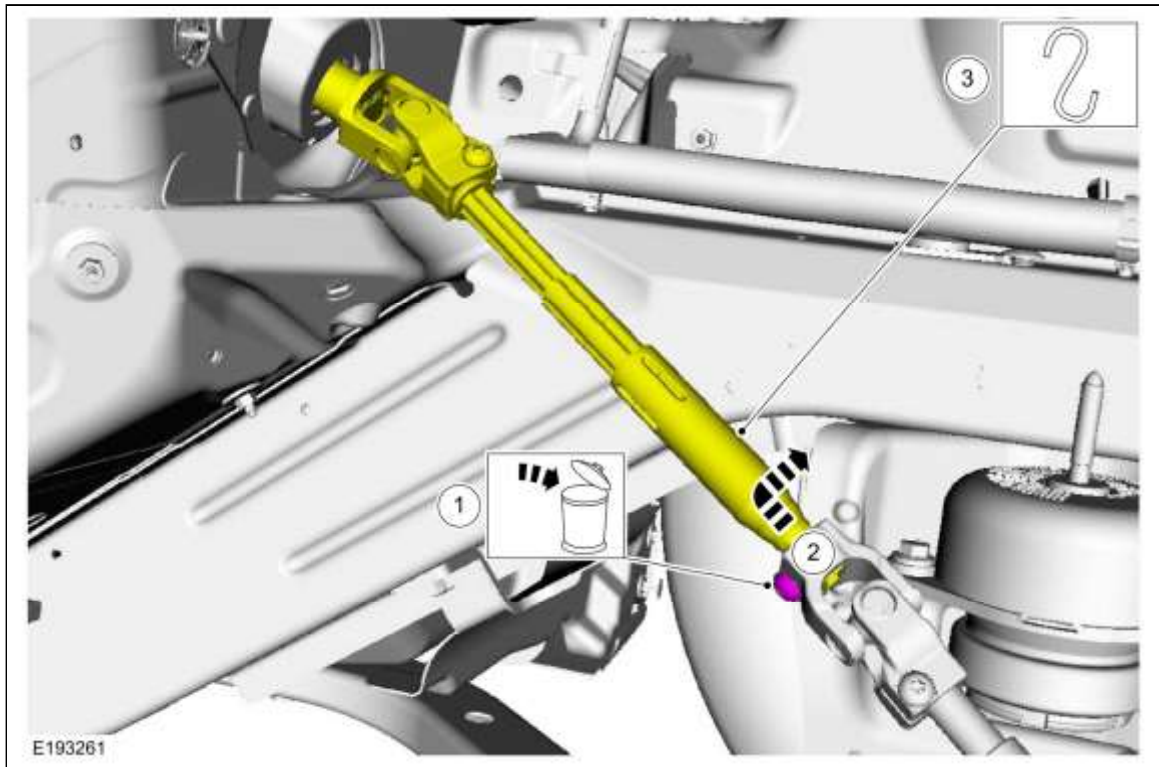
20. **⚠️ WARNING:** Do not reuse steering column shaft bolts. This may result in fastener failure and steering column shaft detachment or loss of steering control. Failure to follow this instruction may result in serious injury to vehicle occupant(s).

**⚠️ WARNING:** DO NOT hammer, pry or force steering column and column shafts during installation or removal. Failure to follow this instruction may cause damage to steering components that could lead to loss of steering control during vehicle operation and could result in serious personal injury or death.

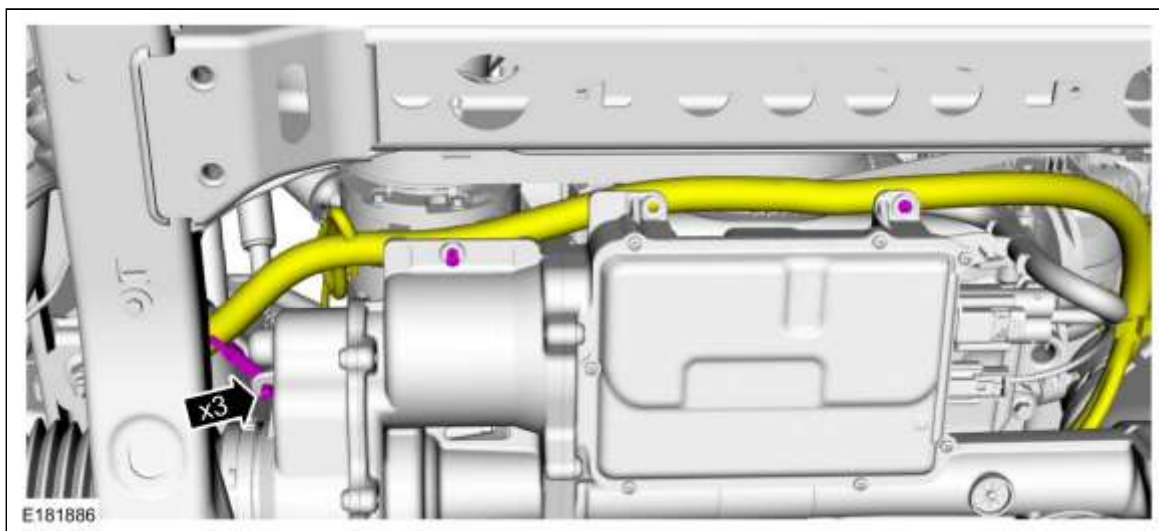
**⚠️ WARNING: DO NOT attempt to remove or install the steering column lower u-joint at the steering gear without first loosening the steering column dash seal and fasteners. Failure to follow this instruction may cause damage to steering components that could lead to loss of steering control during vehicle operation and could result in serious personal injury or death.**

Detach the steering column lower shaft from the lower coupling.

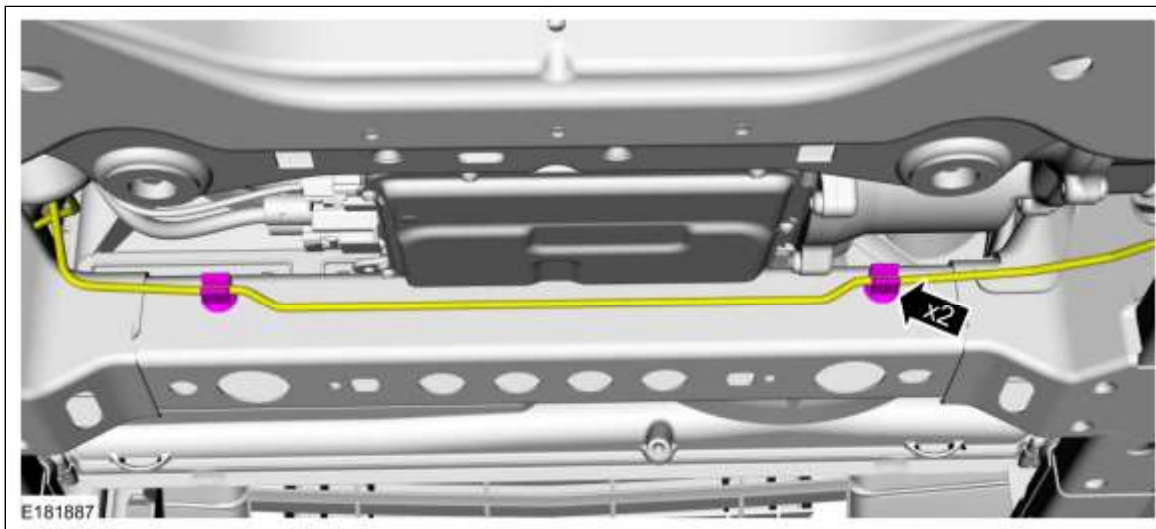
1. Remove and discard the steering column shaft bolt.
2. Pull apart the steering column shaft from the coupling.
3. Secure the lower shaft to the frame rail to avoid damaging it during subframe removal.



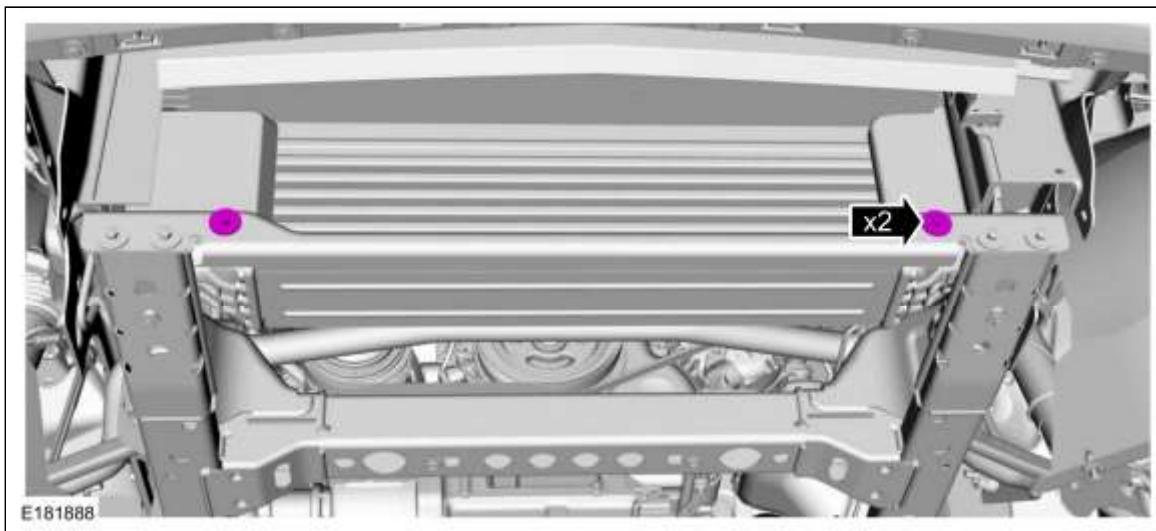
21. Detach the EPAS wiring harness pin-type retainers.



22. Detach the brake line retainers from the subframe.



23. Remove the bolts from the support bar on the front of the subframe.

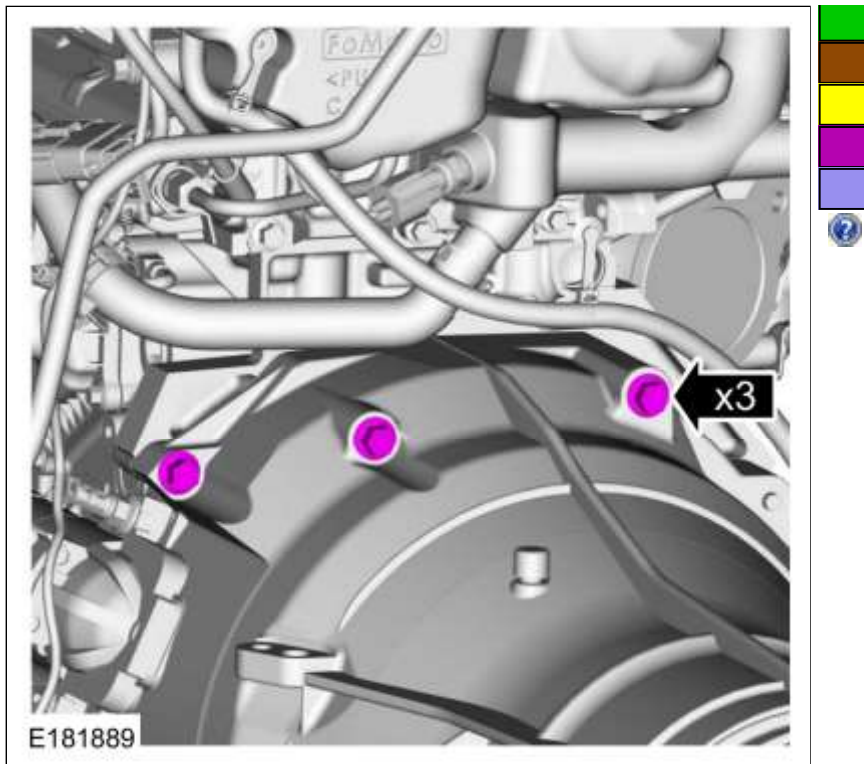


24. **NOTICE:** To prevent damage to the transmission, do not loosen the transmission-to-engine fasteners more than 5 mm (0.19 in).

**NOTE:** Automatic transmission shown, manual transmission similar.

Loosen the bolts 5 mm (0.19 in).

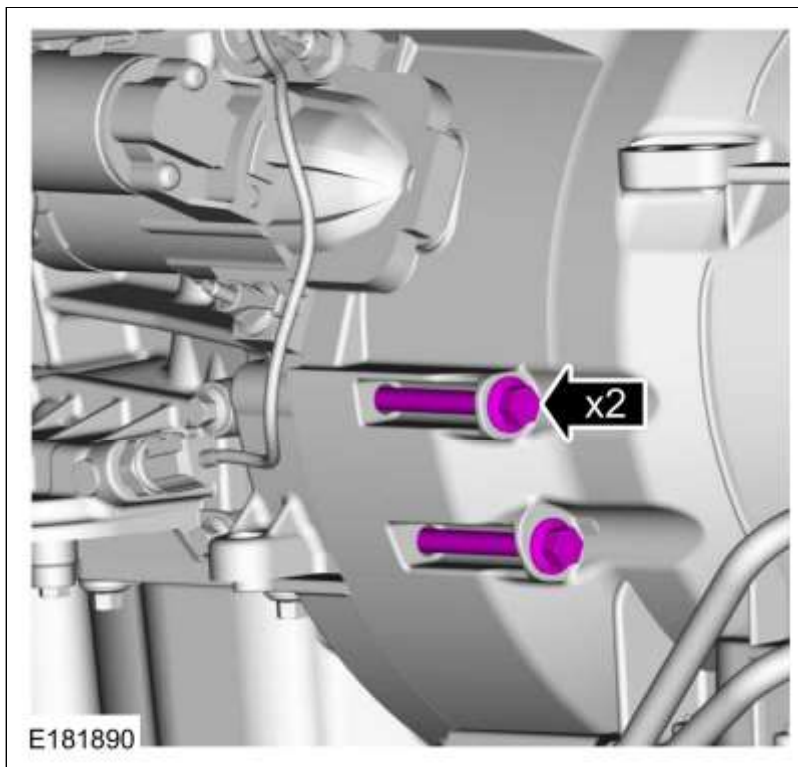




25. **NOTICE:** To prevent damage to the transmission, do not loosen the transmission-to-engine fasteners more than 5 mm (0.19 in).

**NOTE:** Automatic transmission shown, manual transmission similar.

Loosen the bolts 5 mm (0.19 in).

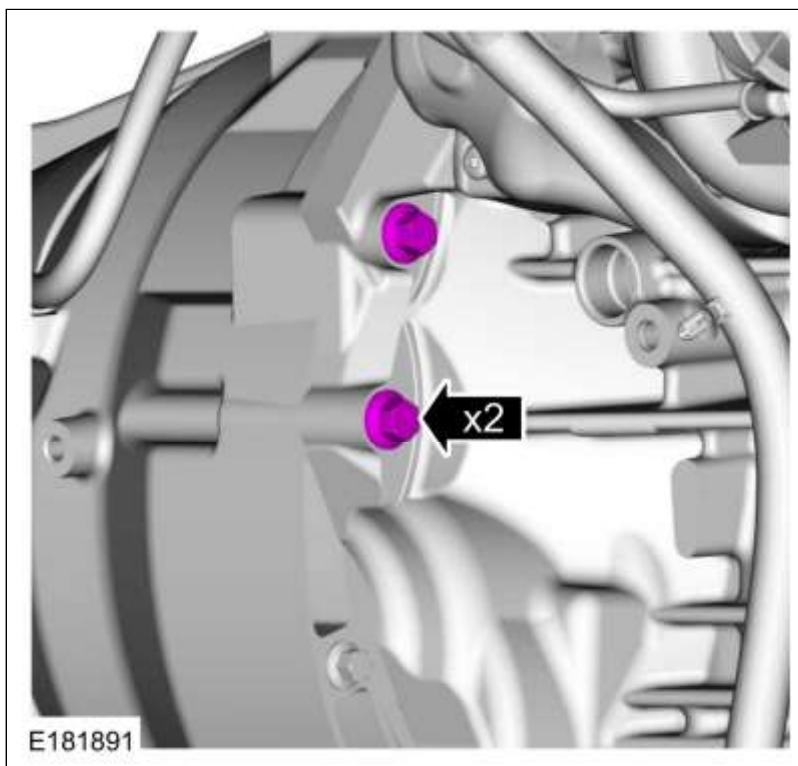


26. **NOTICE:** To prevent damage to the transmission, do not loosen the engine-to-transmission fasteners more than 5 mm (0.19 in).

**NOTE:** Automatic transmission shown, manual transmission similar.

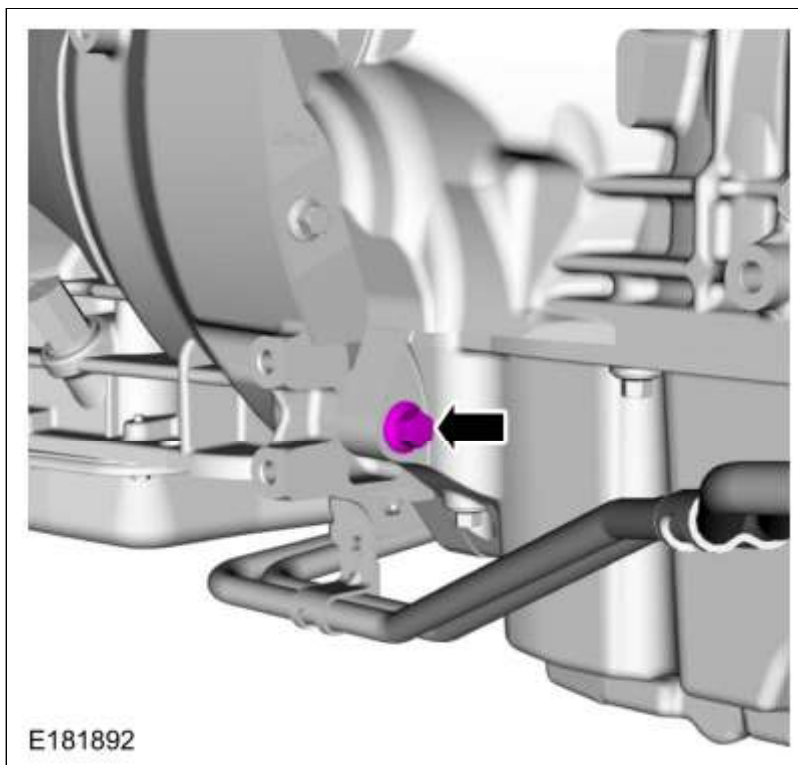


Loosen bolts 5 mm (0.19 in).

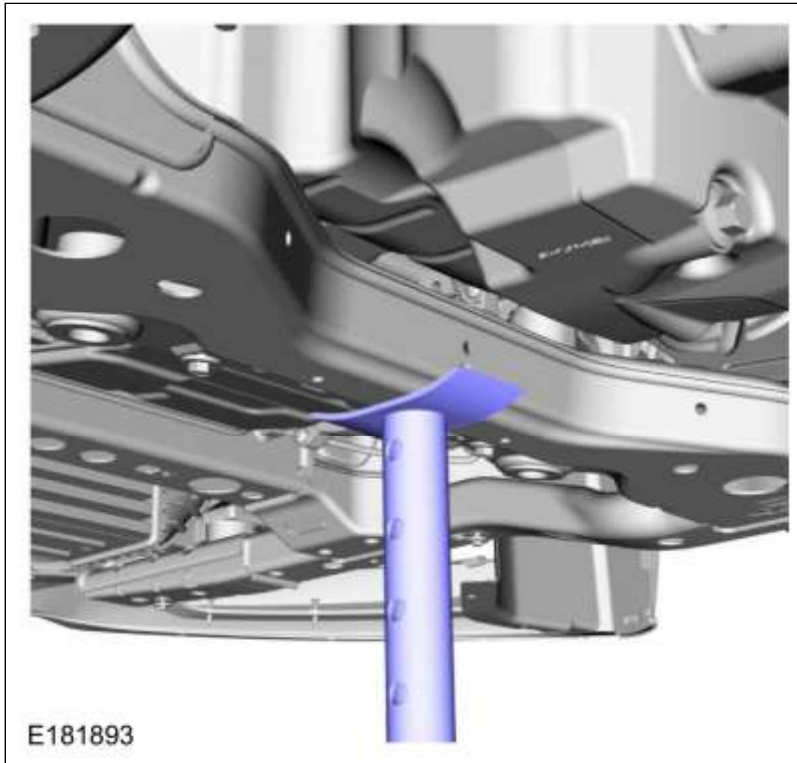


27. **NOTE:** Automatic transmission shown, manual transmission similar.

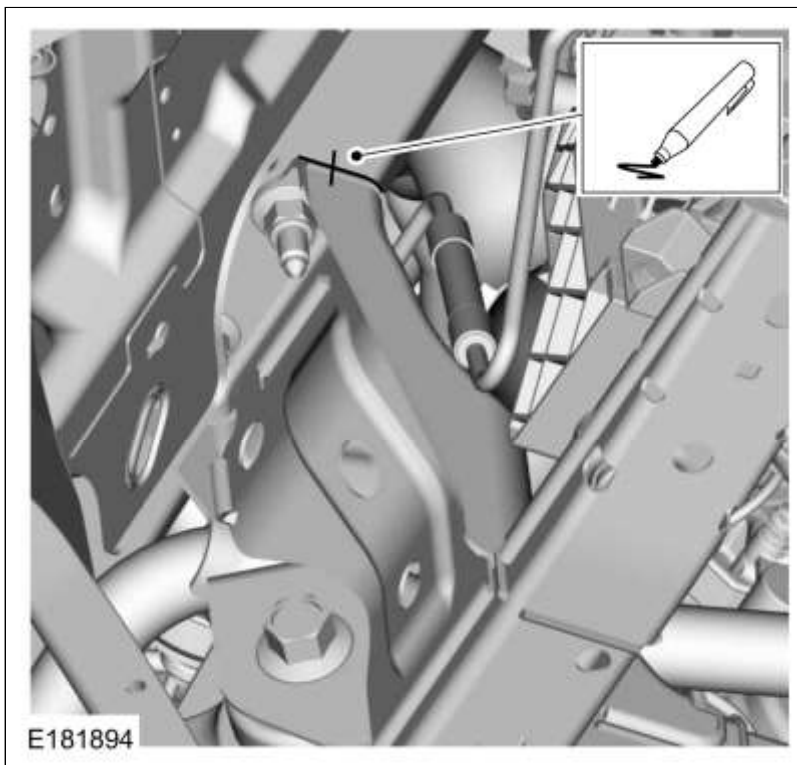
Remove the oil pan bolt.



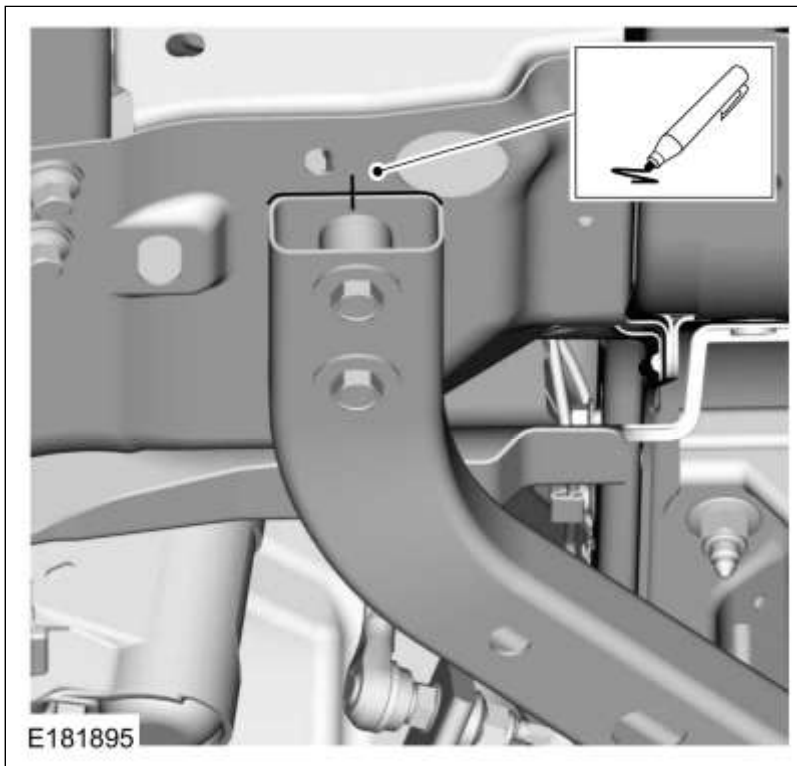
28. Using an adjustable stand, support the subframe.  
Use the General Equipment: Vehicle/Axle Stands



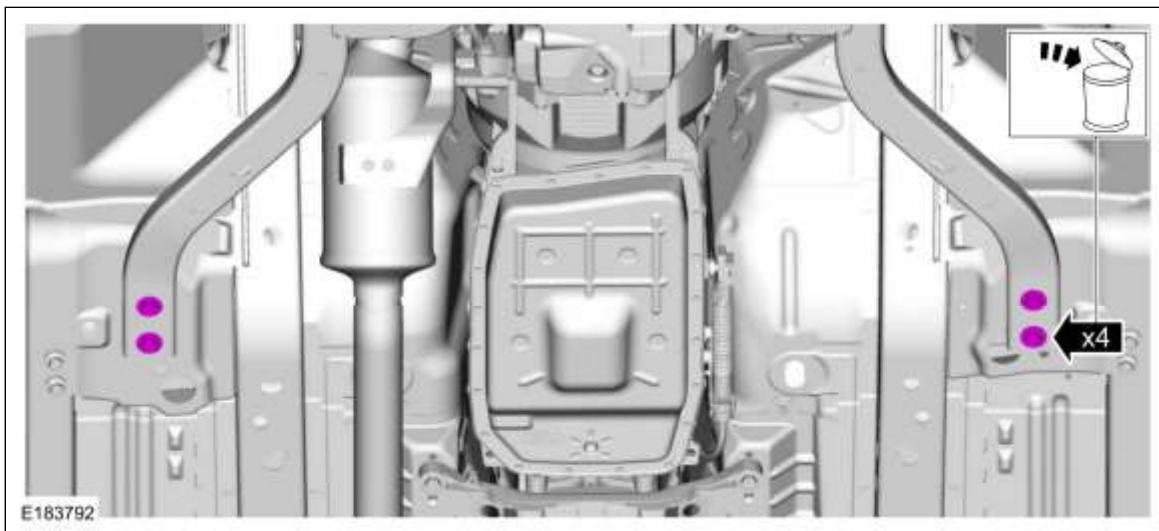
29. Mark the position of the front subframe for reference during installation.



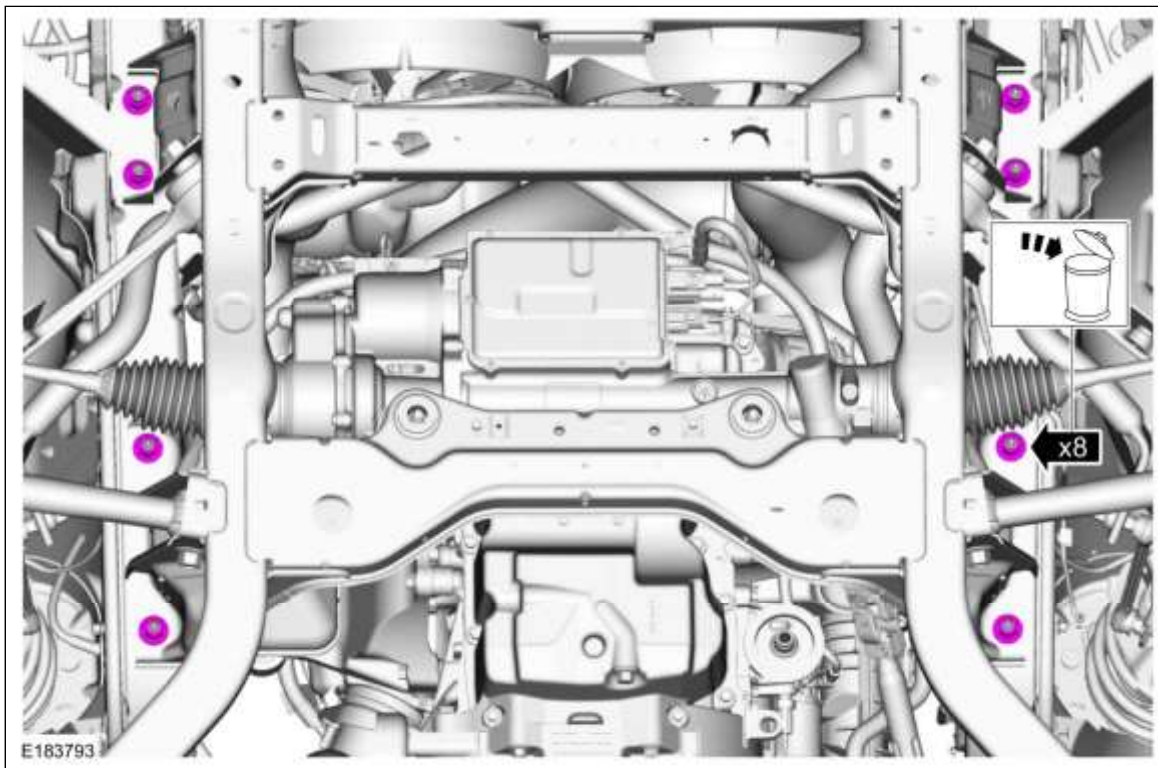
30. Mark the position of the rear subframe for reference during installation.



31. Remove and discard the rear subframe bolts.

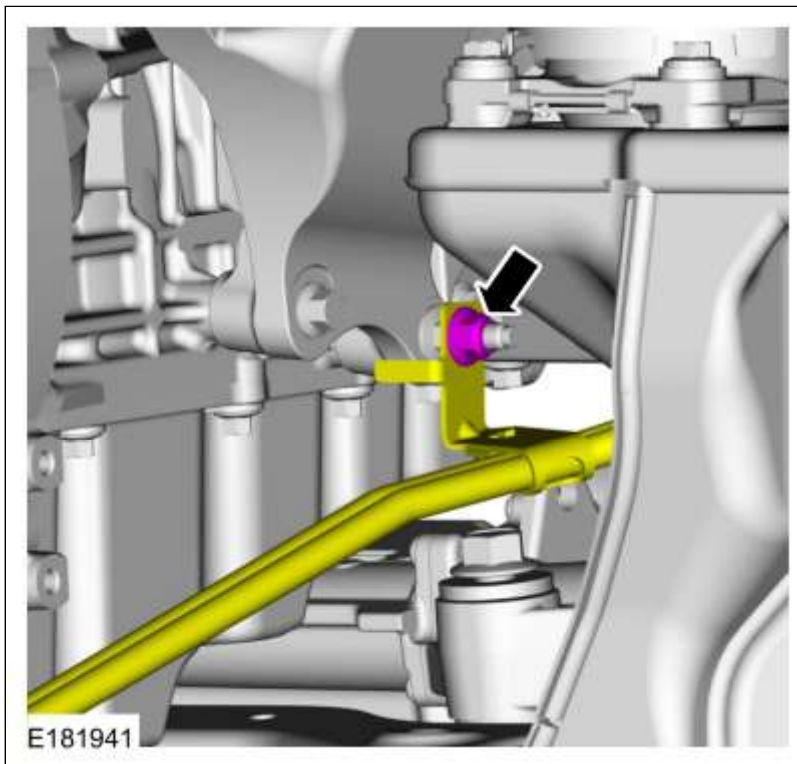


32. Remove and discard the front subframe nuts.



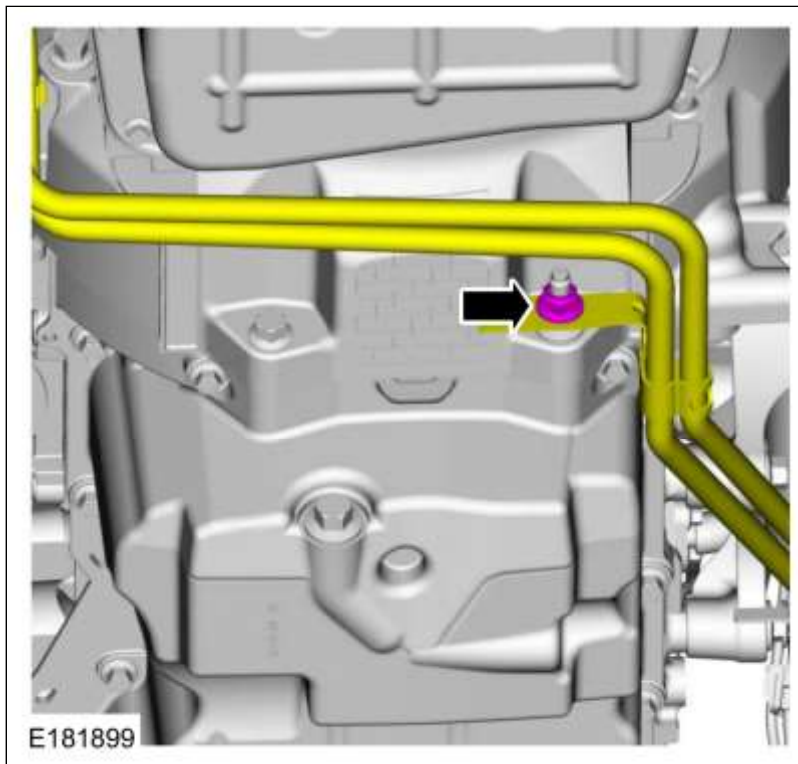
### 6-Speed Automatic Transmission - 6R80

33. Remove the nut from the RH engine mount bracket stud bolt for the transmission cooling tubes.



34. Remove the transmission cooling tube bracket nut and position aside.

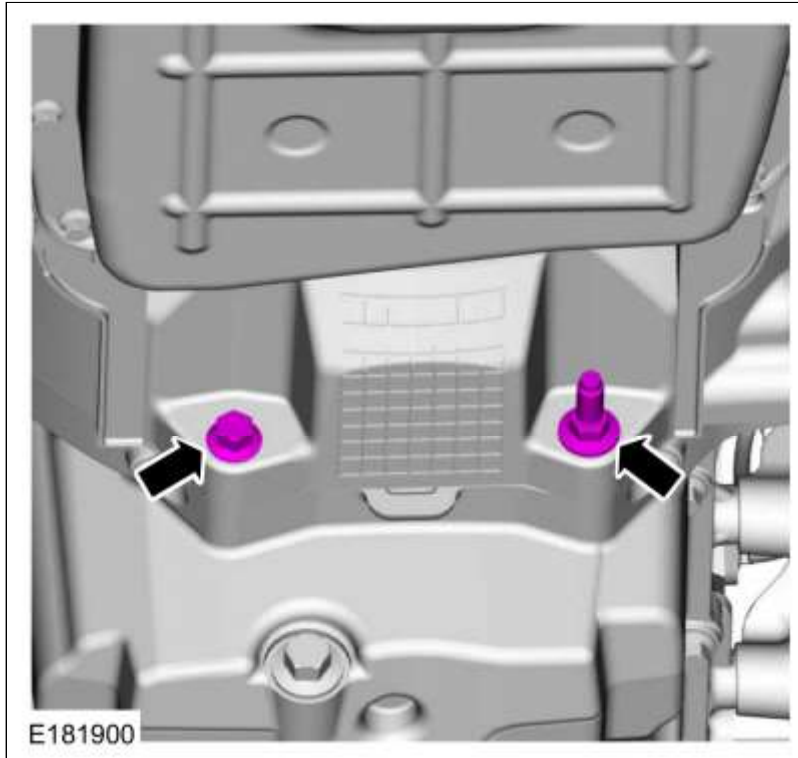




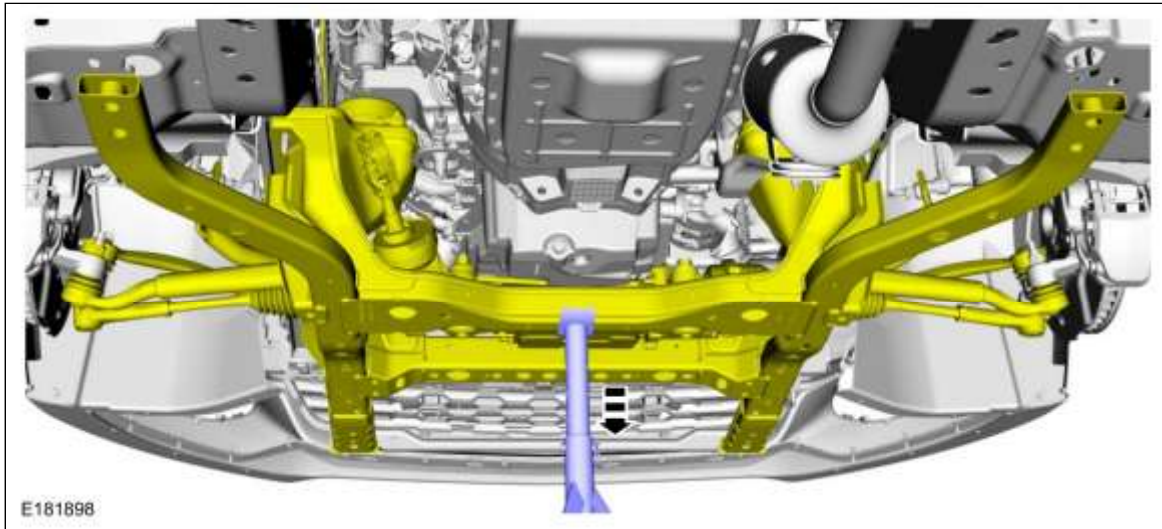
### 6-Speed Automatic Transmission - 6R80/6-Speed Manual Transmission - MT82

35. **NOTE:** Automatic transmission shown, manual transmission similar.

Remove the oil pan bolts.

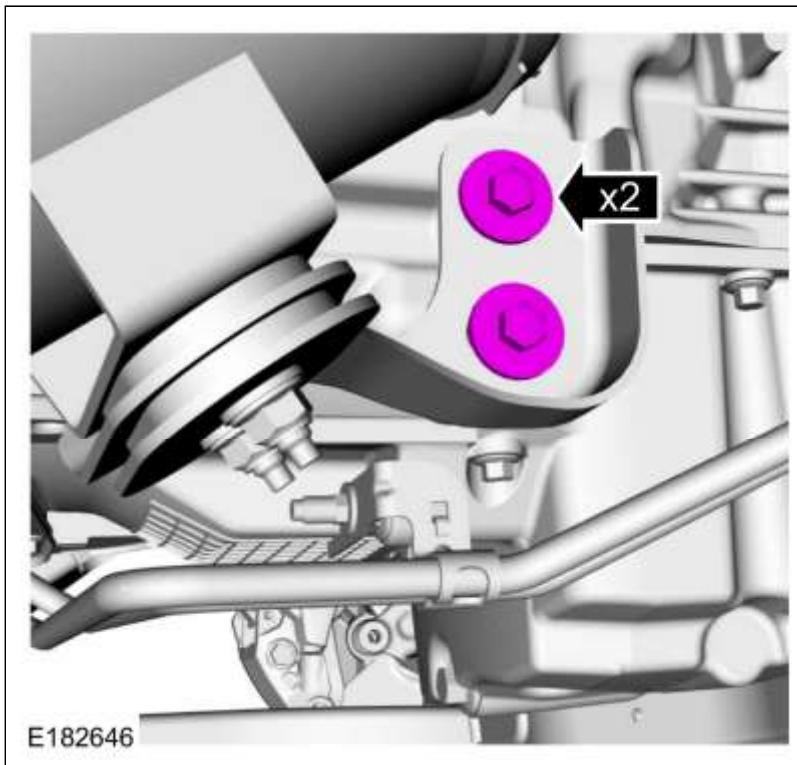


36. Using an adjustable stand, lower the subframe 102 mm (4.0 in).  
Use the General Equipment: Vehicle/Axle Stands

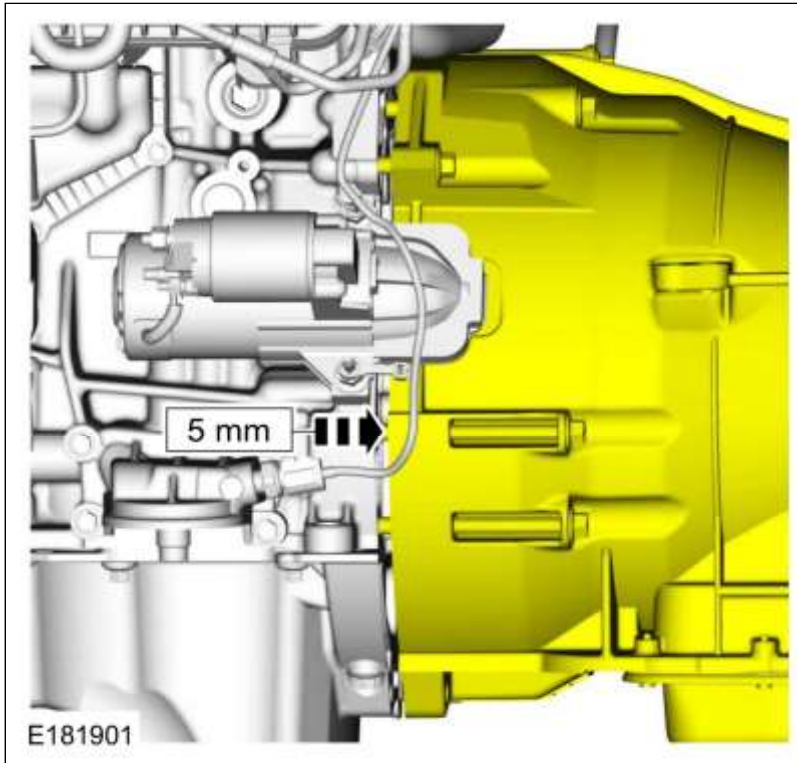


37. **NOTE:** Automatic transmission shown, manual transmission similar.

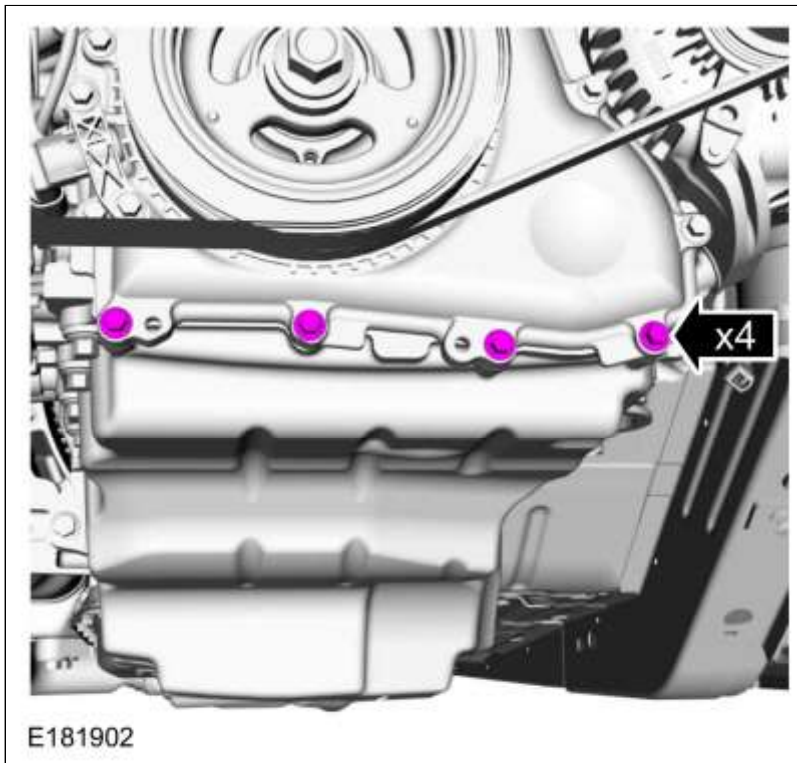
Remove the bolts for the catalytic converter bracket.



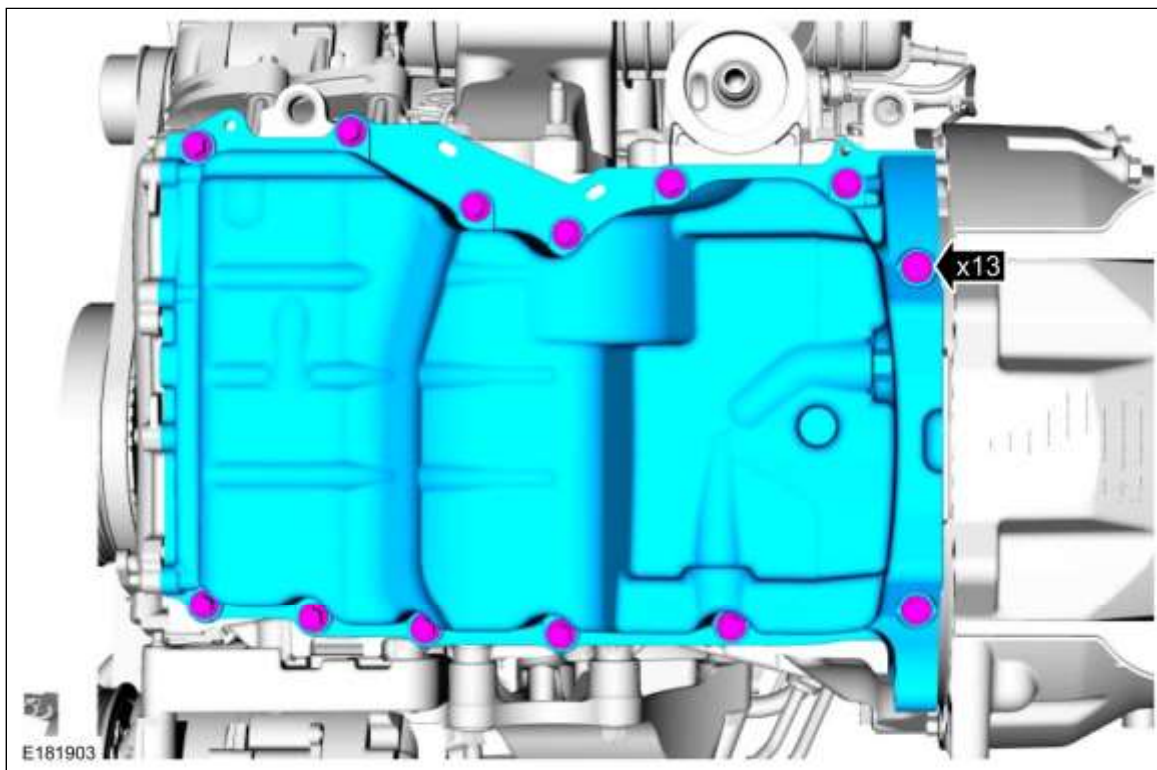
38. Separate the engine from the transmission 5 mm (0.19 in).



39. Remove the engine front cover bolts.



40. Remove the bolts and the oil pan.



41. **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 traces of sealant.**

Make sure that the mating faces are clean and free of foreign material.

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

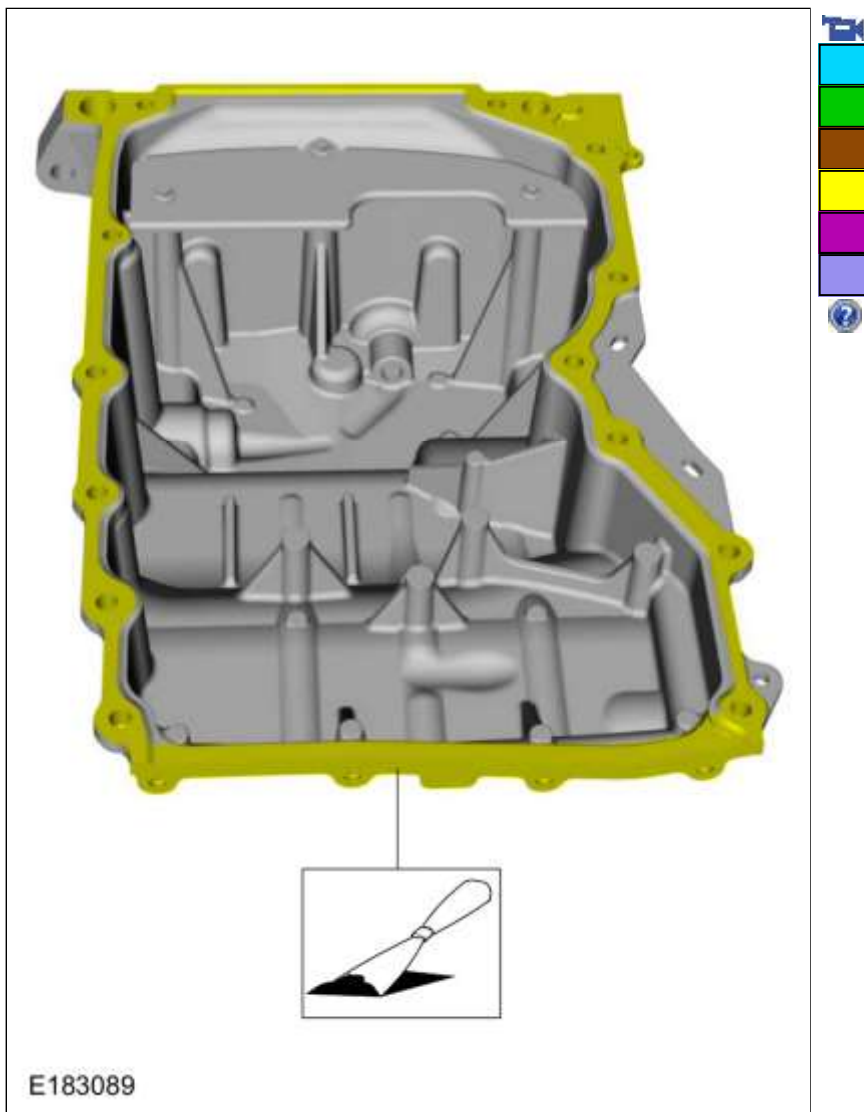
Use the General Equipment: Plastic Scraper

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

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

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





42. **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 traces of sealant.**

Make sure that the mating faces are clean and free of foreign material.

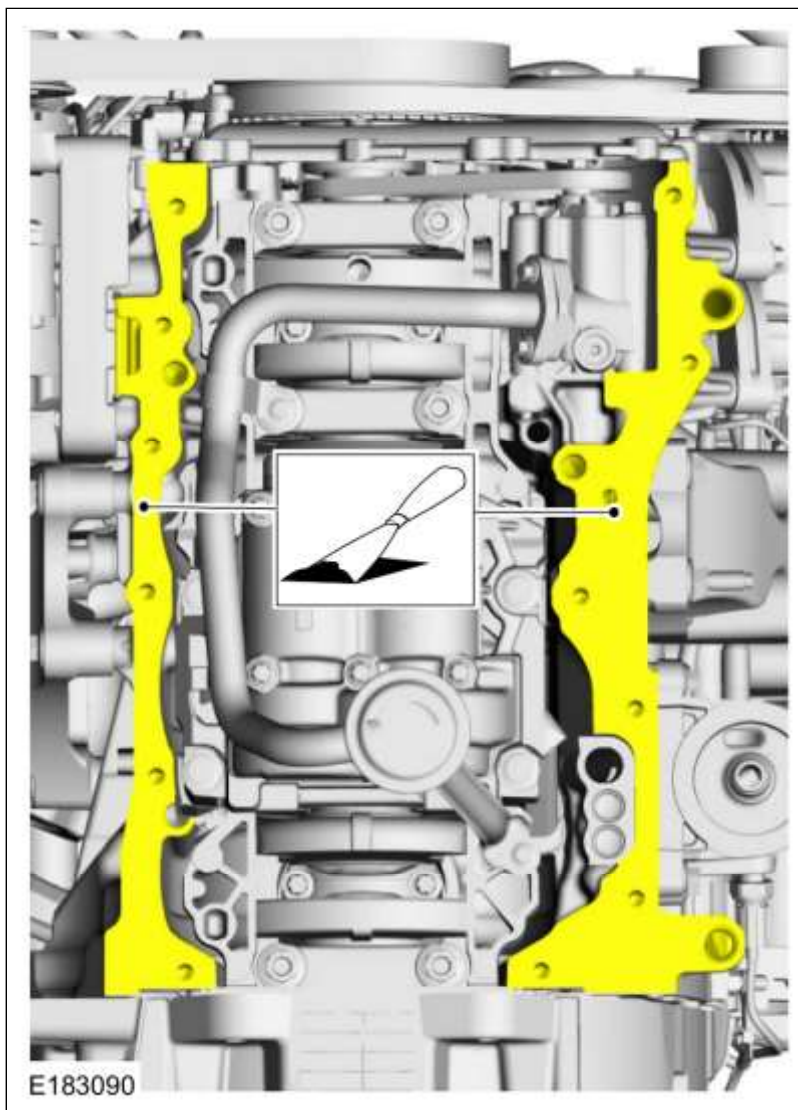
Refer to: [RTV Sealing Surface Cleaning and Preparation](#) (303-00 Engine System - General Information, General Procedures).

Use the General Equipment: Plastic Scraper

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

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

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



43. **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 traces of sealant.**

Make sure that the mating faces are clean and free of foreign material.

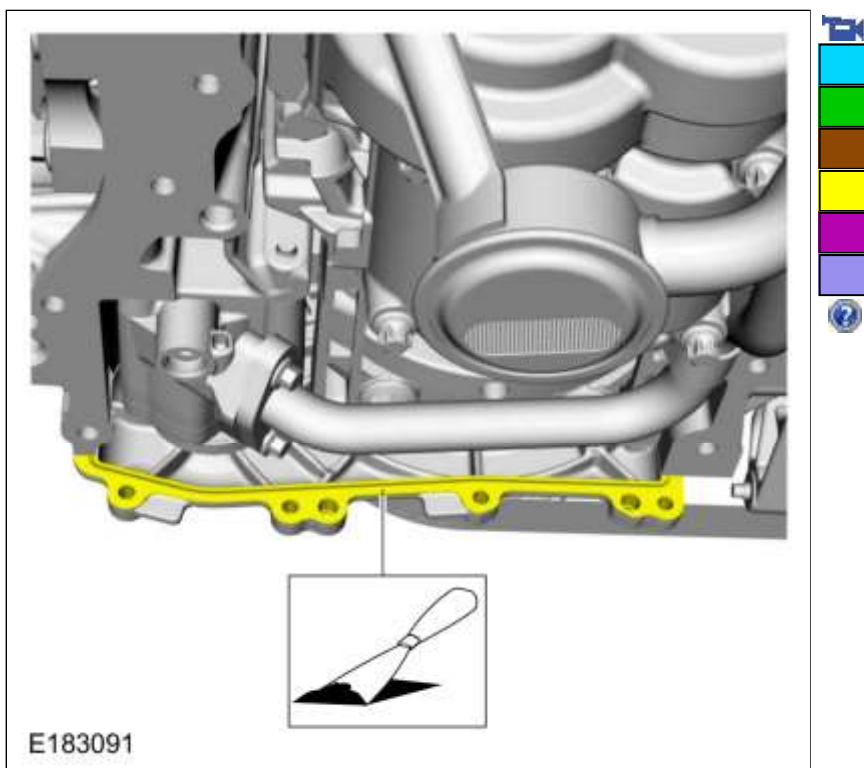
Refer to: [RTV Sealing Surface Cleaning and Preparation](#) (303-00 Engine System - General Information, General Procedures).

Use the General Equipment: Plastic Scraper

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

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

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



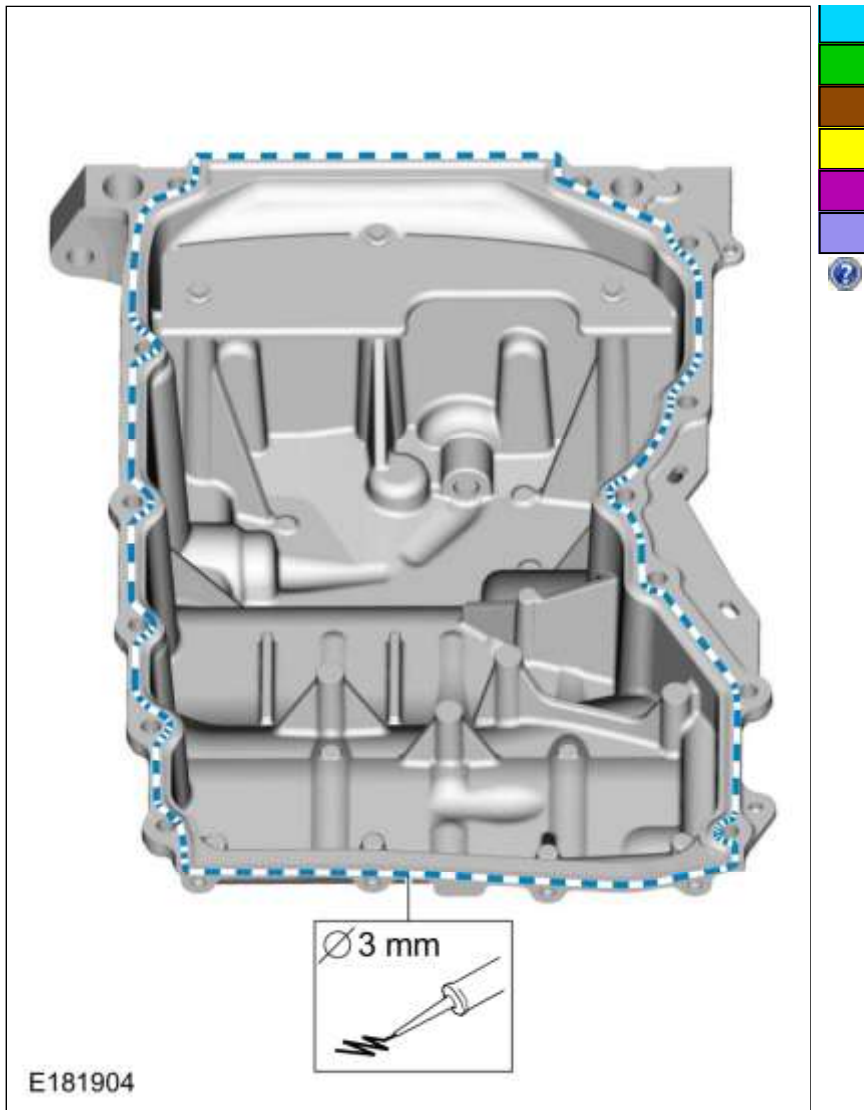
## Installation

### 6-Speed Automatic Transmission - 6R80/6-Speed Manual Transmission - MT82

1. **NOTE:** *If the oil pan is not secured within 10 minutes of sealant application, the sealant must be removed and the sealing area cleaned. Allow to dry until there is no sign of wetness, or 10 minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.*

Apply a 3 mm (0.19 in) bead of silicone sealant.

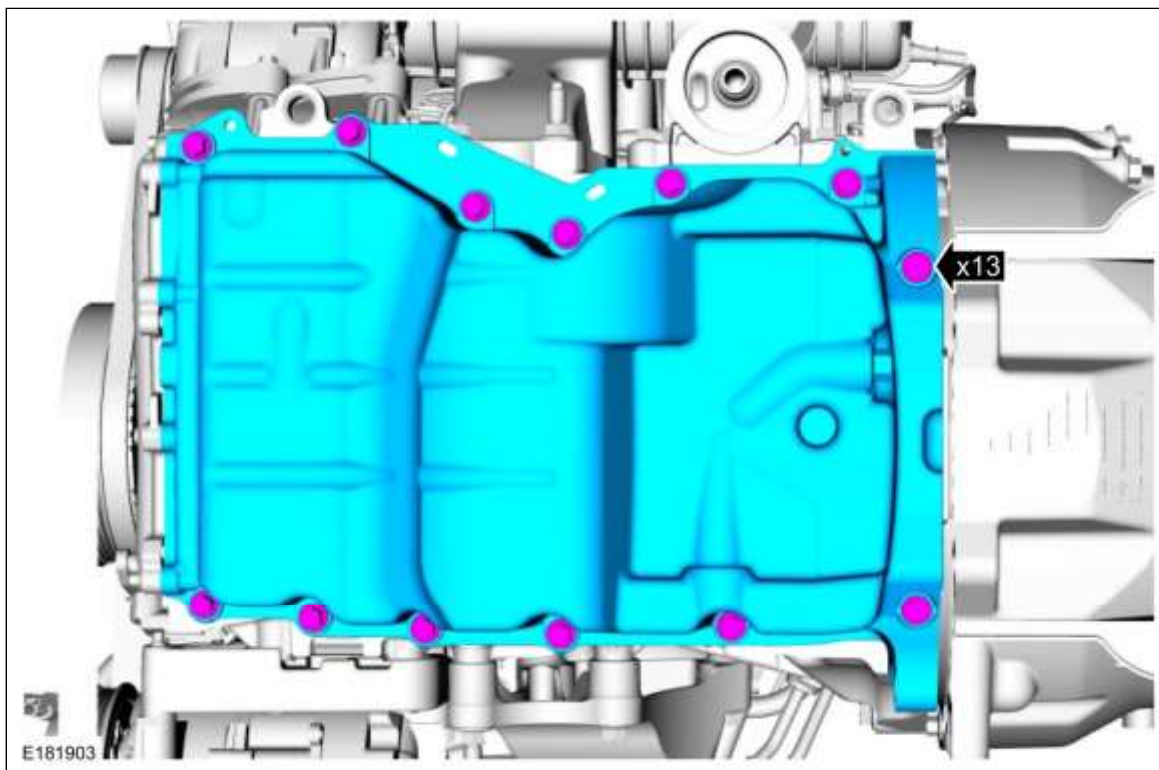
*Material:* Silicone Gasket and Sealant / TA-30 (WSE-M4G323-A4)



2. Install the oil pan and the bolts finger tight.

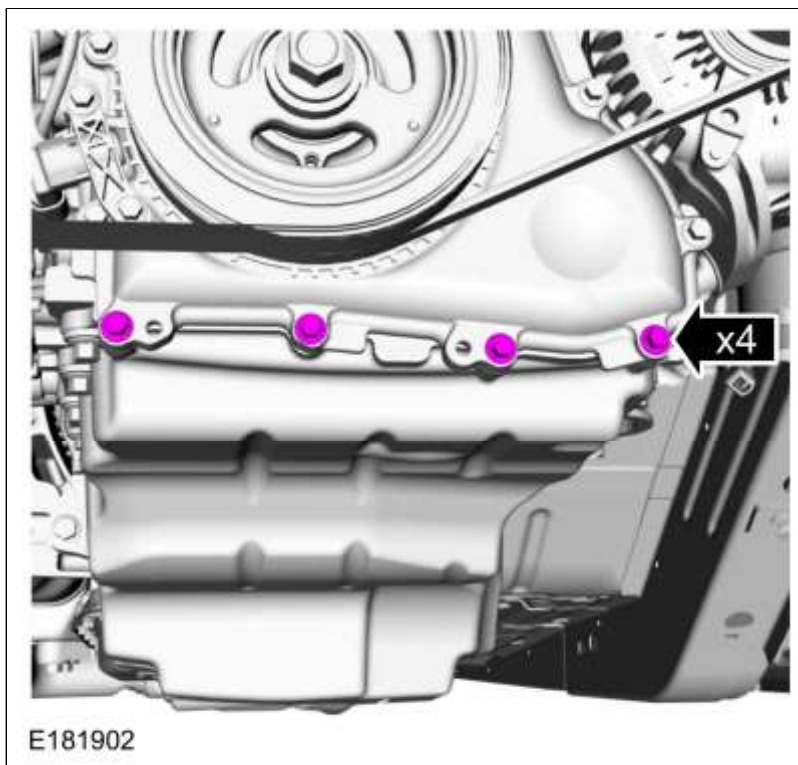




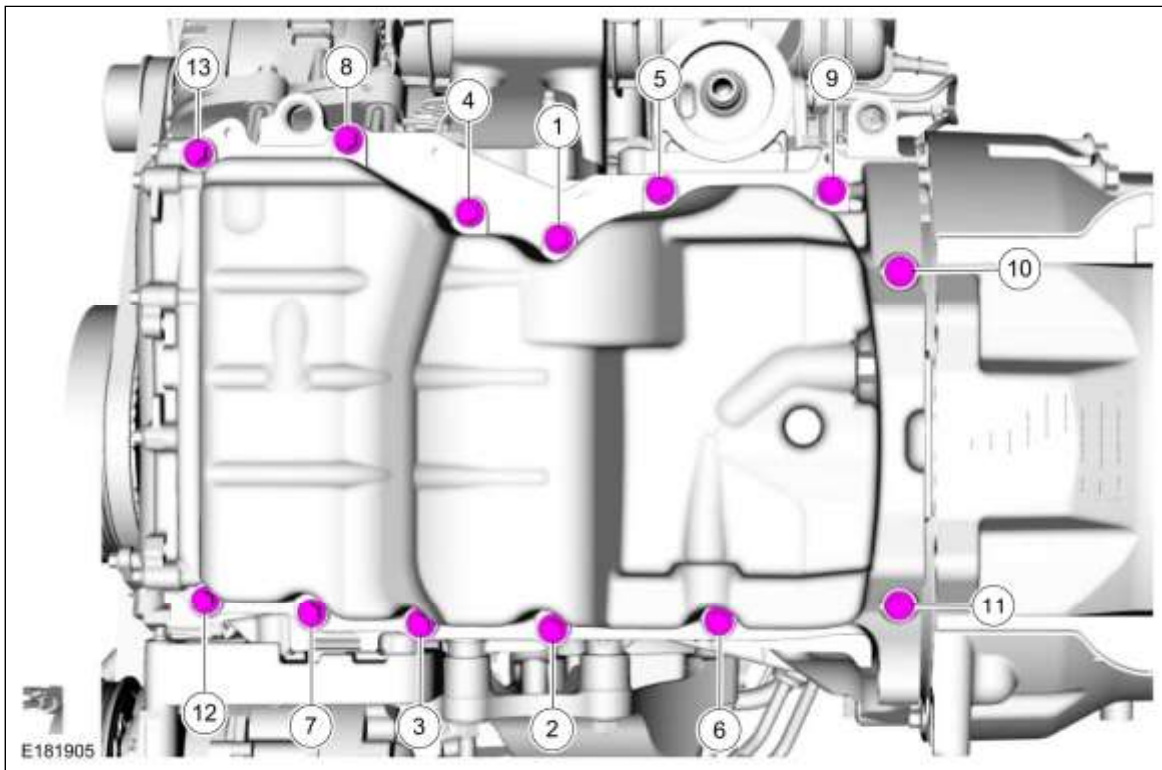


3. **NOTE:** The engine front cover-to-oil pan fasteners must be tightened first to align the front surface of the oil pan flush with the front surface of the engine block.

Install the engine front cover bolts.  
Torque: 89 lb.in (10 Nm)



4. Tighten the oil pan bolts.  
Torque: 18 lb.ft (25 Nm)

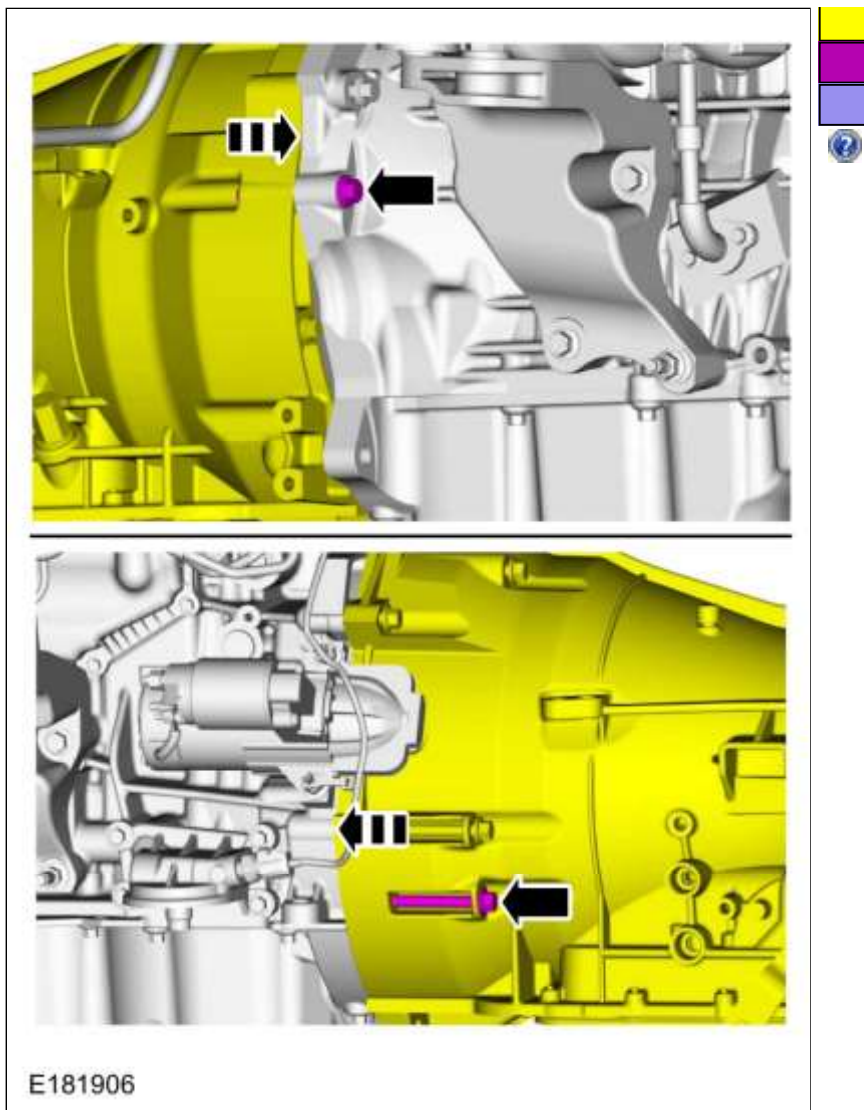


5. **NOTE:** Automatic transmission shown, manual transmission similar.

Alternate tightening the LH bellhousing-to-engine and RH engine-to-bellhousing lower bolts to draw the transmission and engine together.

*Torque:* 35 lb.ft (48 Nm)

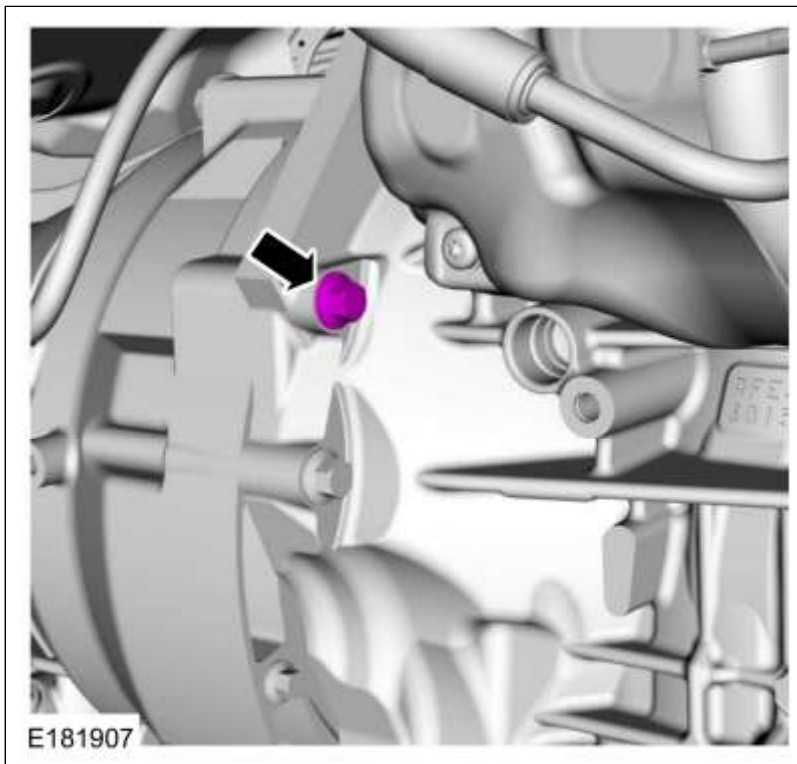




6. **NOTE:** Automatic transmission shown, manual transmission similar.

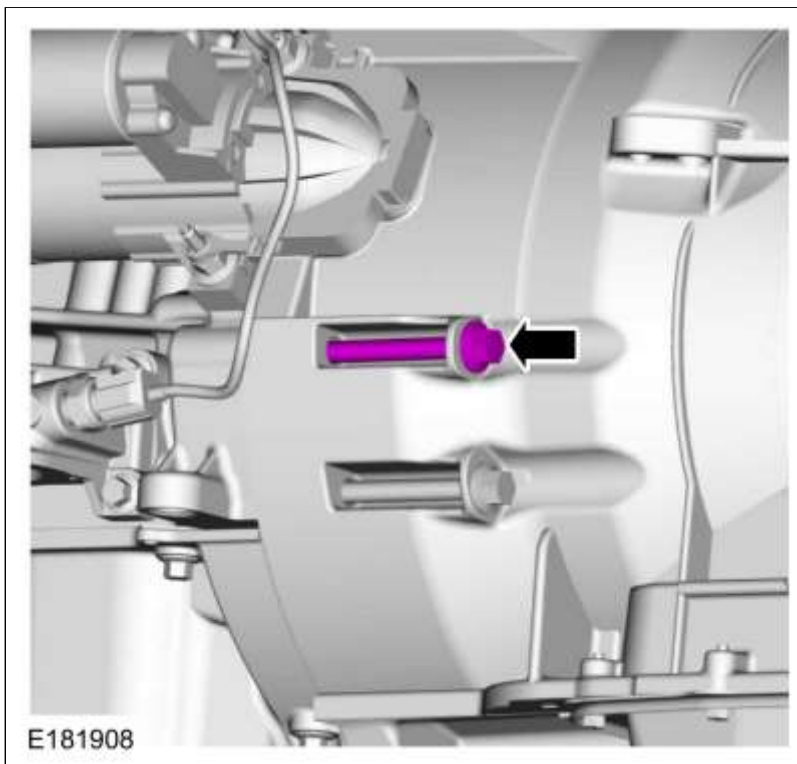
Tighten the bolt.

Torque: 35 lb.ft (48 Nm)



7. **NOTE:** Automatic transmission shown, manual transmission similar.

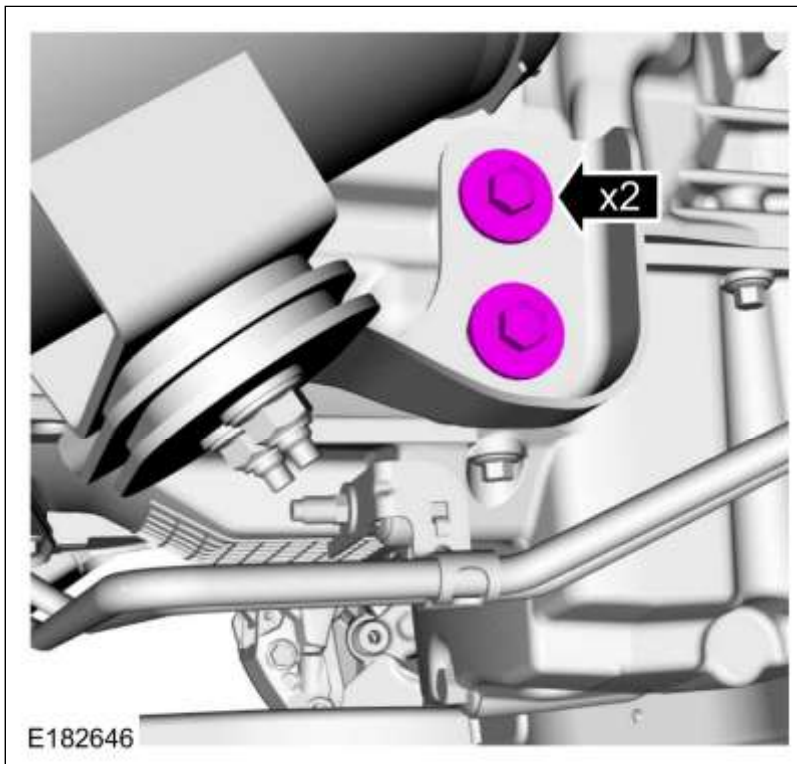
Tighten the bolt.  
Torque: 35 lb.ft (48 Nm)



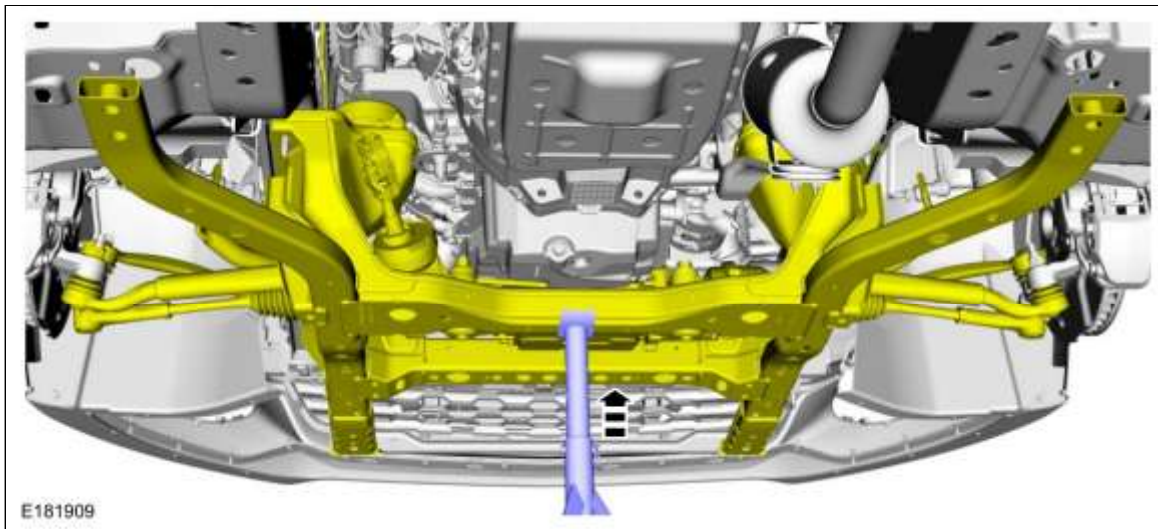
8. **NOTE:** Automatic transmission shown, manual transmission similar.

Install the bolts for the catalytic converter bracket.  
Torque: 18 lb.ft (25 Nm)



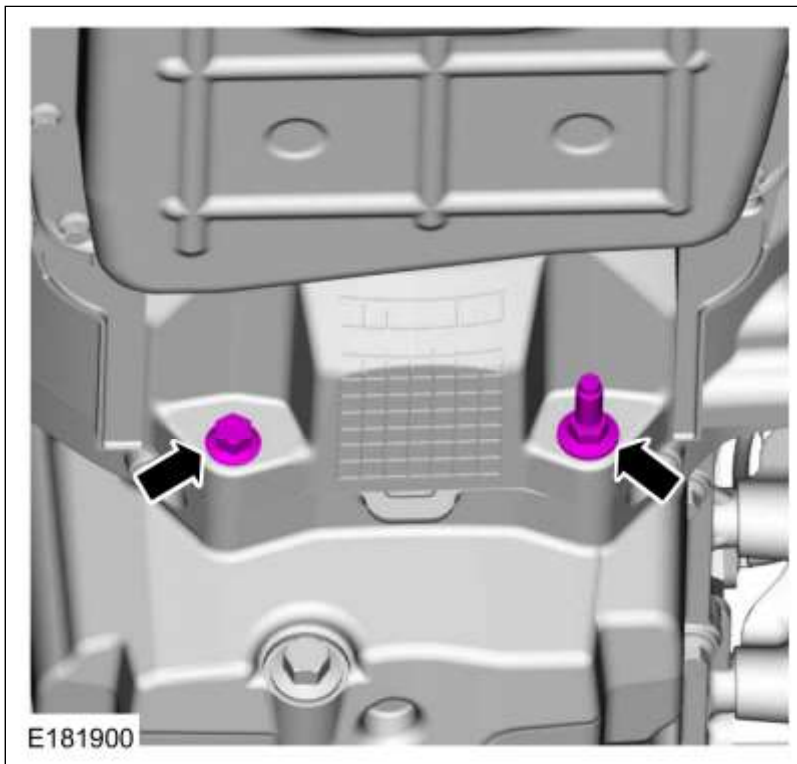


9. Using an adjustable stand, raise the subframe.  
Use the General Equipment: Vehicle/Axle Stands



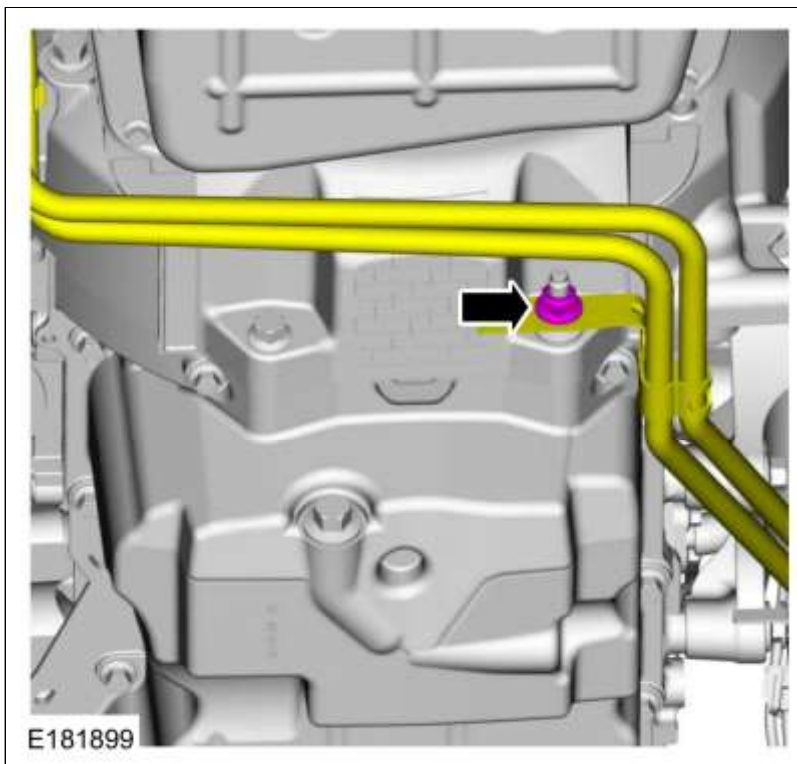
10. **NOTE:** Automatic transmission shown, manual transmission similar.

Install the oil pan bolts.  
Torque: 35 lb.ft (48 Nm)

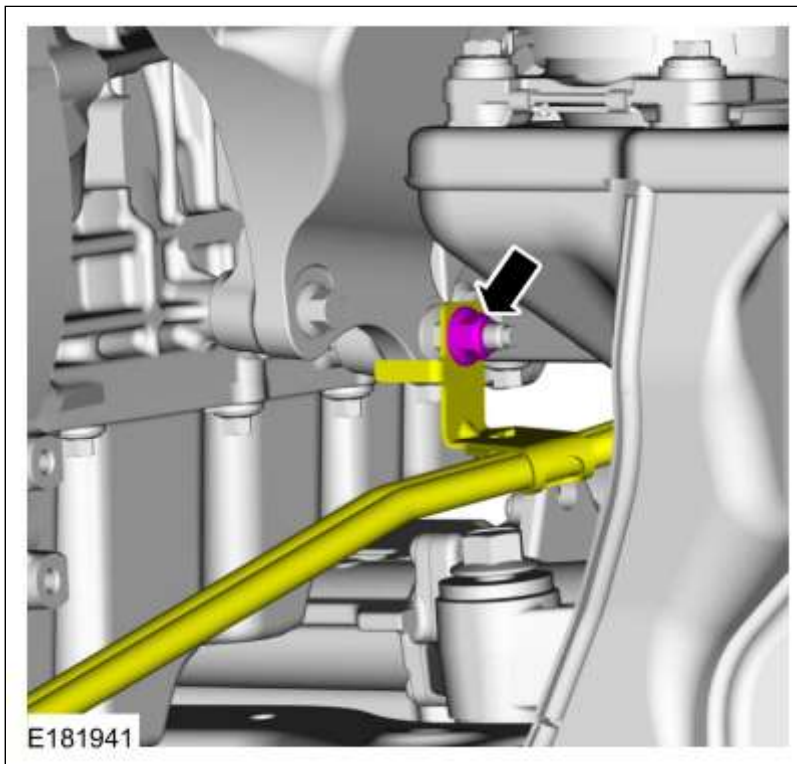


### 6-Speed Automatic Transmission - 6R80

11. Position the transmission cooling tube bracket and install the nut.  
*Torque: 124 lb.in (14 Nm)*



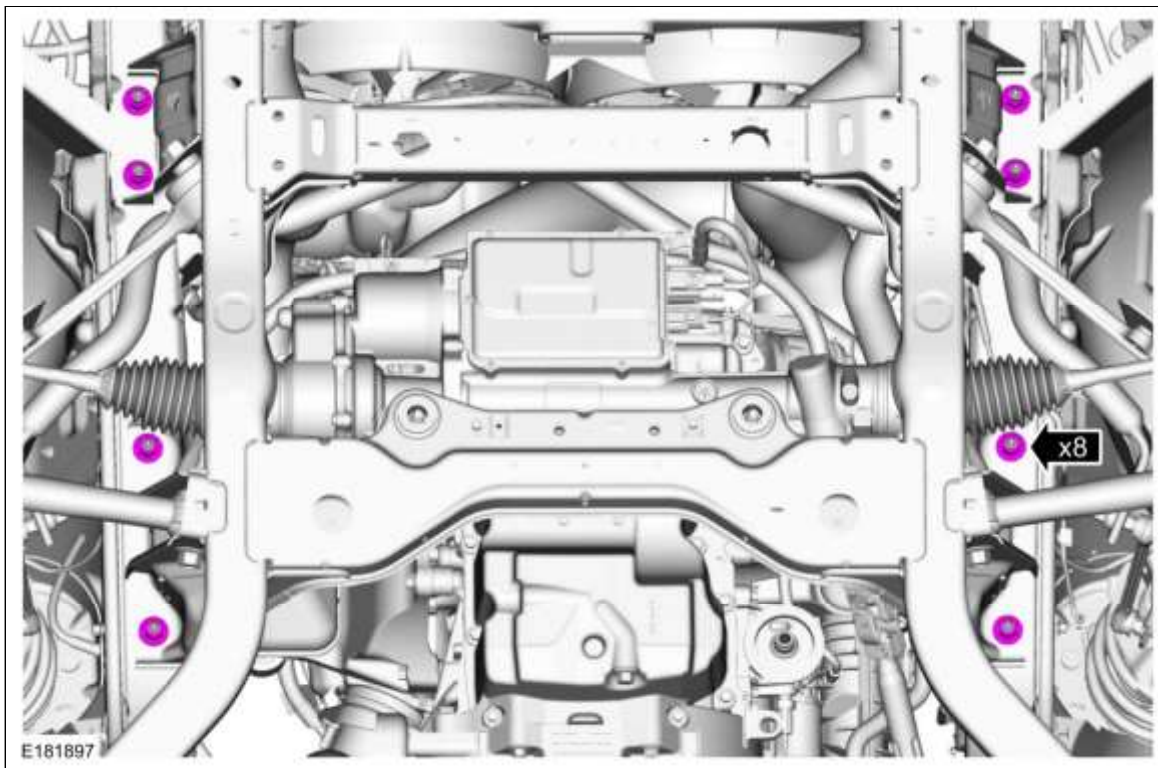
12. Install the nut on the RH engine mount bracket stud bolt.  
*Torque: 35 lb.ft (48 Nm)*



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### 6-Speed Automatic Transmission - 6R80/6-Speed Manual Transmission - MT82

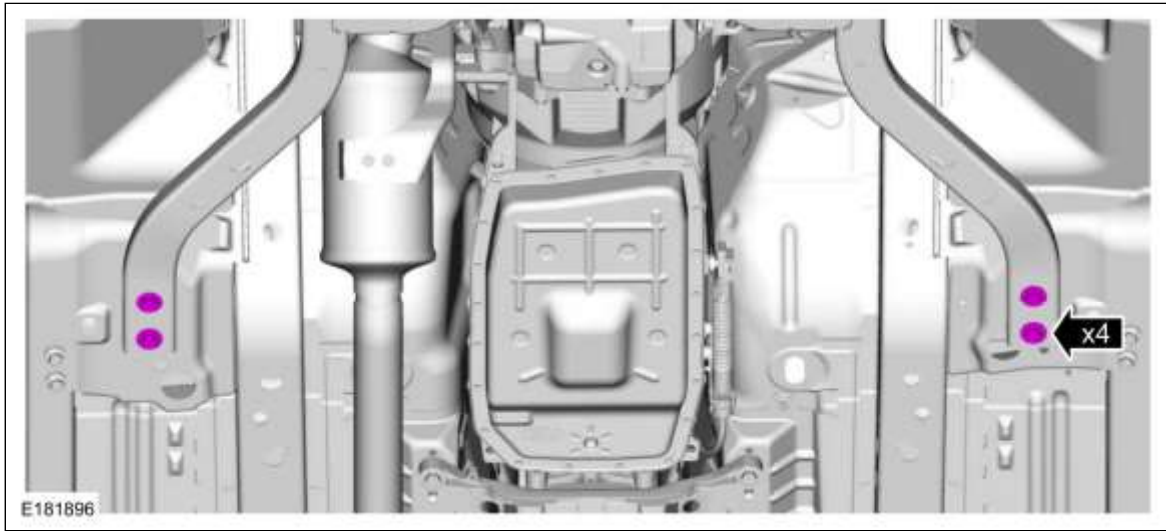
13. Install the new front subframe nuts loosely.



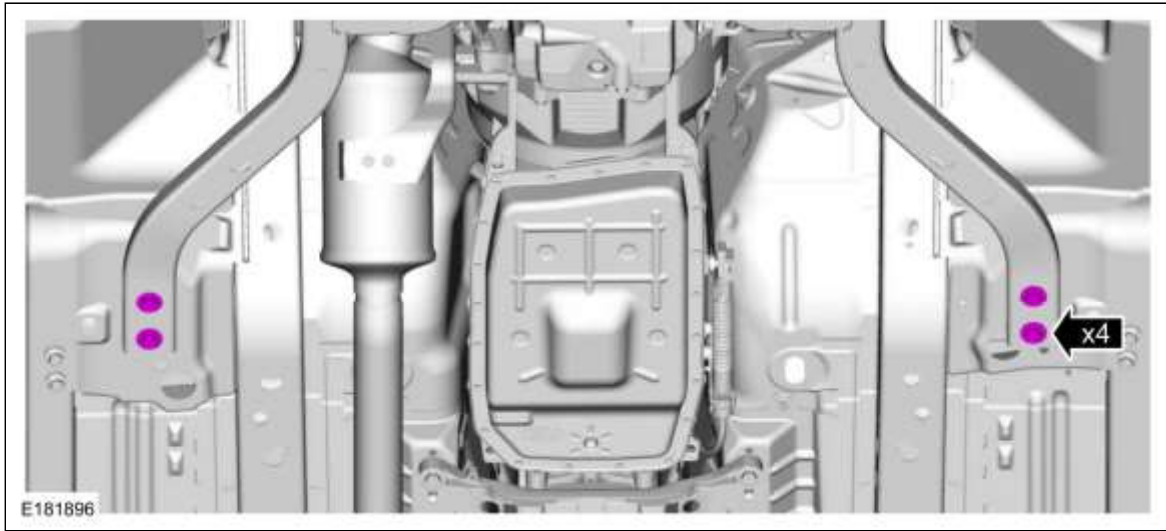
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14.

- Use a suitable alignment tool with a 15 mm (0.59 in) OD shaft that is long enough to go through the subframe and body.
- Align the subframe to the alignment marks made during removal.
- Install the new rear subframe bolts loosely.

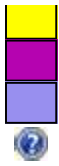
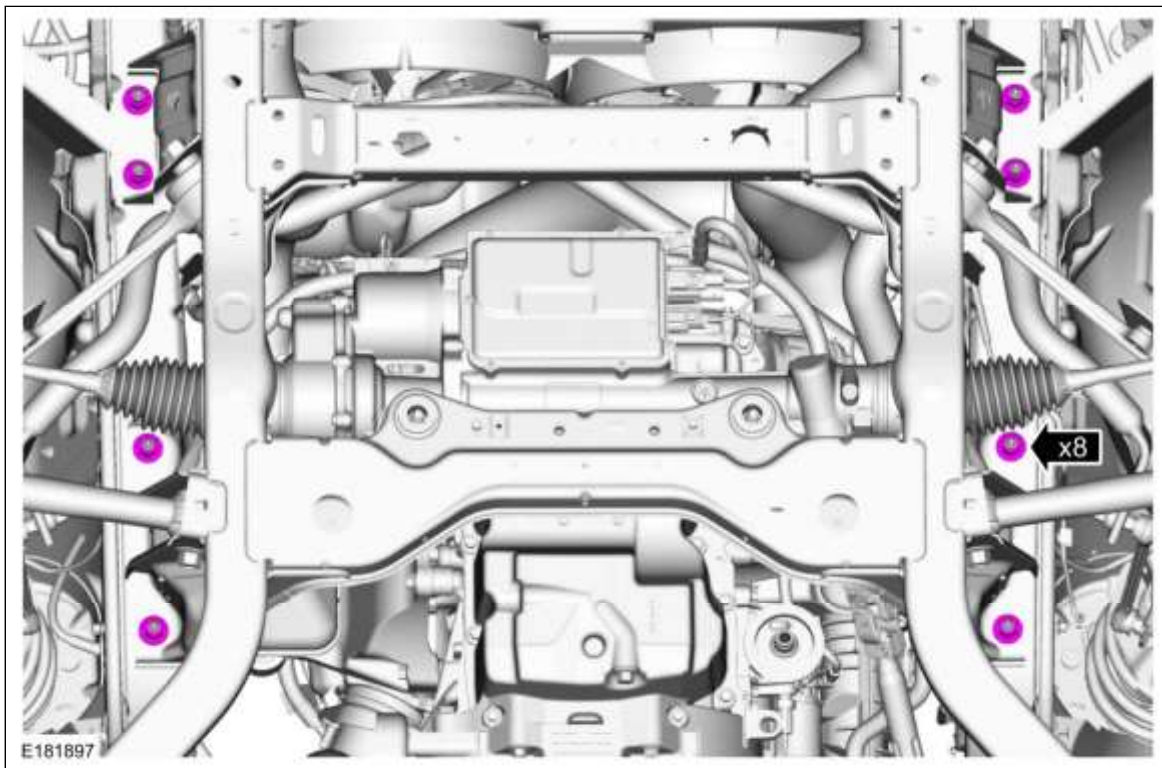


- 15. Tighten the rear subframe bolts in a cross pattern.  
*Torque: 85 lb.ft (115 Nm)*

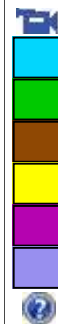
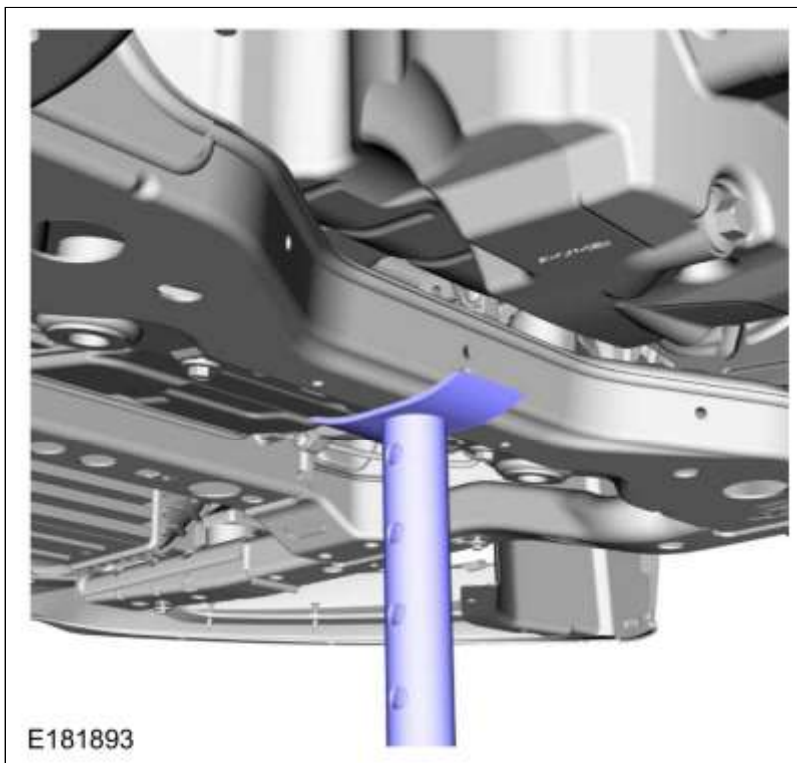


- 16. Tighten the front subframe nuts in a cross pattern.  
*Torque: 85 lb.ft (115 Nm)*



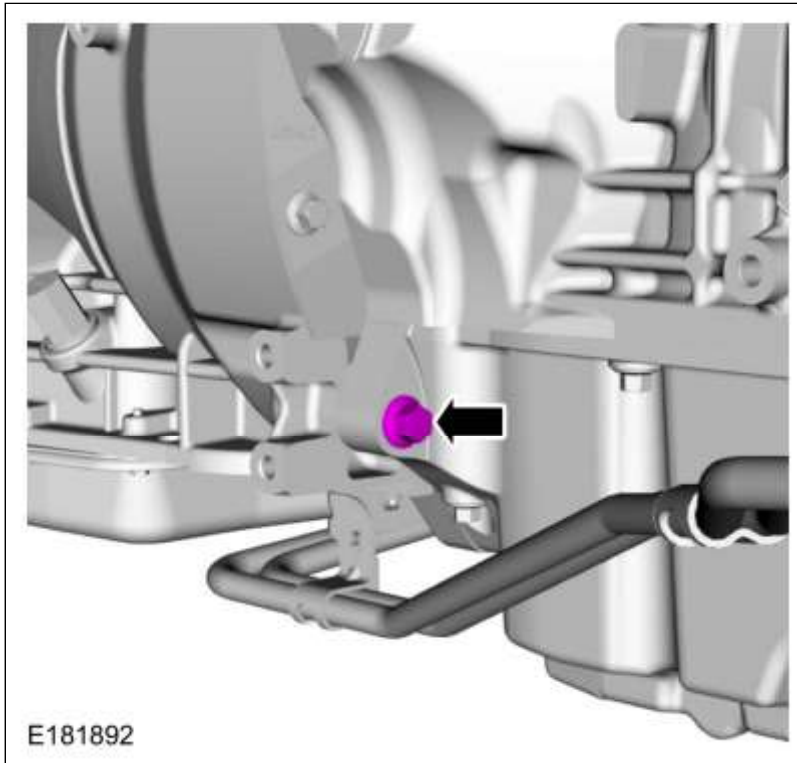


17. Remove the adjustable stand.  
Use the General Equipment: Vehicle/Axle Stands



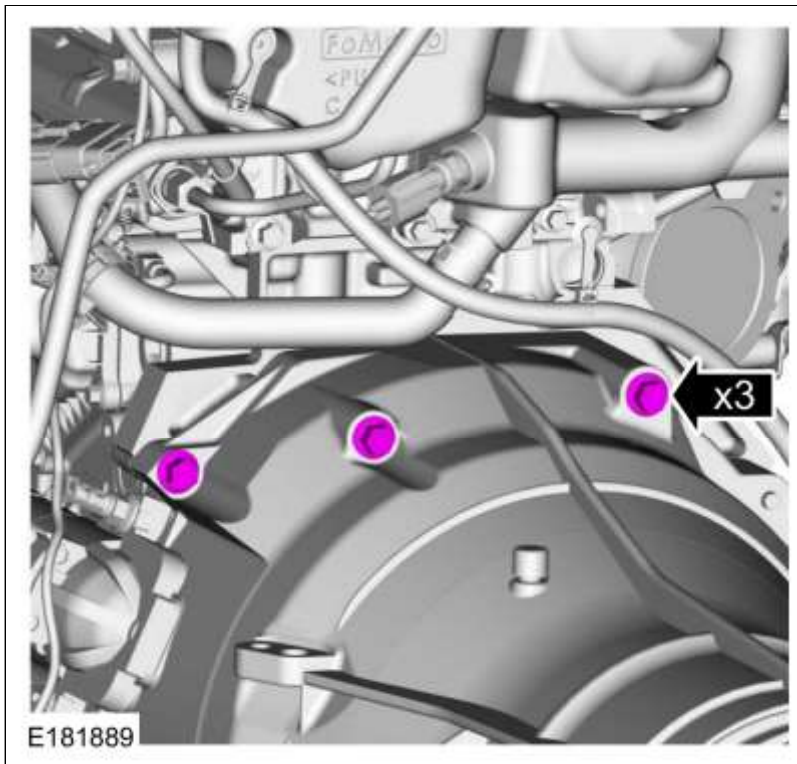
18. **NOTE:** Automatic transmission shown, manual transmission similar.

Install the oil pan bolt.  
Torque: 35 lb.ft (48 Nm)

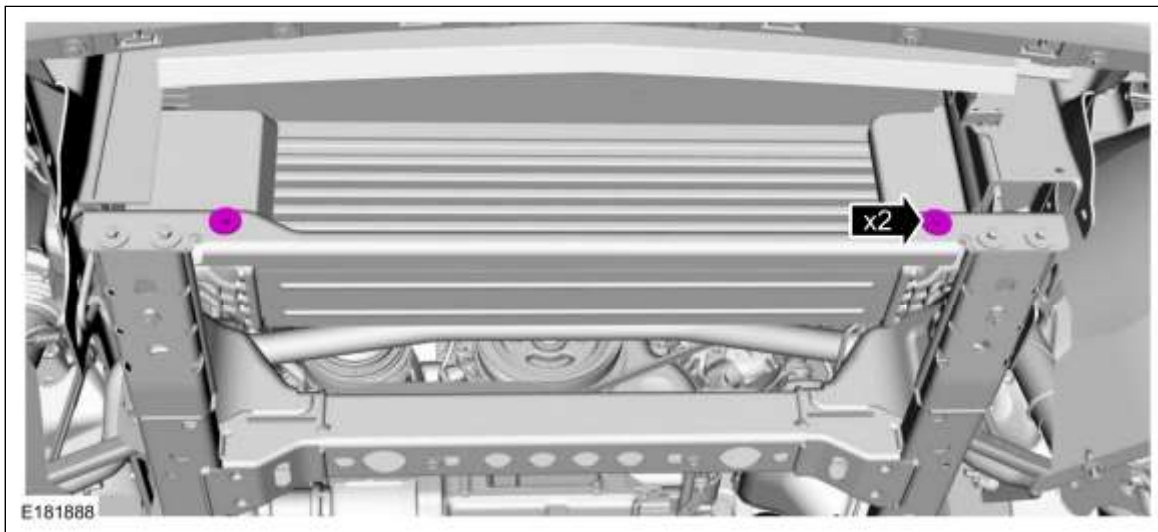


19. **NOTE:** Automatic transmission shown, manual transmission similar.

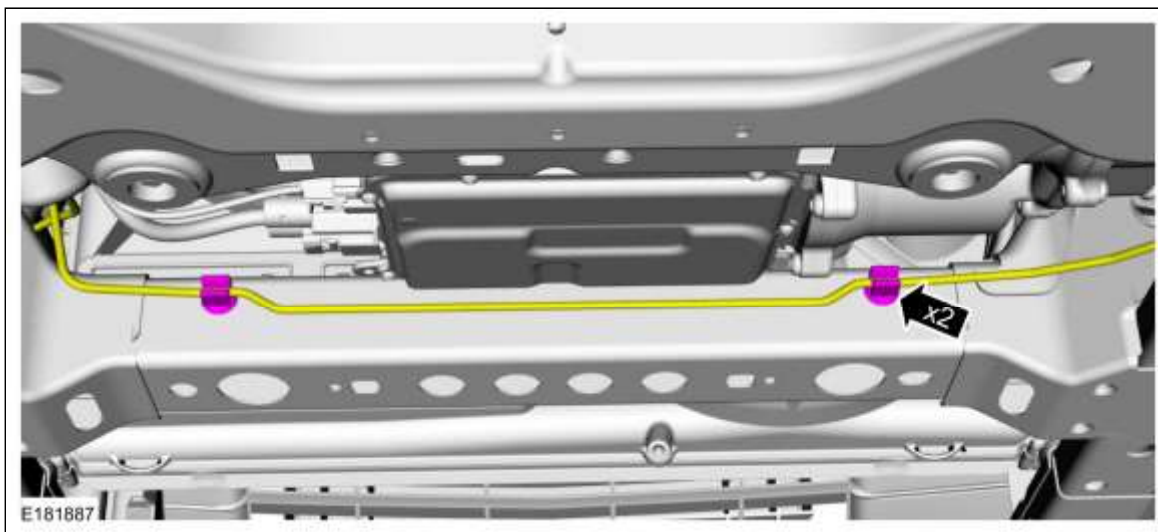
Tighten the bolts.  
Torque: 35 lb.ft (48 Nm)



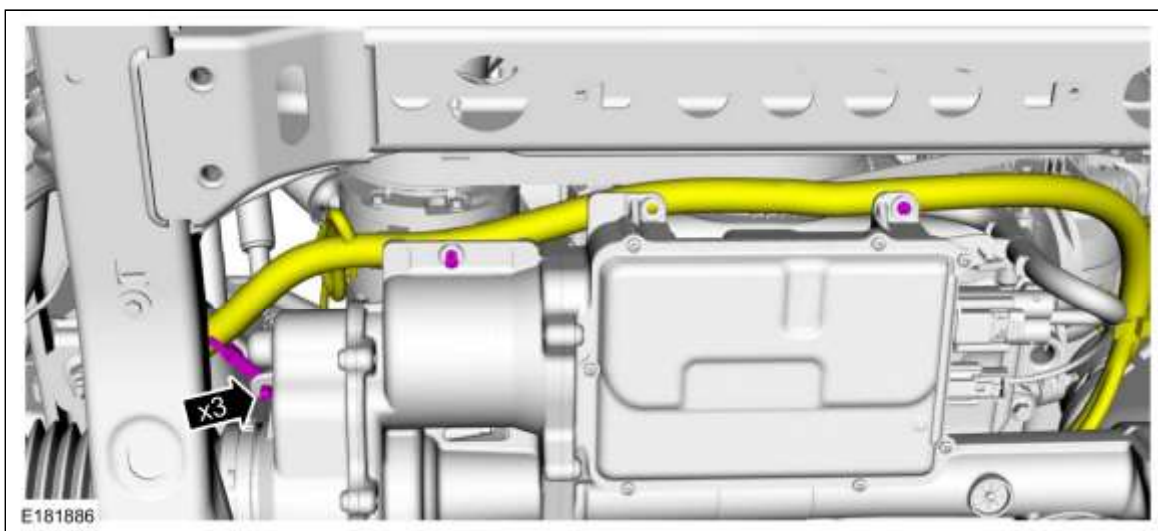
20. Install the bolts in the support bar.  
Torque: 89 lb.in (10 Nm)



21. Attach the brake line retainers to the subframe.



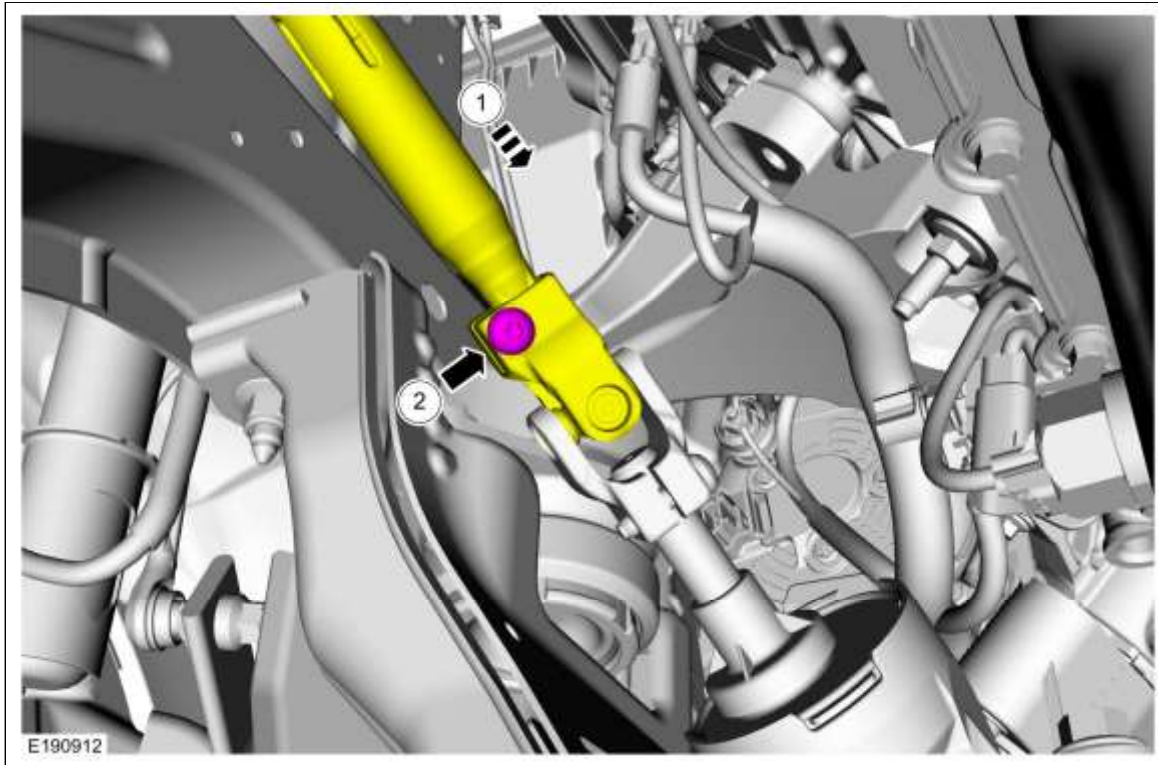
22. Attach the EPAS wiring harness pin-type retainers.



23. **⚠️ WARNING: DO NOT hammer, pry or force steering column and column shafts during installation or removal. Failure to follow this instruction may cause damage to steering components that could lead to loss of steering control during vehicle operation and could result in serious personal injury or death.**

**⚠ WARNING: DO NOT attempt to remove or install the steering column lower u-joint at the steering gear without first loosening the steering column dash seal and fasteners. Failure to follow this instruction may cause damage to steering components that could lead to loss of steering control during vehicle operation and could result in serious personal injury or death.**

1. Connect the steering column shaft to the steering gear universal joint.
2. Install the new steering column shaft bolt.  
*Torque: 22 lb.ft (30 Nm)*



24. Inspect the steering column lower shaft.  
Refer to: [Steering Column Collapsed Check](#) (211-04 Steering Column, General Procedures).
25. **NOTE:** *Lubricate the engine oil filter seal with clean engine oil.*

Install a new engine oil filter.

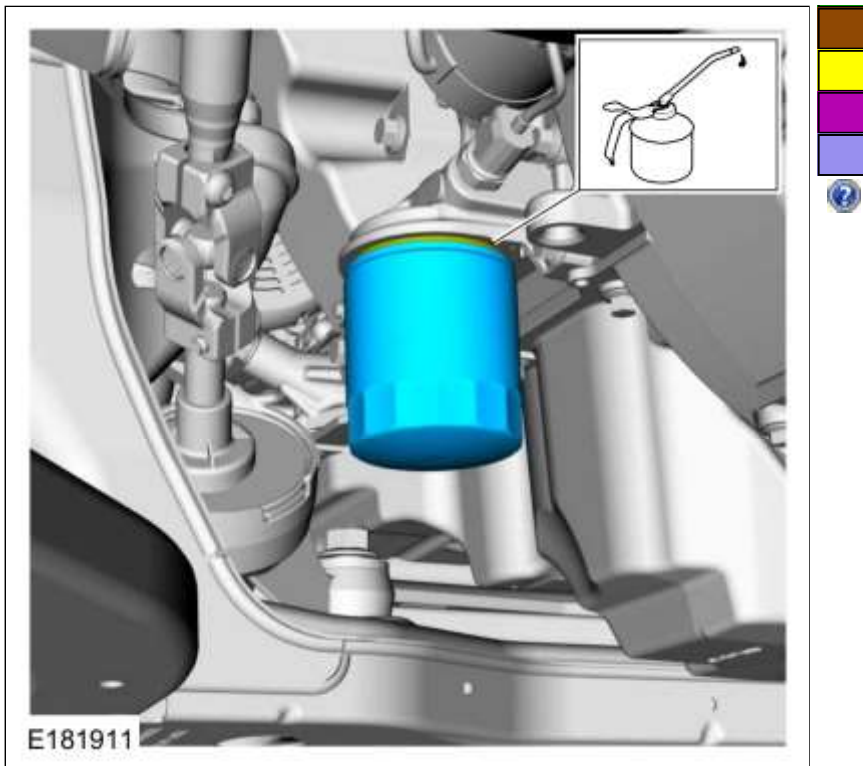
*Torque:*

Stage 1: 71 lb.in (8 Nm)

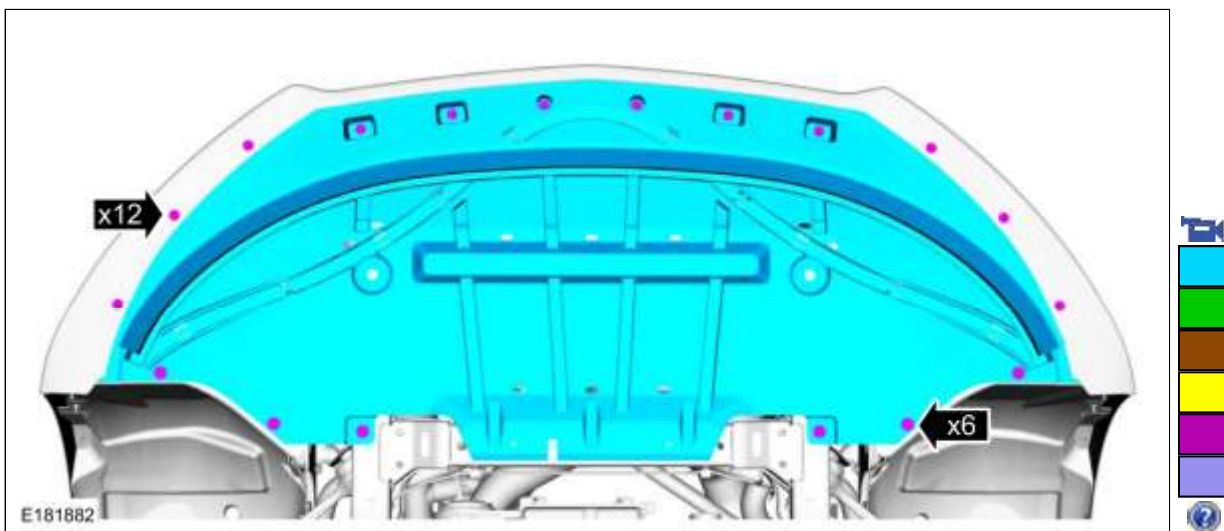
Stage 2: 180°





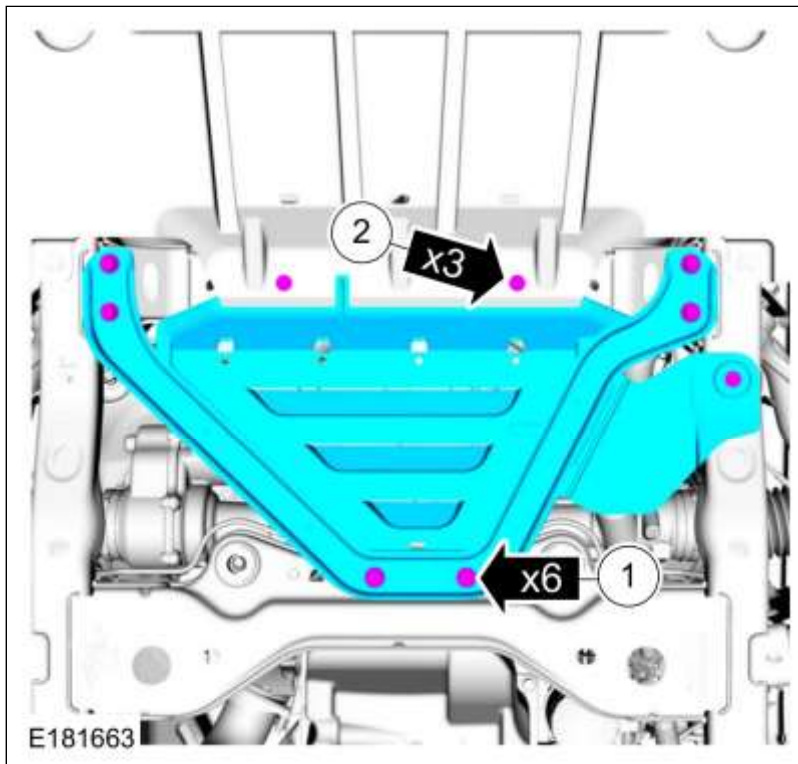


26. Install the underbody shield, bolts and the pin-type retainers.



27.

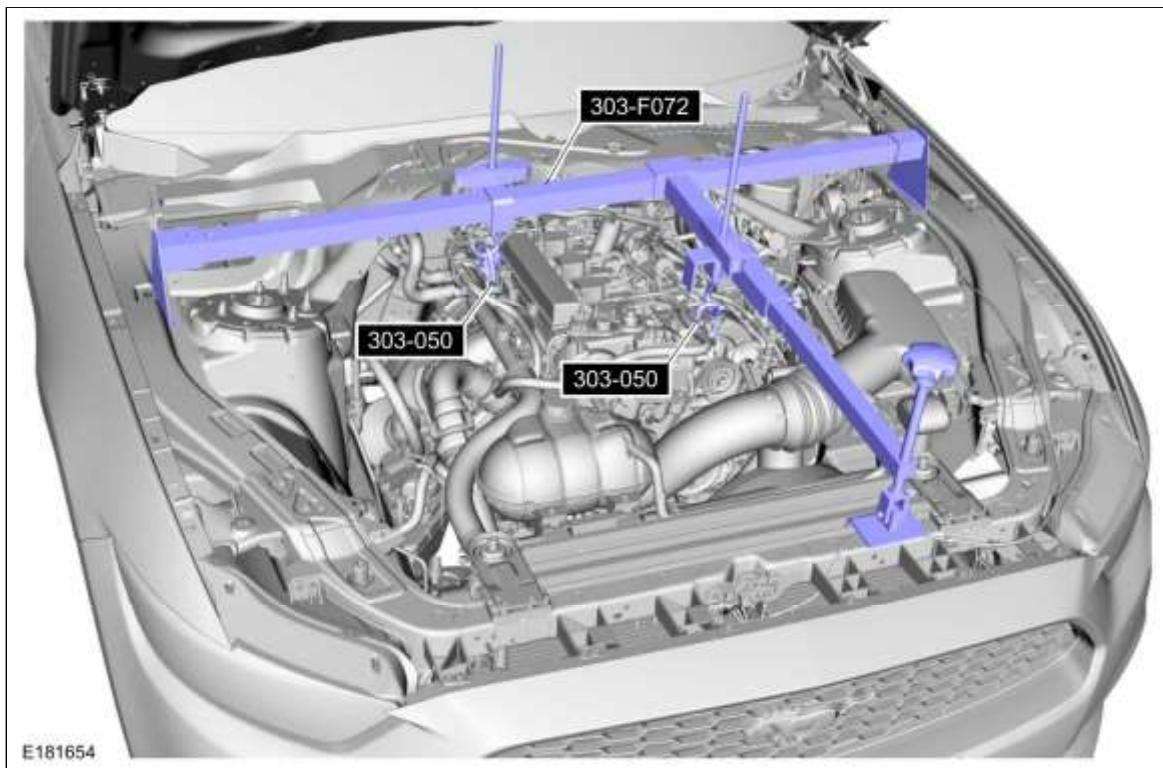
1. Install the underbody shield and the bolts.  
*Torque: 46 lb.ft (63 Nm)*
2. Install the underbody shield screws.



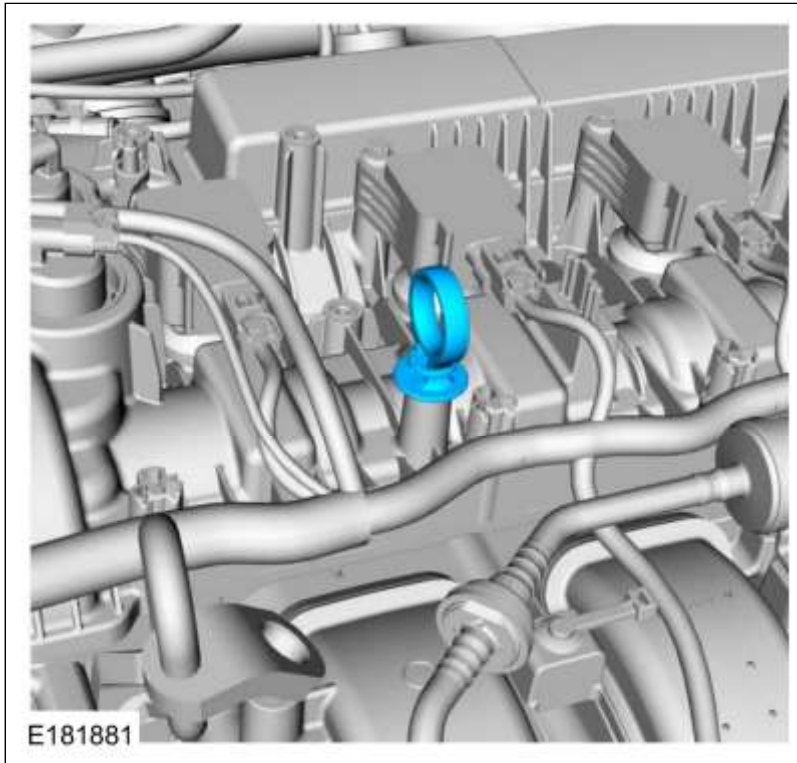
28. Install the front wheels and tires.

Refer to: [Wheel and Tire](#) (204-04A Wheels and Tires, Removal and Installation).

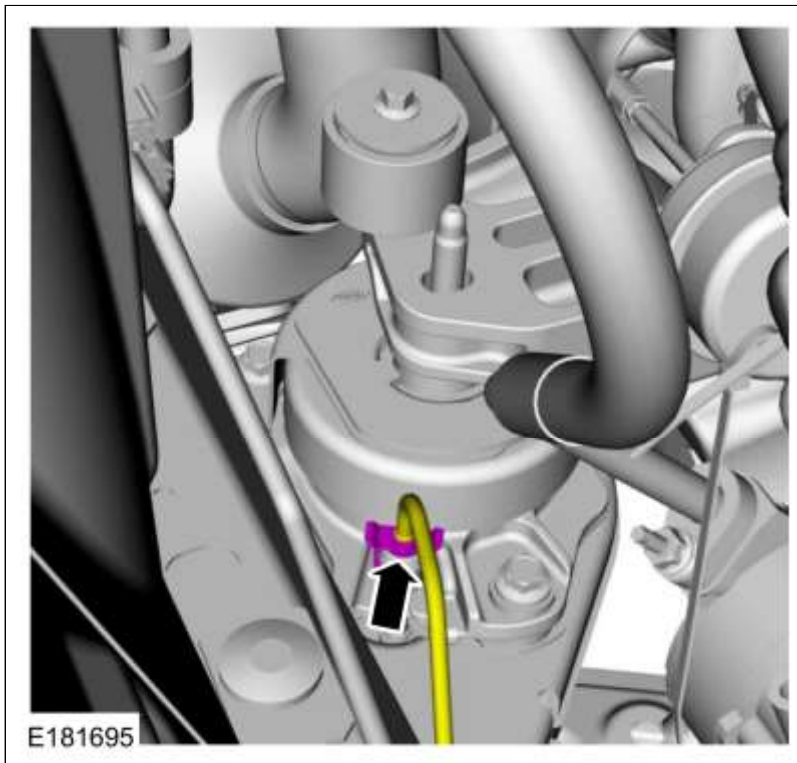
29. Remove Special Service Tool: [303-F072 Support Bar, Engine](#).



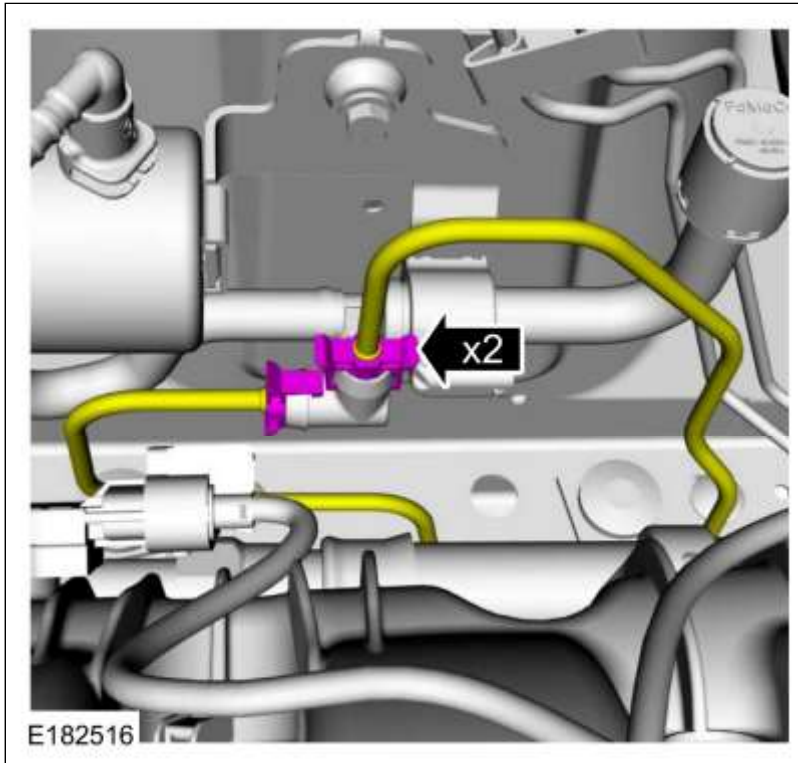
30. Install the oil level indicator.



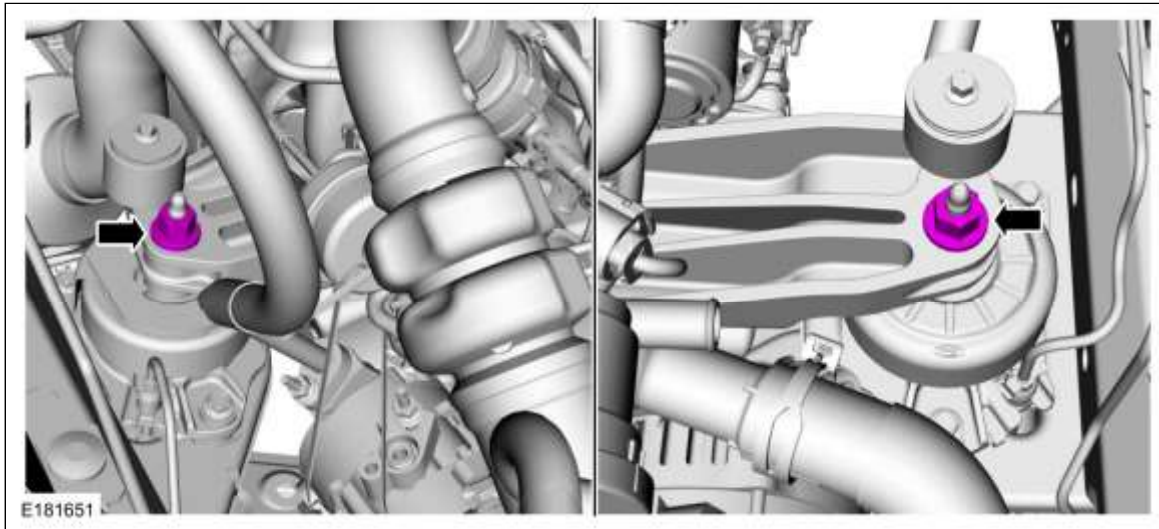
31. Connect the vacuum tube to the RH engine mount.



32. Connect the vacuum tubes to the engine mount control vacuum reservoir.

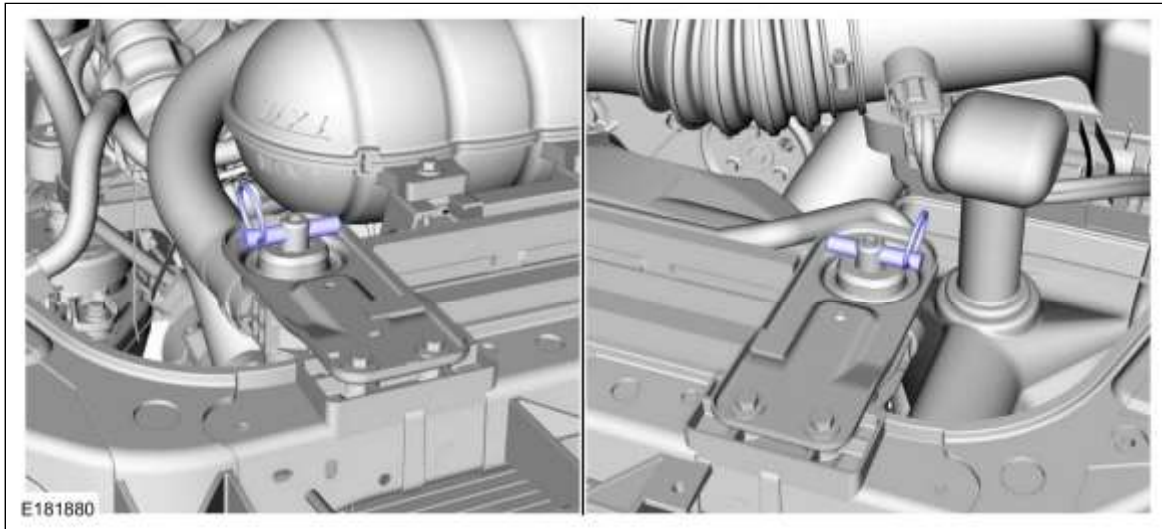


33. Install the RH and LH engine mount bracket nuts.  
*Torque: 92 lb.ft (125 Nm)*

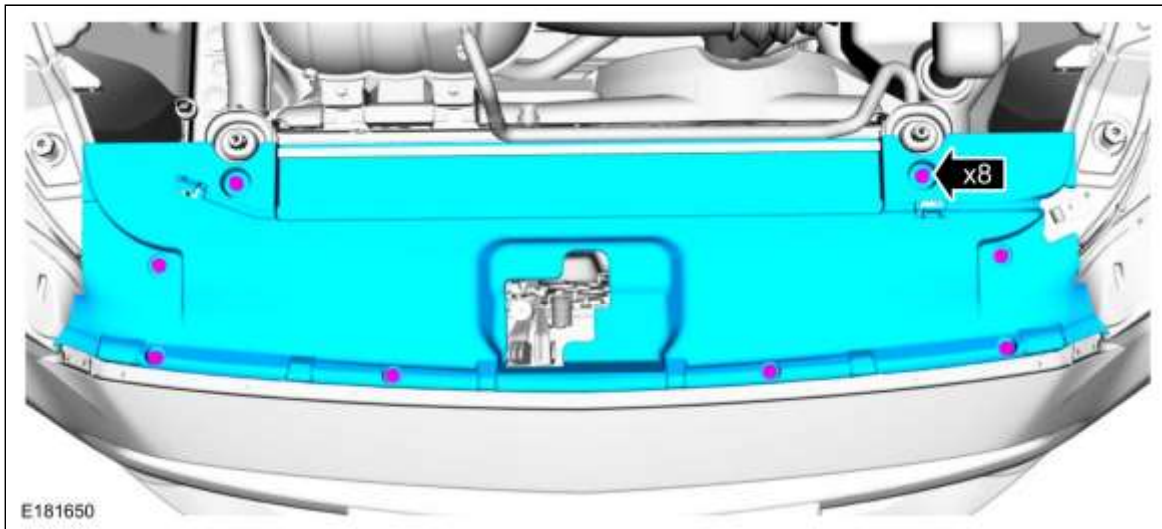


34. Remove the retaining pins.





35. Install the radiator top shield and the retainers.

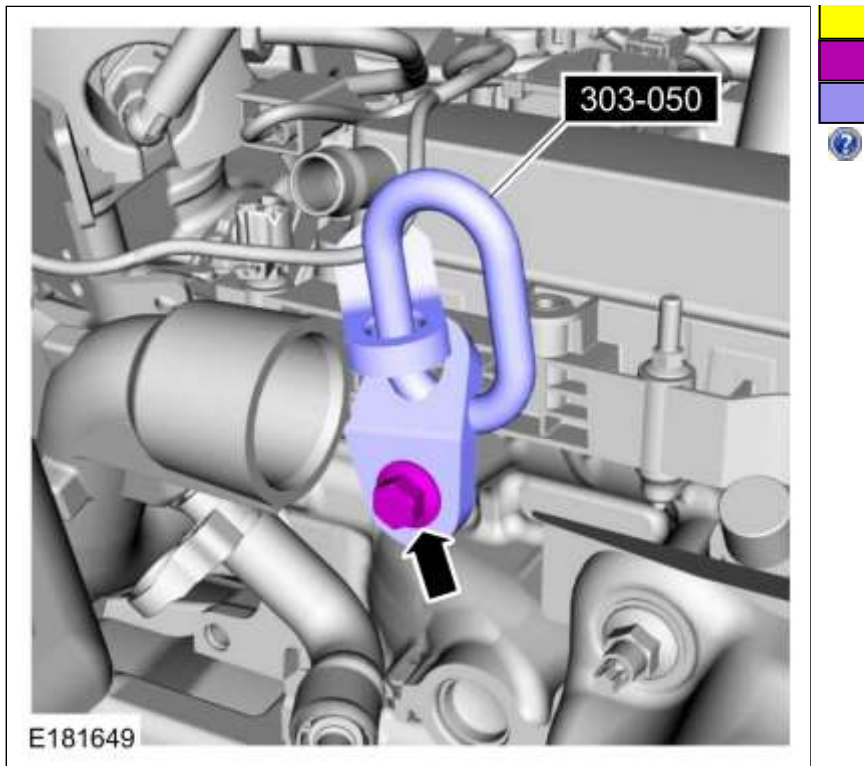


36. Connect the battery ground.

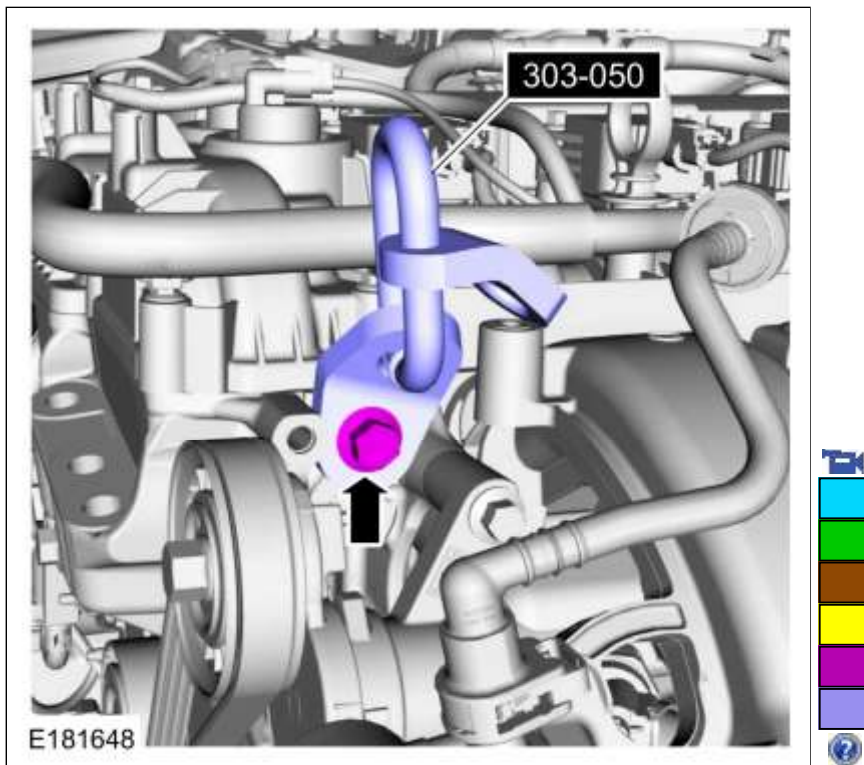
Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

37. Remove Special Service Tool: [303-050 \(T70P-6000\) Lifting Bracket, Engine](#).

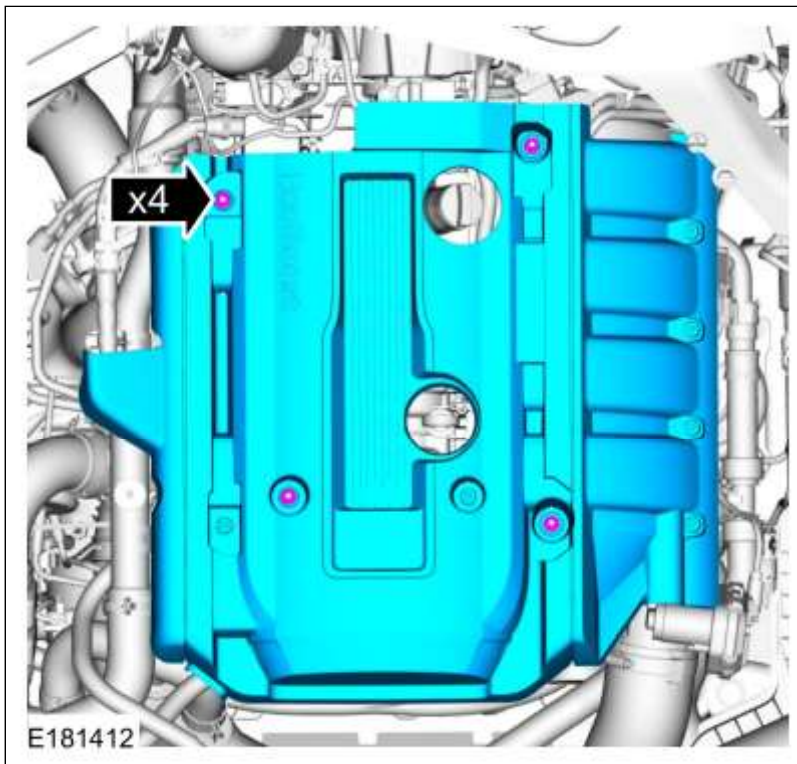




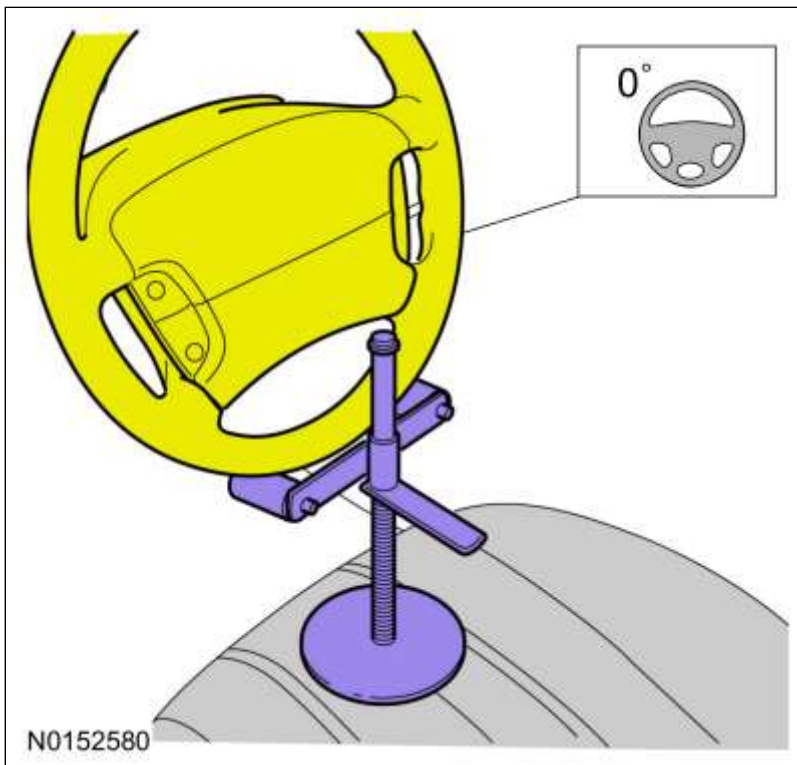
38. Remove Special Service Tool: [303-050 \(T70P-6000\) Lifting Bracket, Engine.](#)



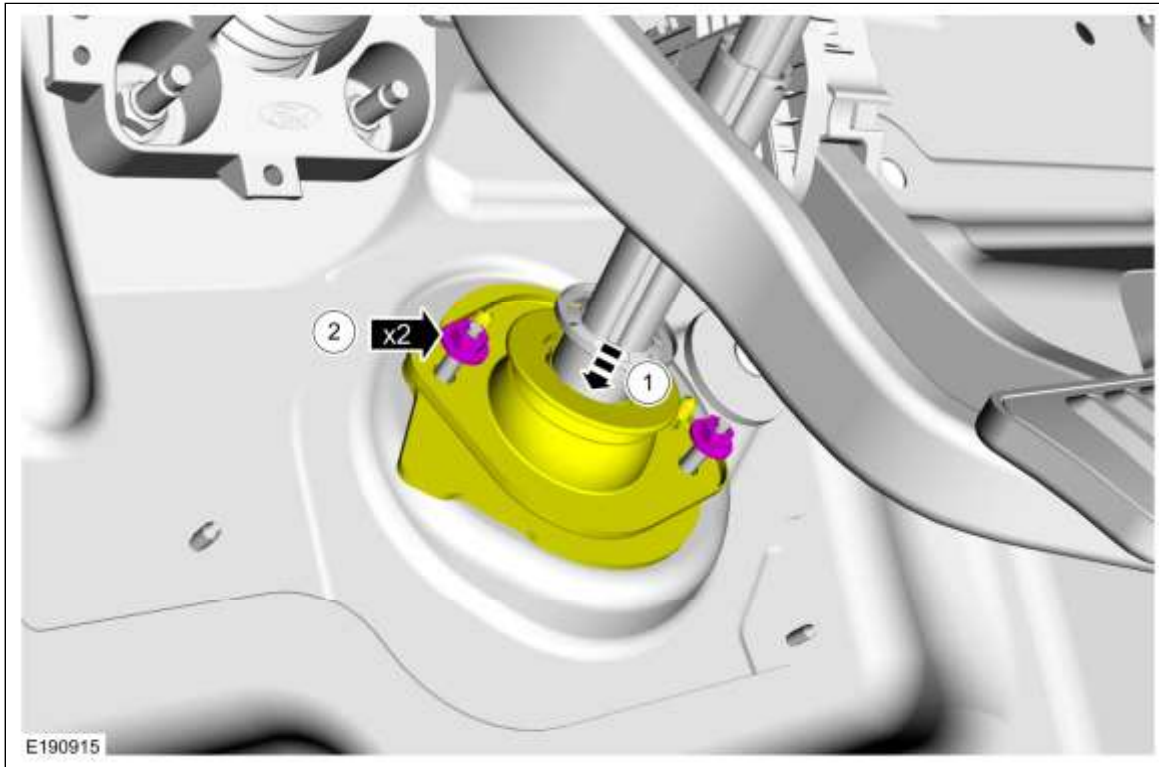
39. Install the engine appearance cover and the nuts.  
*Torque: 80 lb.in (9 Nm)*



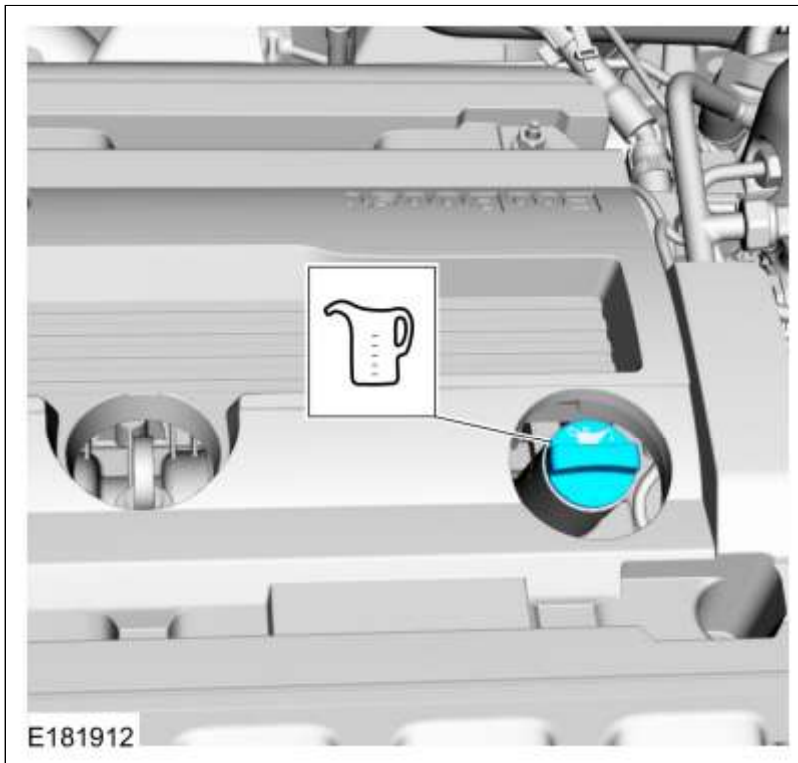
40. Remove the holding device.



- 41.
1. Position the steering column dash seal.
  2. Tighten the steering column dash seal nuts.  
*Torque: 80 lb.in (9 Nm)*



- 42. Fill the engine with clean engine oil.  
Refer to: [Specifications](#) (303-01A Engine - 2.3L EcoBoost (231kW/314PS), Specifications).



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