

Transmission - Raptor

Base Part Number: Base Part Number: 7000

Special Tool(s) / General Equipment

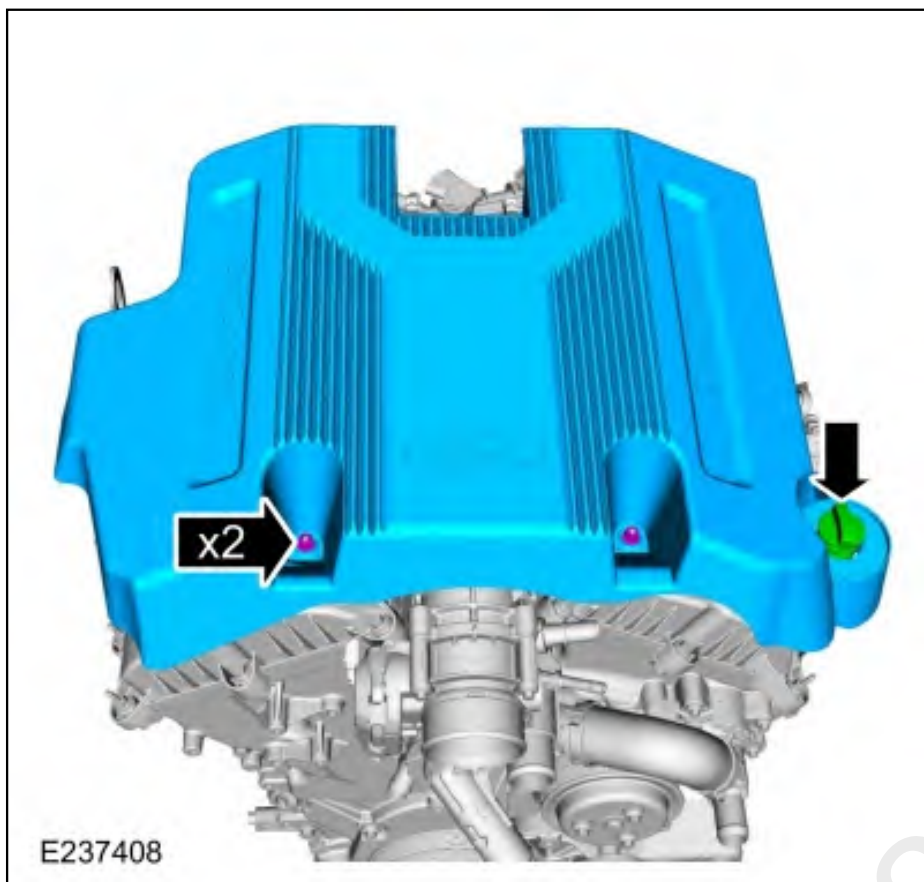
	307-346 (T97T-7902-A) Retainer, Torque Converter TKIT-1997-F/FLM/LT TKIT-1998-LM (NavigatoR)
Transmission Jack	

Materials

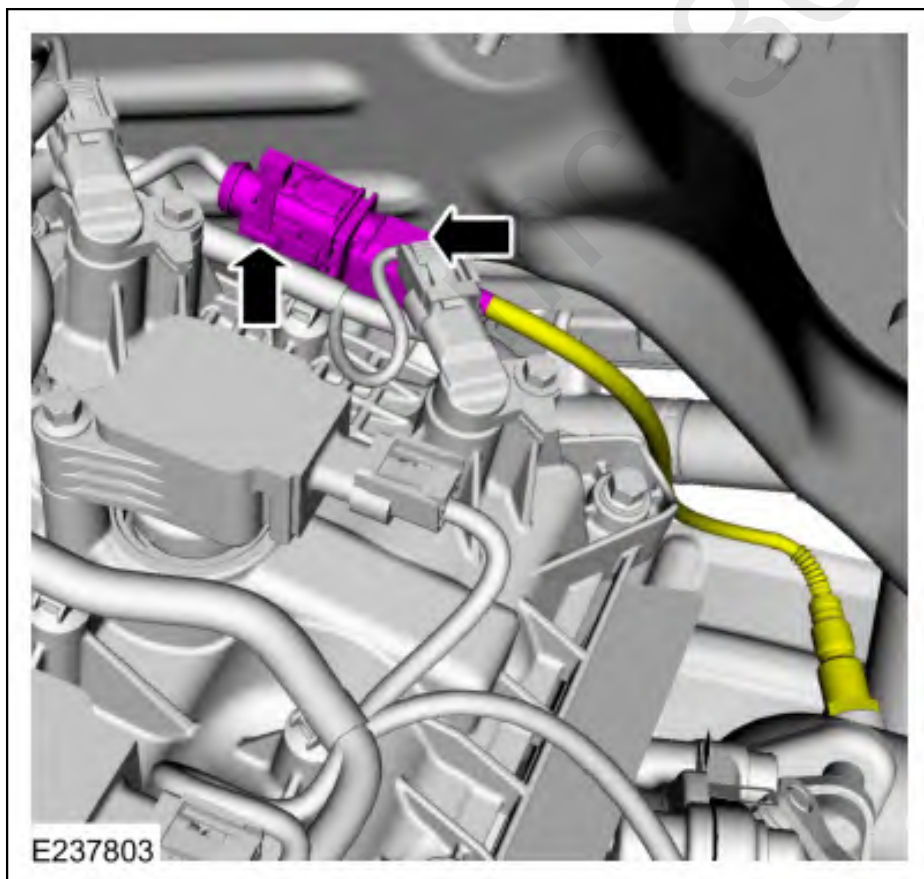
Name	Specification
Motorcraft® Multi-Purpose Grease Spray XL-5-A	ESB-M1C93-B
Motorcraft® MERCON® ULV Automatic Transmission Fluid XT-12-QULV	MERCON® ULV WSS-M2C949-A

Removal

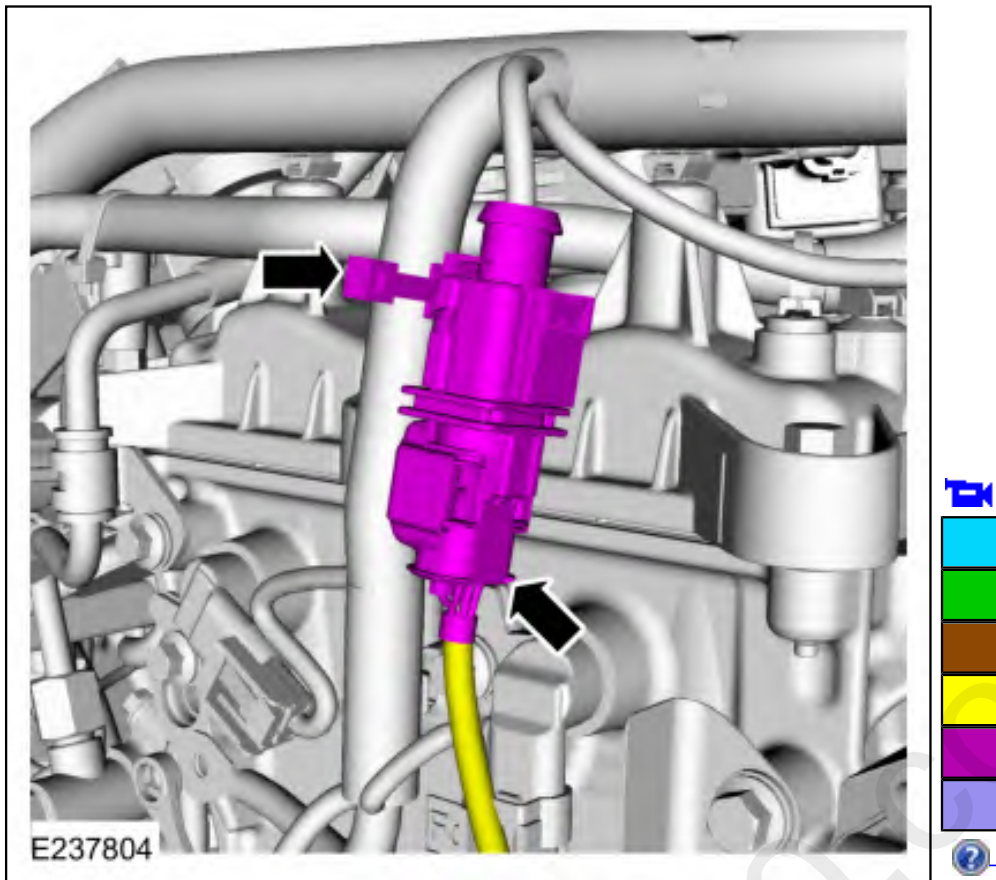
1. With the vehicle in NEUTRAL, position it on a hoist.
Refer to: [Jacking and Lifting - Overview](#) (100-02 Jacking and Lifting, Description and Operation).
2. Remove the nuts and the engine appearance cover.



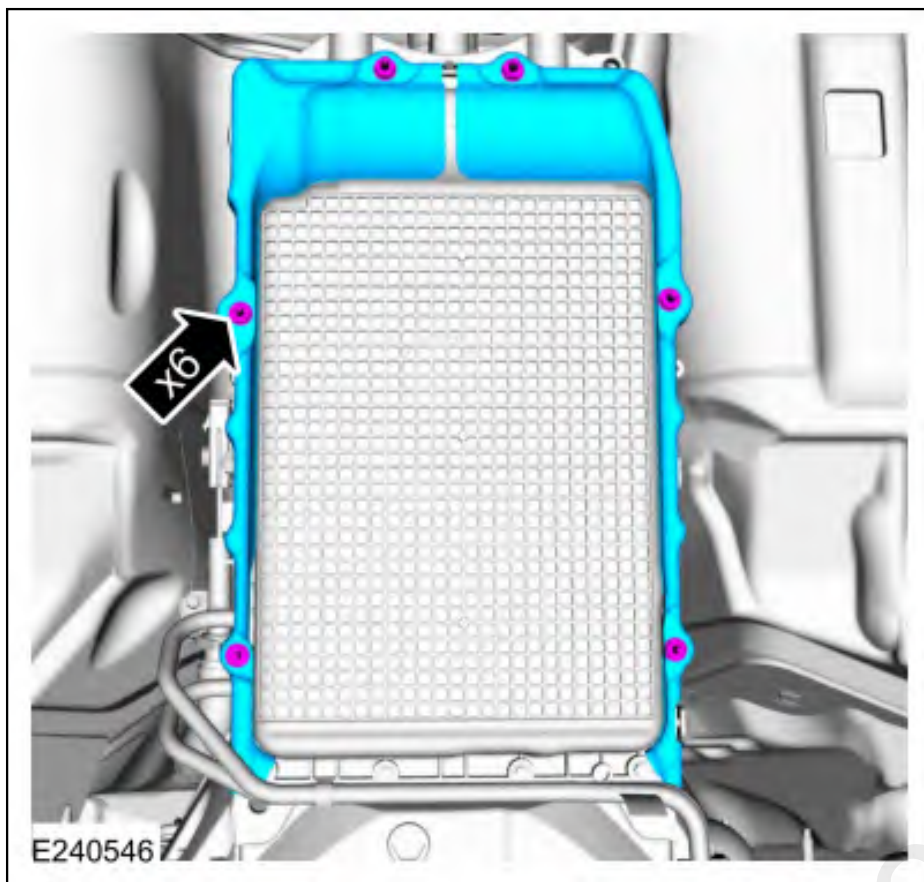
3. Disconnect the LH HO2S electrical connector.



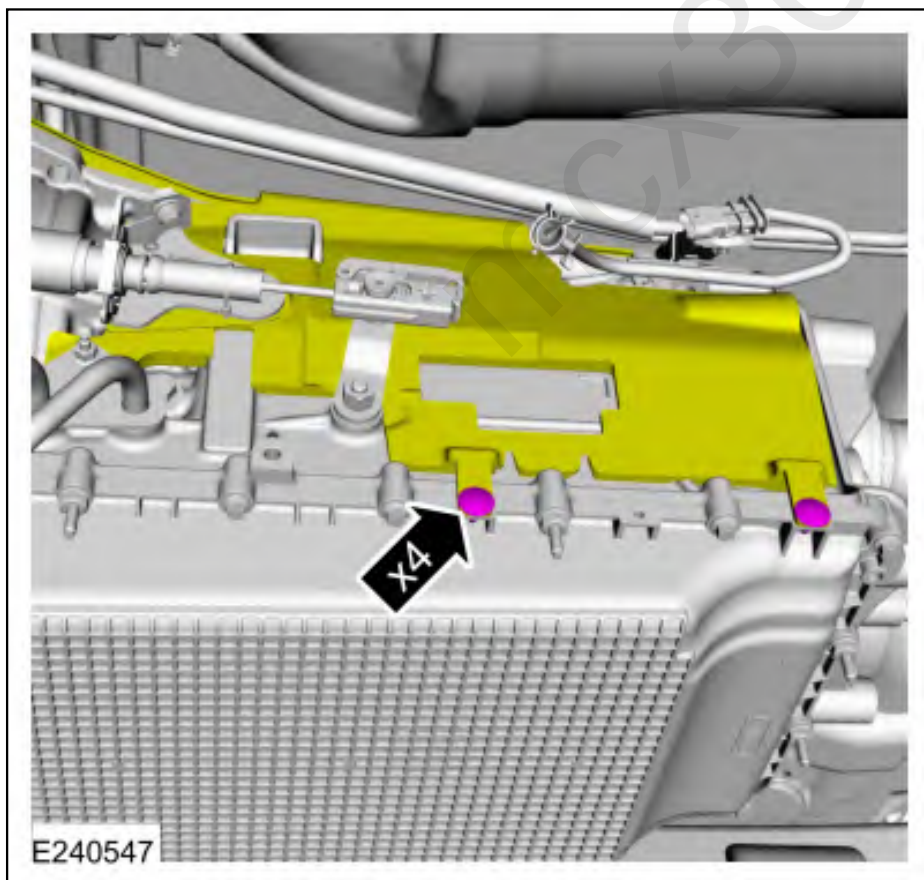
4. Disconnect the RH HO2S electrical connector and the harness retainer.



5. Remove the starter motor assembly.
Refer to: [Starter Motor](#) (303-06C Starting System - 3.5L EcoBoost (272kW/370PS), Removal and Installation).
6. Remove the rear driveshaft assembly.
Refer to: [Rear Driveshaft](#) (205-01 Driveshaft, Removal and Installation).
7. Remove the front driveshaft assembly.
Refer to: [Front Driveshaft](#) (205-01 Driveshaft, Removal and Installation).
8. Remove the retainers and heatshield.



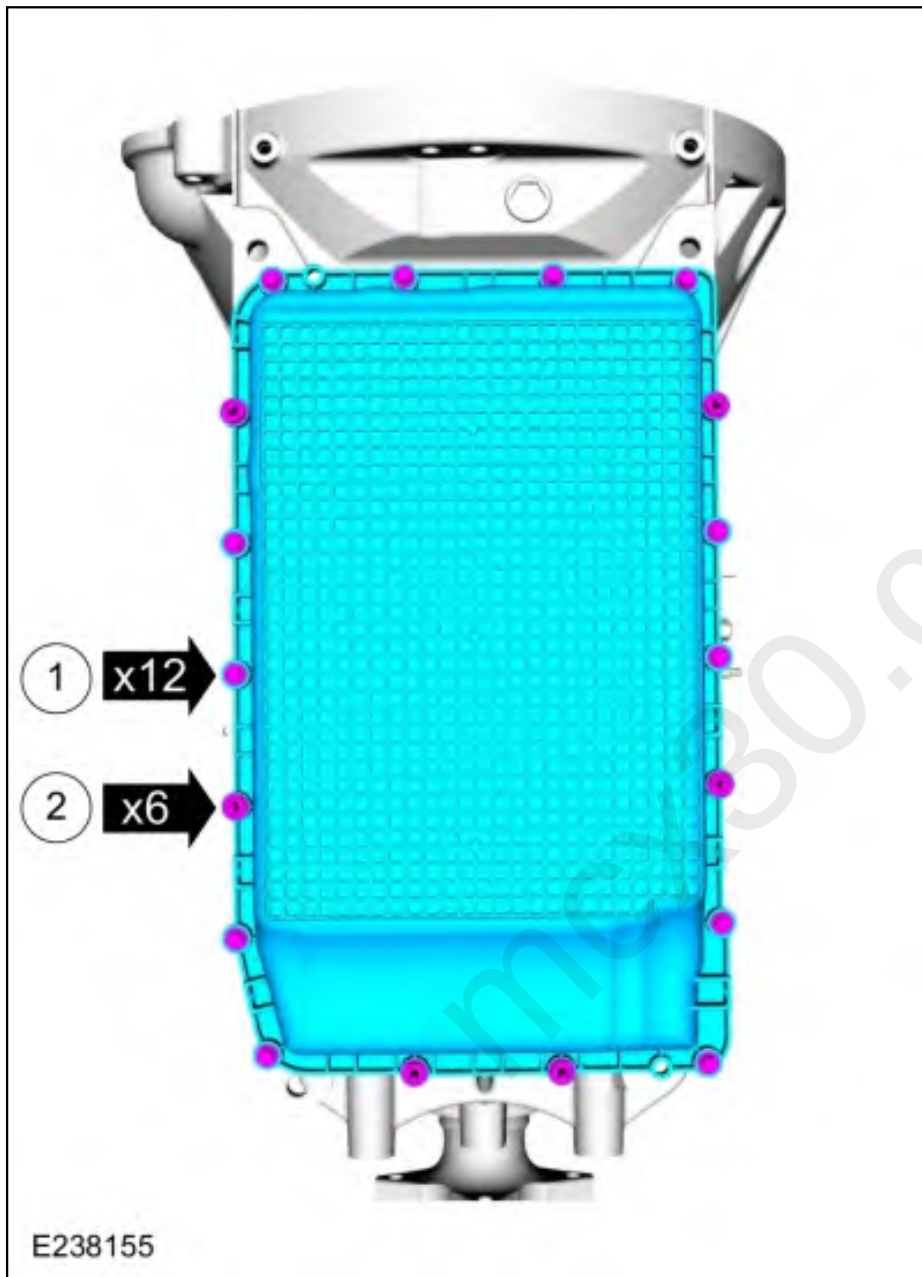
9. Remove the retainers and position aside the NVH cover.



10. **NOTE:** *If transmission disassembly or installation of a new transmission is necessary, drain the transmission fluid.*

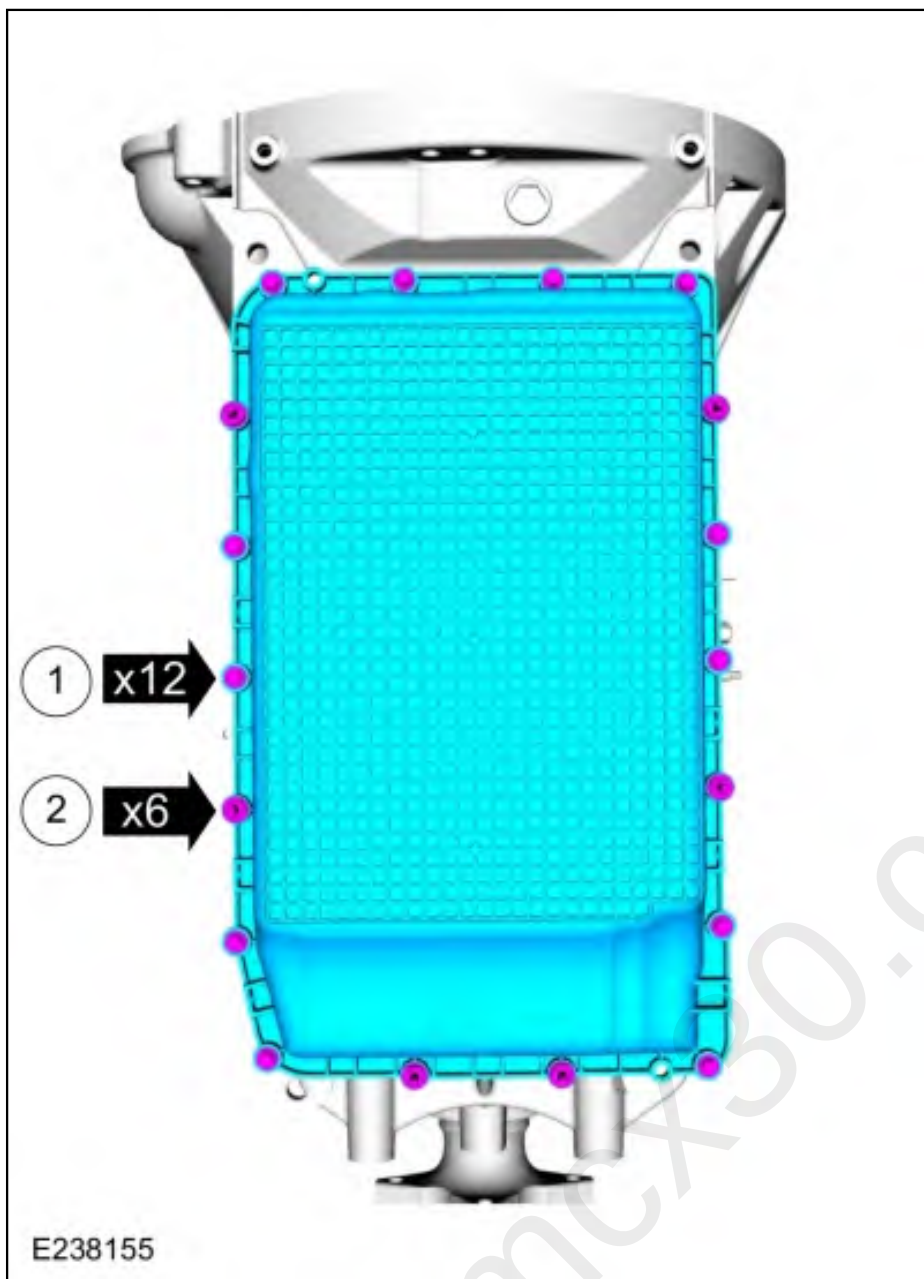
NOTE: *Note the location of the bolts and studbolts for assembly.*

Remove the bolts and the transmission fluid pan.



11. **NOTE:** *It is not necessary to torque transmission fluid pan bolts at this time.*

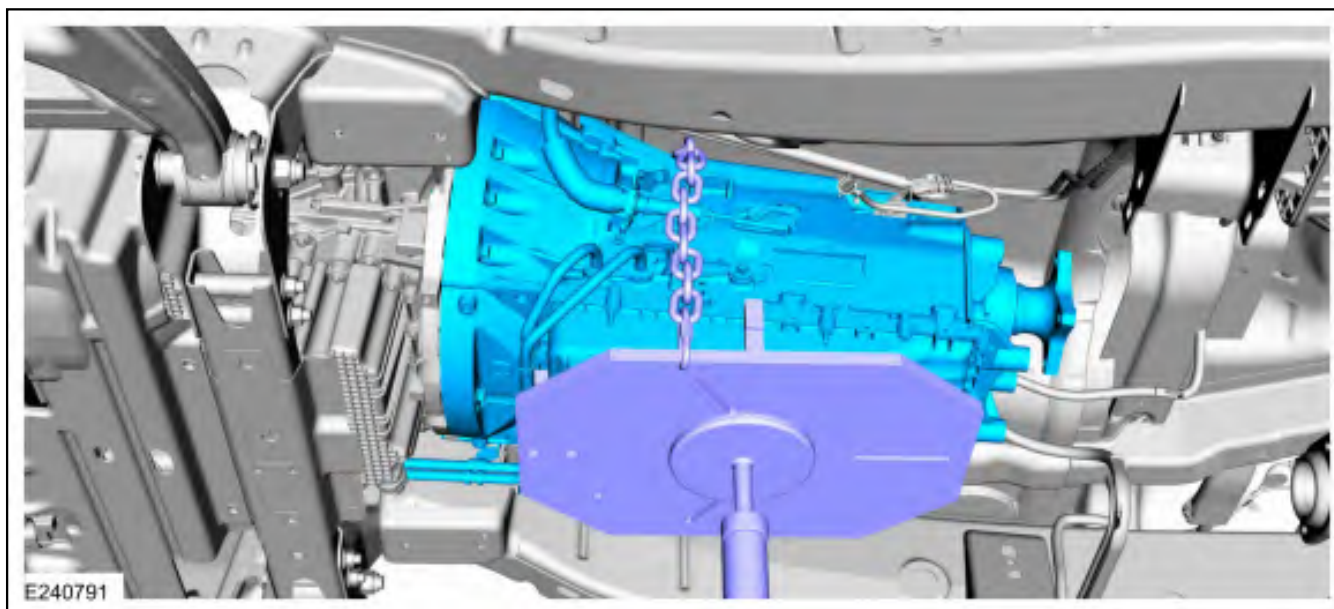
Install the transmission fluid pan and the bolts.



12. **NOTICE:** Secure the transmission to the transmission jack with a safety strap.

NOTE: Make sure the transmission jack makes contact on the outer ribs of the transmission fluid pan.

Using a high-lift transmission jack, support the transmission.
Use the General Equipment: Transmission Jack



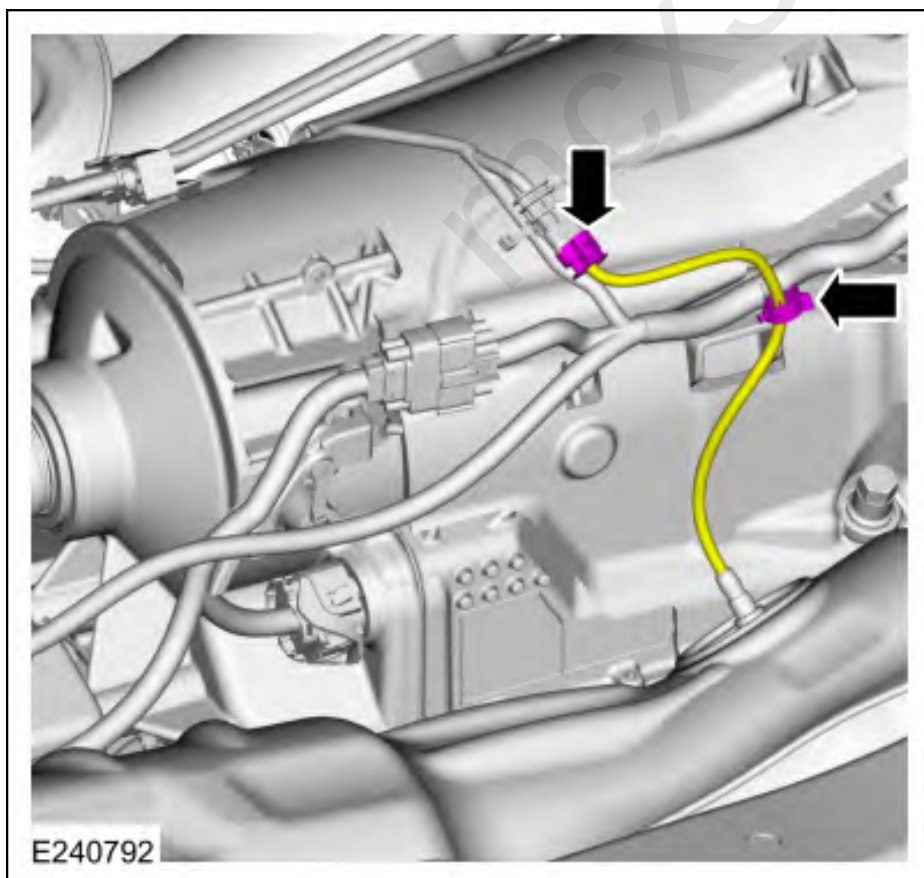
13. Remove the LH catalytic converter.

Refer to: [Catalytic Converter LH - Raptor](#) (309-00C Exhaust System - 3.5L EcoBoost (272kW/370PS), Removal and Installation).

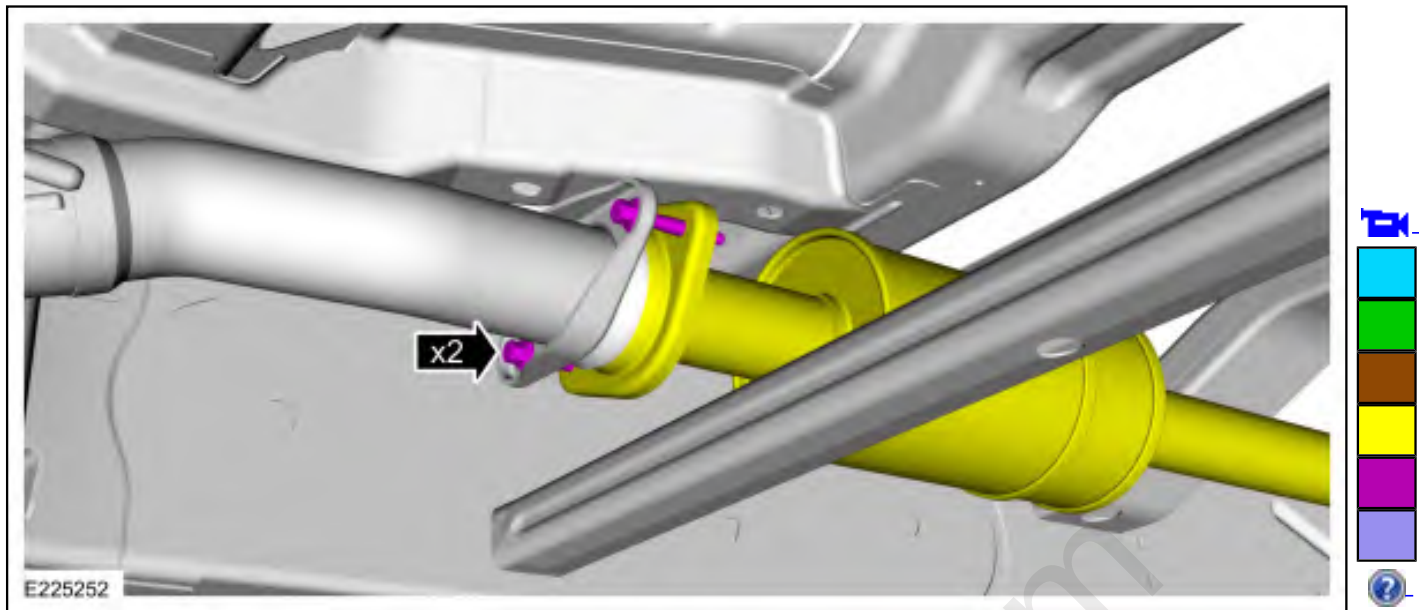
14. Remove the transmission support insulator.

Refer to: [Transmission Support Insulator](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

15. Disconnect the catalyst monitor sensor electrical connector.

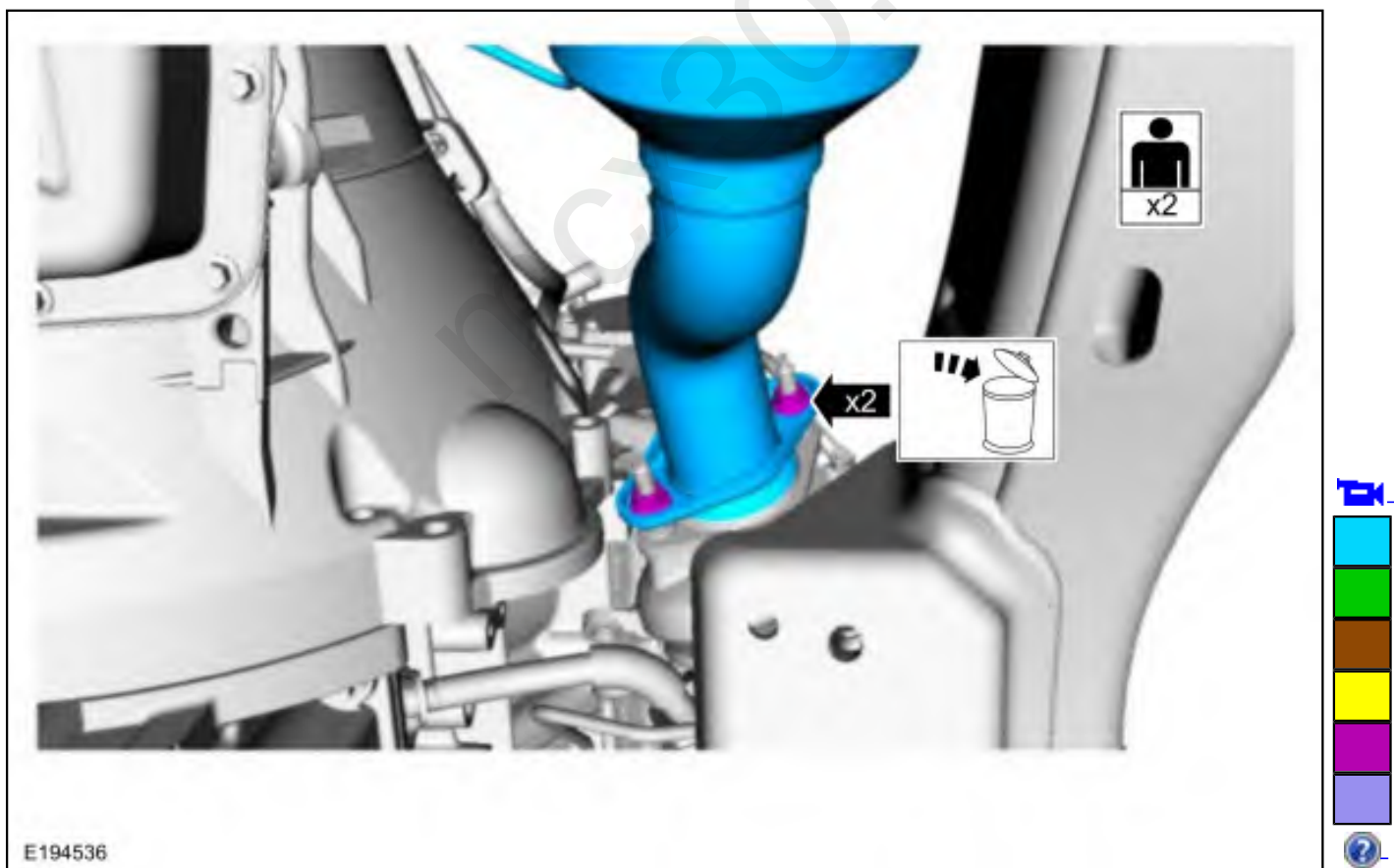


16. Remove the bolts from the catalytic converter flange to the muffler inlet pipe.

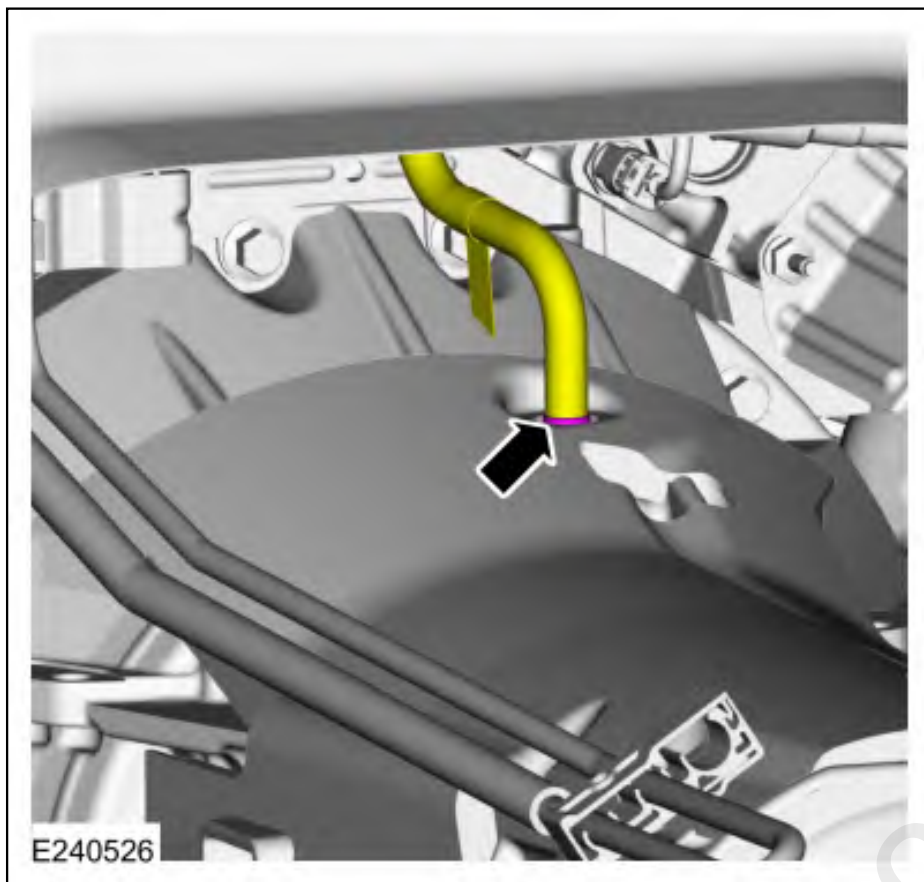


17. **NOTE:** Clean all exhaust connections before reassembly.

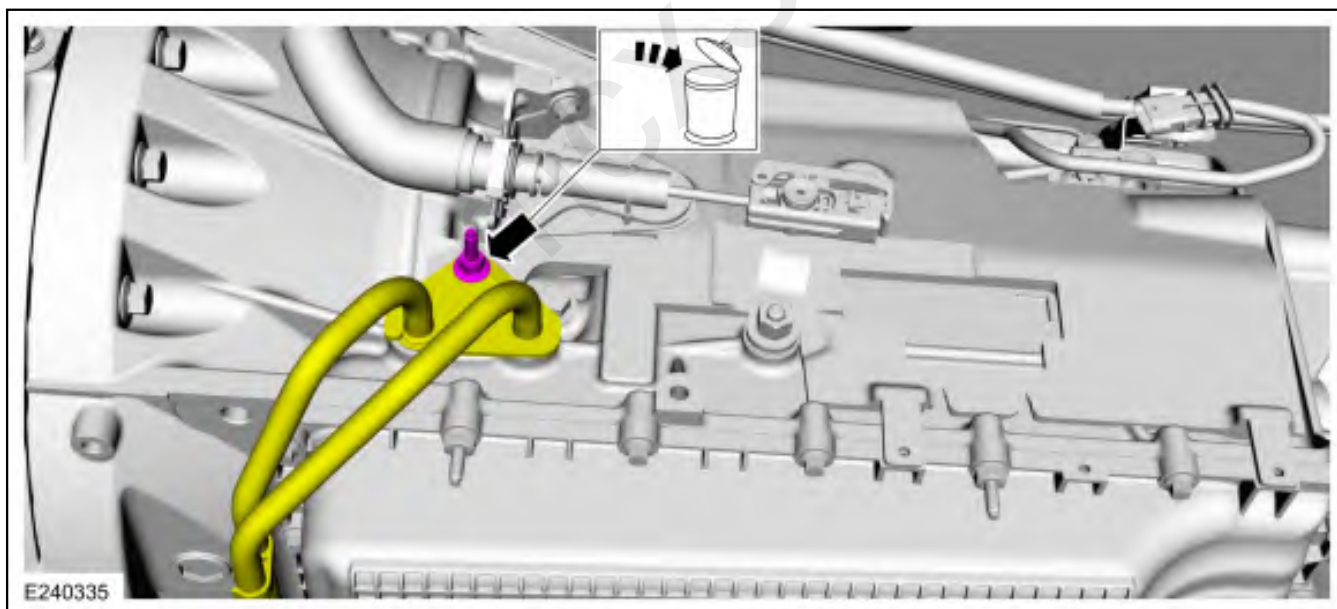
Remove and discard the catalytic converter nuts and remove the catalytic converter. Discard the gasket.



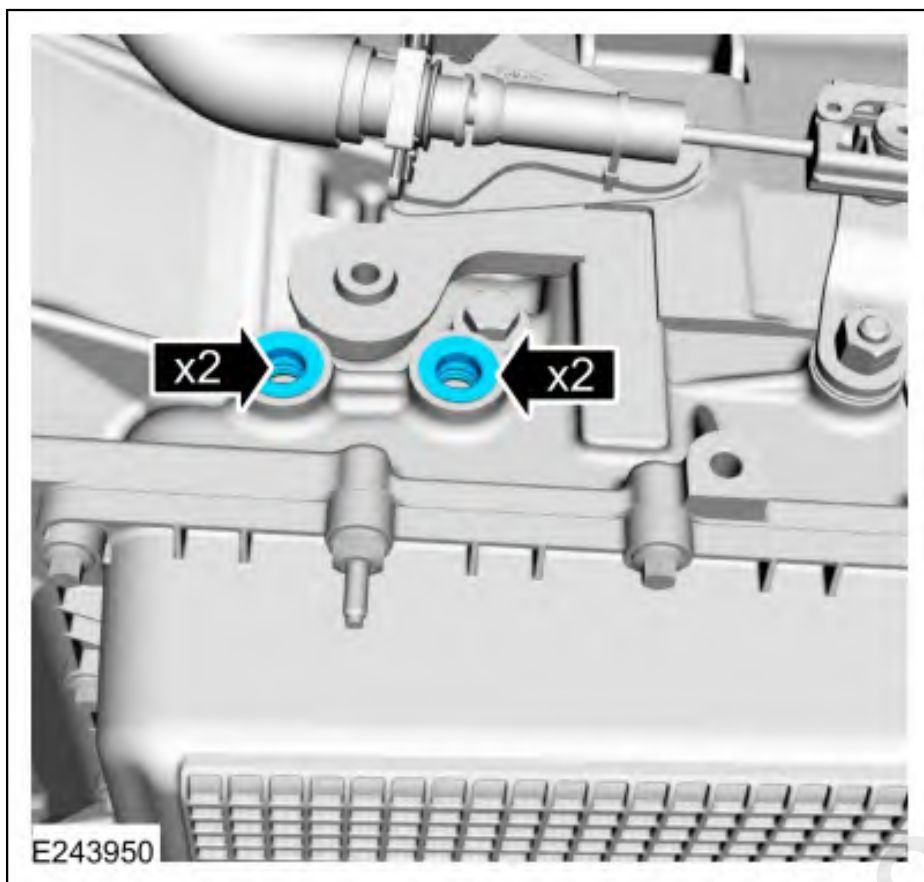
18. Disconnect the transmission vent tube.



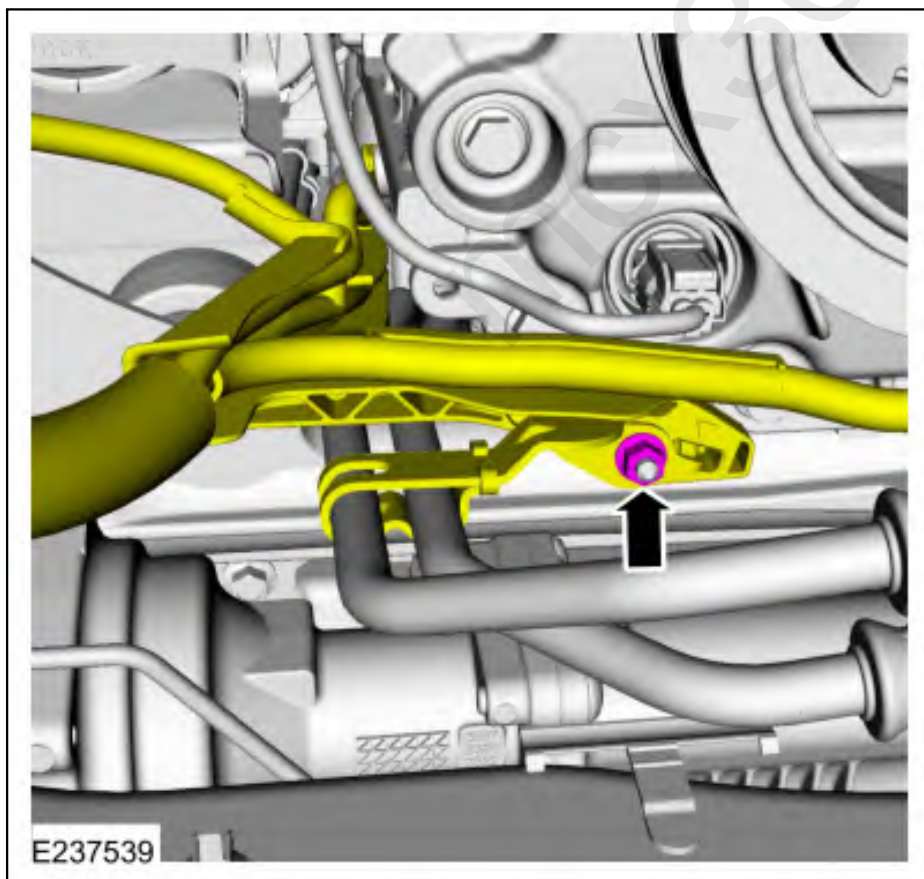
19. Remove and discard the transmission fluid cooler tube bracket studbolt and position aside the transmission fluid cooler tubes.



20. Inspect the transmission to be sure the transmission fluid tube seals and backing rings were removed with the transmission fluid tubes and are not stuck in the transmission. If the transmission fluid tube seals or backing rings are stuck in the transmission, remove the seals and backing rings.

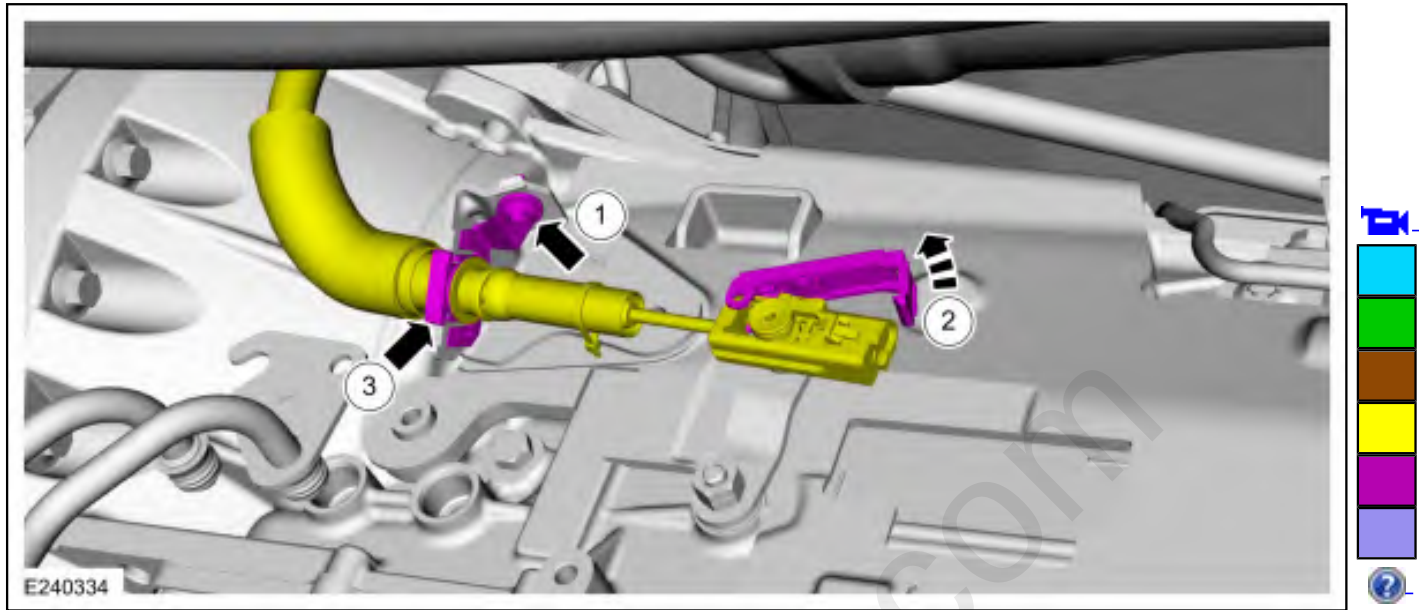


21. Remove the nut and position the transmission cooler tube bracket and wiring harness aside.

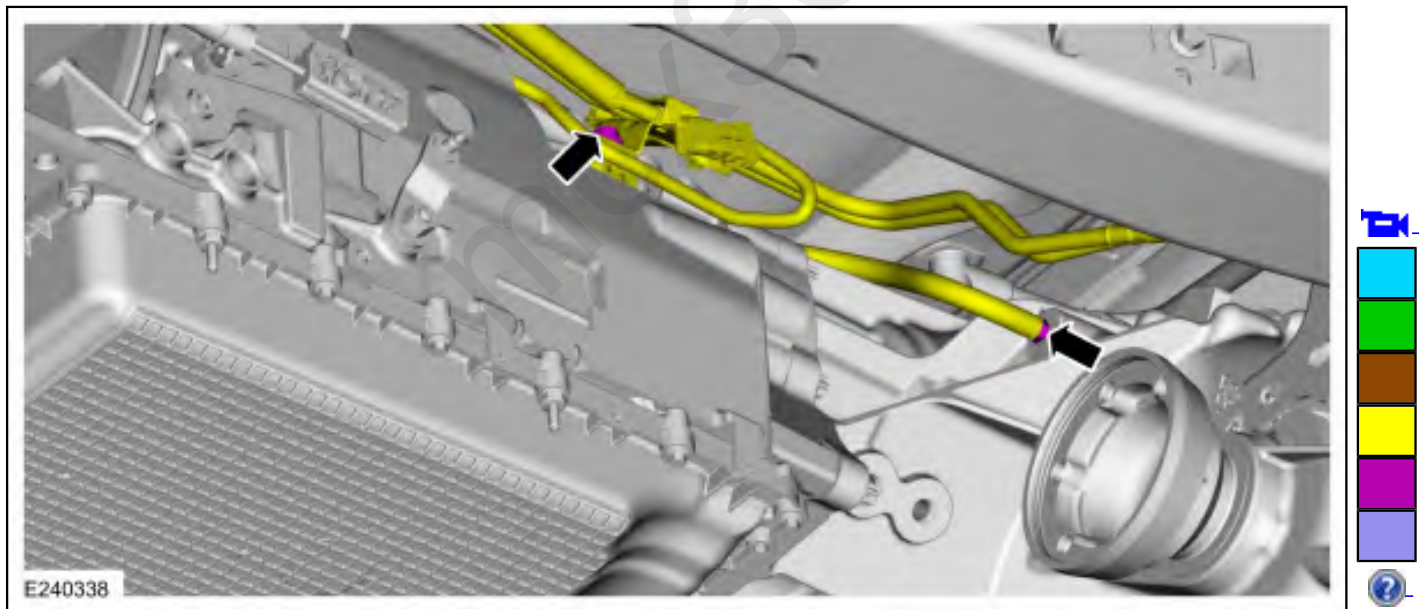


22. **NOTICE:** To prevent selector lever cable damage, do not apply force to the selector lever cable between the manual control lever and the selector lever cable bracket.

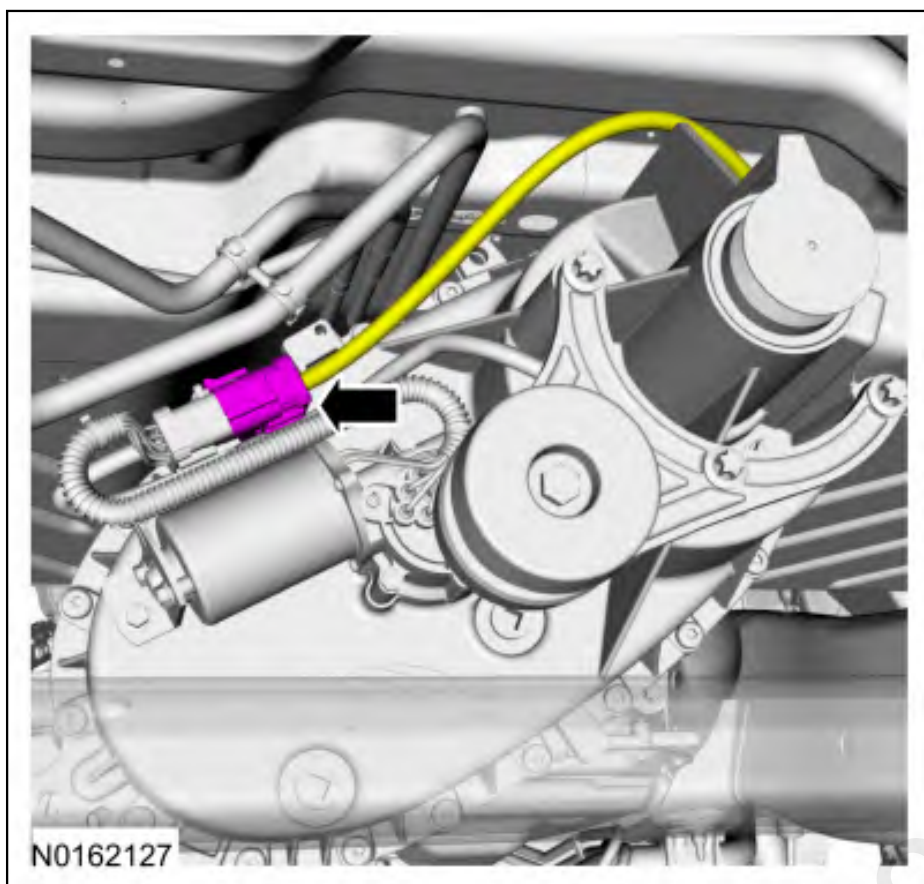
1. Remove the selector lever cable bolt.
2. Move the locking tab up and disconnect the selector lever cable end from the manual control lever.
3. Disconnect the selector lever cable from the bracket and position aside.



23. Remove the fuel line bracket bolt and disconnect the transfer case vent tube.

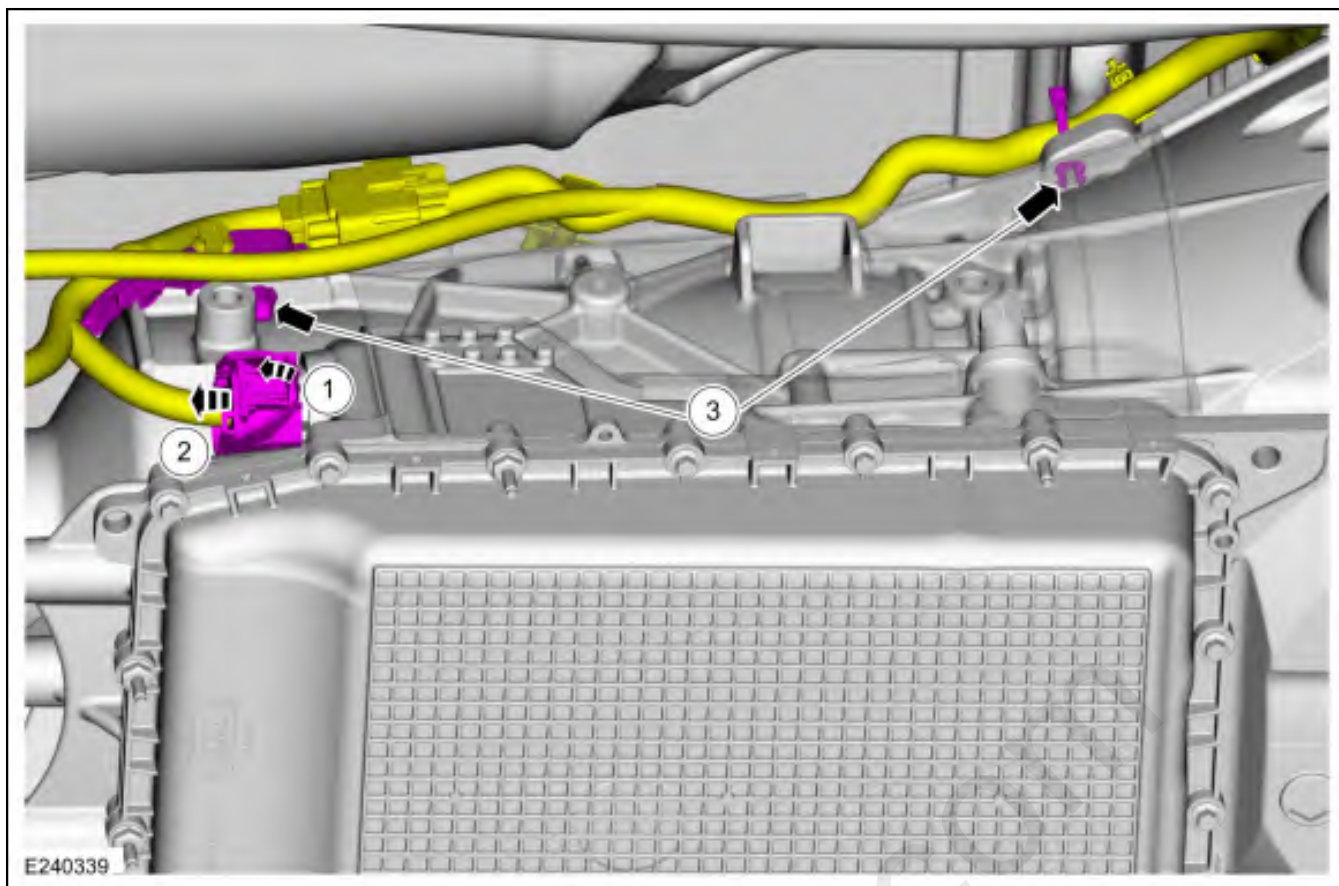


24. Disconnect the transfer case electrical connector.

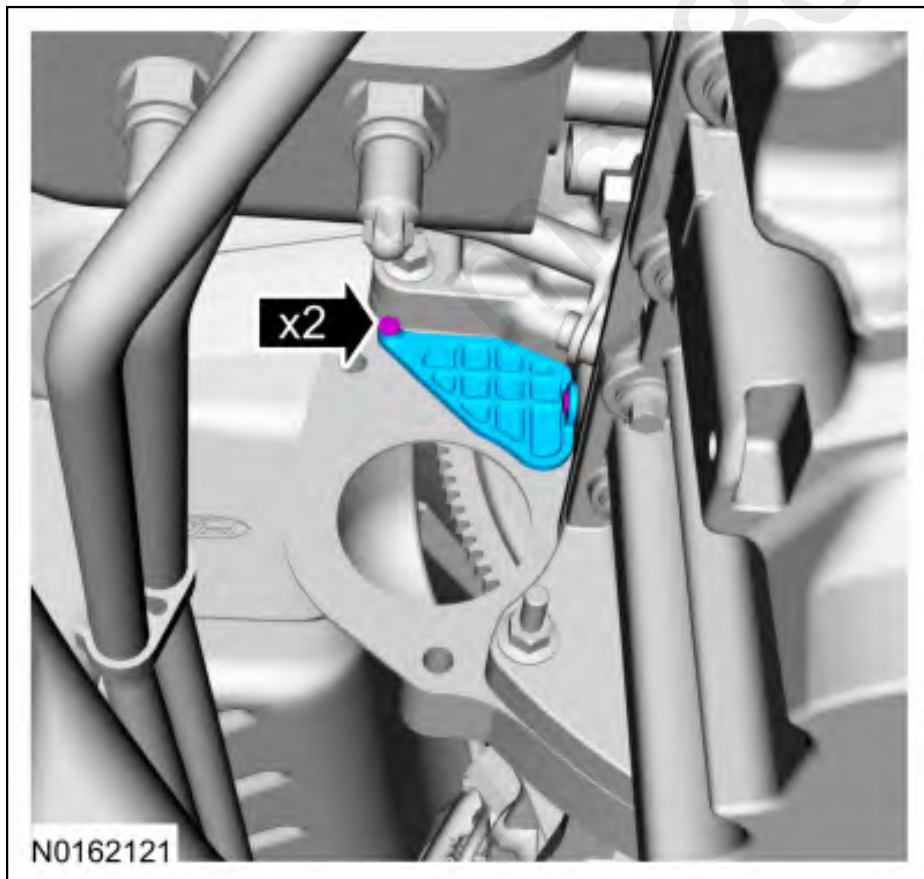


25. **NOTICE: Do not pull on the wire harness to disconnect the electrical connector or damage to the electrical connector will occur.**

1. Slide the lock tab up and disconnect the transmission electrical connector.
2. Pull the transmission electrical connector out to disconnect.
3. Detach the retainers from the transmission and position the wiring harness aside.

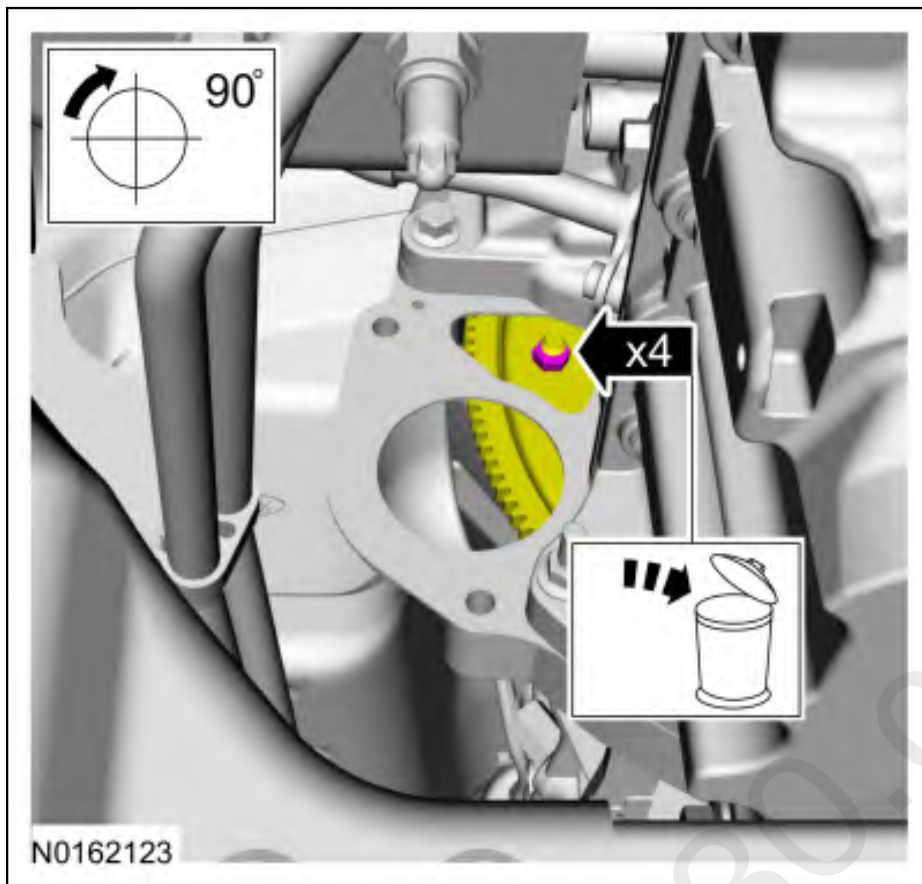


26. Remove the pin-type retainers and the access cover.

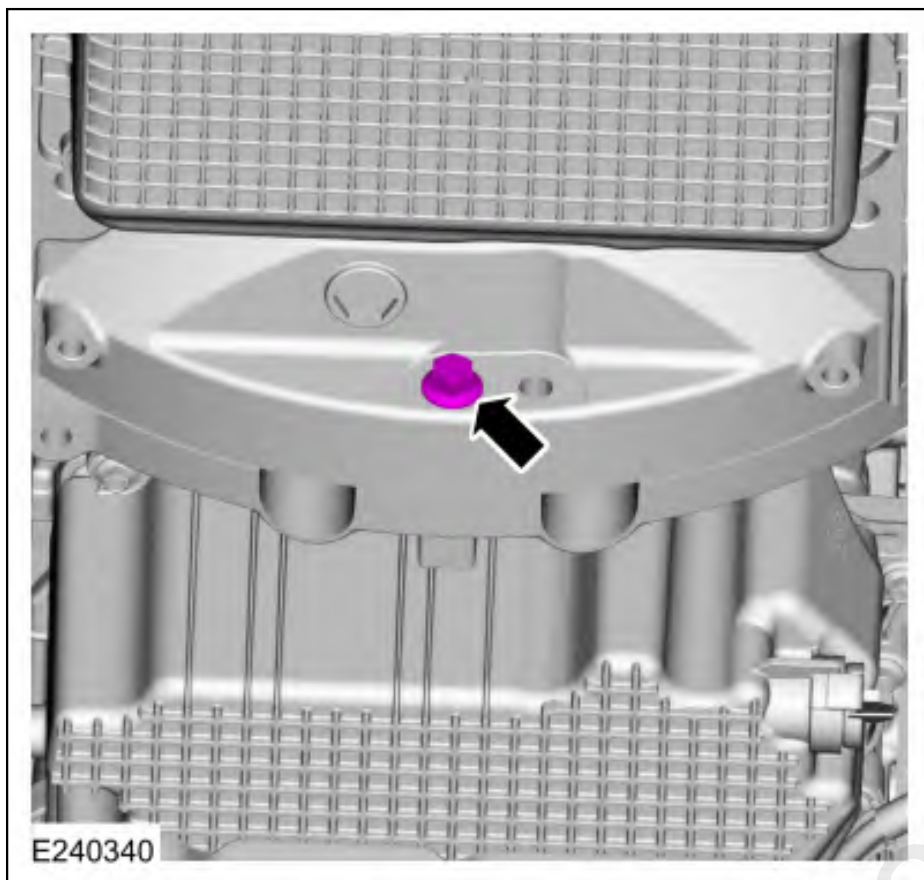


27. **NOTE:** Using the crankshaft pulley bolt, turn the engine clockwise.

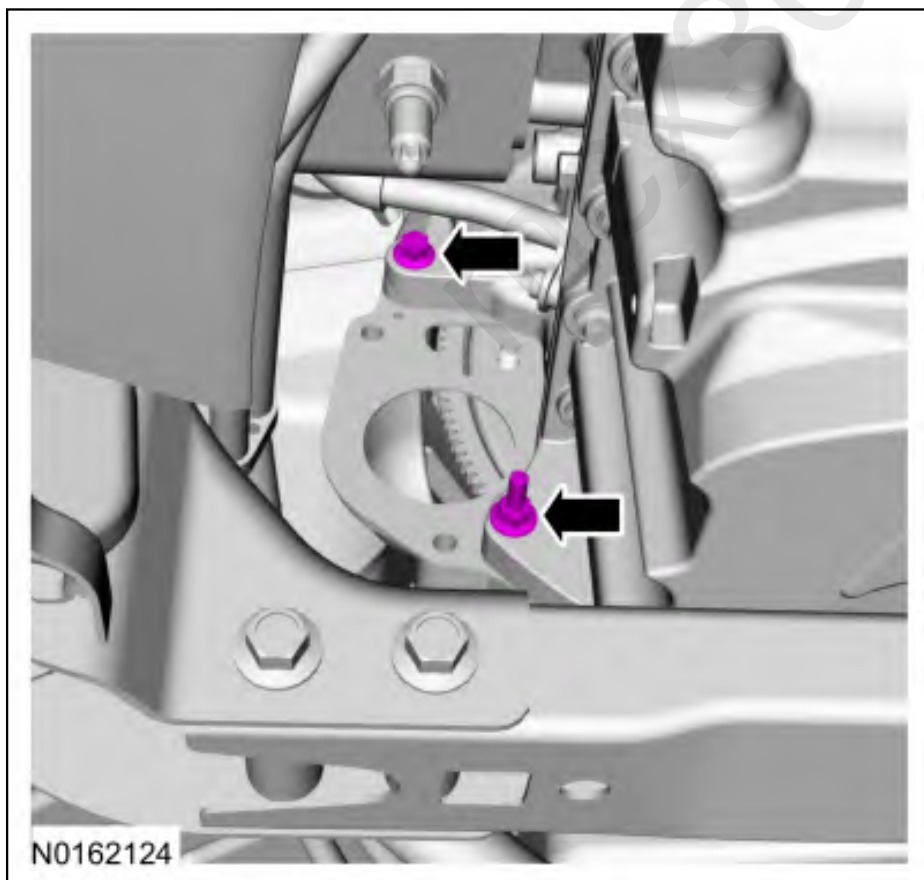
Remove and discard the torque converter nuts.



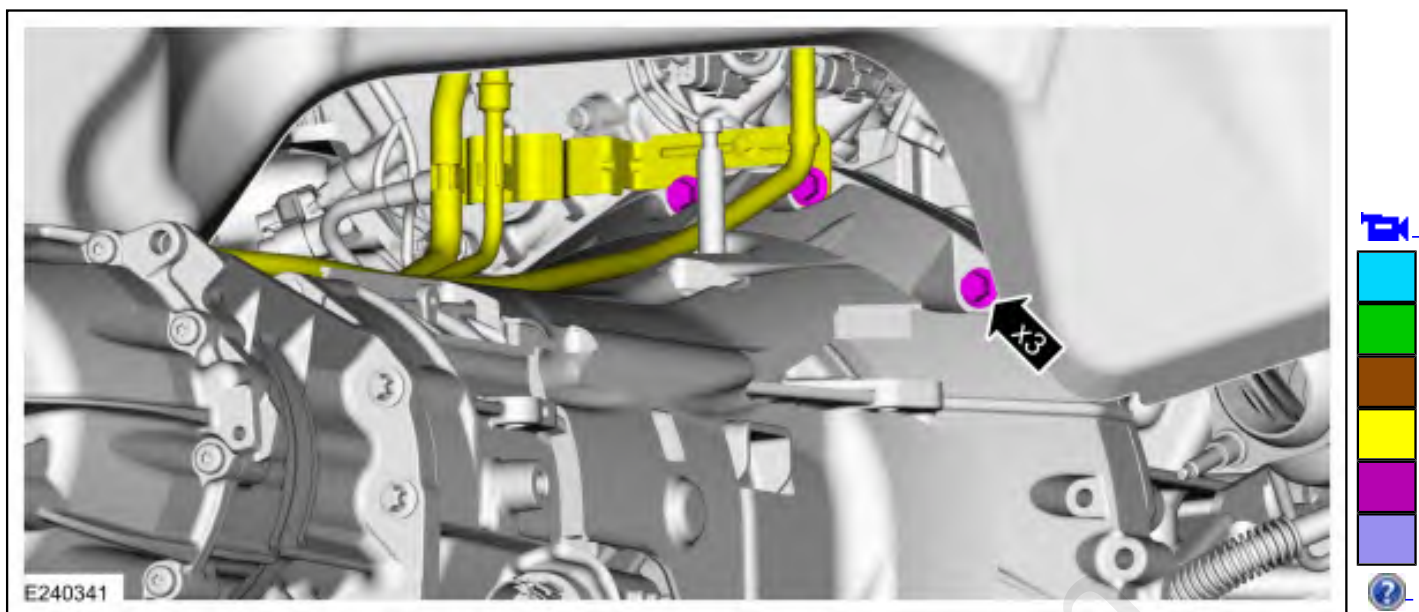
28. Remove the lower bellhousing bolt.



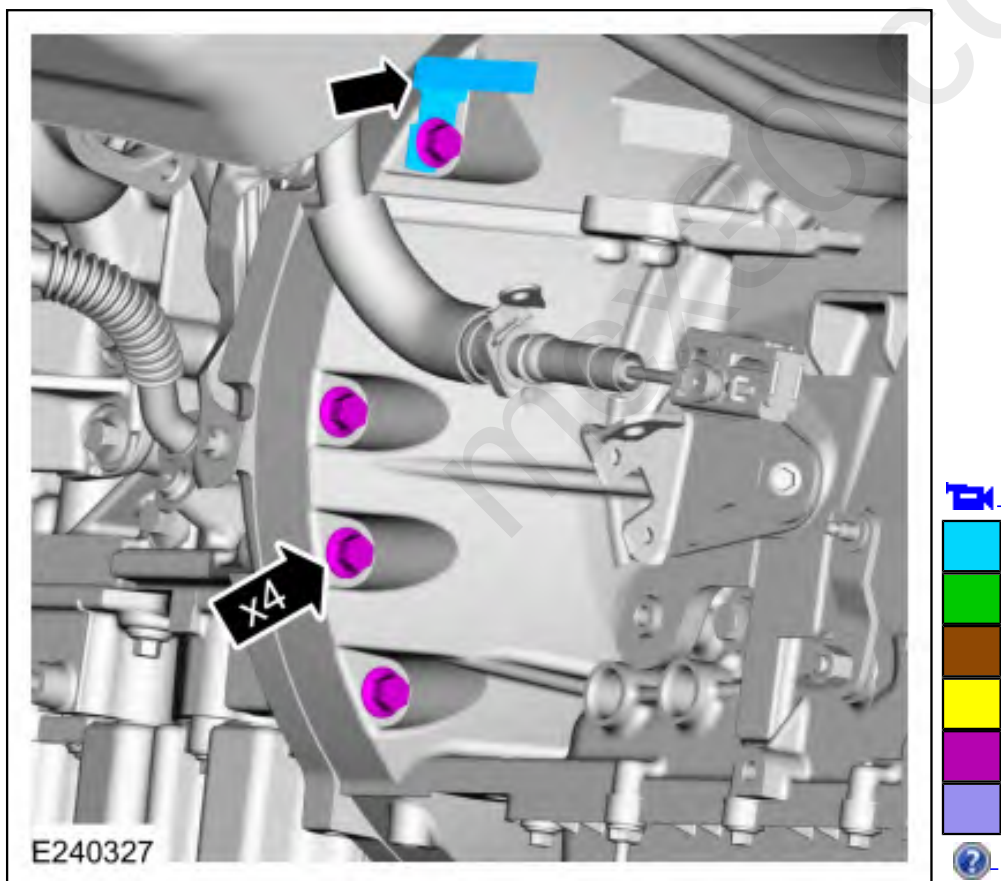
29. Remove the RH side bellhousing bolts.



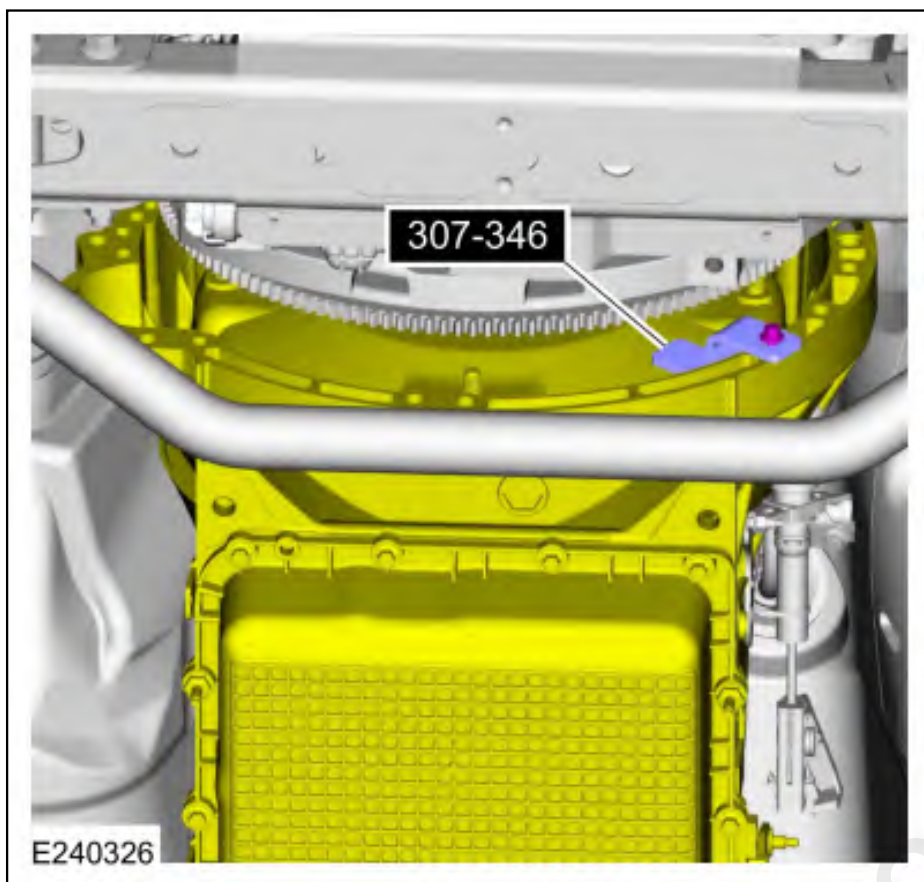
30. Remove the top bellhousing bolts and position aside the bracket.



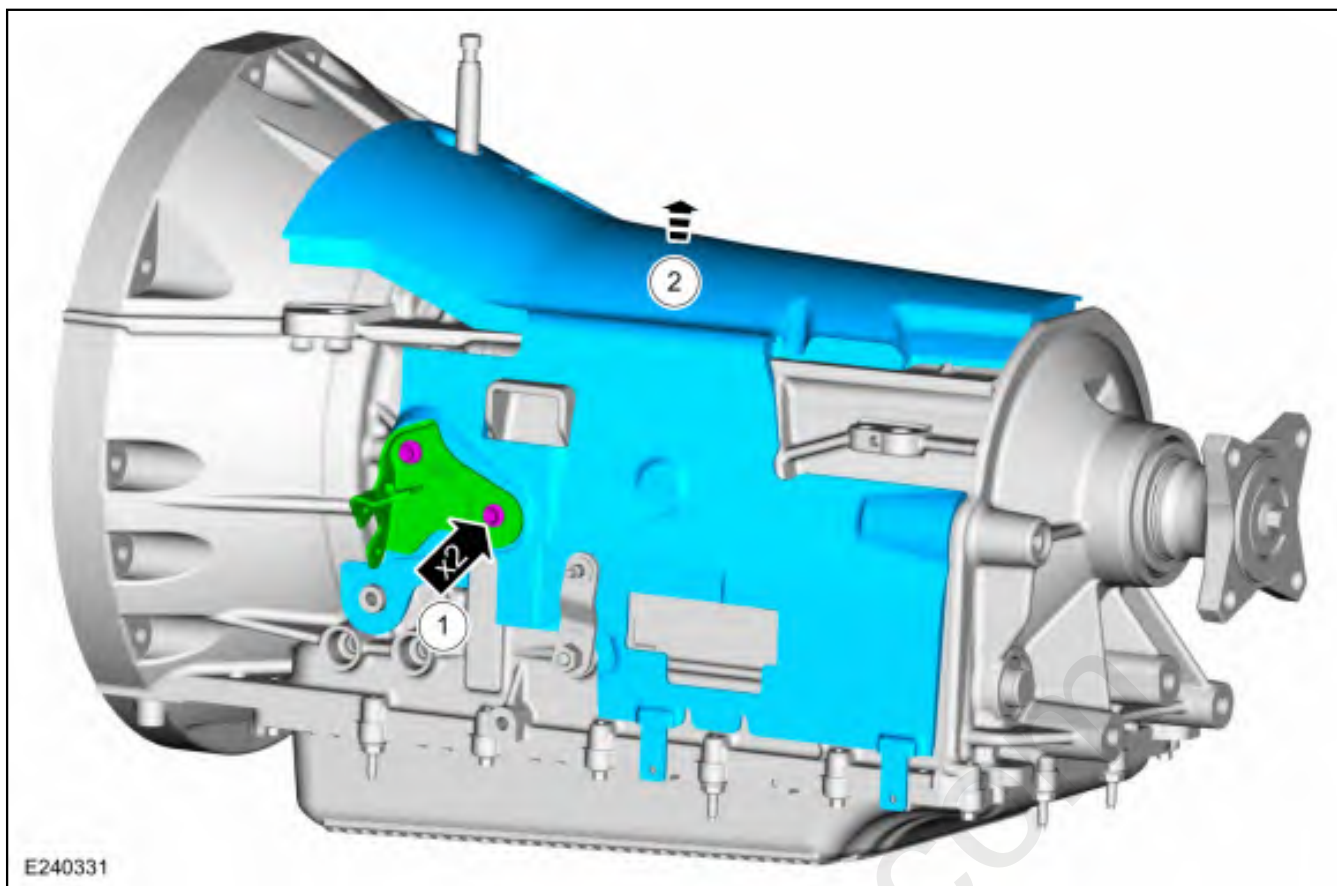
31. Remove the LH bellhousing bolts and the selector lever cable bracket.



32. Slide the transmission back enough to install the special tool.
Use Special Service Tool: 307-346 (T97T-7902-A) Retainer, Torque Converter.



1. Make sure the transmission is securely fastened to the transmission jack.
2. Slide the transmission towards the rear of the vehicle.
3. Tilt the front of the transmission down.
4. Remove the transmission from the vehicle.



36. **NOTICE:** Failure to clean the transmission fluid cooler tubes can result in transmission failure.

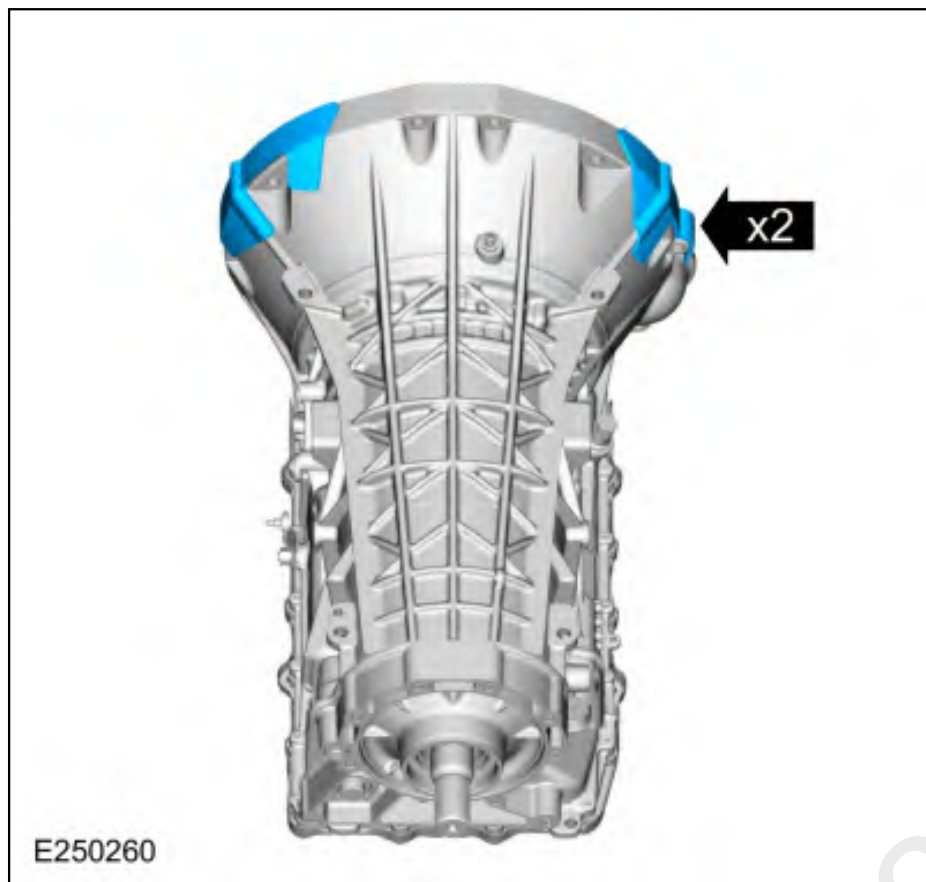
If the transmission is to be overhauled or if installing a new or re-manufactured transmission, carry out the transmission fluid cooler backflushing and cleaning procedure.

Refer to: [Transmission Fluid Cooler - Backflushing and Cleaning - 3.3L Duratec - V6, Raptor](#) (307-02 Transmission Cooling, General Procedures).

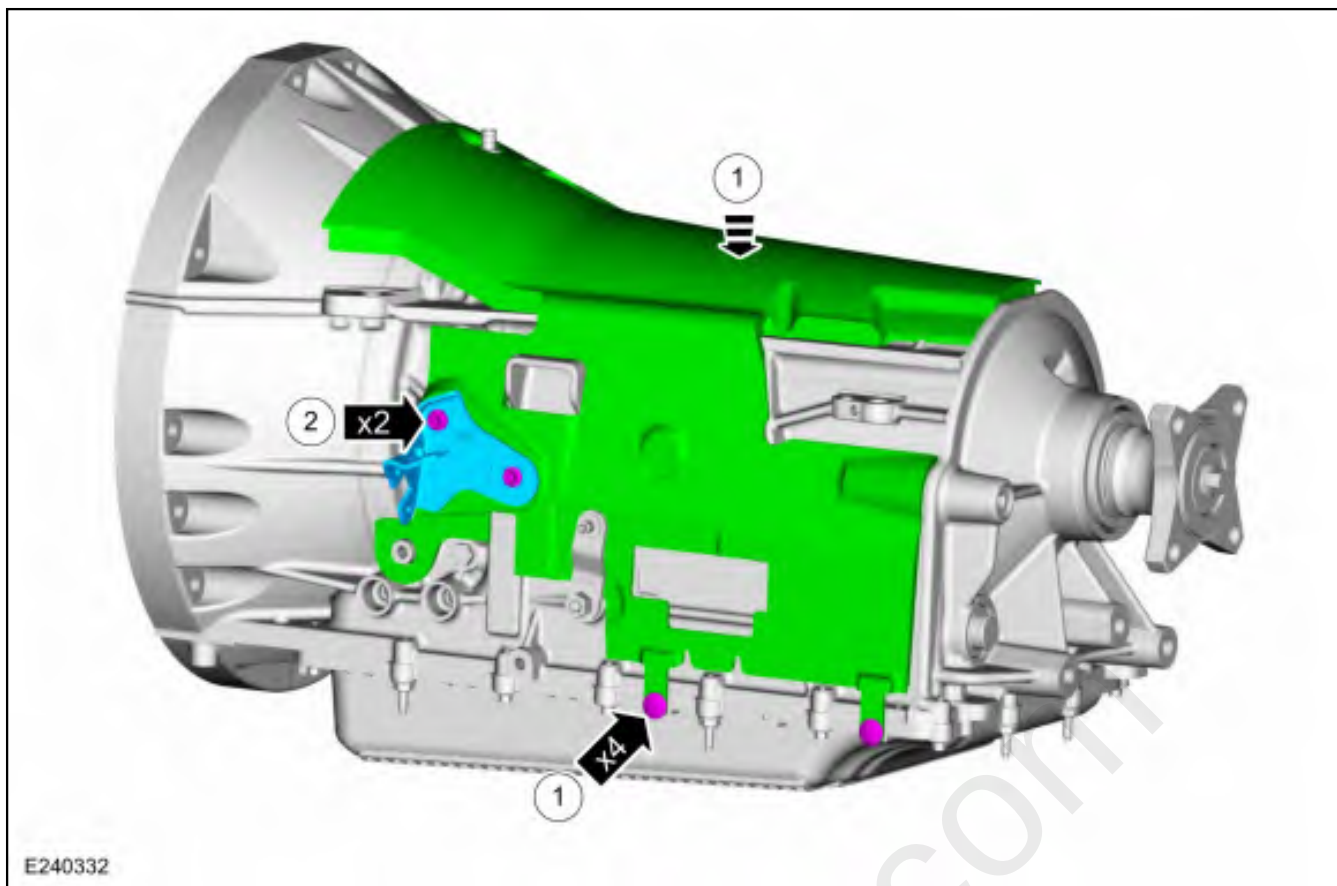
Installation

NOTE: Prior to installing a new transmission or an overhauled transmission with a new main control, record the solenoid strategy identification tag. If a new main control was installed, install the replacement solenoid body tag over the original identification tag.

1. If installing a new or re-manufactured transmission, install the new stick on heat shields to the bellhousing.



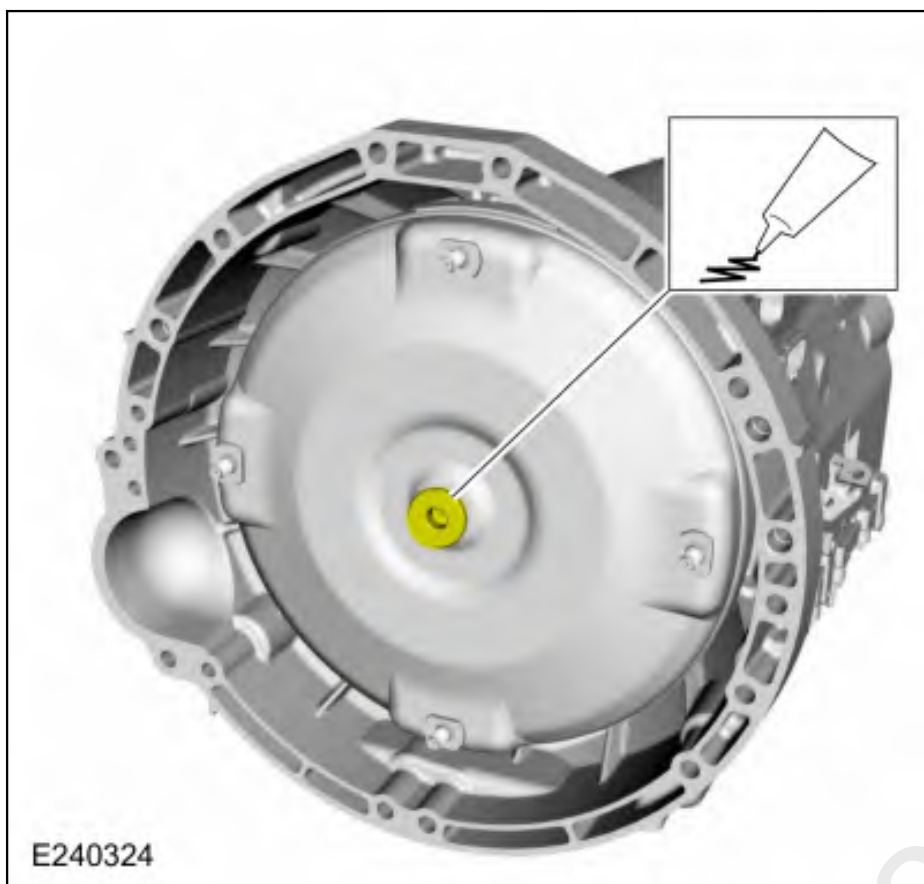
1. If removed, install the NVH cover and push pins.
 2. Install the new bolts and the shift cable bracket.
- Torque: 22 lb.ft (30 Nm)*



3. **NOTICE:** Prior to installation of the transmission, lubricate the torque converter pilot hub or damage to the torque converter or the engine crankshaft can occur.

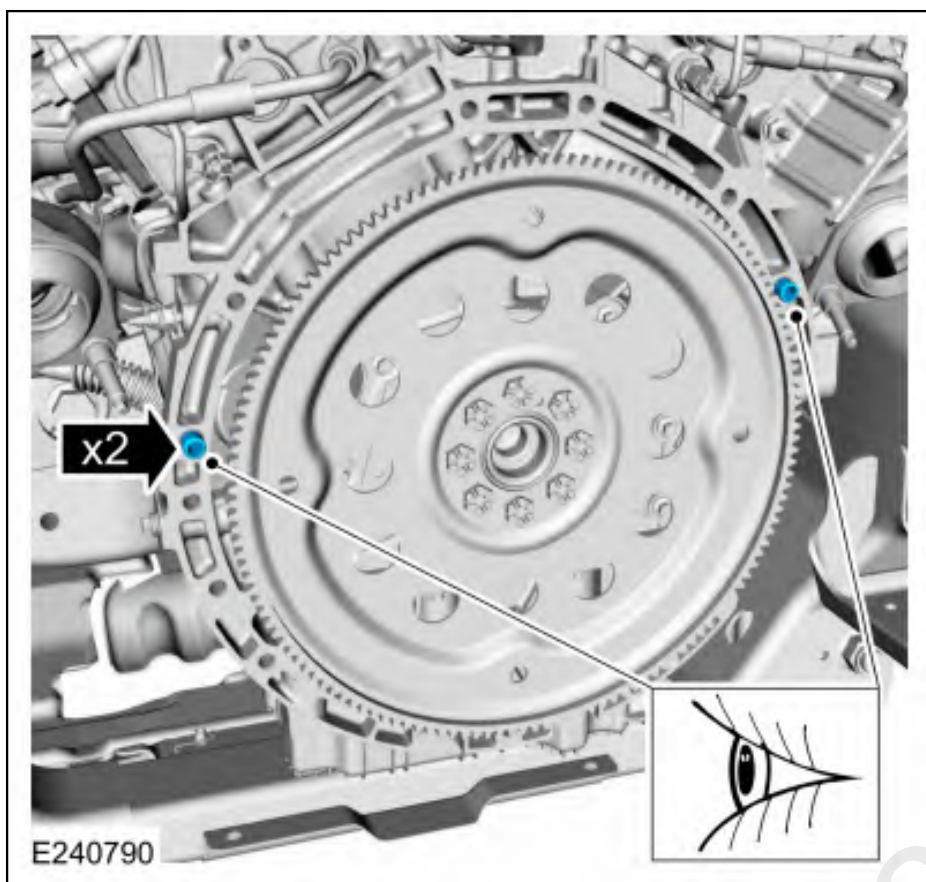
Lubricate the torque converter pilot hub with multi-purpose grease.

Material: Motorcraft® Multi-Purpose Grease Spray / XL-5-A (ESB-M1C93-B)

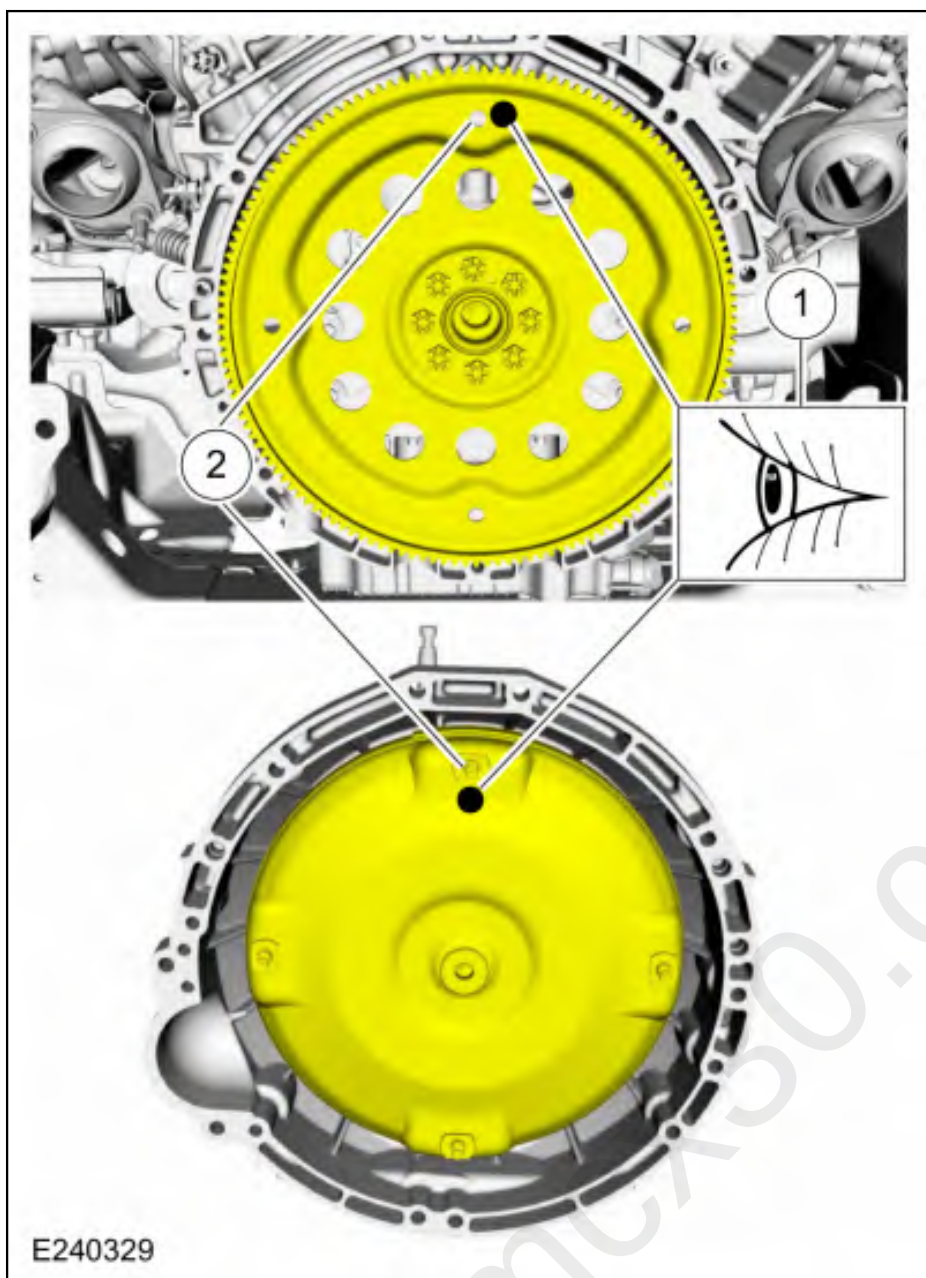


4. **NOTICE:** If the transmission is not positioned on the dowel pins, damage to the transmission may occur.

If the dowel pins were pulled out of the engine block during removal, install new dowel pins in the engine block.

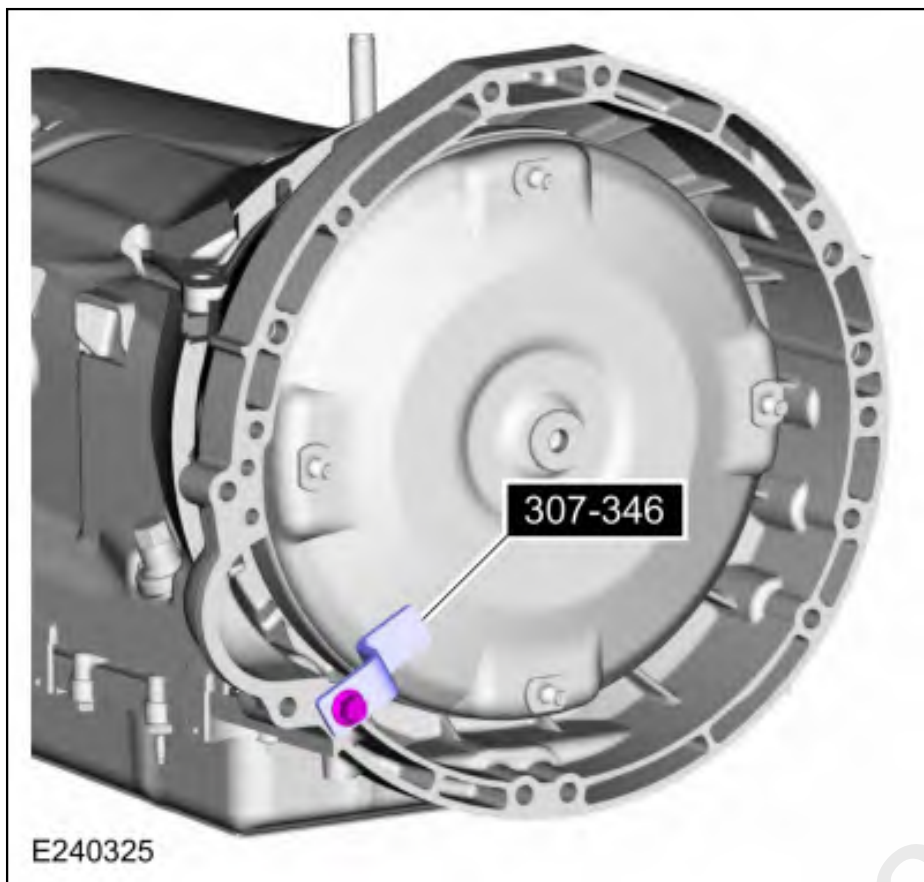


1. Inspect the torque converter stud and flexplate for paint marks.
2. Align the torque converter stud and flexplate hole near the paint marks to the 12 o'clock position.



6. Install the special tool.

Use Special Service Tool: 307-346 (T97T-7902-A) Retainer, Torque Converter.



7. **NOTE:** If transmission is being replaced, remove the transmission fluid fill plug and verify that the transmission is filled with transmission fluid.

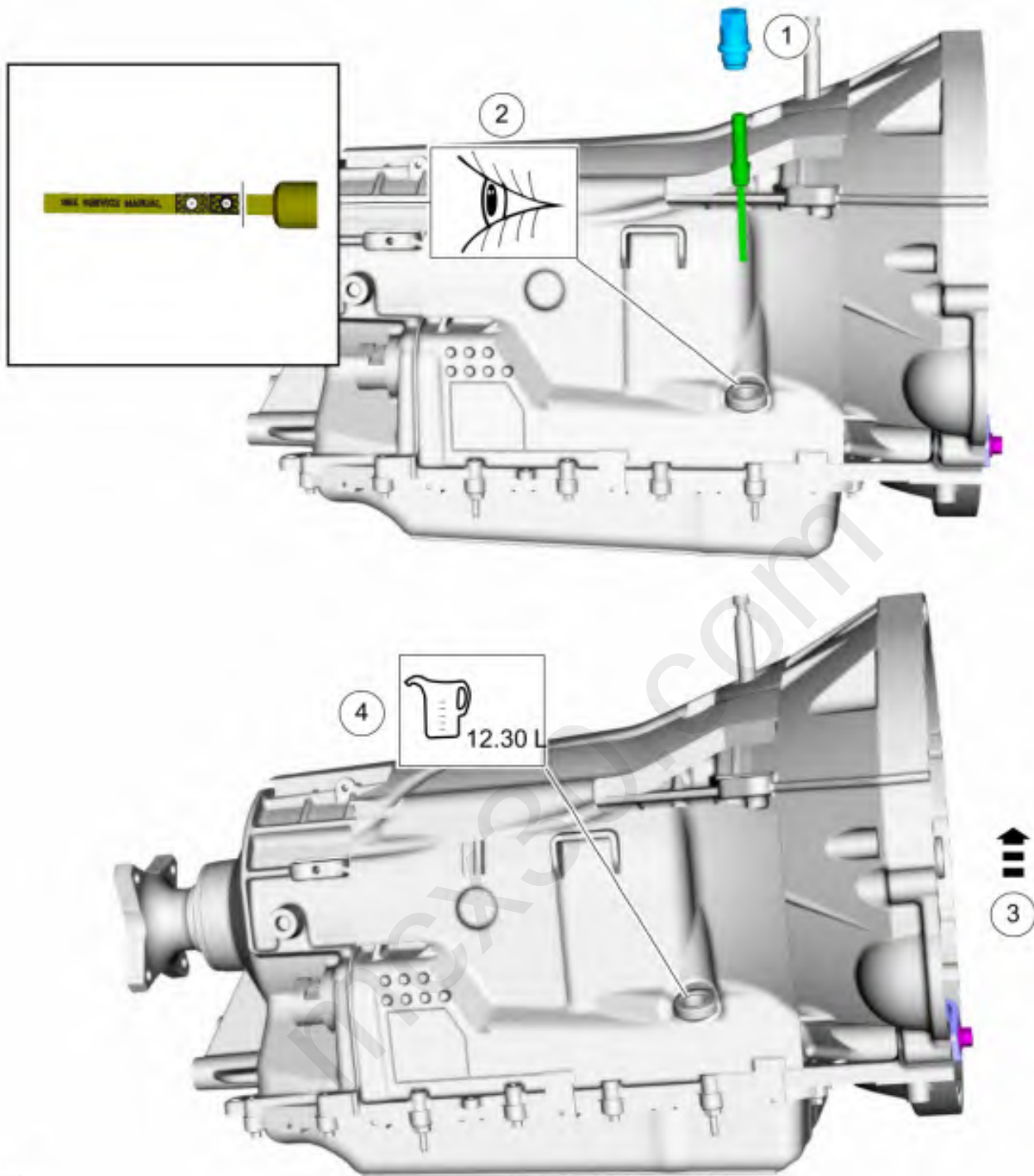
NOTE: If transmission was disassembled, add transmission fluid to the transmission.

NOTE: Rear Wheel Drive (RWD) shown, Four-Wheel Drive (4WD) similar.

1. Remove the transmission fluid fill plug transmission fluid level indicator assembly.
2. Verify transmission is filled with transmission fluid.
3. Slightly tilt the transmission rearward.
4. If the transmission was disassembled, add 12.30L (13 qt) of transmission fluid to the transmission through the transmission fluid fill hole.

Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (MERCON® ULV) (WSS-M2C949-A)

- Loosely install the transmission fluid fill plug when finished.



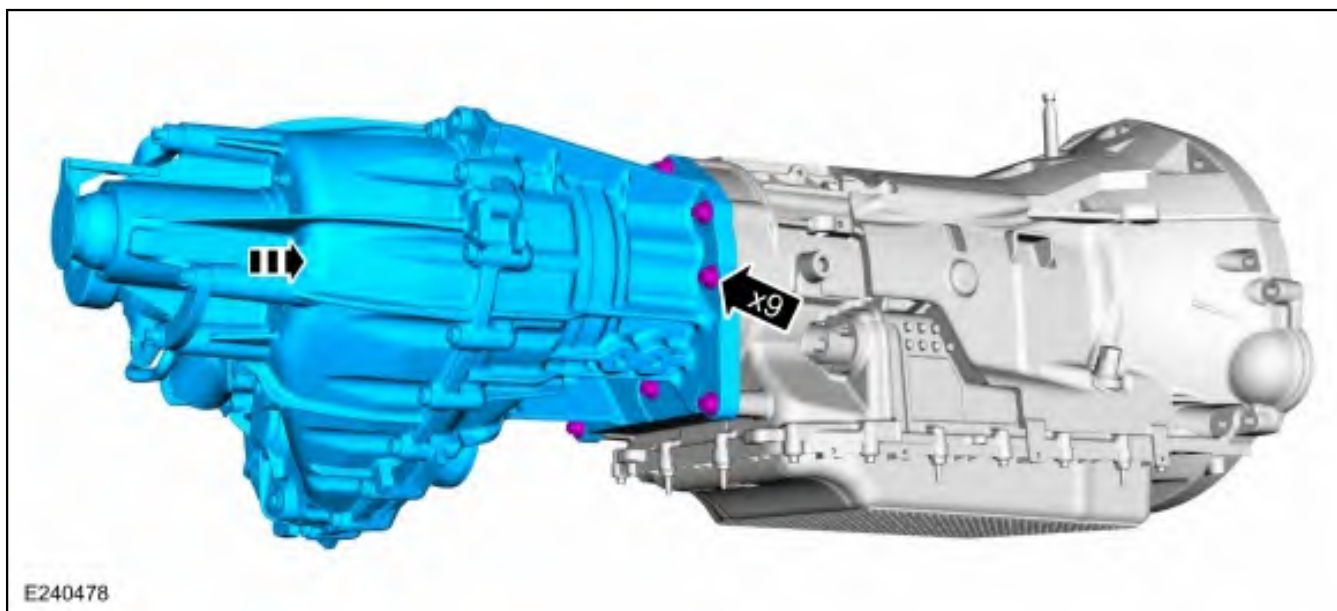
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8.

If removed, install the transfer case and the new bolts.

- Tighten the bolts evenly in a star pattern.

Torque: 150 lb.in (17 Nm)

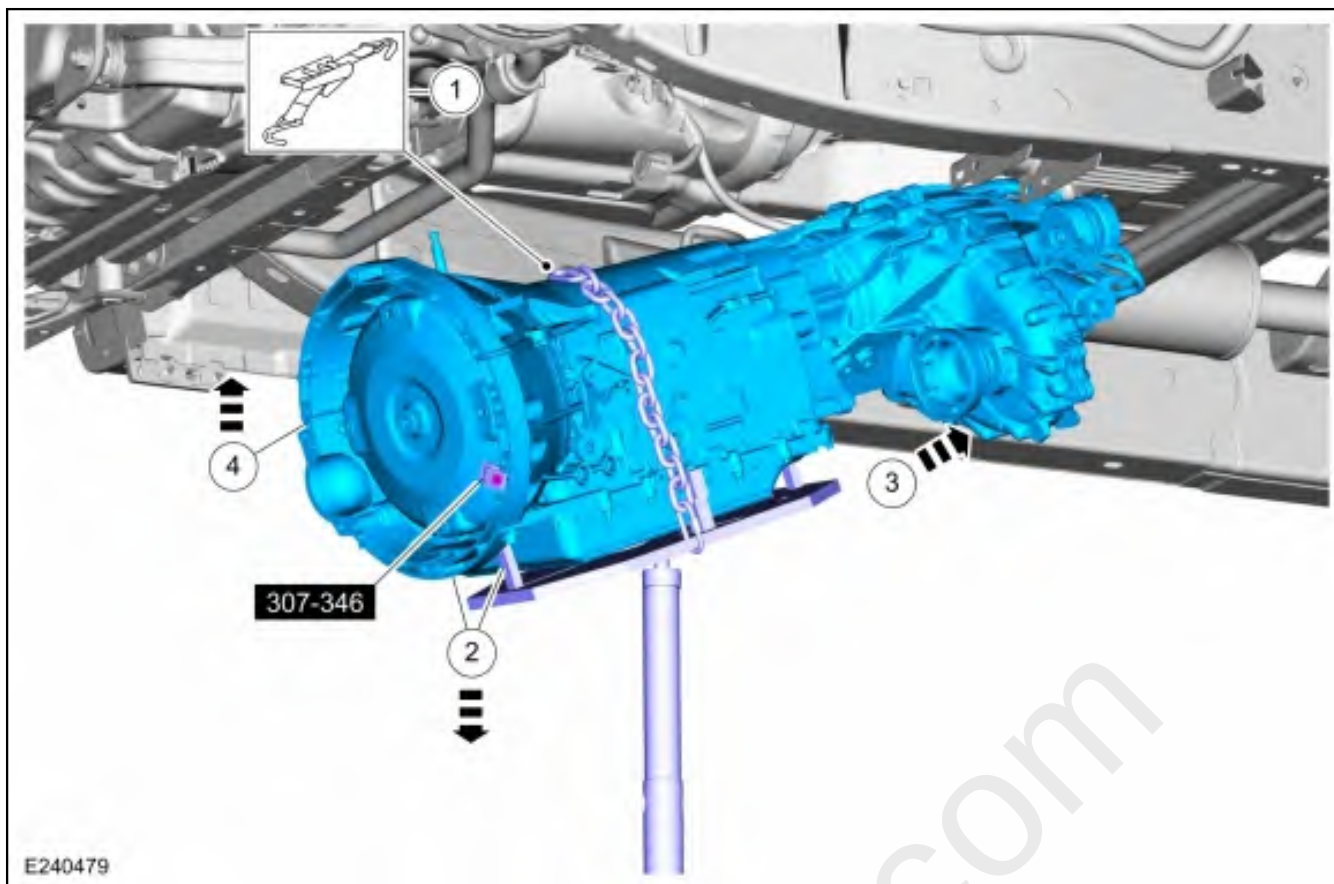


9. **NOTICE:** Secure the transmission to the transmission jack with a safety strap.

NOTE: Make sure the transmission jack makes contact on the outer ribs of the transmission fluid pan.

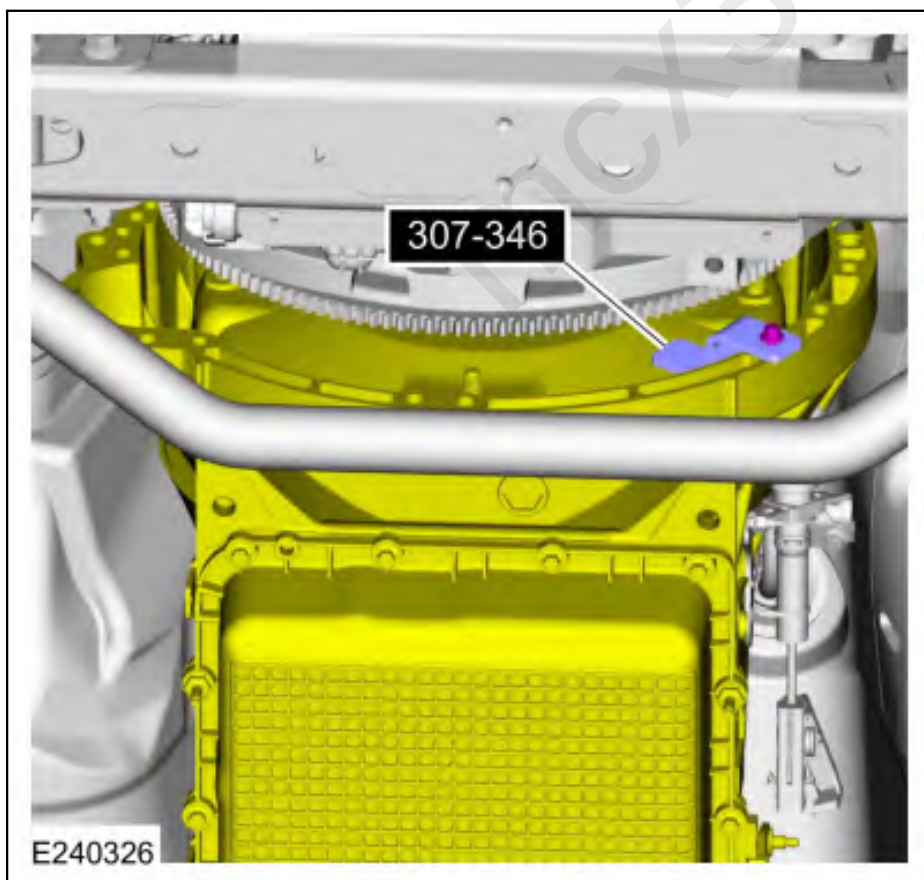
Using a high-lift transmission jack, support the transmission.

1. Make sure the transmission is securely fastened to the transmission jack.
Use the General Equipment: Transmission Jack
2. Tilt the front of the transmission down.
3. Slide the transmission towards the rear of the vehicle.
4. Raise the front of the transmission into a horizontal position.



10. Remove the special tool.

Use Special Service Tool: 307-346 (T97T-7902-A) Retainer, Torque Converter.

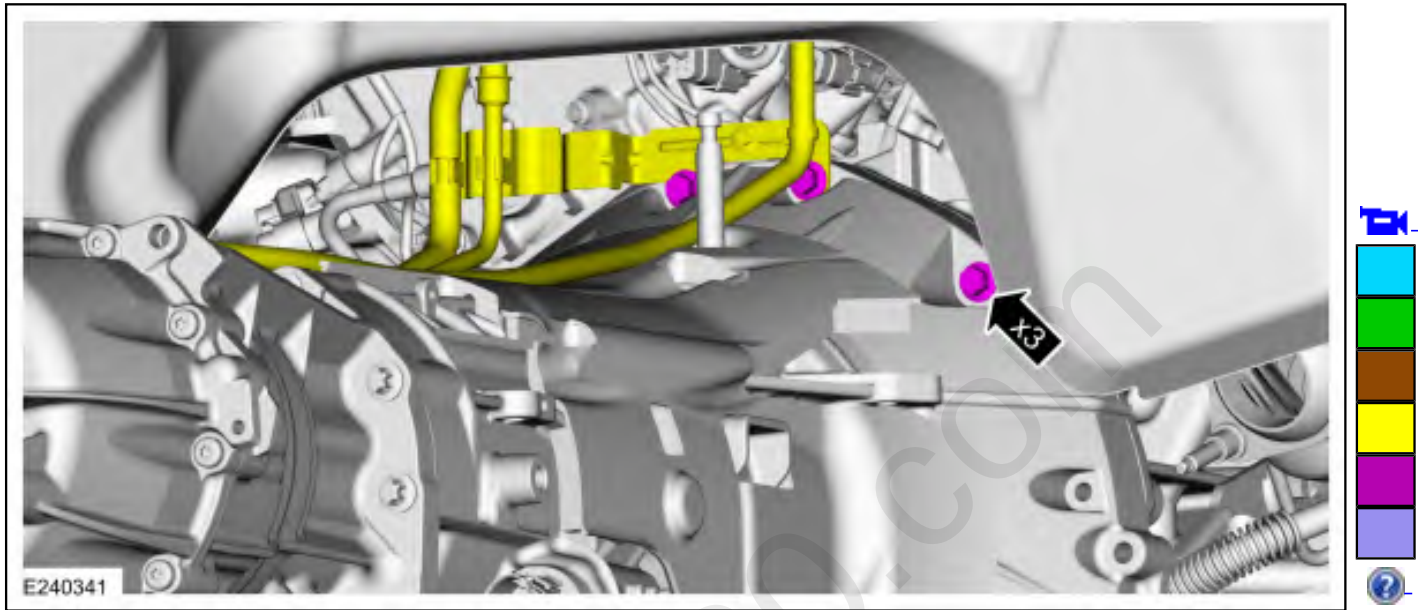


11. **NOTE:** Make sure the torque converter is fully seated in the transmission before aligning the transmission to the engine.

NOTE: With the transmission in a horizontal position, move it toward the engine and position it on the dowel pins.

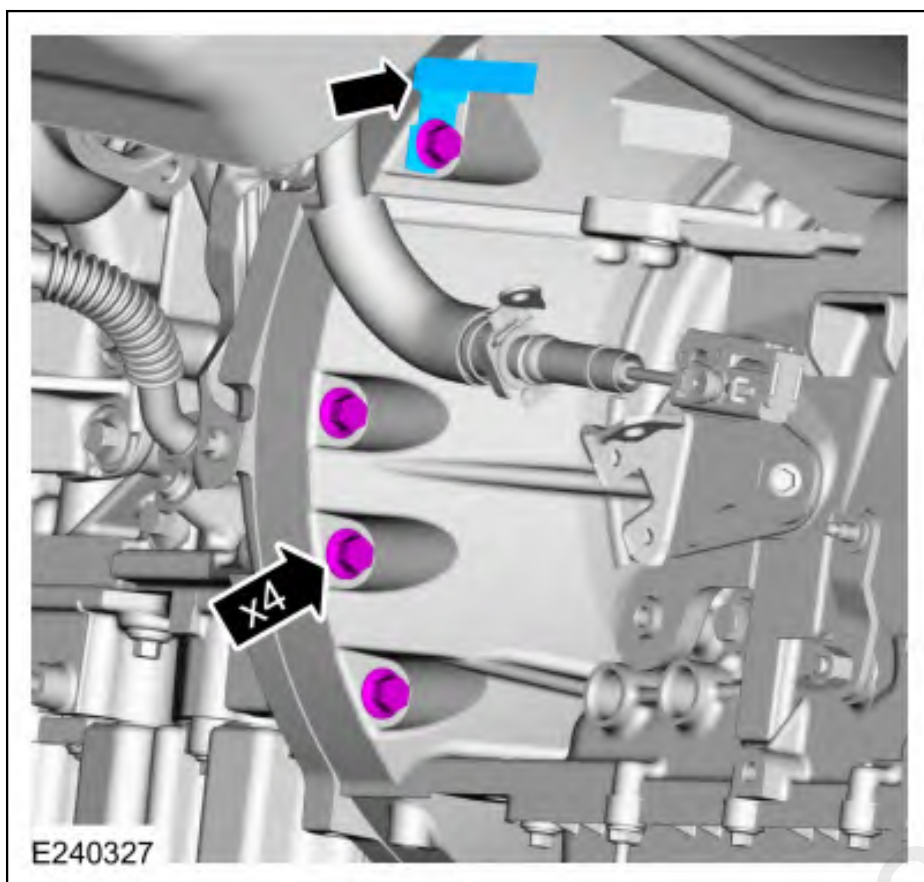
Position the bracket and install the top bellhousing bolts.

Torque: 35 lb.ft (48 Nm)

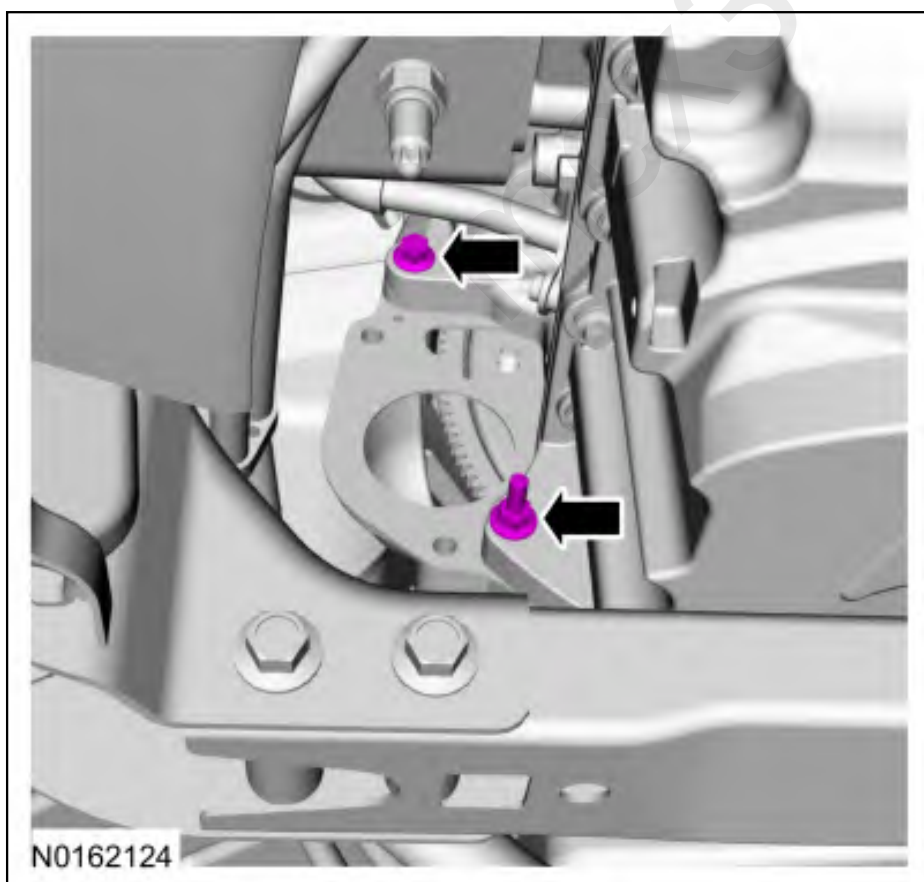


12. Install the selector lever cable bracket and the LH bellhousing bolts.

Torque: 35 lb.ft (48 Nm)

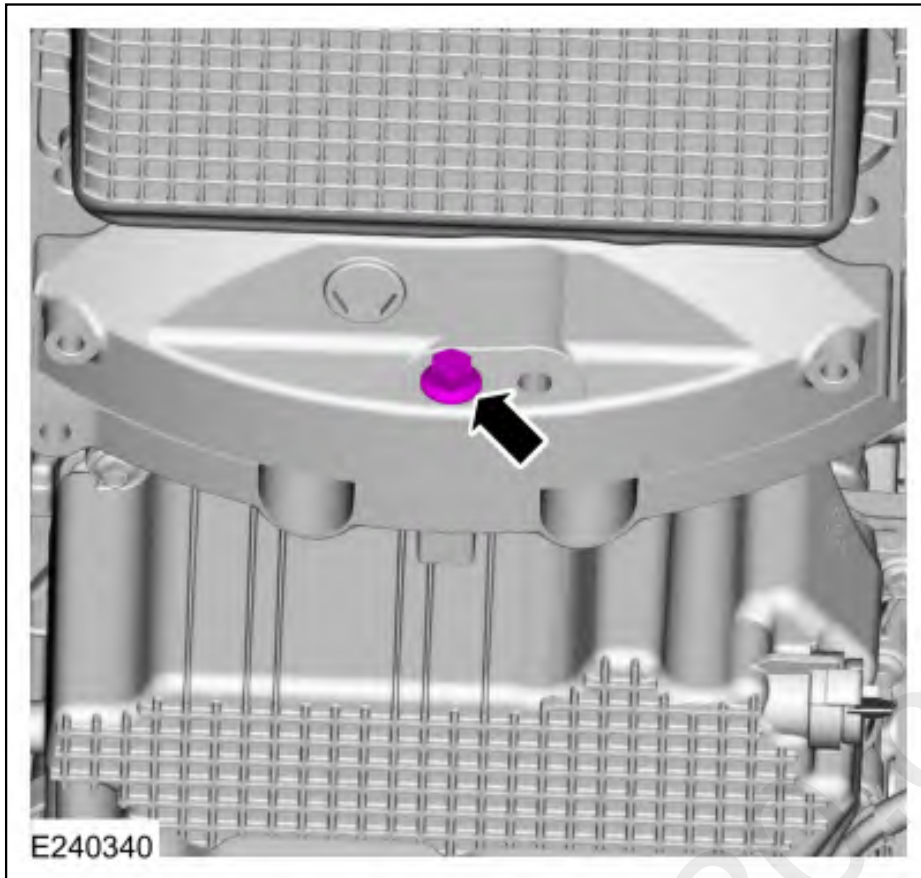


13. Install the RH bellhousing bolts.
Torque: 35 lb.ft (48 Nm)



14. Install the lower bellhousing bolt.

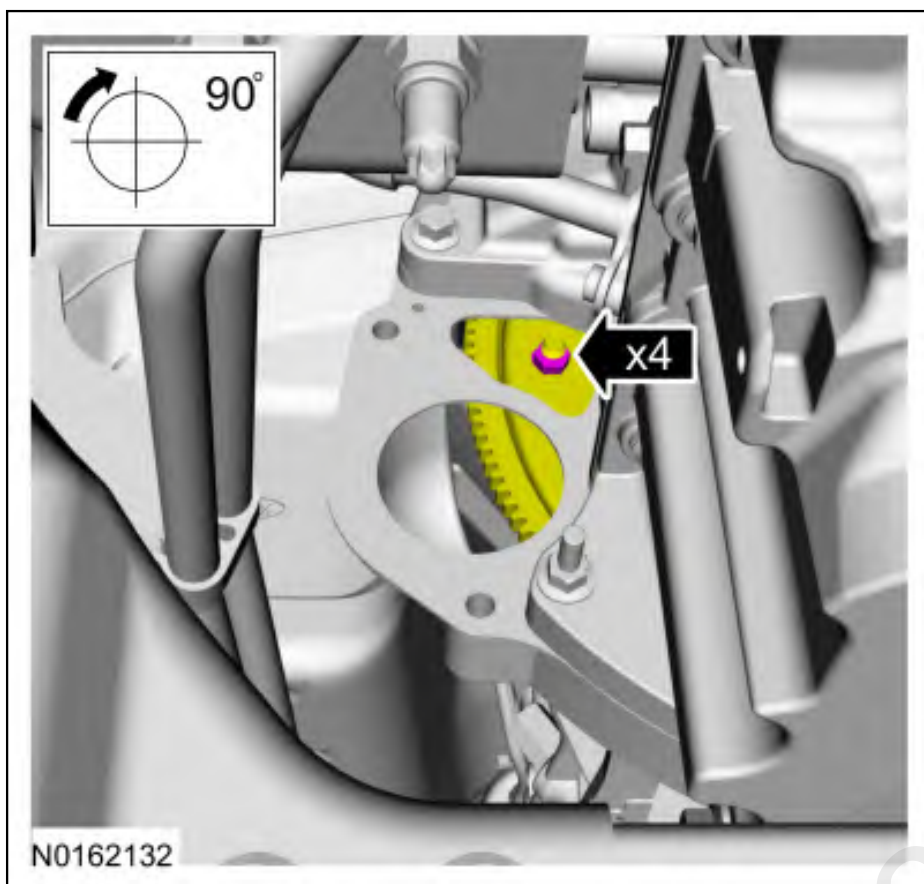
Torque: 35 lb.ft (48 Nm)



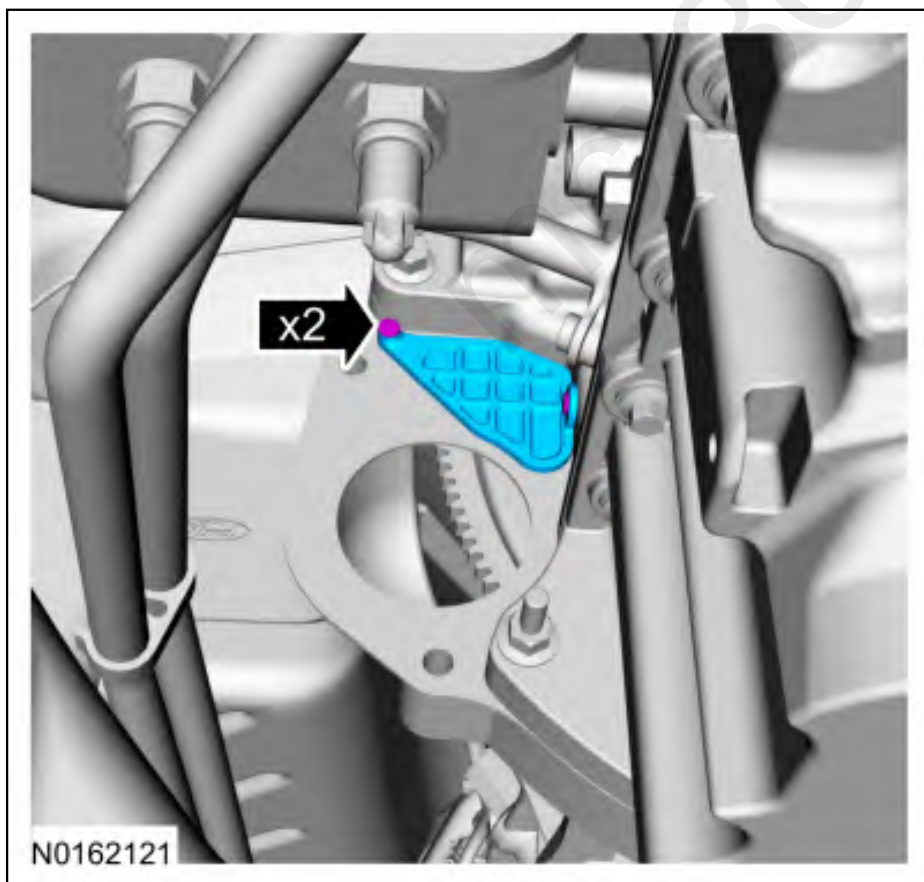
15. **NOTE:** *Using the crankshaft pulley bolt, turn the engine clockwise.*

Install the new torque converter nuts.

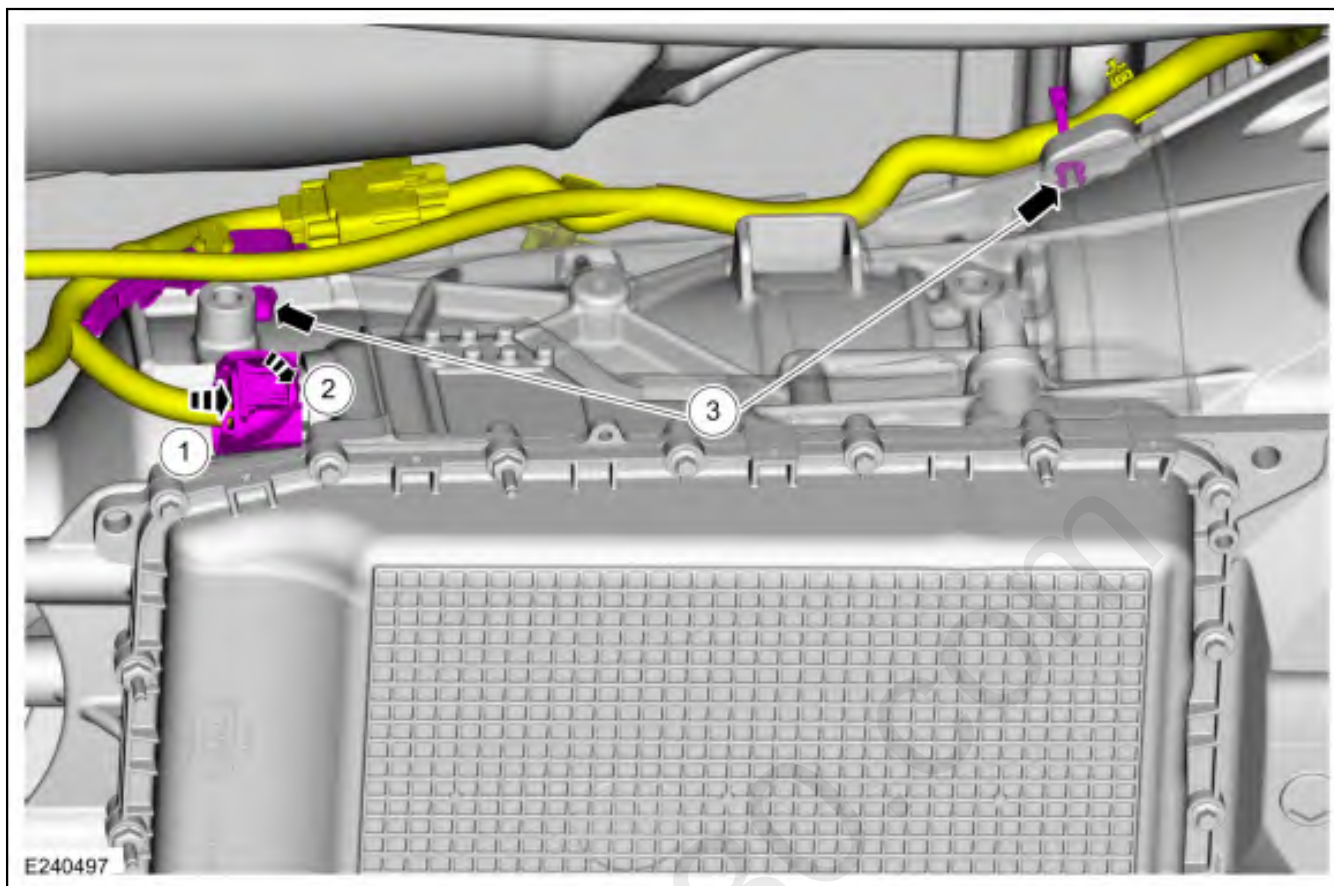
Torque: 30 lb.ft (40 Nm)



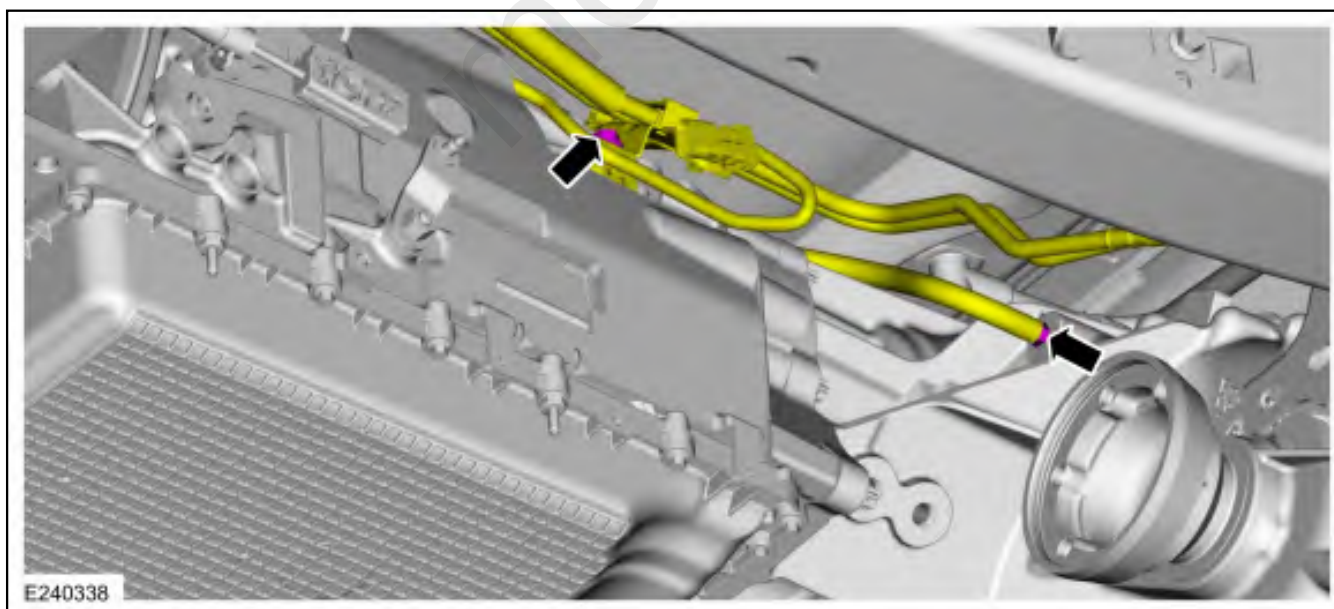
16. Install the access cover and the pin-type retainers.



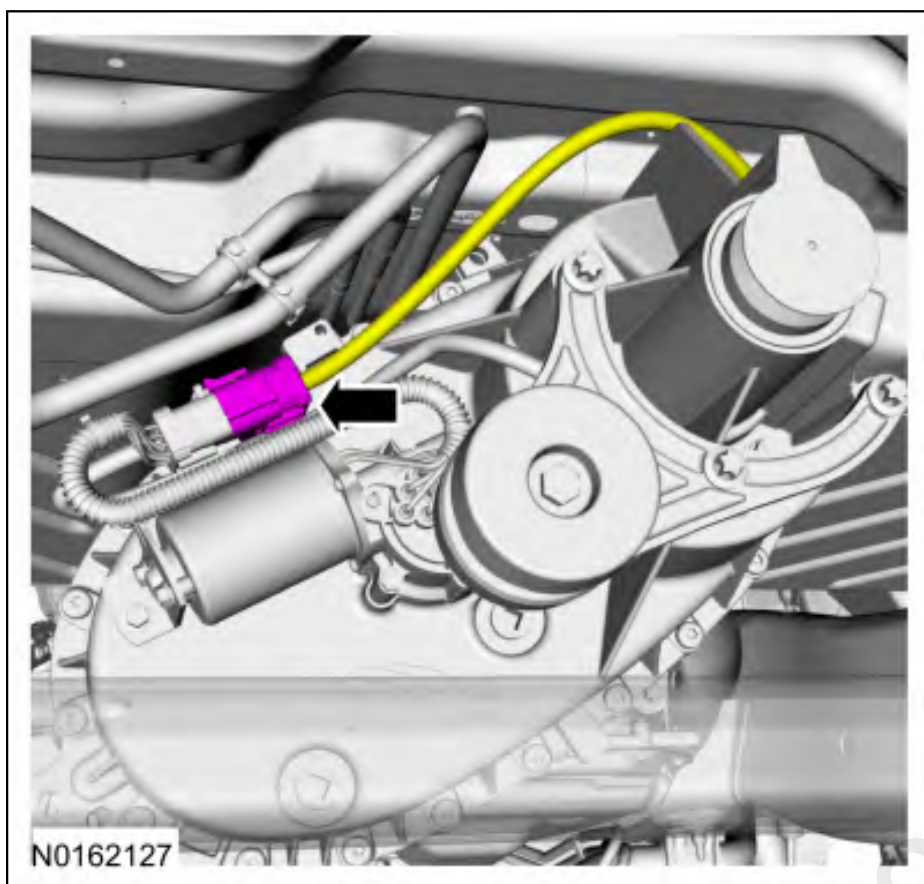
1. Push the transmission electrical connector in.
2. Lock the tab to connect the transmission electrical connector.
3. Attach the wiring harness retainers in the transmission.



18. Position the fuel line bracket and install the bolt. Connect the transfer case vent tube.
Torque: 26 lb.ft (35 Nm)



19. Connect the transfer case electrical connector.



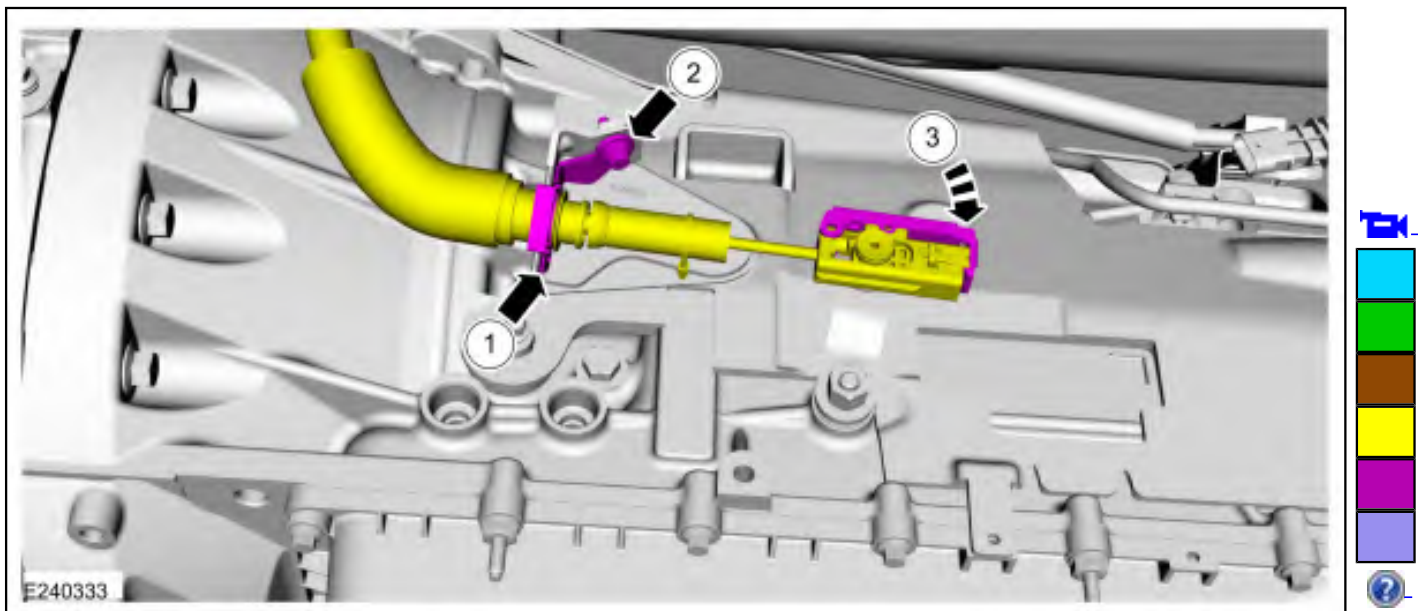
20. **NOTE:** When installing the selector lever cable end, make sure that the selector lever cable end is correctly installed onto the manual control lever. Pull back on the selector lever cable to make sure the selector lever cable end is securely installed onto the manual control lever.

NOTE: Apply pressure to the selector lever cable end while connecting it to the manual control lever to make sure the selector lever has not moved out of the *DRIVE* position.

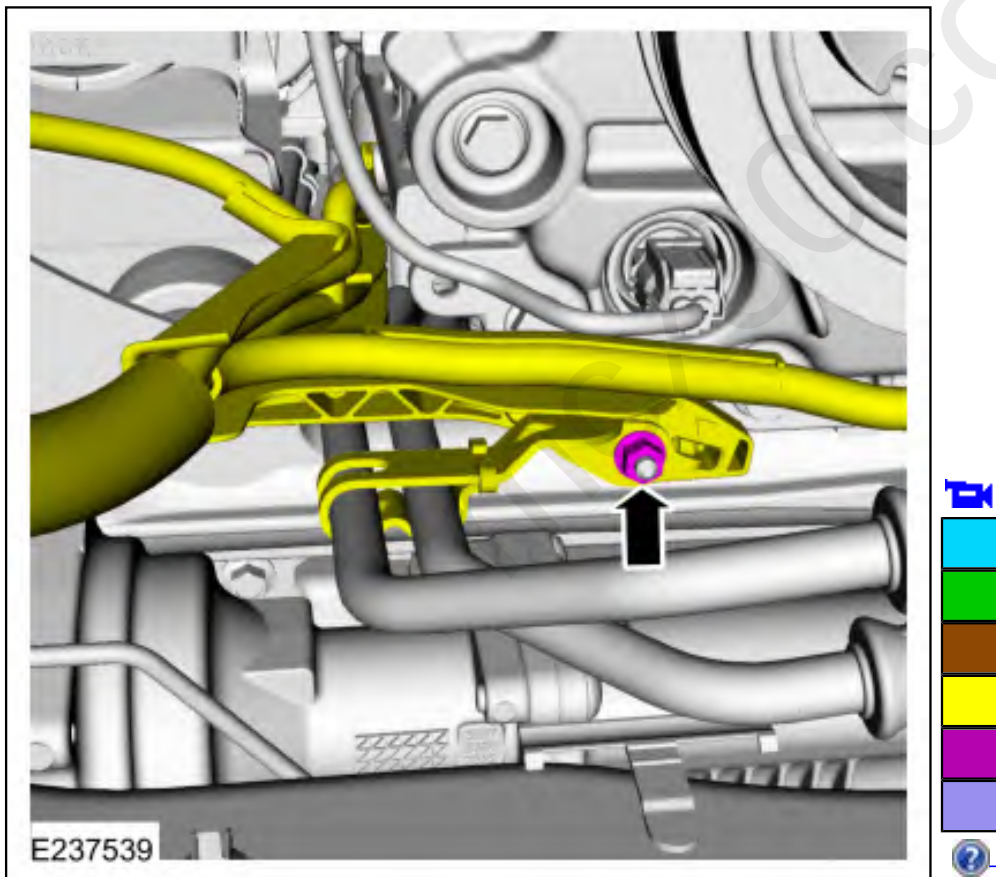
Connect the selector lever cable to the manual control lever.

1. Connect the selector lever cable to the bracket.
2. Install the selector lever cable bolt.
Torque: 62 lb.in (7 Nm)
3. **NOTE:** Listen for a audible click when sliding the locking tab down.

Connect the selector lever cable end to the manual control lever and slide the locking tab down.



21. Position the wiring harness and transmission cooler tube bracket and install the nut.
Torque: 106 lb.in (12 Nm)



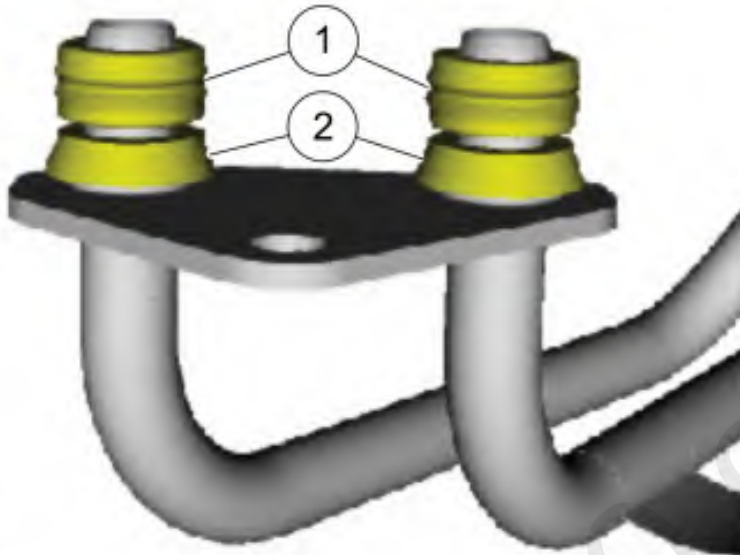
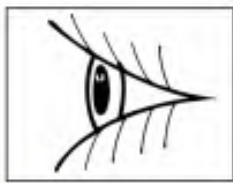
22. **NOTE:** *Inspect the transmission fluid tube backing rings and seals are not stuck in the case.*

Inspect the transmission fluid tube backing rings and seals for damage and install new backing rings or seals if necessary.

- Seal (7D285)

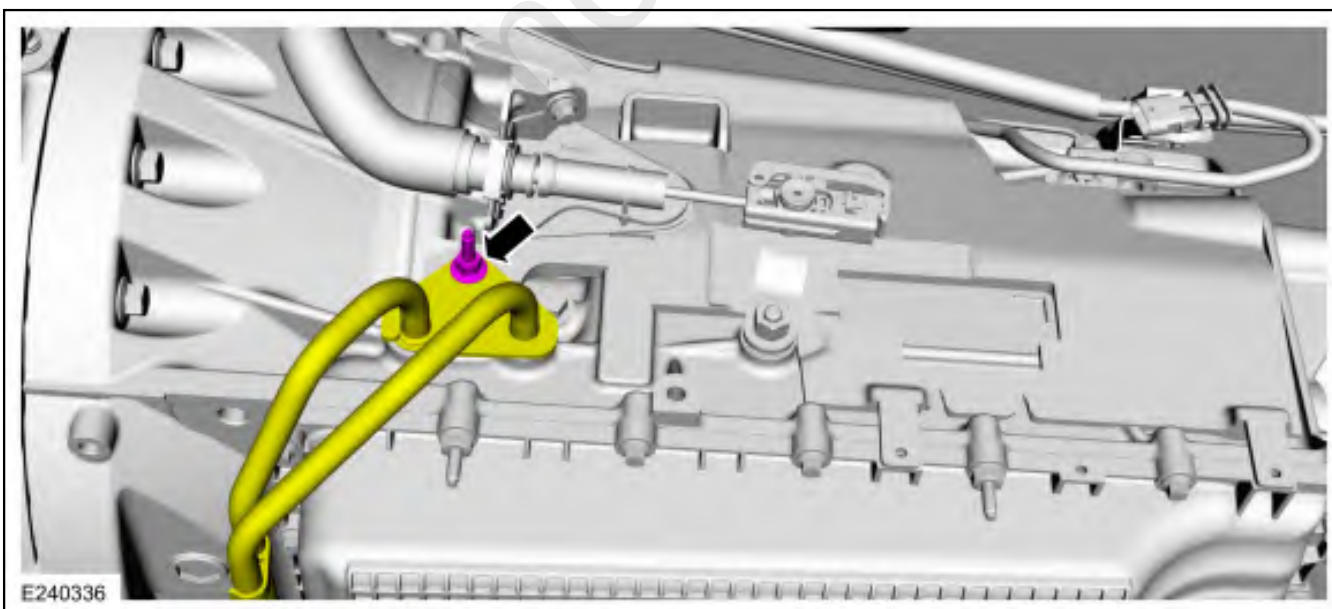
Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (MERCON® ULV) (WSS-M2C949-A)

- Backing ring (7J324)



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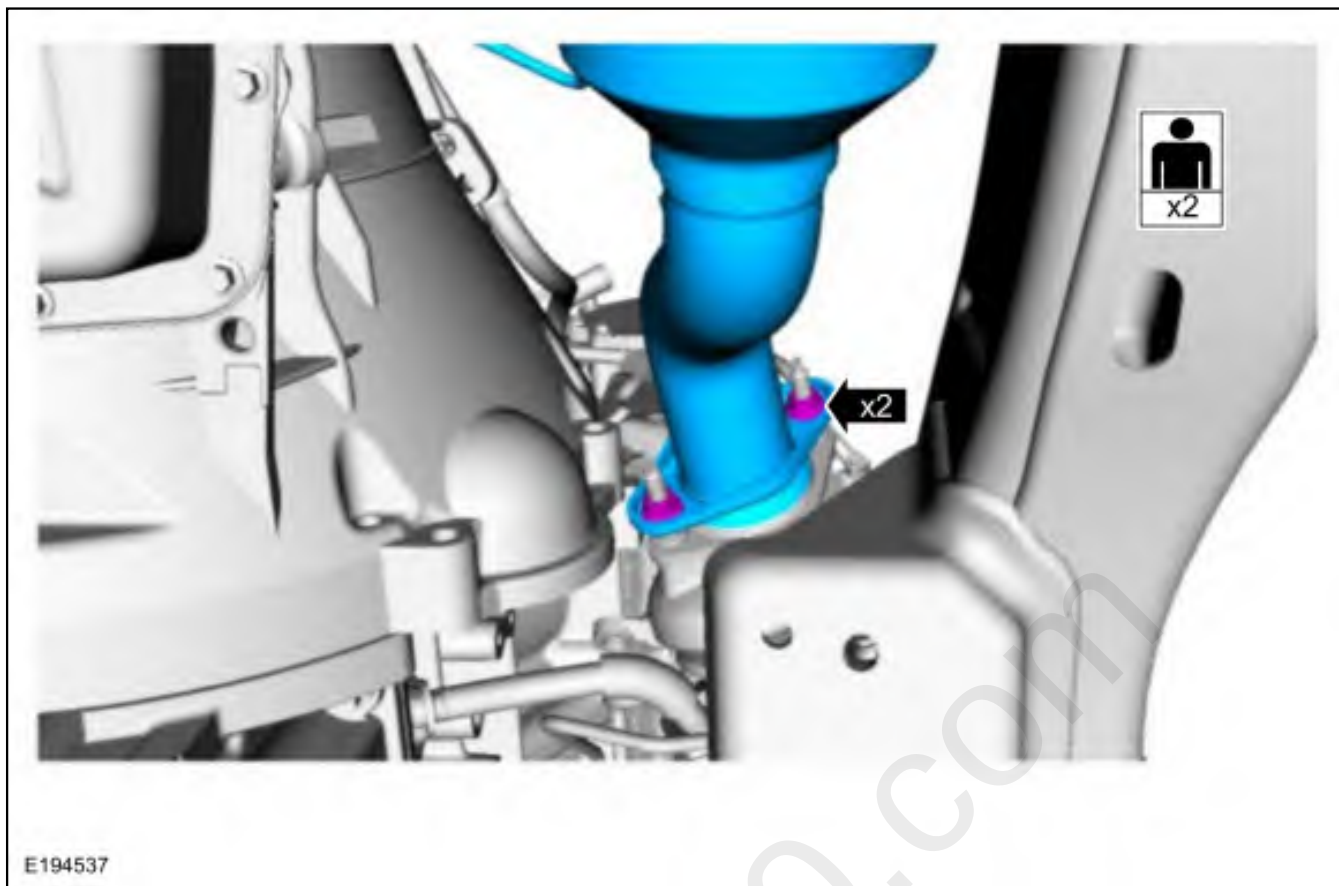
23. Install the transmission fluid cooler tubes and the new transmission fluid cooler tube bracket studbolt.
Torque: 22 lb.ft (30 Nm)



E240336

24. **NOTE:** Loosely install the new RH catalytic converter nuts. Do not tighten at this time.

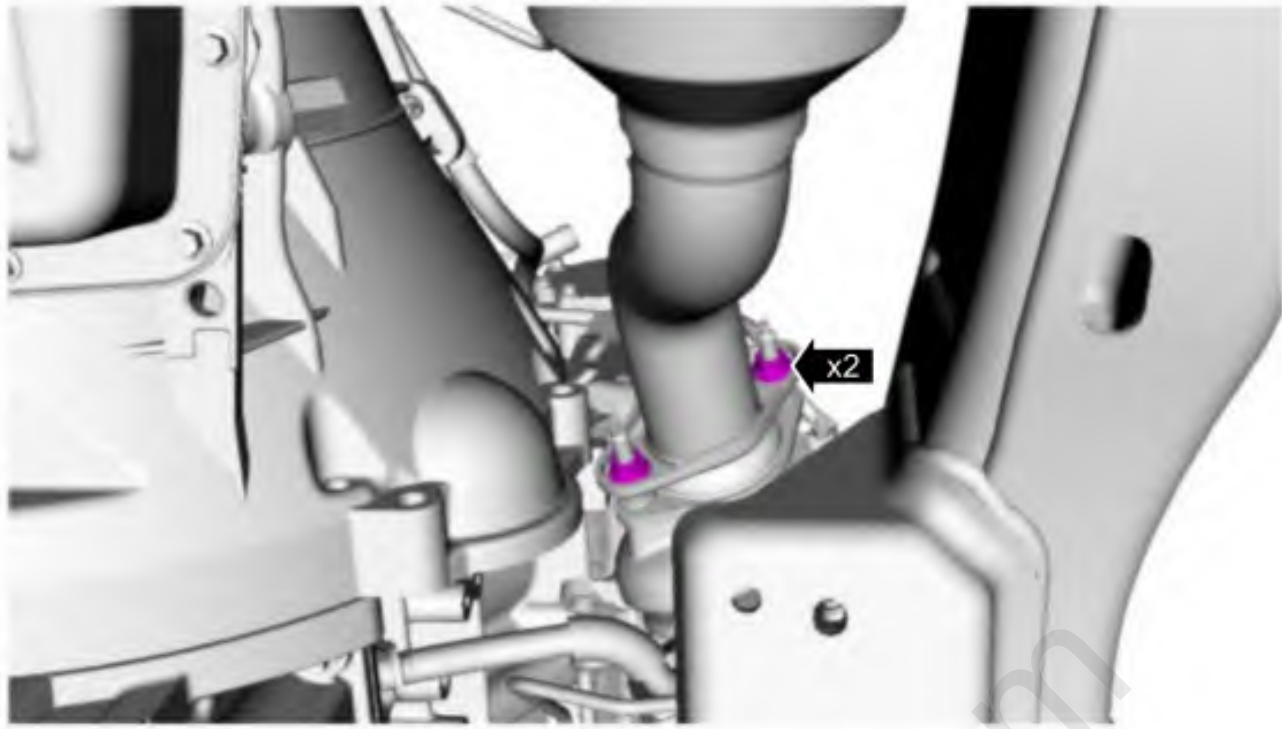
Position the RH catalytic converter in the vehicle. Loosely install the new RH catalytic converter nuts.



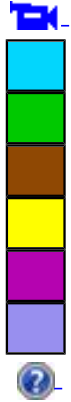
25. Install the transmission support insulator.
Refer to: [Transmission Support Insulator](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

26. **NOTE:** *Evenly tighten the catalytic converter nuts.*

Tighten the RH catalytic converter nuts.
Torque: 30 lb.ft (40 Nm)



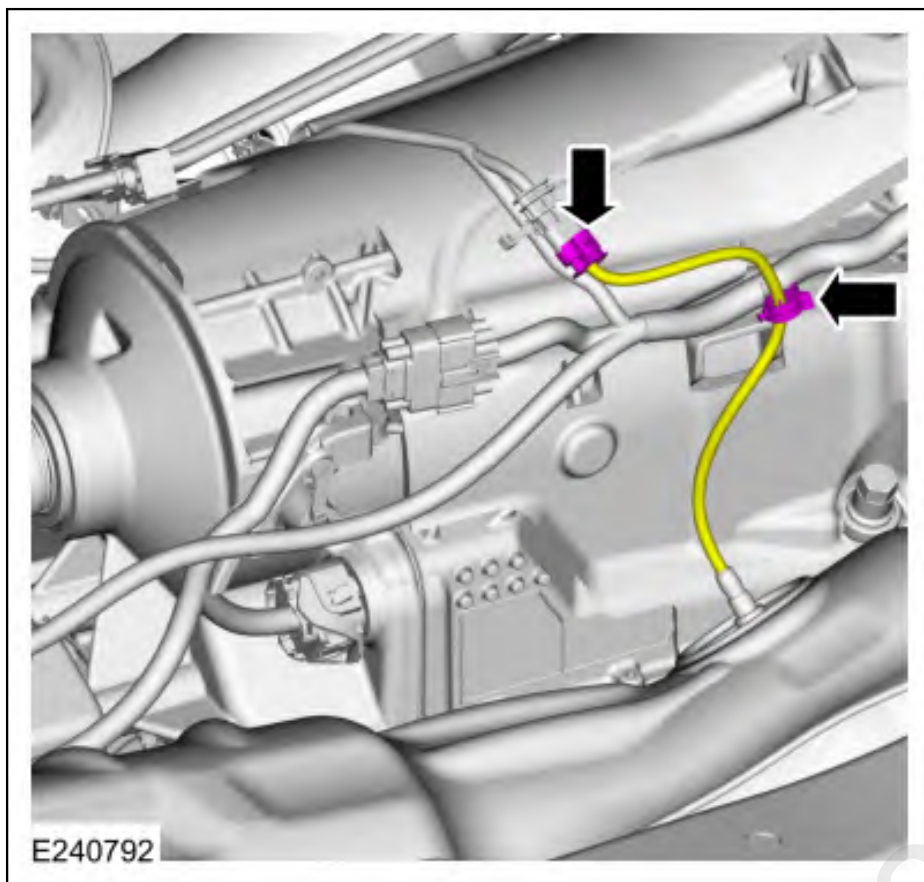
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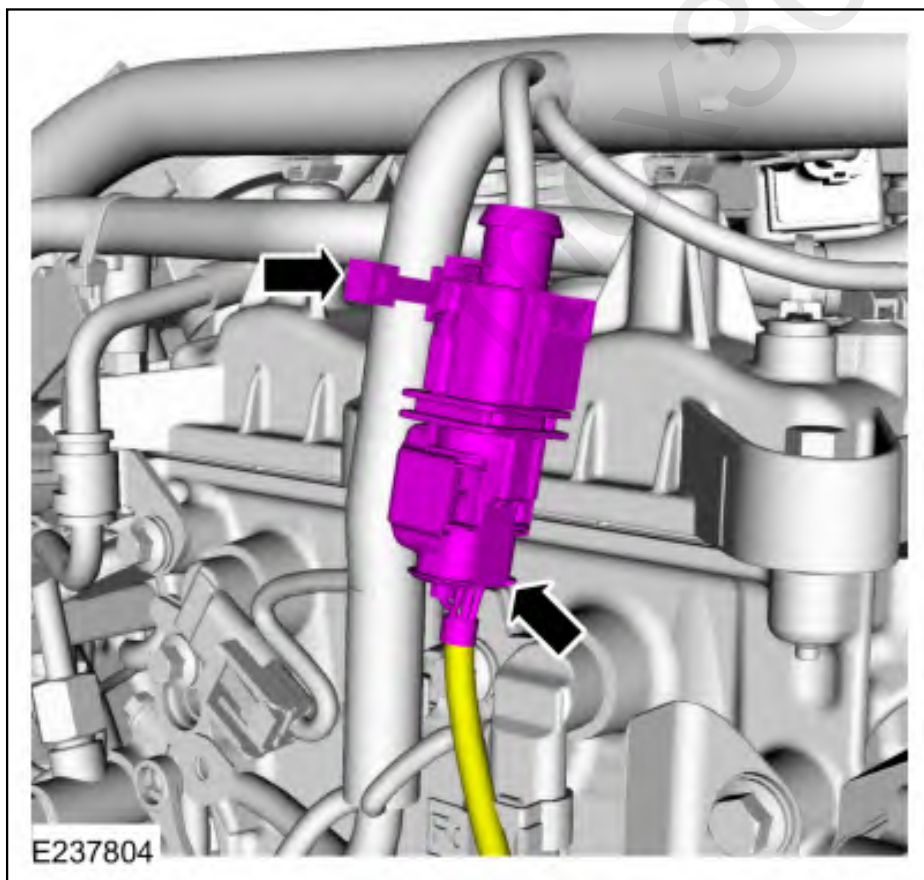
27. Install the LH catalytic converter.

Refer to: [Catalytic Converter LH - Raptor](#) (309-00C Exhaust System - 3.5L EcoBoost (272kW/370PS), Removal and Installation).

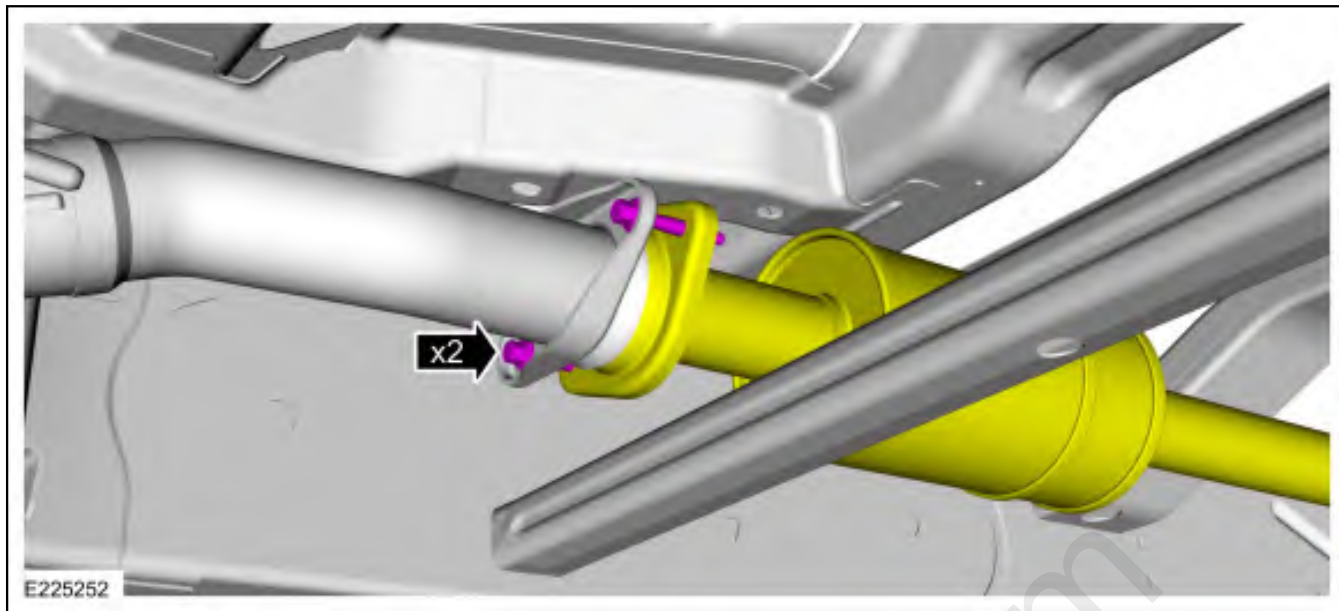
28. Connect the catalyst monitor sensor electrical connector and the harness retainer.



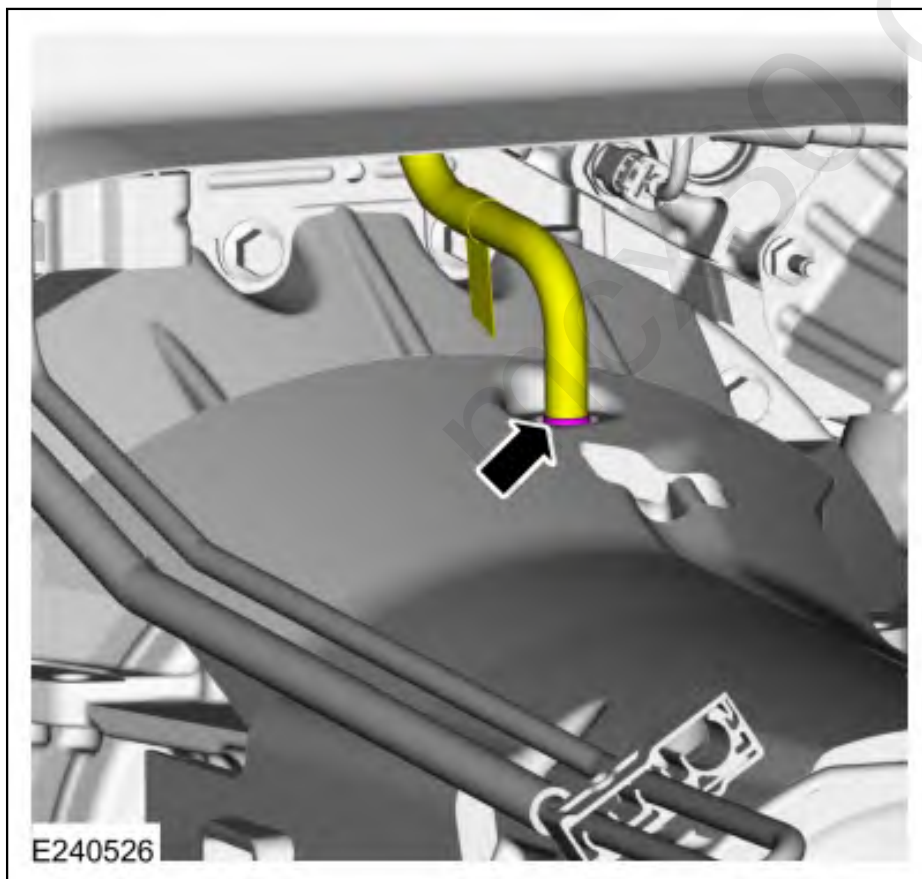
29. Connect the RH HO2S electrical connector and the harness retainer.



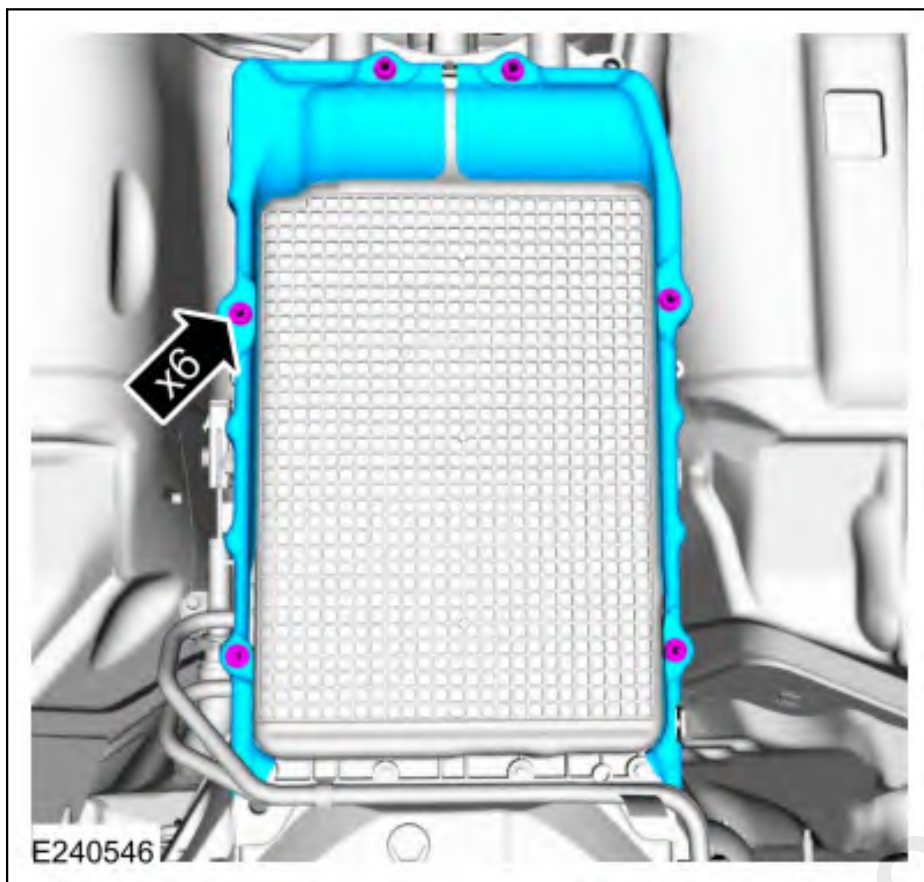
30. Install the catalytic converter flange to the muffler inlet pipe bolts.
Torque: 30 lb.ft (40 Nm)



31. Connect the transmission vent tube.



32. Install the retainers and heatshield.
Torque: 80 lb.in (9 Nm)

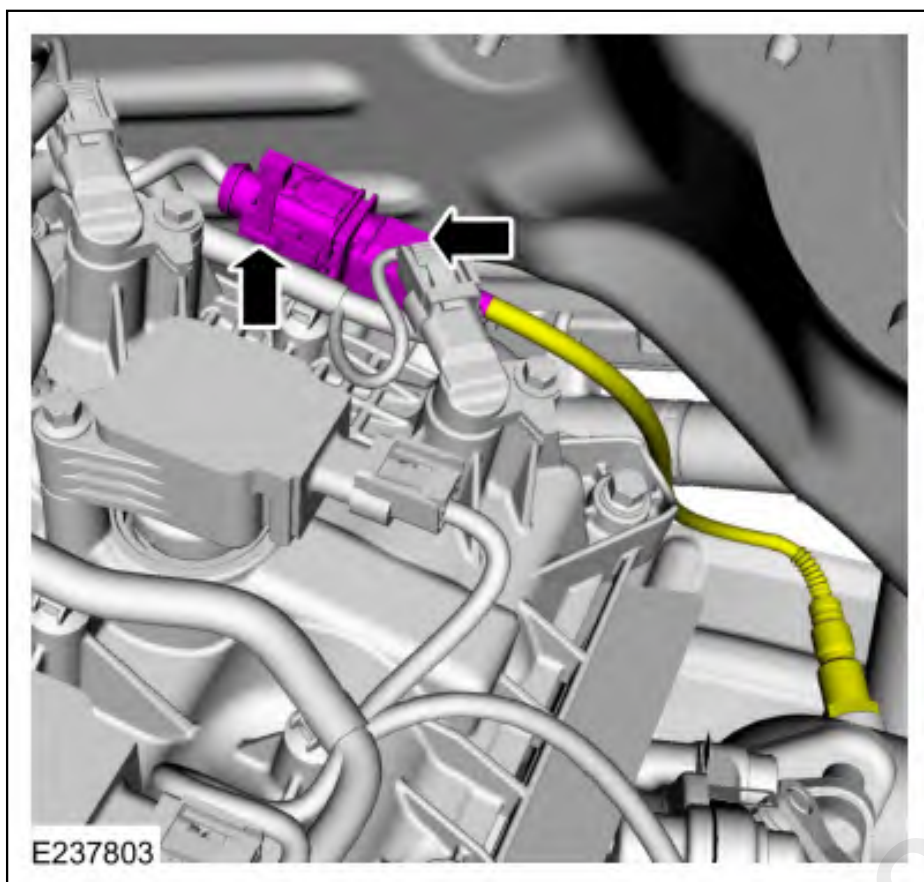


33. Install the rear driveshaft assembly.
Refer to: [Rear Driveshaft](#) (205-01 Driveshaft, Removal and Installation).
34. Install the front driveshaft assembly.
Refer to: [Front Driveshaft](#) (205-01 Driveshaft, Removal and Installation).
35. Check the transfer case fluid level.
Refer to: [Transfer Case Draining and Filling](#) (308-07B Transfer Case, General Procedures).
36. **NOTE:** *If equipped with a underbody splash shield, do not install the splash shield at this time.*

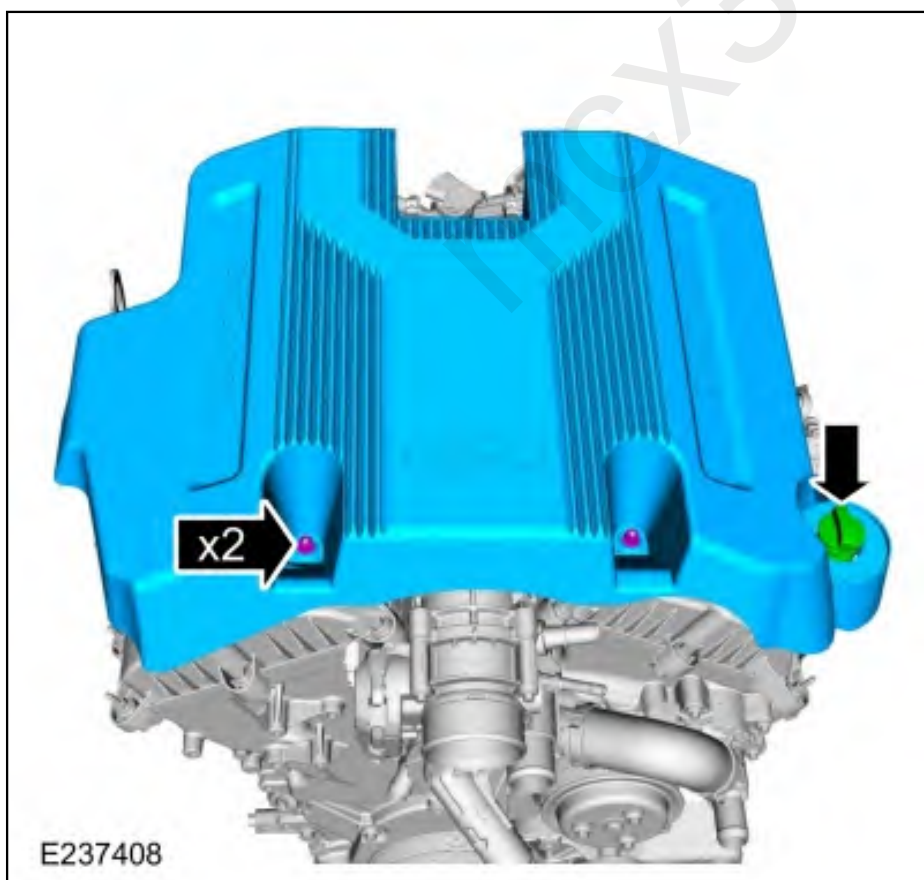
Install the starter motor assembly.

Refer to: [Starter Motor](#) (303-06C Starting System - 3.5L EcoBoost (272kW/370PS), Removal and Installation).

37. Connect the LH HO2S electrical connector.



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



39. Connect the battery ground cable.
Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
40. Verify that the selector lever cable is correctly adjusted.
Refer to: [Selector Lever Cable Adjustment - Raptor](#) (307-05 Automatic Transmission External Controls, General Procedures).
41. After completing the repairs, perform the Misfire Monitor Neutral Profile Correction procedure using a diagnostic scan tool.
42. If a new transmission or a new main control was installed, the solenoid body strategy must be updated.
Refer to: [Transmission Strategy Download](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
43. If the transmission was overhauled, the adaptive drive cycle must be updated.
Refer to: [Adaptive Learning Drive Cycle](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
44. While driving the vehicle, use the scan tool to verify that the TFT has reached a temperature of 96.7°C-102°C (206°F-215°F). This will circulate the transmission fluid through the torque converter and the transmission fluid cooling system, eliminating any trapped air in the transmission fluid cooling system.
45. Check the transmission fluid level.
Refer to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).