




Steering Gear

Special Tool(s) / General Equipment

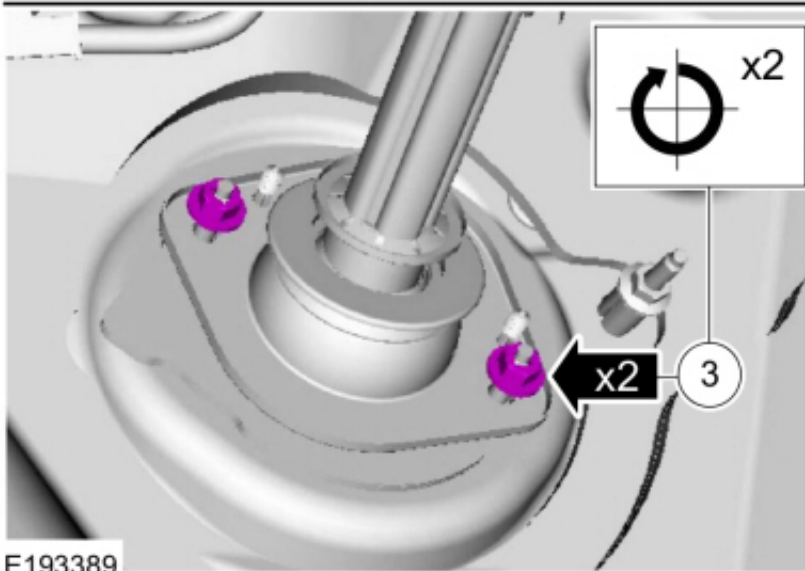
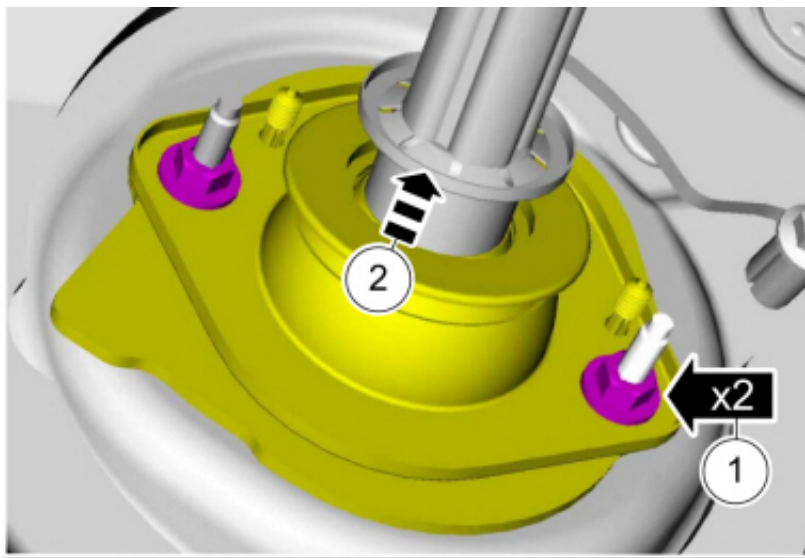
 E188617	204-816 Rack Holding Tool TKIT-2014D-ROW2 TKIT-2014D-FL_ROW
Boot Clamp Pliers	
Oil Drain Equipment	

Materials

Name	Specification
Motorcraft® Premium Long-Life Grease XG-1-E1	ESA-M1C75-B
Motorcraft® SAE 5W-30 Synthetic Blend Motor Oil XO-5W30-QSP	WSS-M2C946-A

Removal

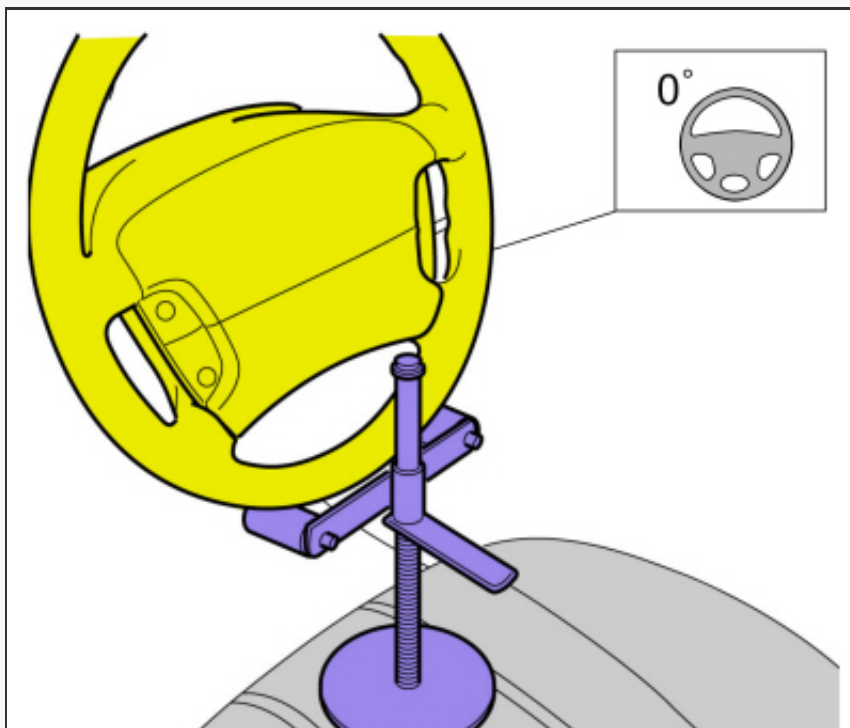
1. If installing a new steering gear, connect the scan tool and upload the module configuration information from the PSCM.
Refer to: [Module Configuration - System Operation and Component Description](#) (418-01 Module Configuration, Description and Operation).
2. **NOTICE: Make sure to minimize damage 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.**
 1. Remove the steering column dash seal nuts.
 2. Loosen the dash seal.
 3. Hand start the dash seal nuts.



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



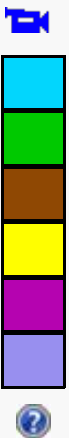
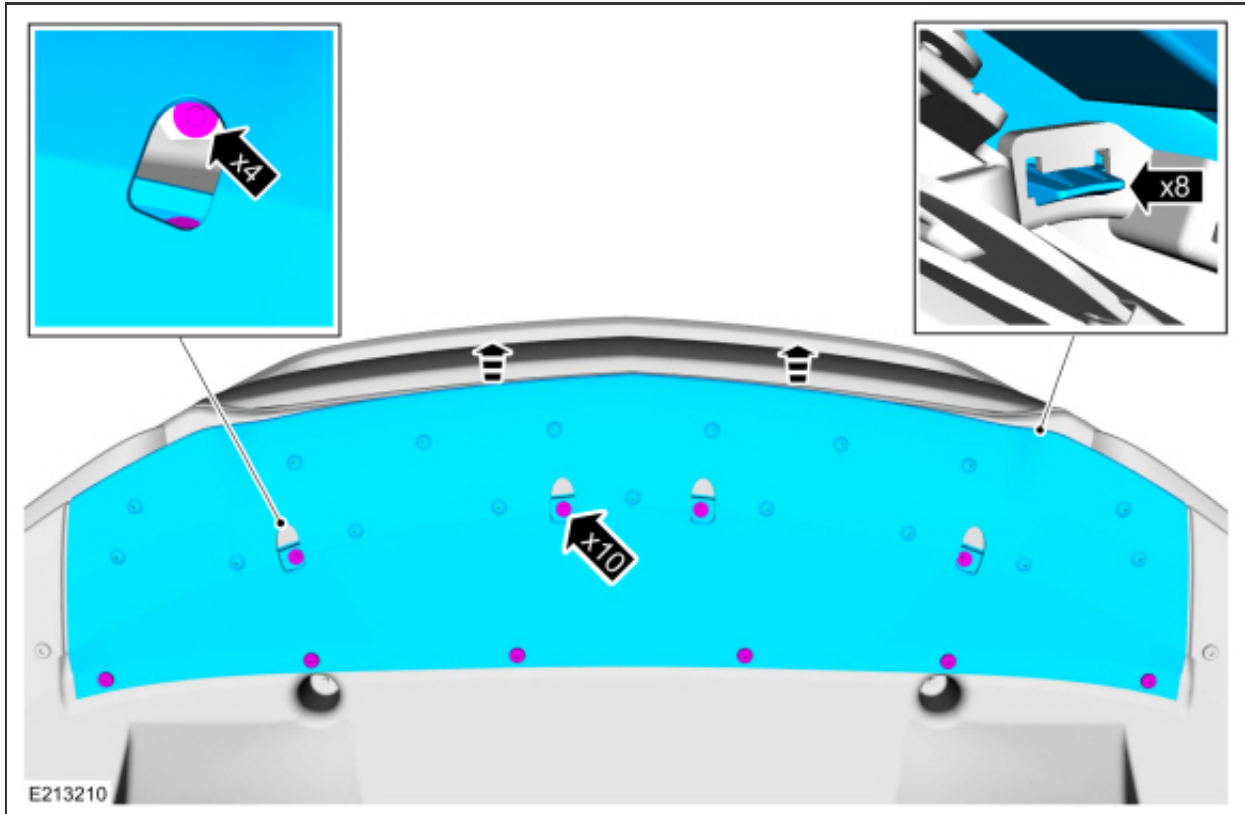
N0152580



4. On both sides. Remove the tie rod end.
Refer to: [Tie Rod End](#) (211-02 Power Steering, Removal and Installation).

5. **NOTE:** *If equipped.*

Remove the bolts and the underbody shield.



6. **NOTE:** *If equipped.*

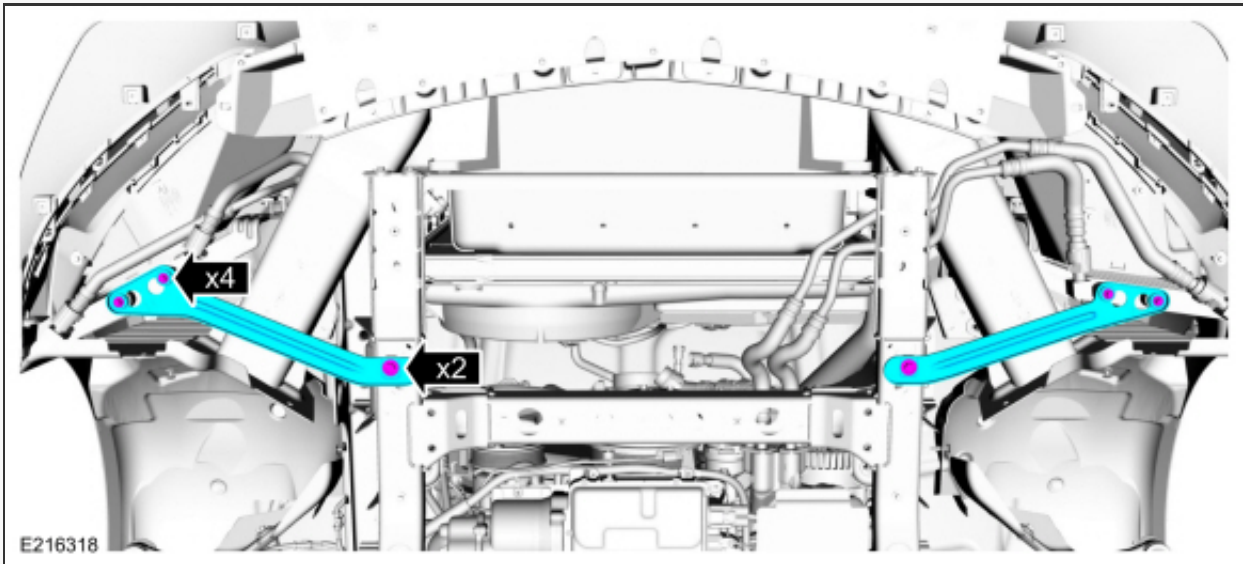
Remove the bolts and the underbody shield.





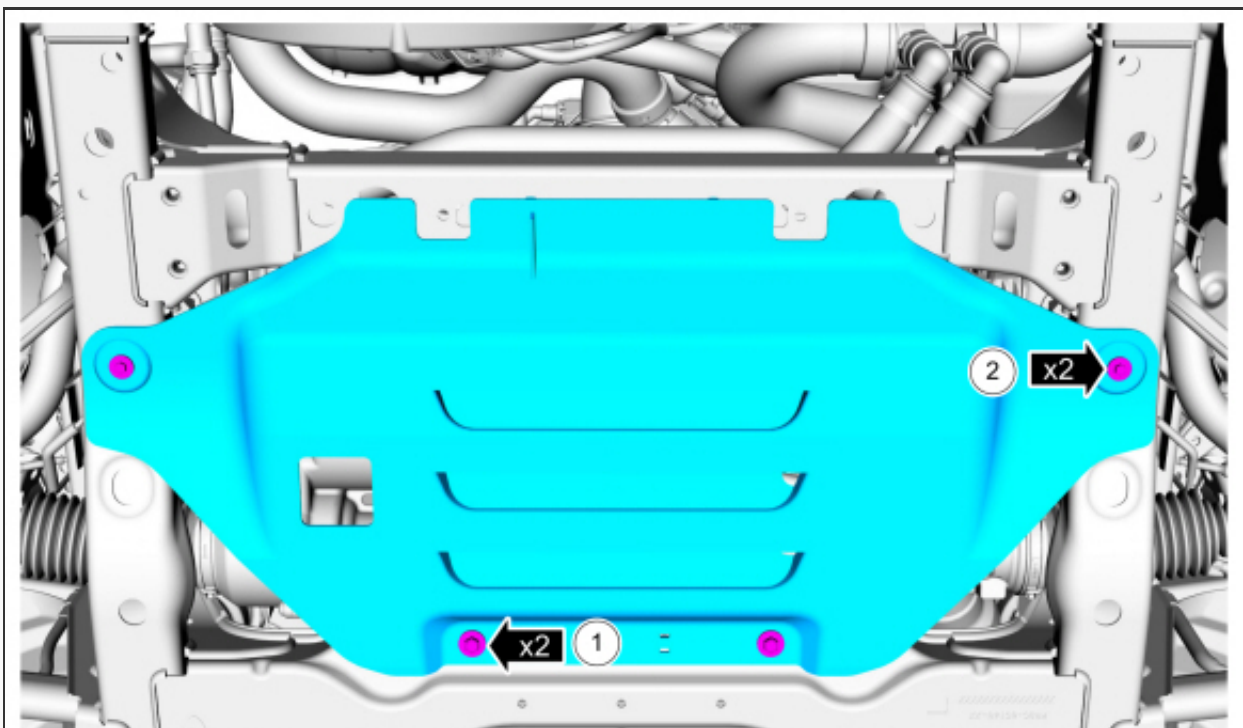
7. **NOTE:** *If equipped.*

Remove the bolts and the support brackets.



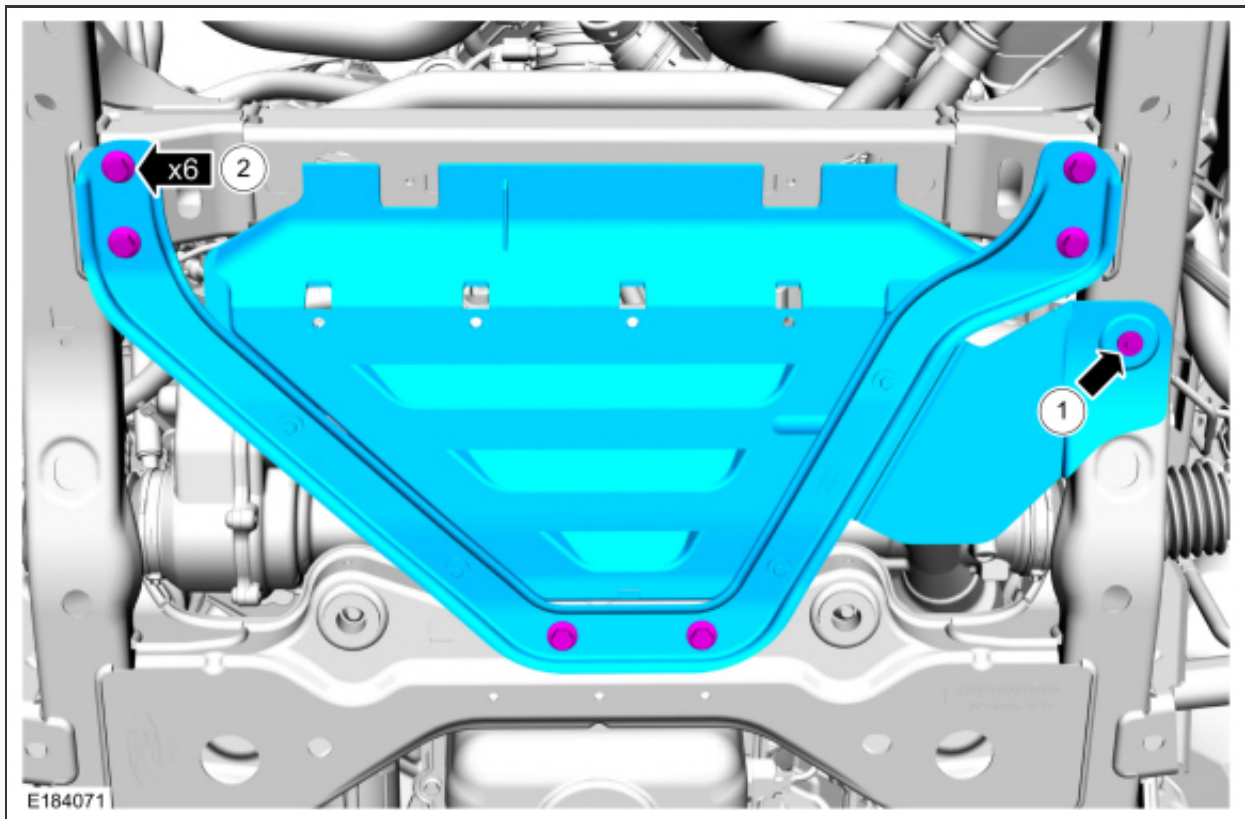
8. **NOTE:** *If equipped.*

1. Remove the 2 rearward underbody shield bolts.
2. Remove the 2 remaining underbody shield bolts and remove the underbody shield.





9.
 1. **NOTE:** *If equipped.*
Remove the underbody shield bolt.
 2. **NOTE:** *It is not necessary to separate the underbody shield from the V-brace.*
Remove the 6 V-brace bolts and remove the V-brace and underbody shield.



10.  **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).

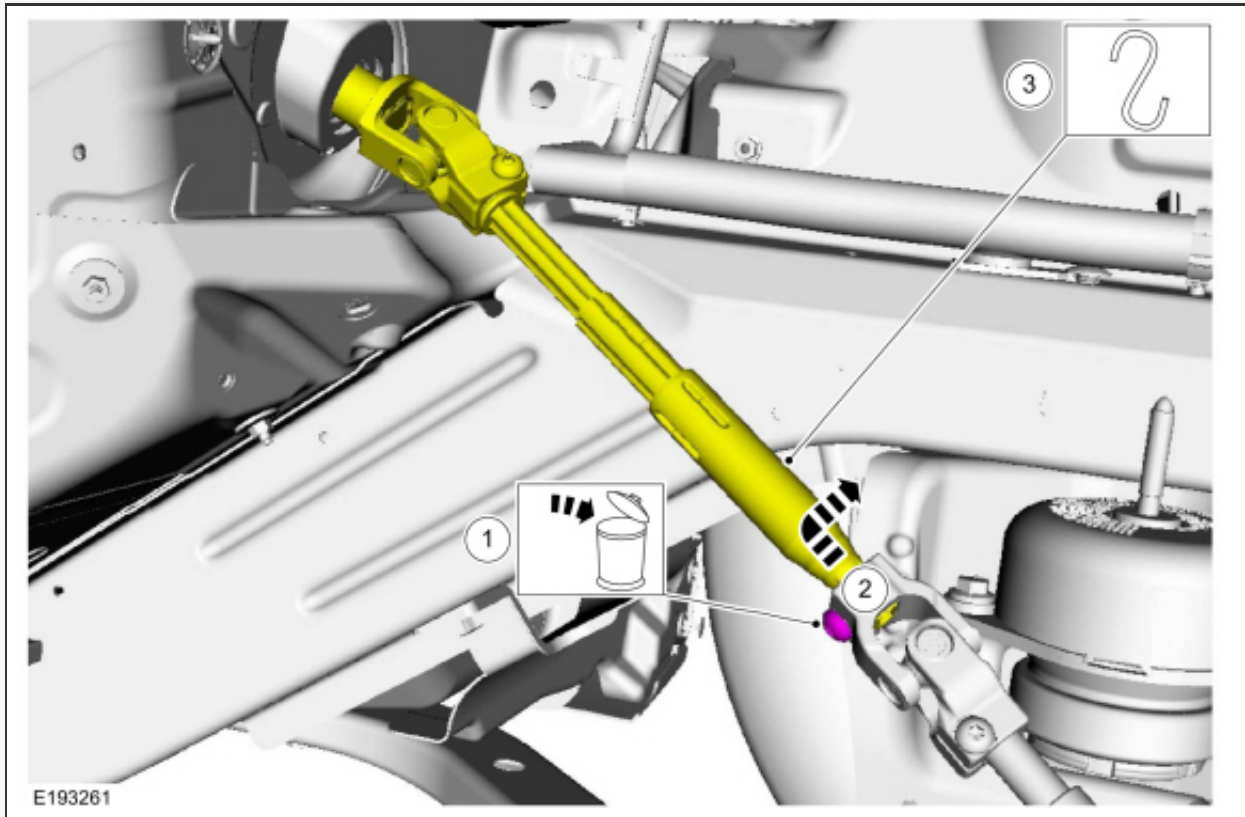
NOTICE: DO NOT hammer, pry or force steering column and column shafts during installation or removal. Failure to follow this instruction may cause damage to steering components that could lead to loss of steering control during vehicle operation and could result in serious personal injury or death.

NOTICE: DO NOT attempt to remove or install the steering column lower coupler 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.

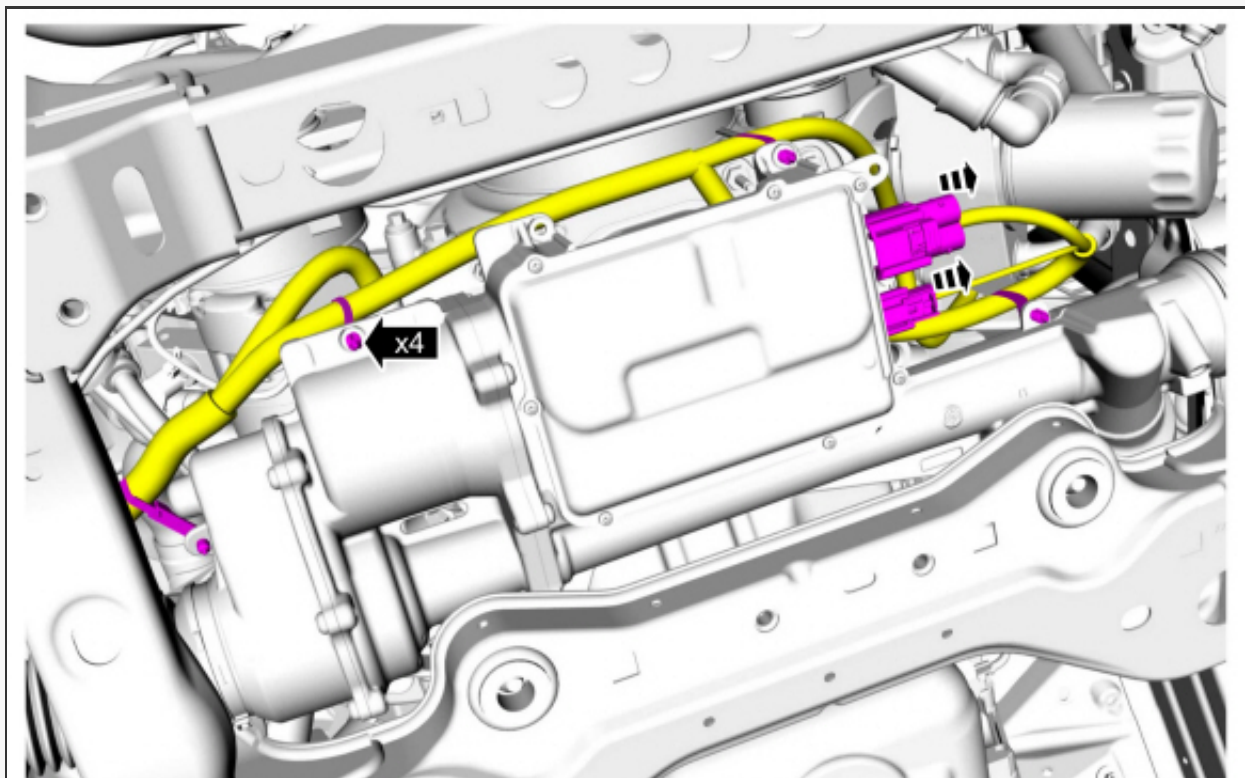
Detach the steering column lower shaft from the lower coupler

Detach the steering column lower shaft from the lower coupler.

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



11. Disconnect the 2 EPAS gear electrical connectors and unclip the 4 wiring fasteners and position the wiring harness aside.

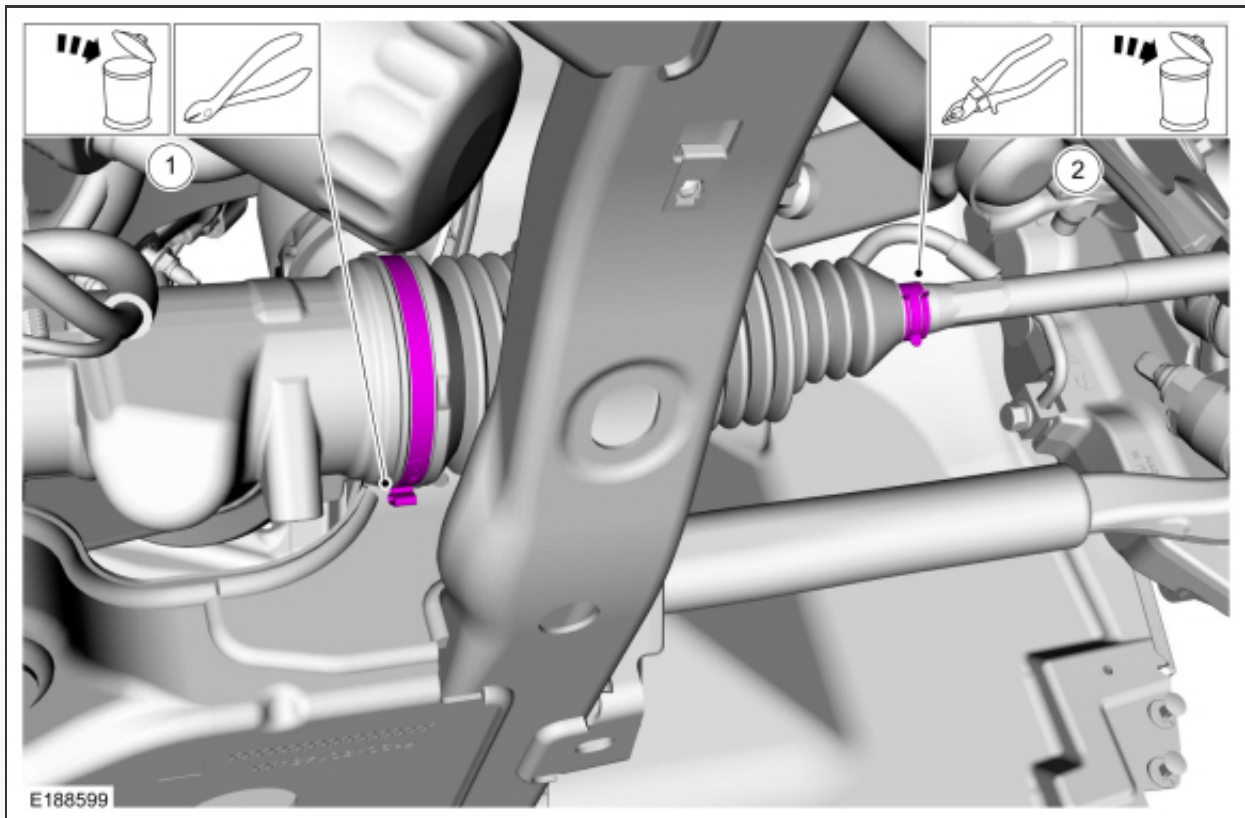




12. **NOTICE:** When servicing inner tie rods, install a new bellows boot and clamps. The boots and clamps are designed to provide an airtight seal and protect the internal components of the steering gear. If the seal is not airtight, the vacuum generated during turning will draw water and contamination into the gear, causing failure of the steering gear components. Zip ties must not be used as they do not provide an airtight seal.

NOTICE: The inner ball joint grease is not compatible with water contamination. Do not allow water to become trapped in the grease or degradation and failure of the joint may occur.

1. On both sides. Remove and discard the inner bellows boot clamp.
2. On both sides. Remove and discard the outer bellows boot clamp.

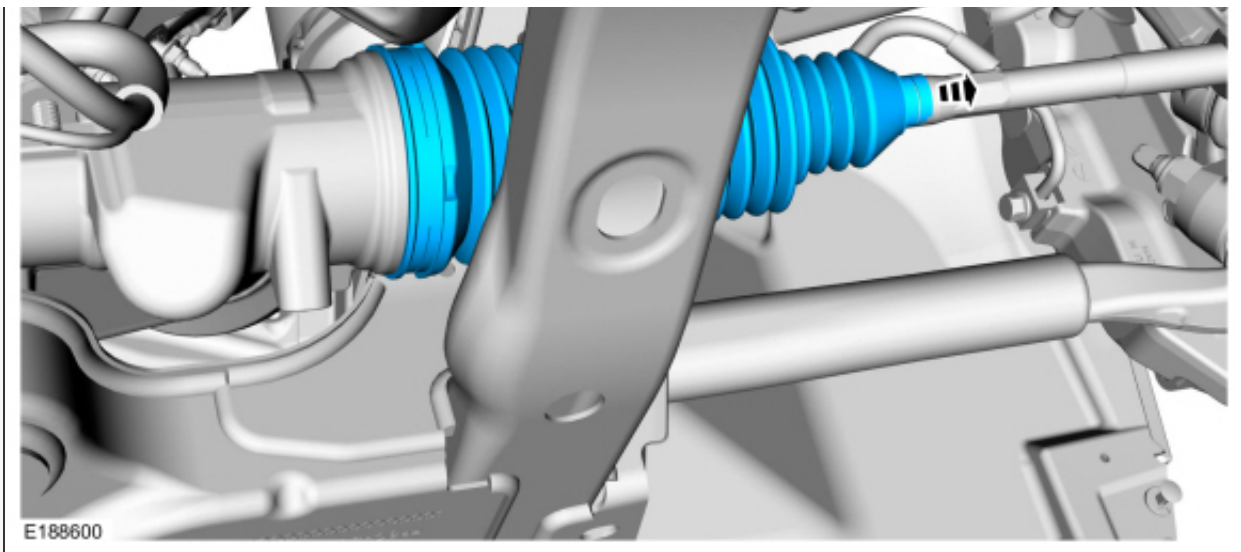


13. **NOTE:** Move the bellows boot enough to gain access to the inner tie rod nut.

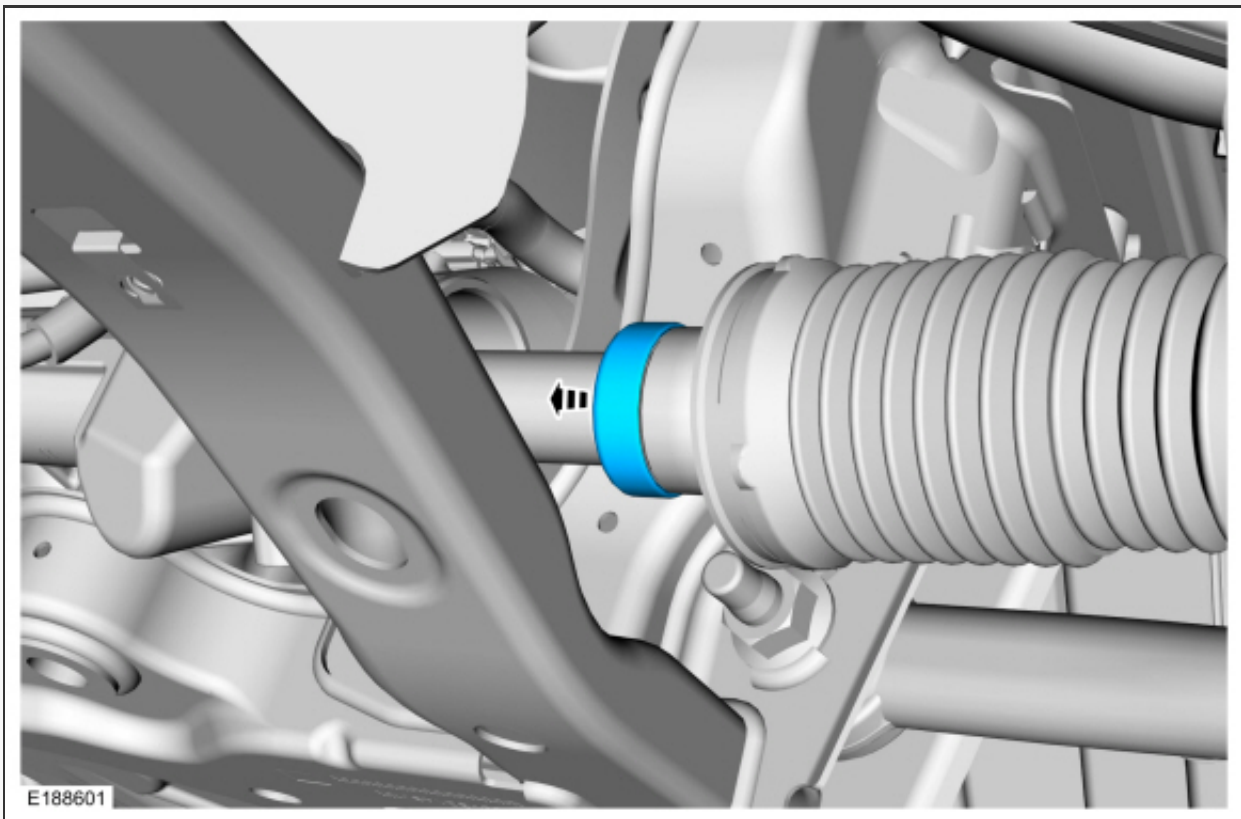
On both sides.

Position aside the bellows boot.

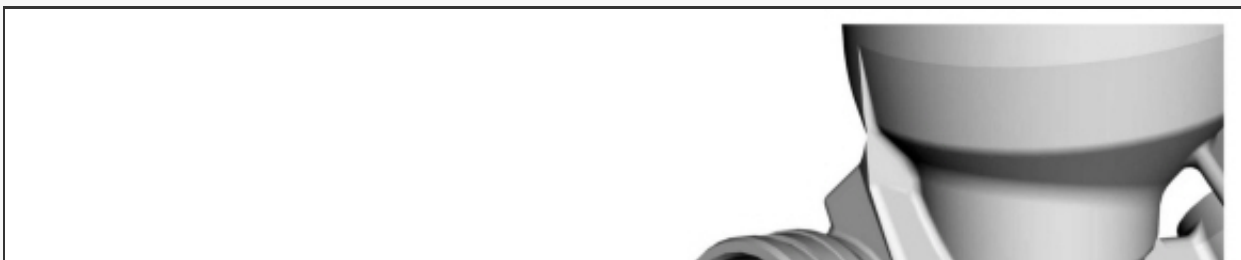


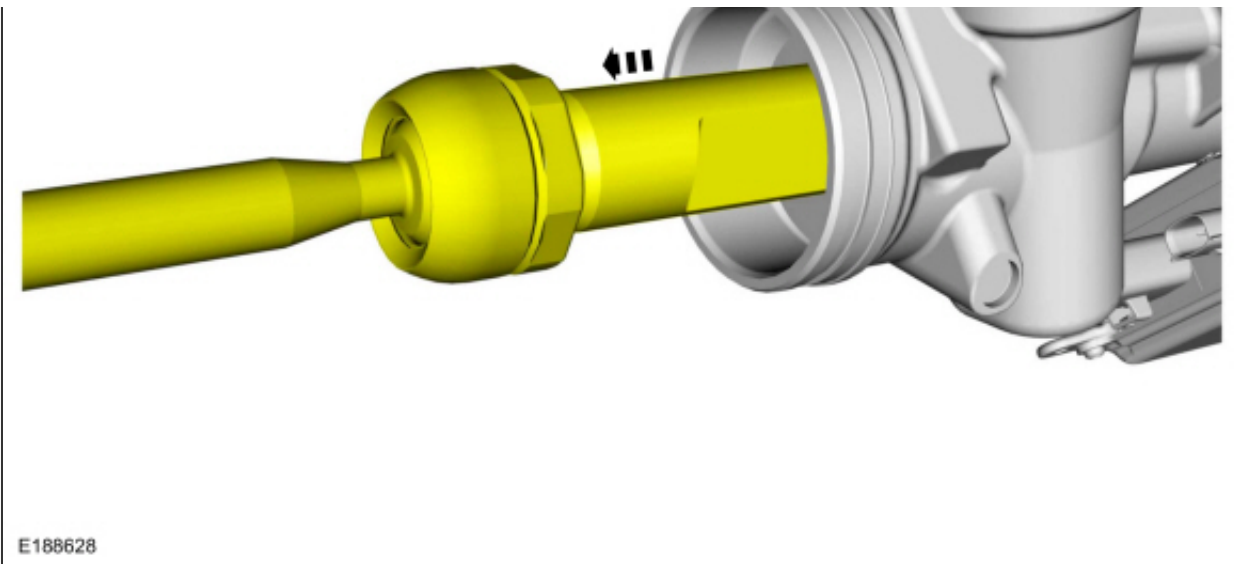


14. On both sides.
Position aside the steering stop.



15. **NOTE:** *The rack must be positioned completely to the LH side to gain clearance for tools.*
Position the steering rack completely to the LH side.





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16. **NOTICE:** Hold the steering gear rack while loosening the inner tie rod. Failure to hold the rack securely could result in steering gear damage.

NOTICE: The steering gear rack holding tool must be reversed to remove the RH tie rod or damage to the rack and/or special tool may occur.

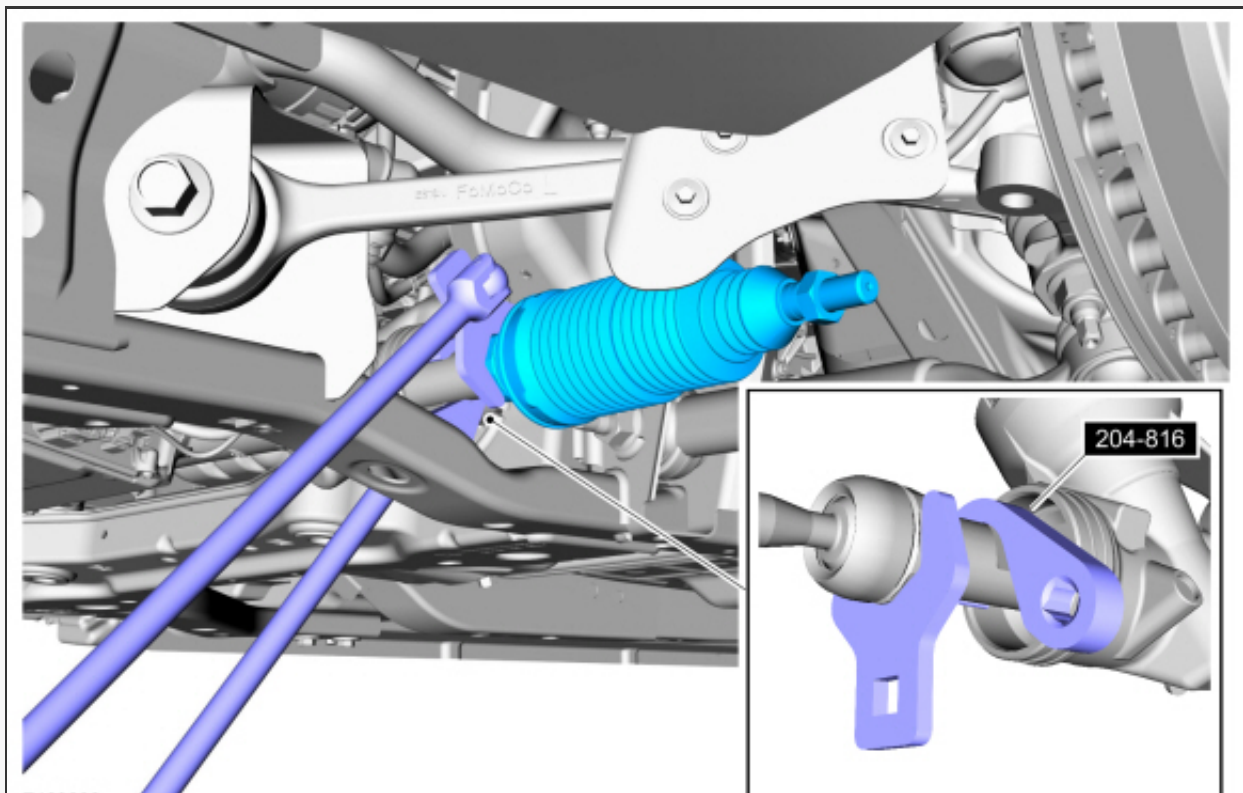
NOTE: *The holding tool can only be used on the LH side of the steering gear.*

NOTE: *LH side shown RH side similar.*

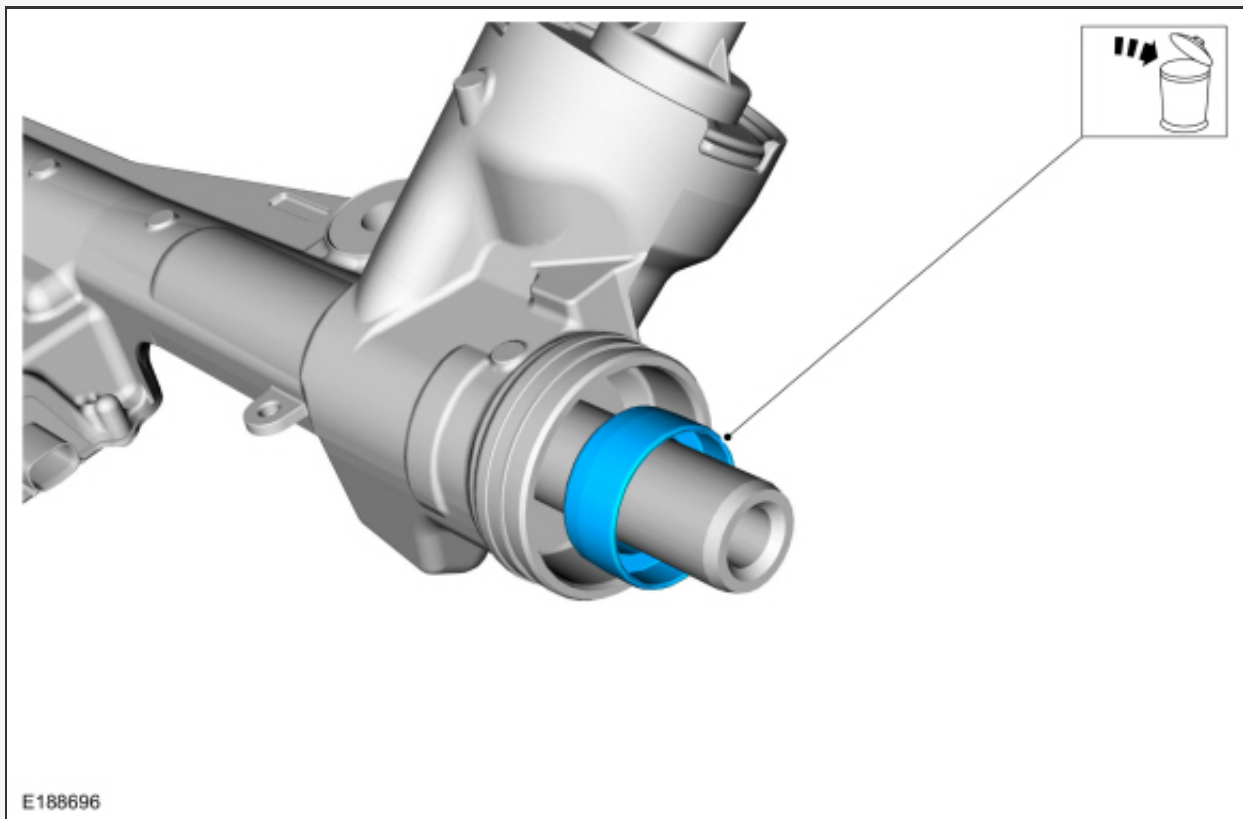
On both sides.

Using the special tool to hold the rack and an appropriate size crows foot wrench or open end wrench, remove and discard the inner tie rod.

Use Special Service Tool: [204-816 Rack Holding Tool](#).

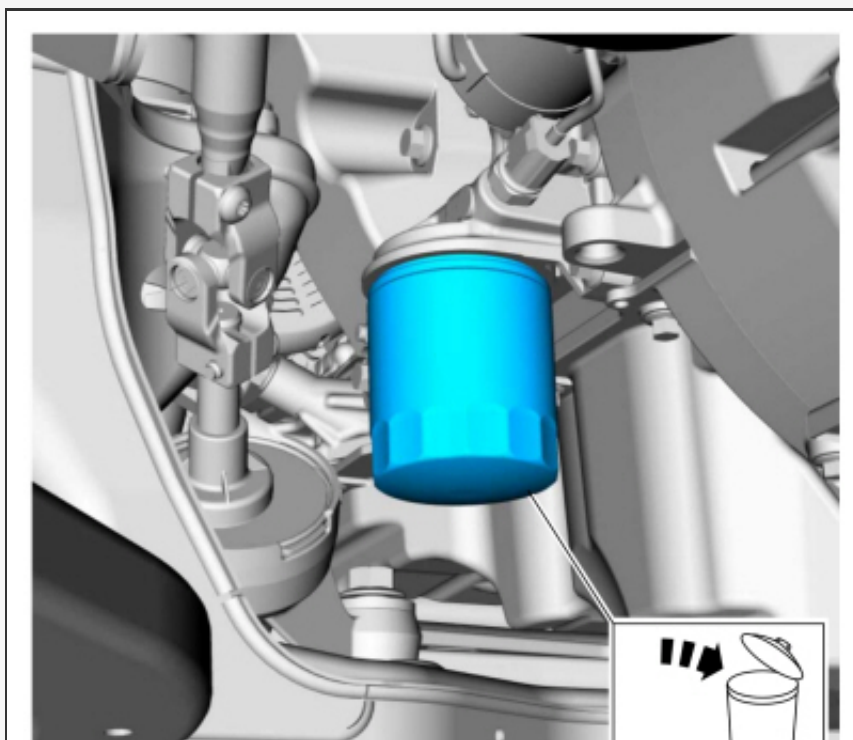


17. On both sides.
Remove and discard the steering stop.



2.3L EcoBoost (231kW/314PS)

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

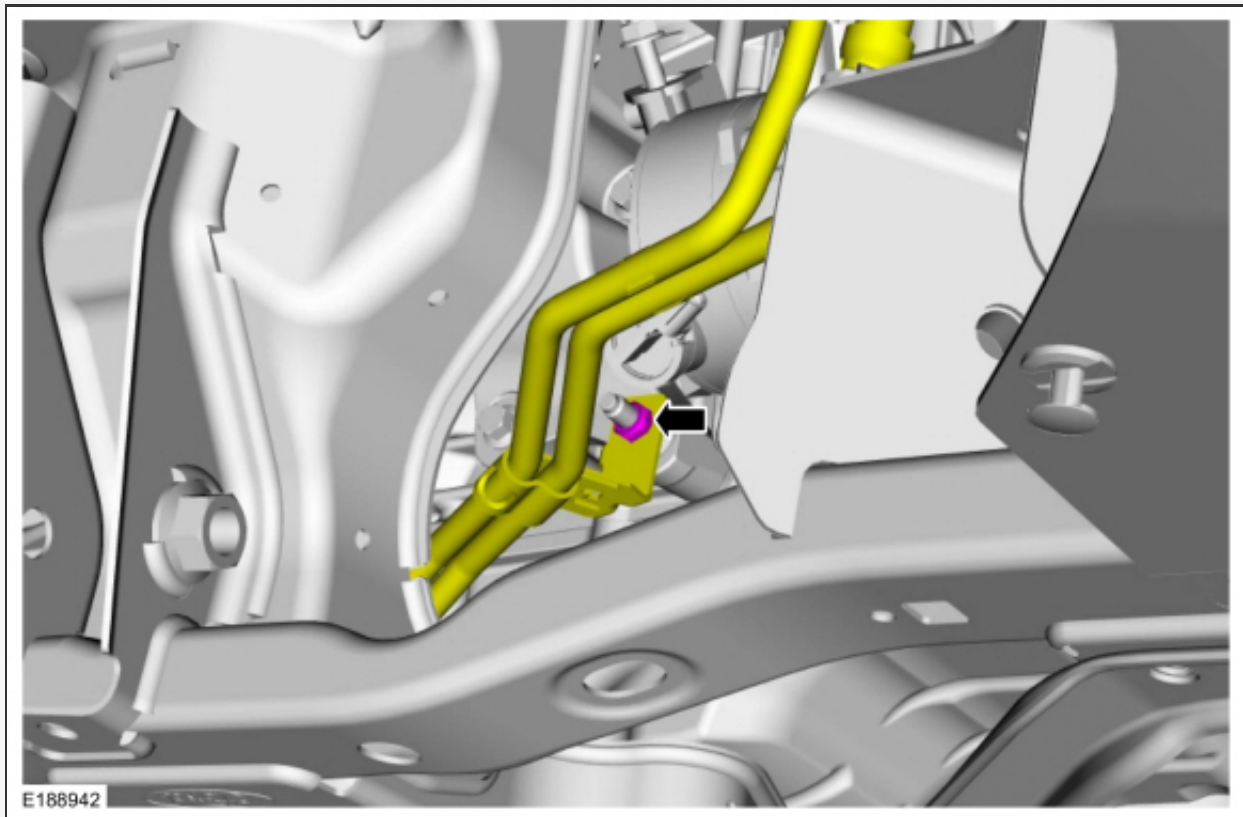


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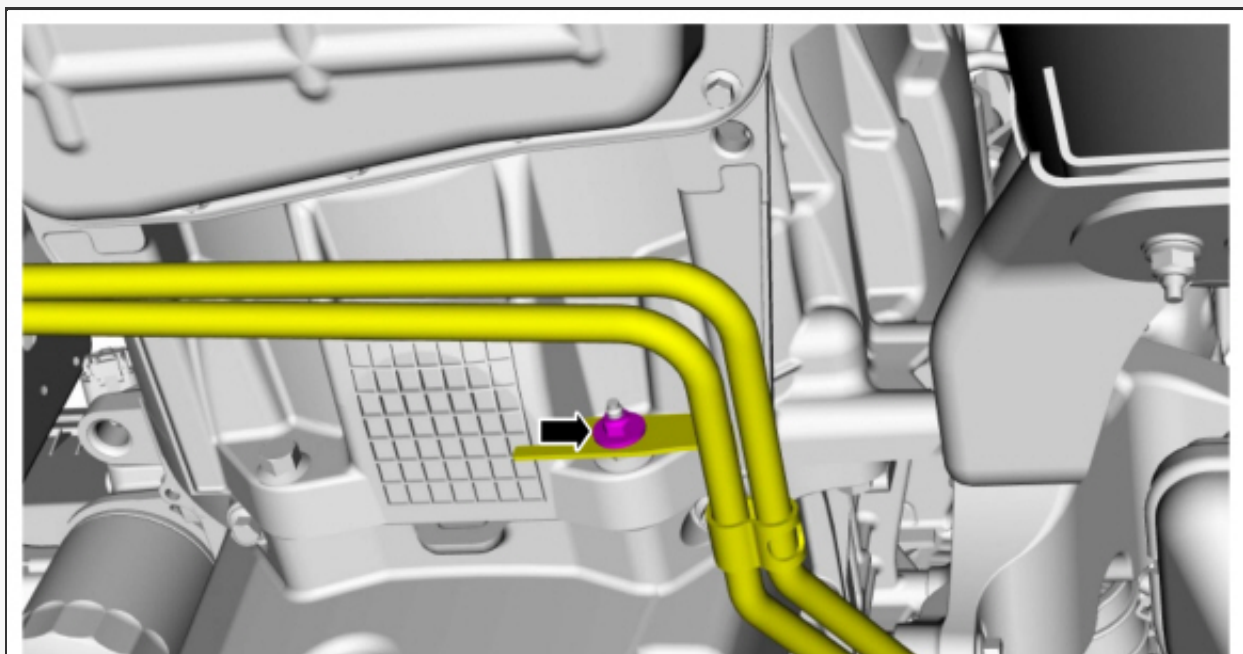
19. **NOTE:** *If equipped with 2.3L EcoBoost and automatic transmission.*

Remove the transmission fluid cooler tubes bracket-to-engine mount nut.



20. **NOTE:** *If equipped with 2.3L EcoBoost and automatic transmission.*

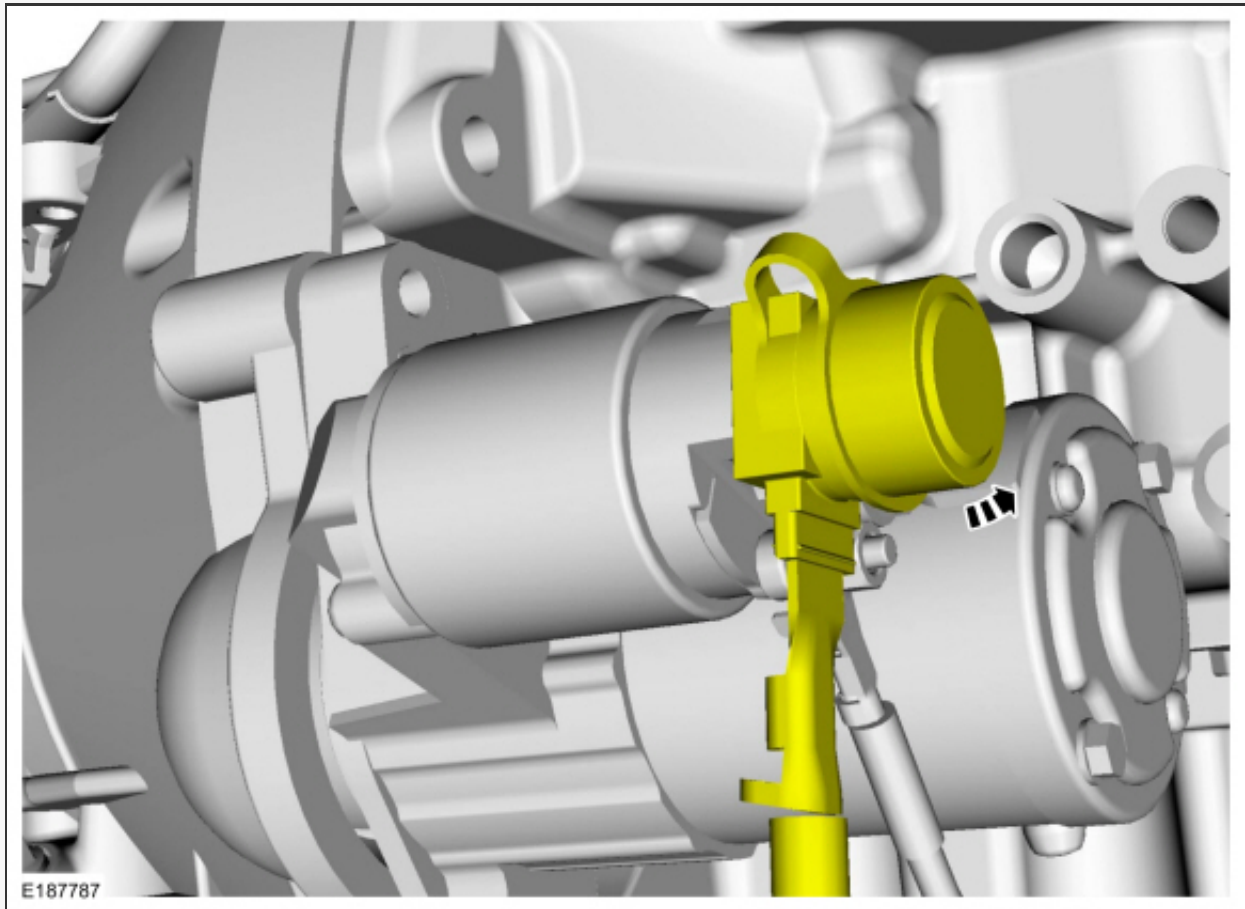
Remove the transmission fluid cooler tubes bracket-to-transmission nut and position the tubes aside.



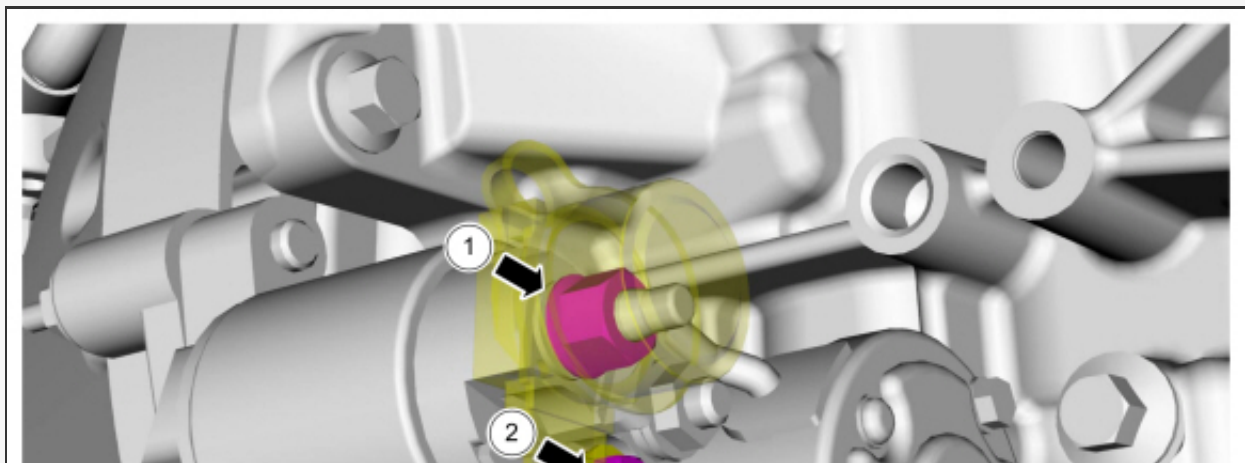


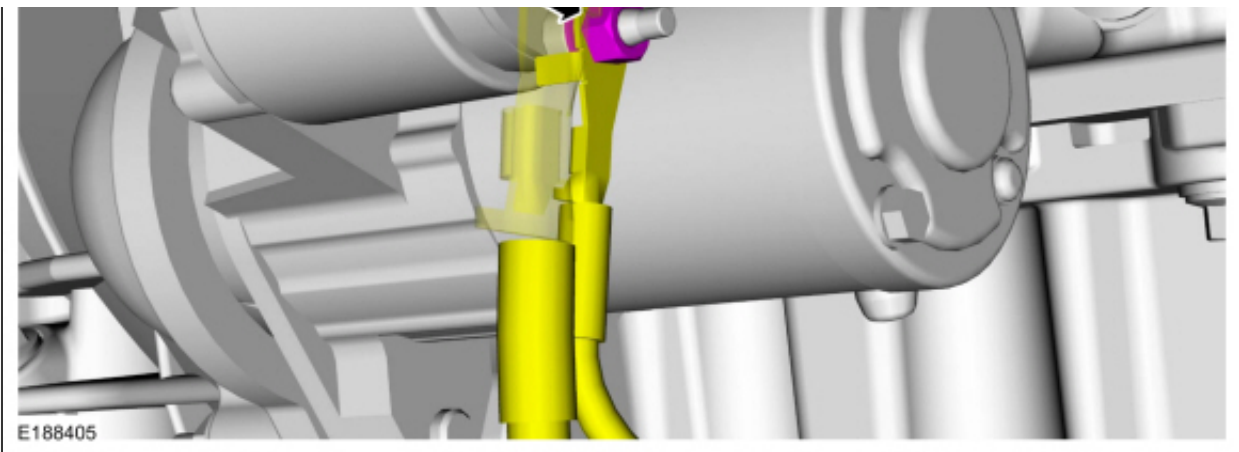
3.7L Duratec (227kW/301PS)

21. Open the starter motor solenoid battery cable cover.



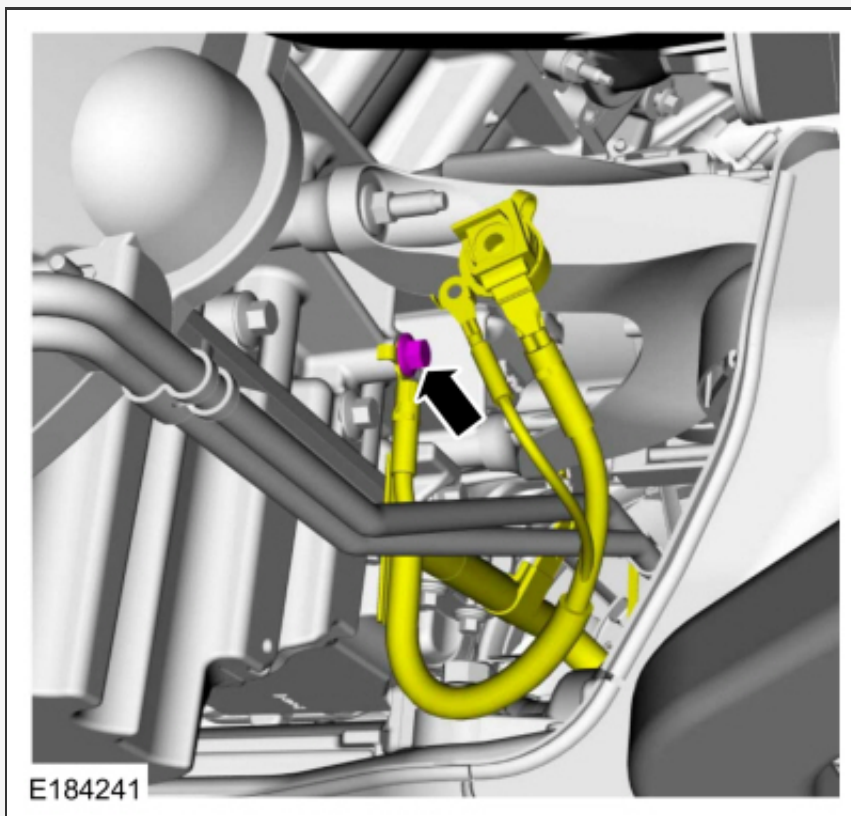
- 22.
1. Remove the starter motor solenoid battery cable nut and then disconnect the starter motor solenoid battery cable.
 2. Remove the starter motor solenoid wire nut and then disconnect starter motor solenoid wire.





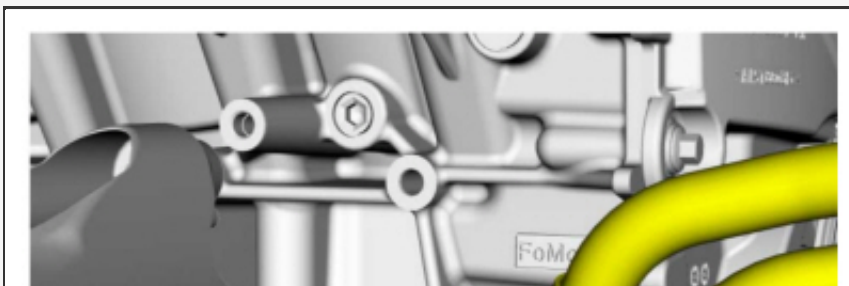
23. **NOTE:** Automatic transmission shown, manual transmission similar.

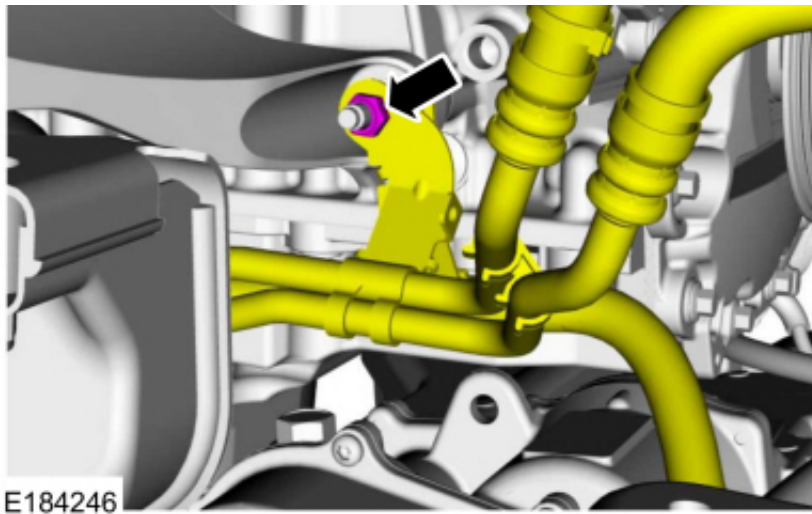
Remove the bolt and ground wire from the RH side of the engine.



6-Speed Automatic Transmission - 6R80

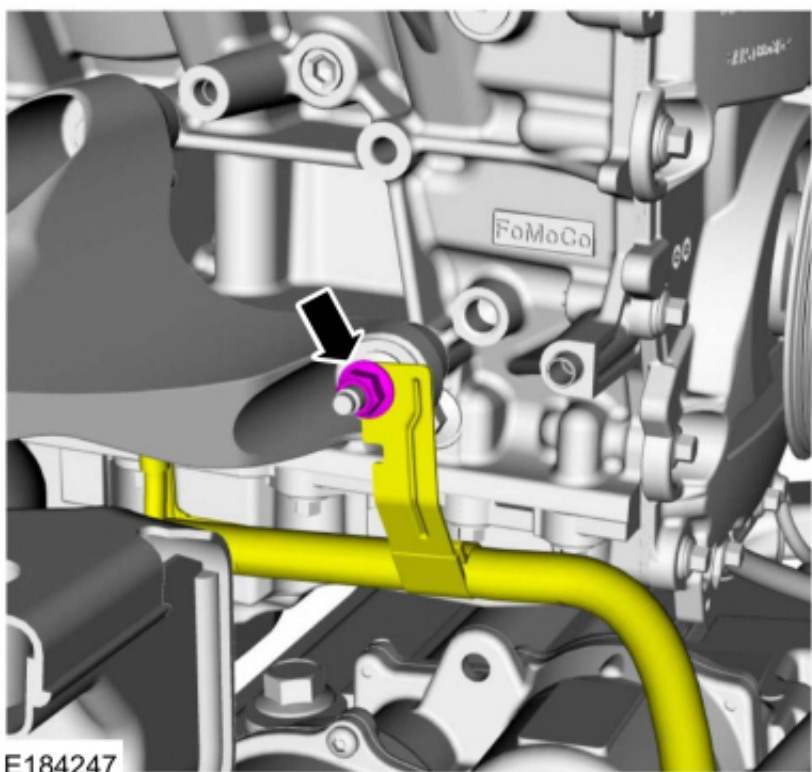
24. Remove the nut from the front of the RH engine mount bracket stud bolt and position the brackets for the transmission cooling tubes and wire harness aside.





6-Speed Manual Transmission - MT82

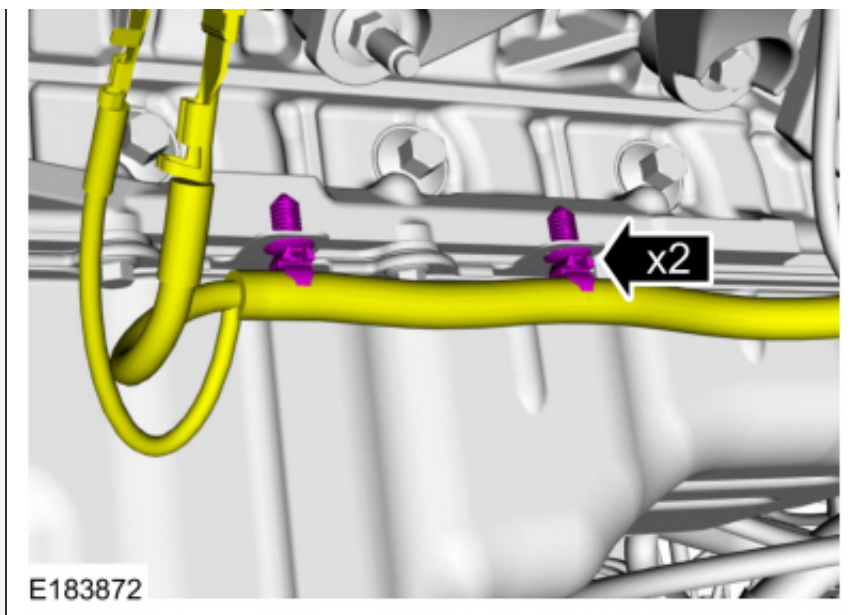
25. Remove the nut from the front of the RH engine mount bracket stud bolt and position the bracket for the wire harness aside.



5.0L 32V Ti-VCT/5.2L 32V Ti-VCT

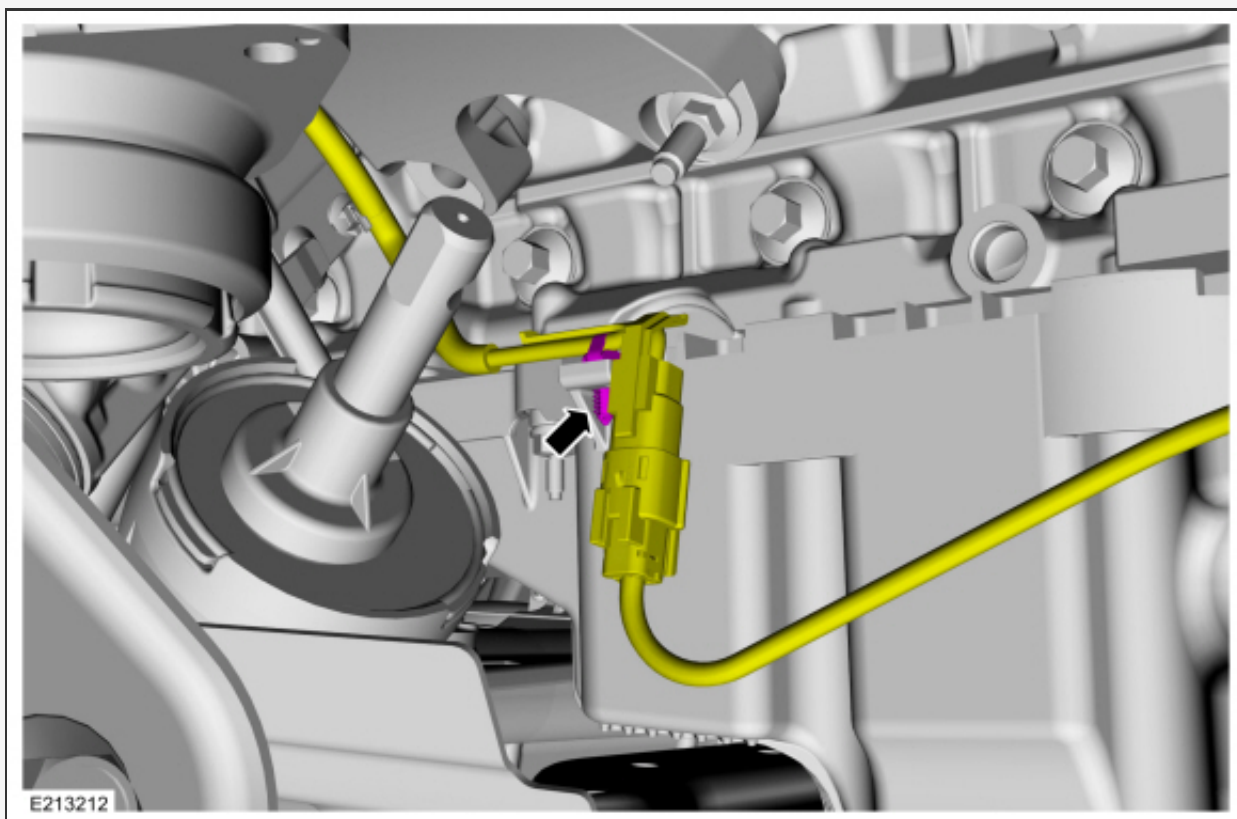
26. Detach the wire harness retainers from the oil pan.





5.2L 32V Ti-VCT

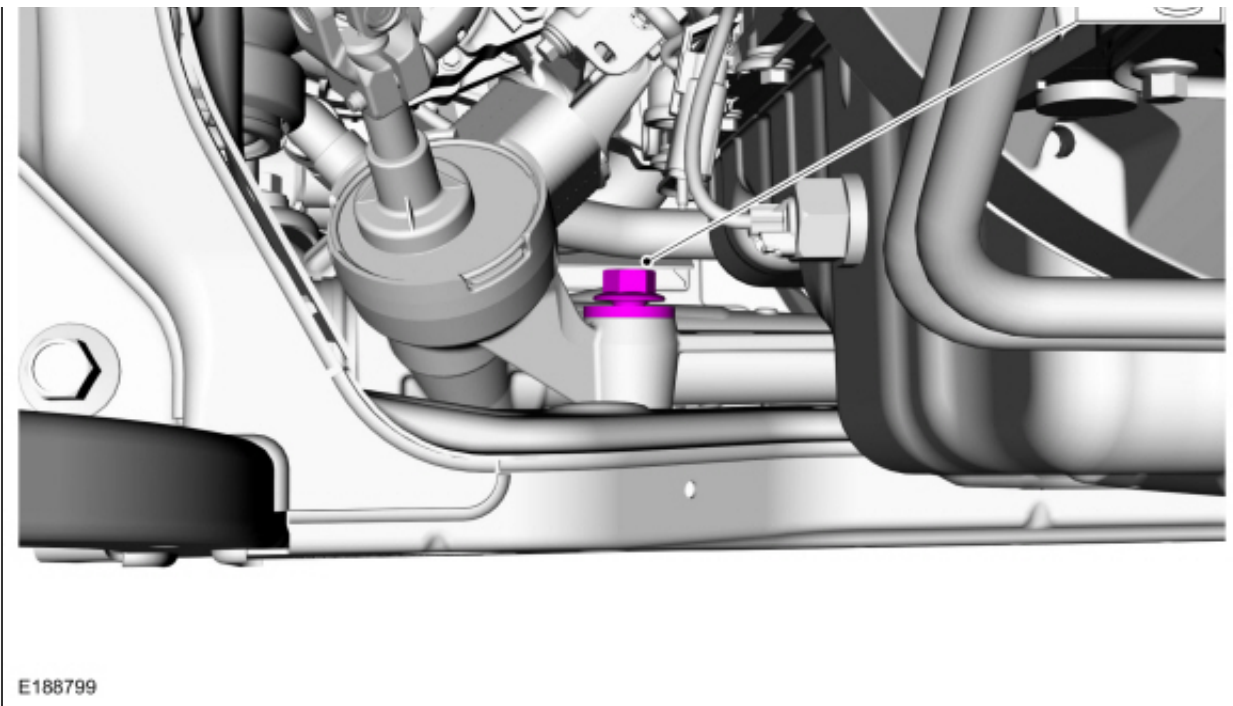
27. Detach the O2 sensor wire harness retainer from the oil pan and position the harness aside.



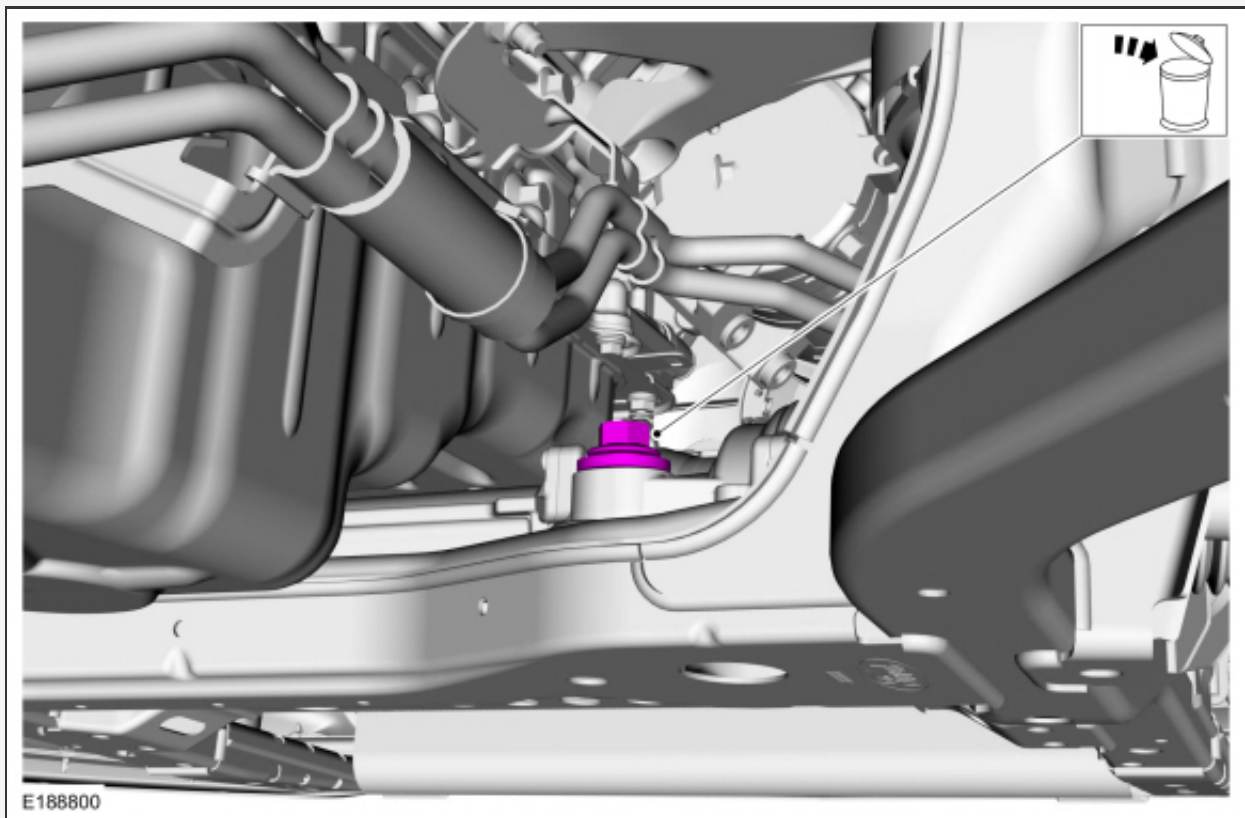
All vehicles

28. Remove and discard the LH steering gear bolt.



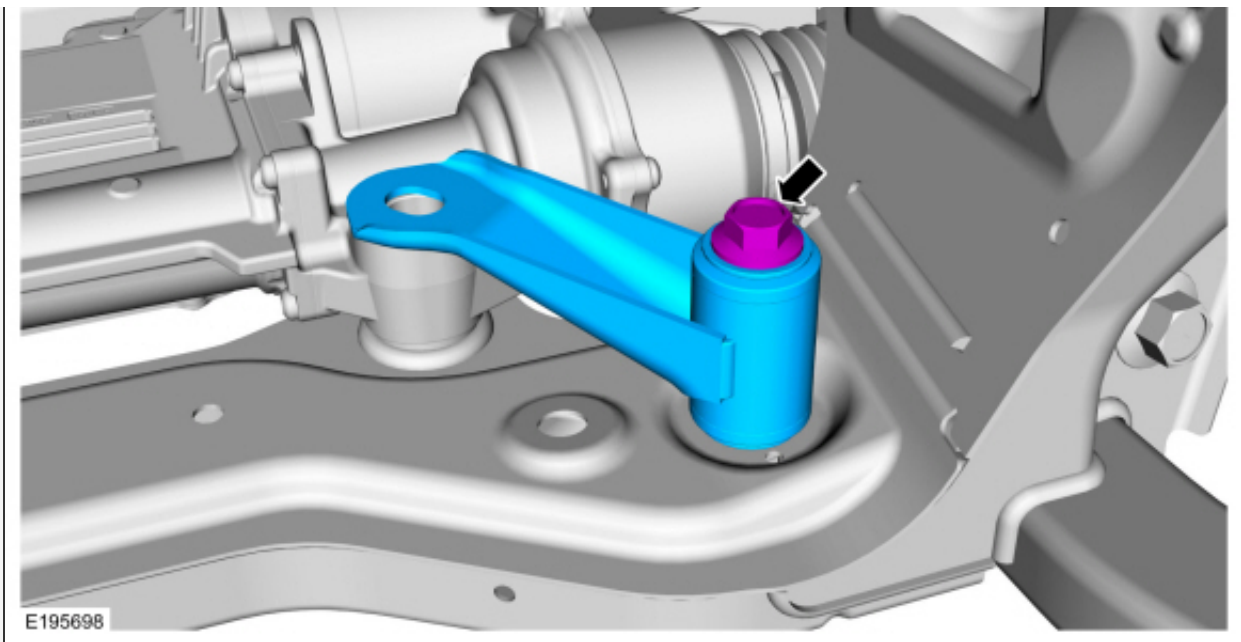


29. Remove and discard the RH steering gear bolt.



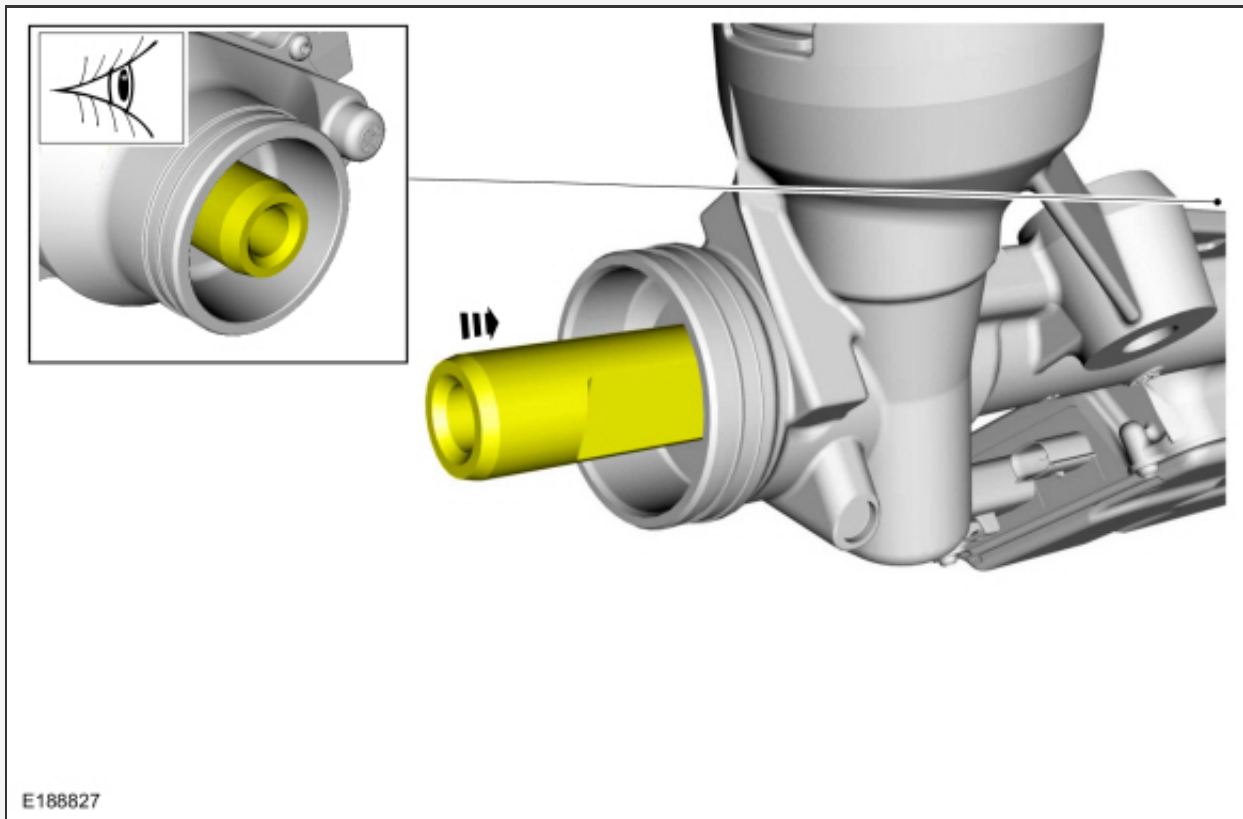
30. On convertible vehicles. If equipped.
Remove the steering gear bracket bolt and the steering gear bracket.





31. **NOTE:** *The steering gear rack must be positioned so that the end of the rack is flush with the RH side of the steering gear case to gain clearance for removal.*

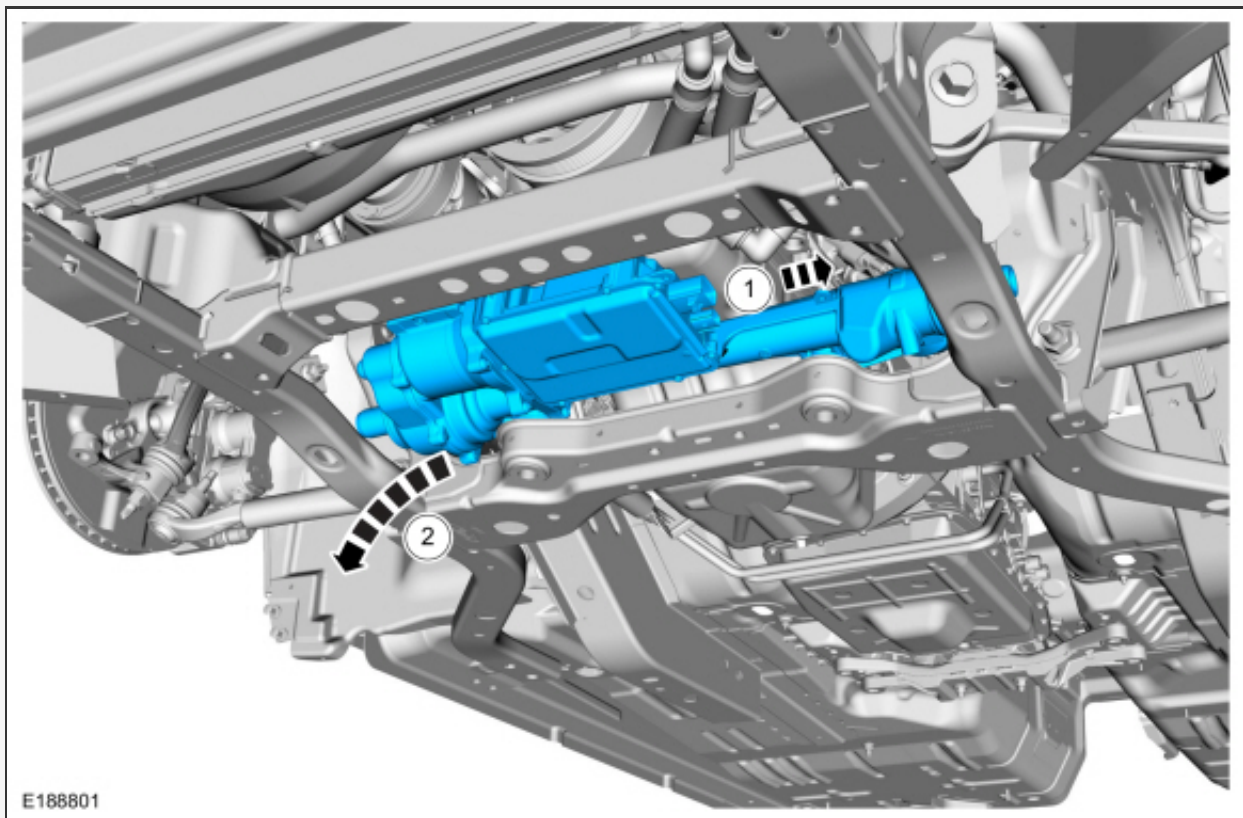
Position the steering gear rack so the end of the rack is flush with the RH side of the steering gear case.



32. **NOTE:** *It will be necessary to slide the steering gear to the LH side of the vehicle, then rotate and remove by lowering the RH side of the steering gear in order to remove it from the vehicle.*

Remove the steering gear.

1. Slide the steering gear to the LH side of the vehicle.
2. Lower the RH side of the steering gear and remove it from the vehicle.



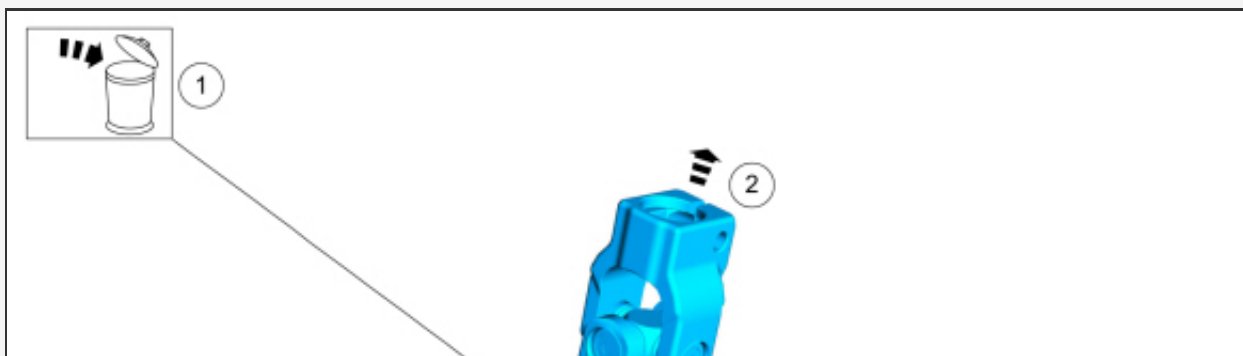
33. **NOTE:** *This step is only necessary when installing a new component.*

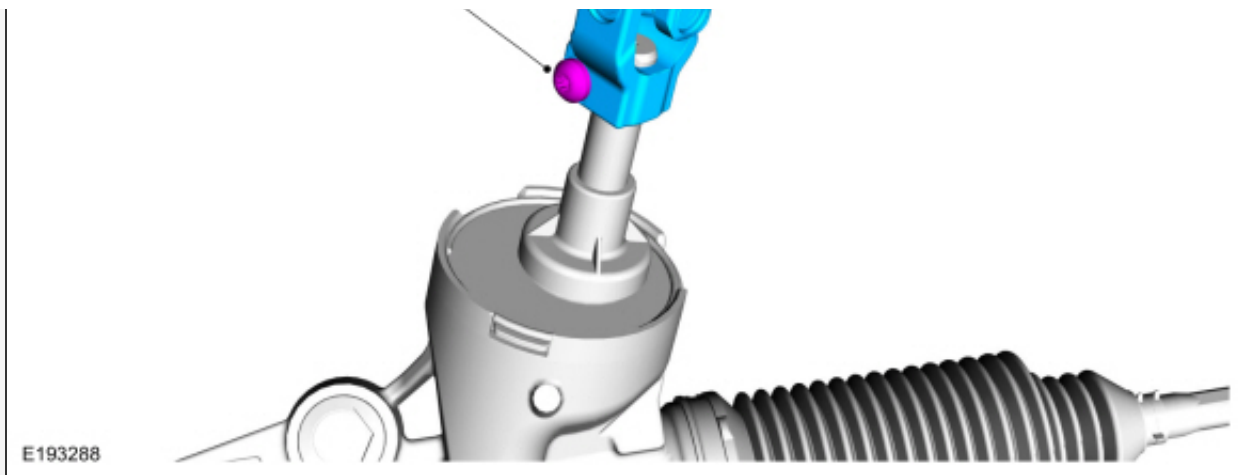
1. **⚠️ WARNING:** Do not reuse steering column shaft bolts. This may result in fastener failure and steering column shaft detachment or loss of steering control. Failure to follow this instruction may result in serious injury to vehicle occupant(s).

NOTICE: DO NOT attempt to remove or install the steering column lower coupler 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.

Remove and discard the steering coupler bolt.

2. Remove the steering coupler.



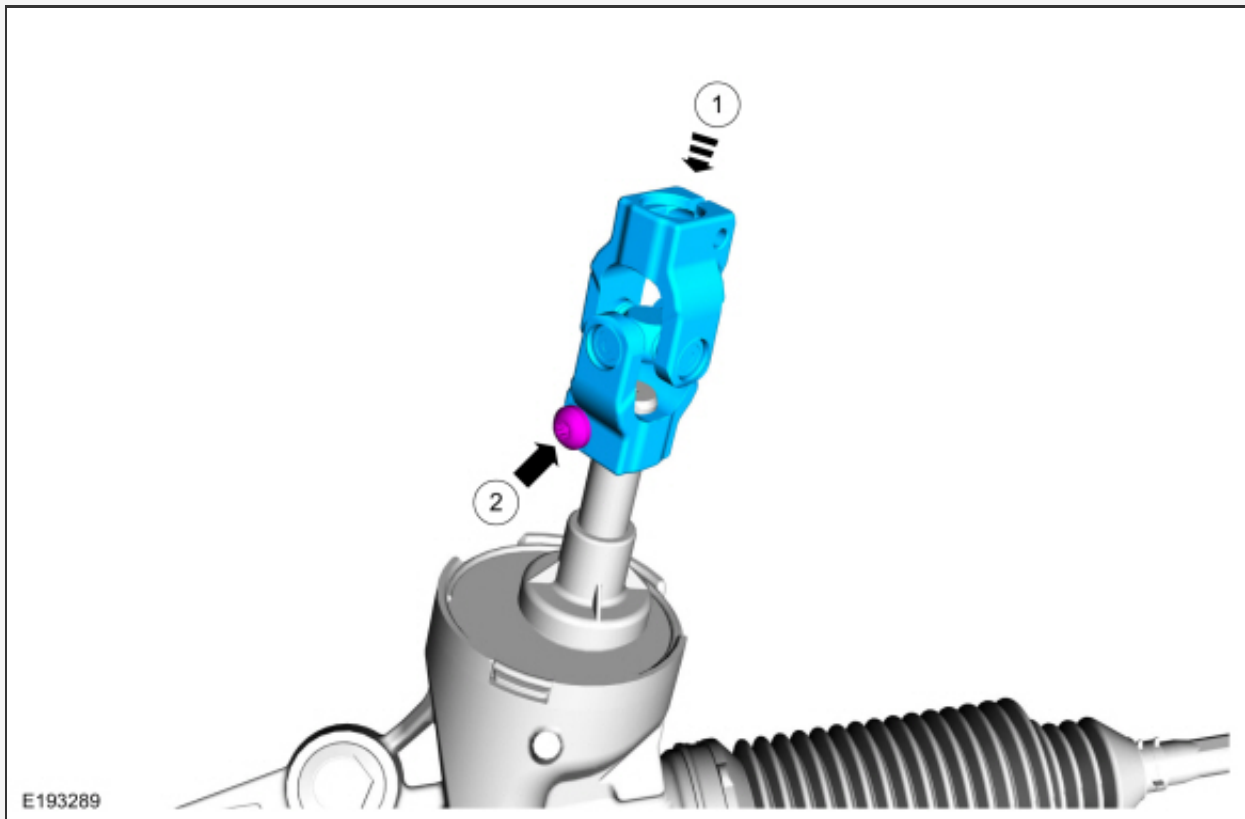


Installation

All vehicles

1. **NOTE:** *This step is only necessary when installing a new component.*

1. Install the steering coupler
2. Install the new steering coupler bolt.
Torque: 22 lb.ft (30 Nm)



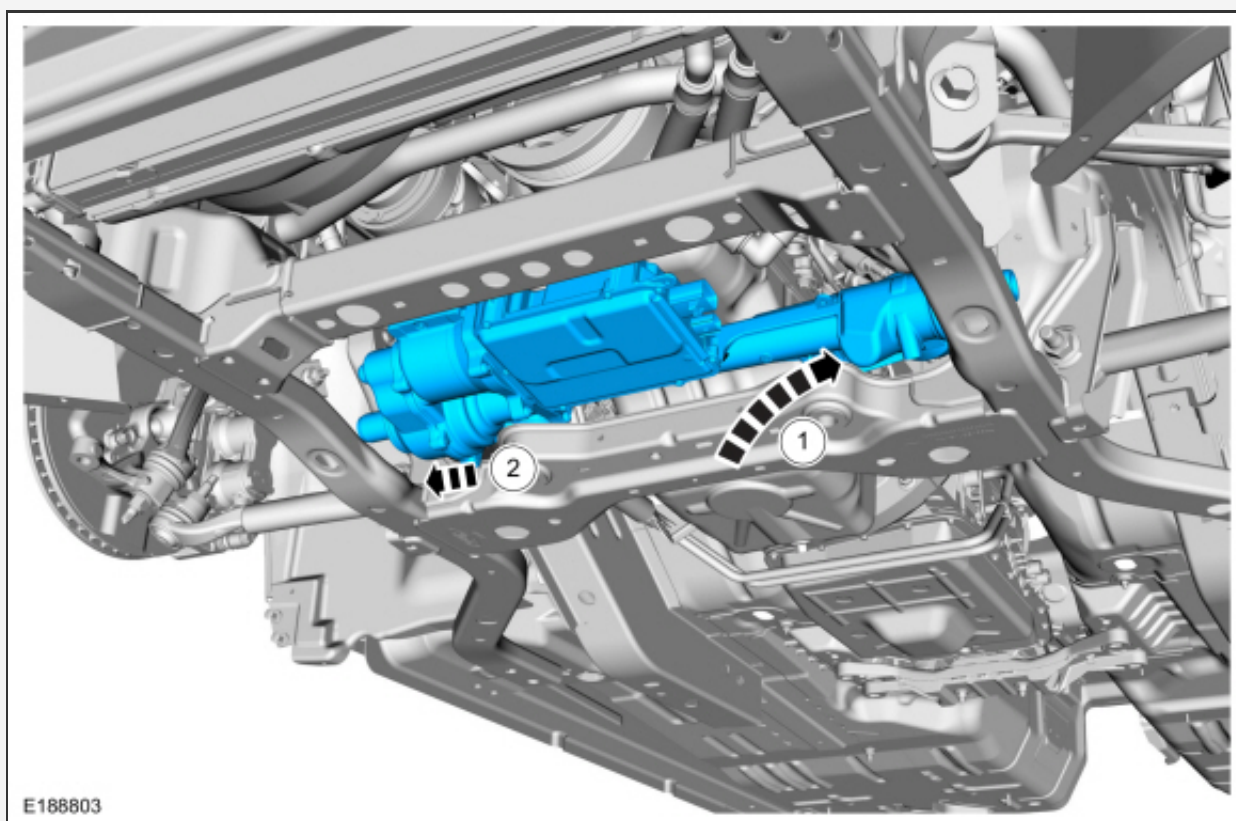
NOTE: *The steering gear is shipped without the inner tie rods attached. The inner tie rods, bellows boots, bellows boot clamps and tie rod end jamb nuts are supplied in a kit and are to be installed after the steering gear is installed into the vehicle.*

2. **NOTE:** *It will be necessary to raise the LH side of the steering gear and slide it to the LH side of the vehicle, then rotate and raise the RH side of the steering gear in order to install*

side of the vehicle, then rotate and raise the RH side of the steering gear in order to install it into the vehicle.

Install the steering gear.

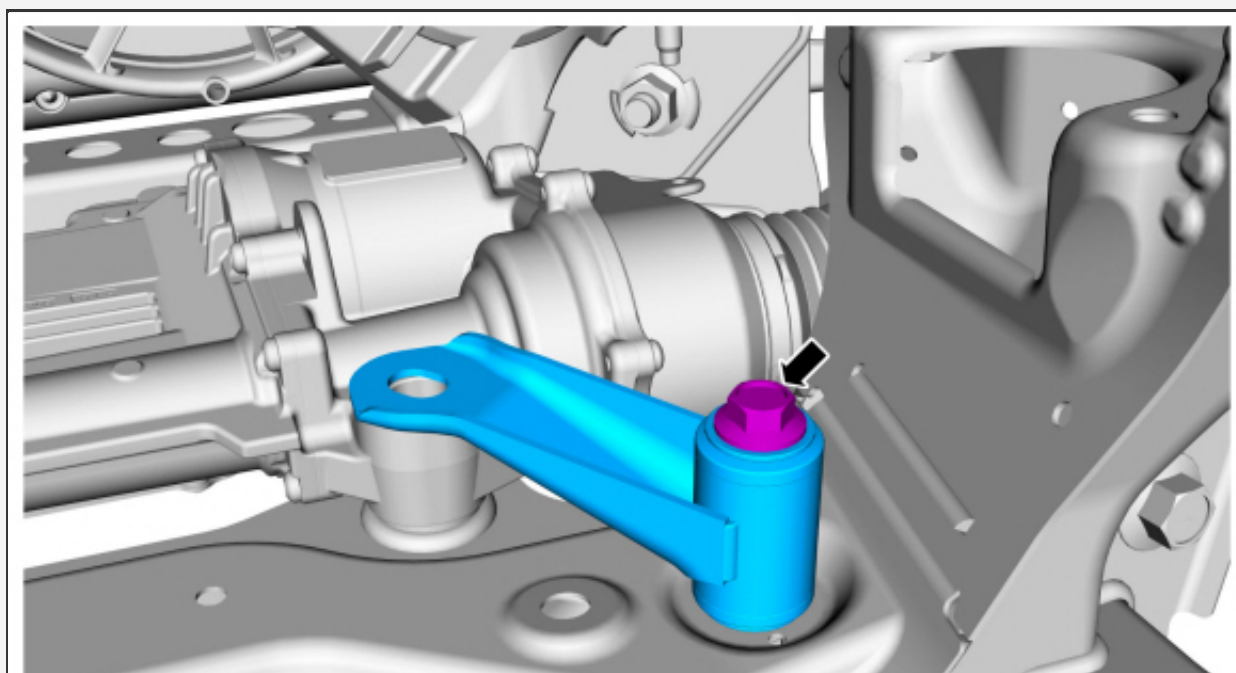
1. Lift the LH side of the steering gear and slide it to the LH side of the vehicle.
2. Raise the RH side of the steering gear and slide it to the RH side of the vehicle.

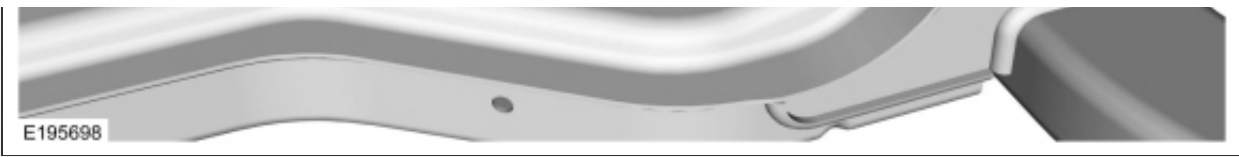


3. **NOTE:** Only tighten the bolt finger tight at this stage.

On convertible vehicles. If equipped.

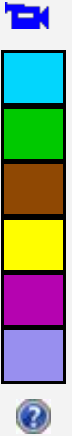
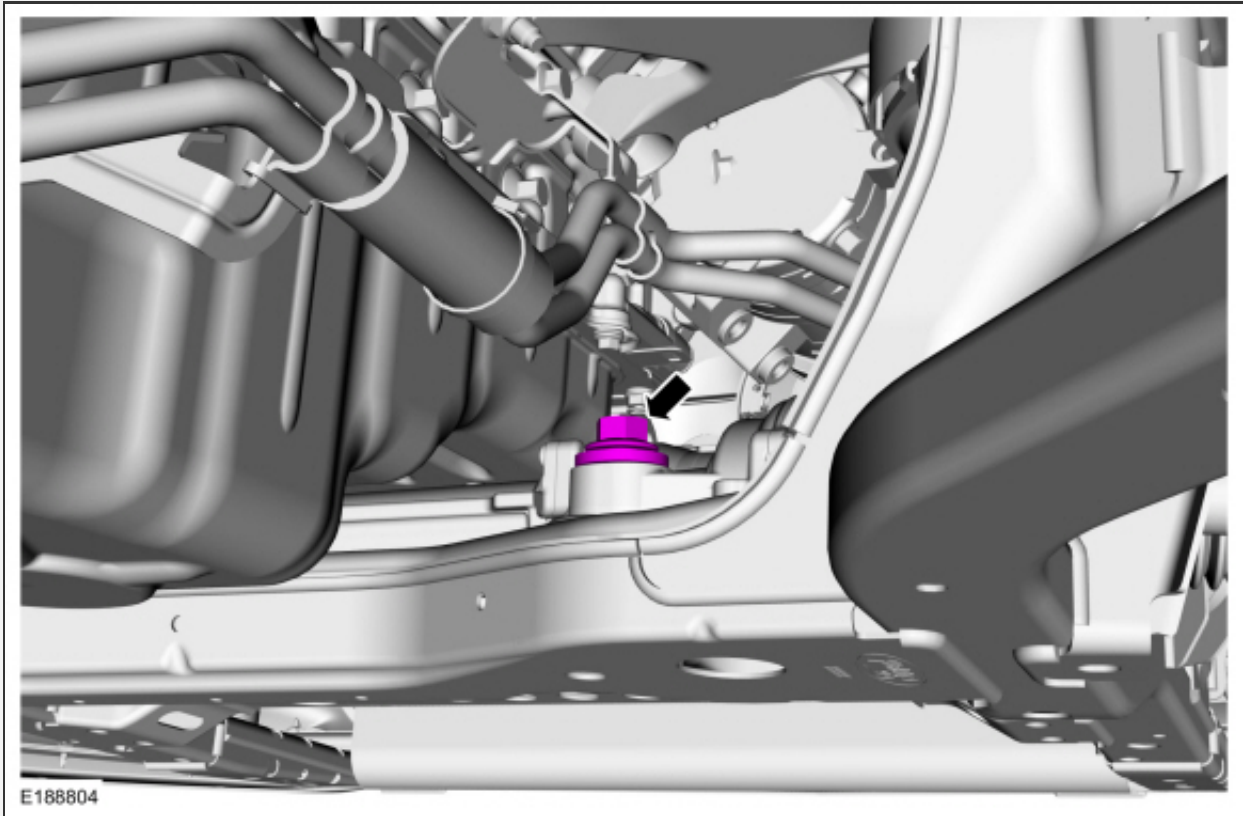
Install the steering gear bracket and the steering gear bracket bolt.





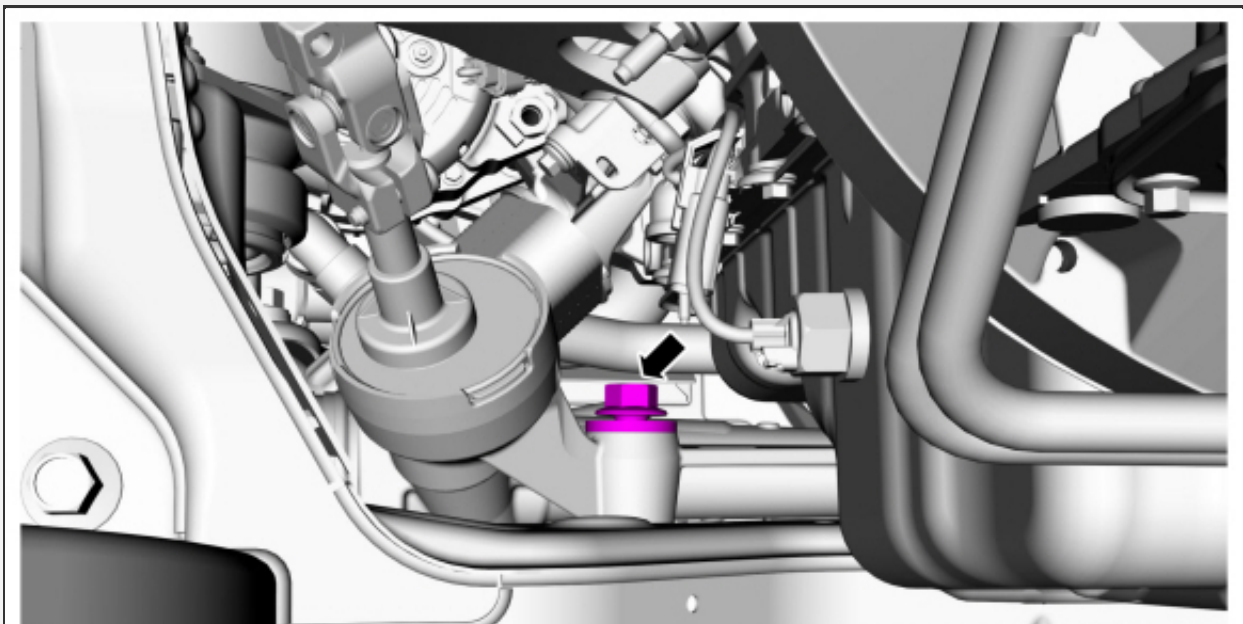
4. **NOTE:** *Only tighten the bolt finger tight at this stage.*

Install the new RH steering gear bolt.



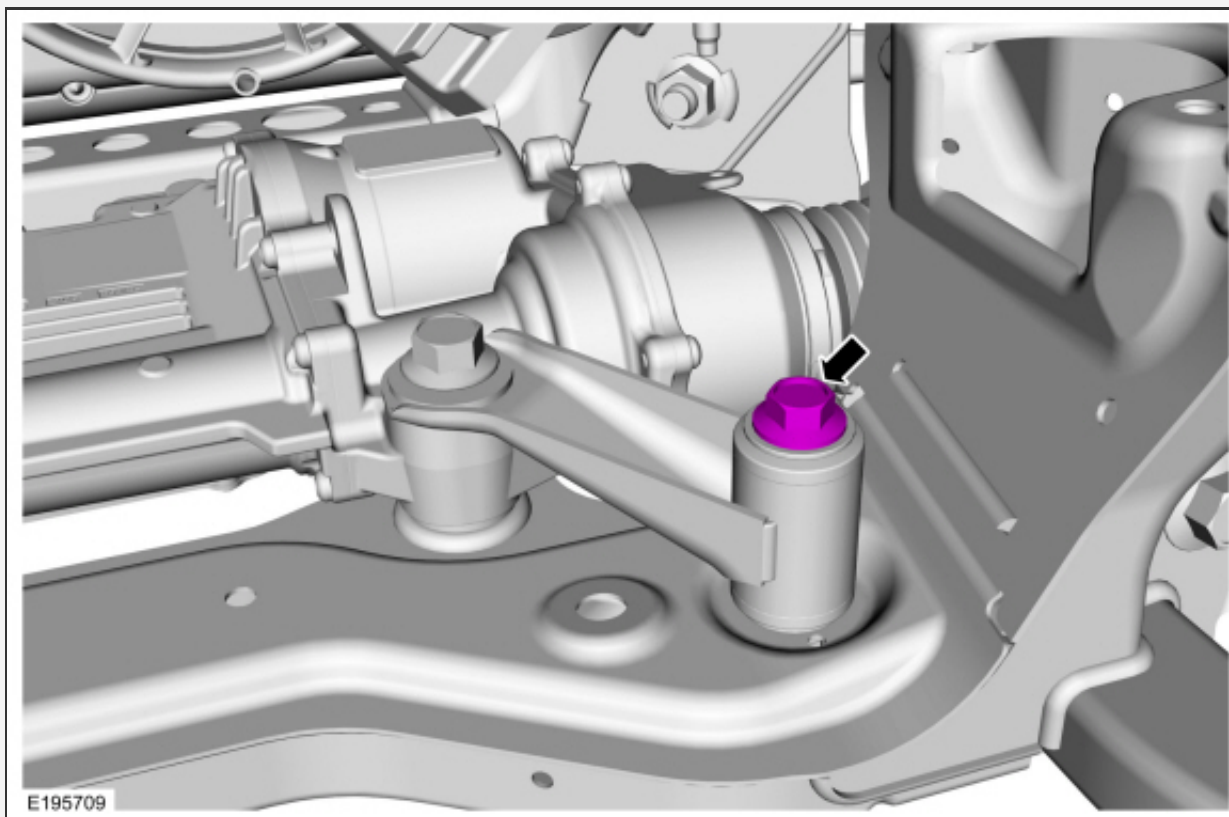
5. **NOTE:** *Only tighten the bolt finger tight at this stage.*

Install the new LH steering gear bolt.

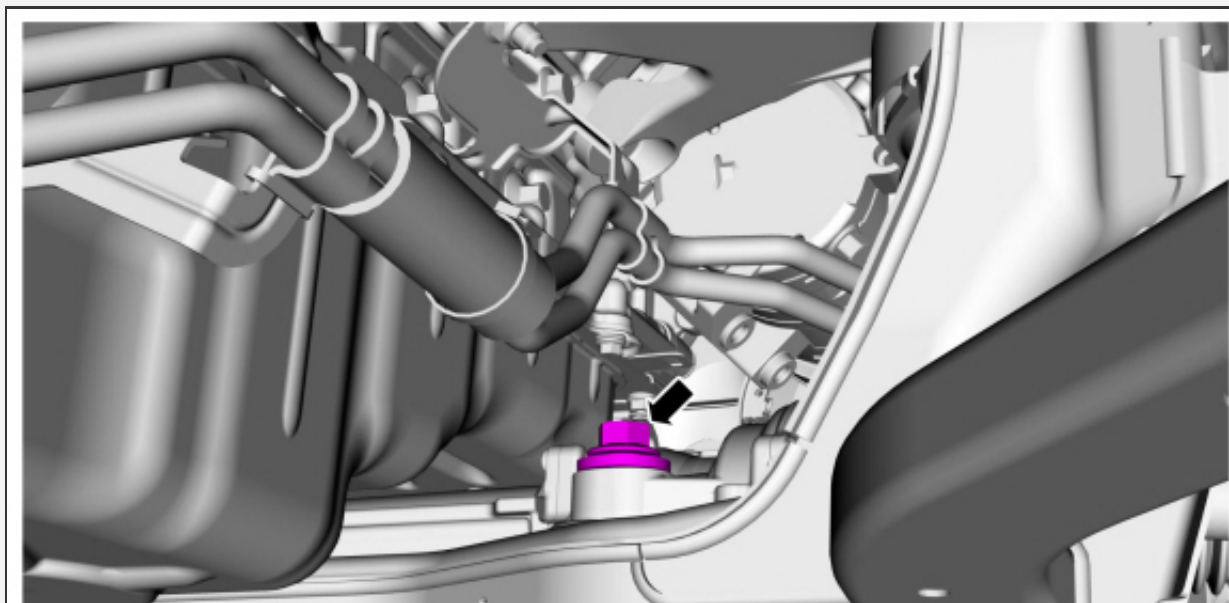




6. On convertible vehicles. If equipped.
Tighten the steering gear bracket bolt.
Torque: 85 lb.ft (115 Nm)

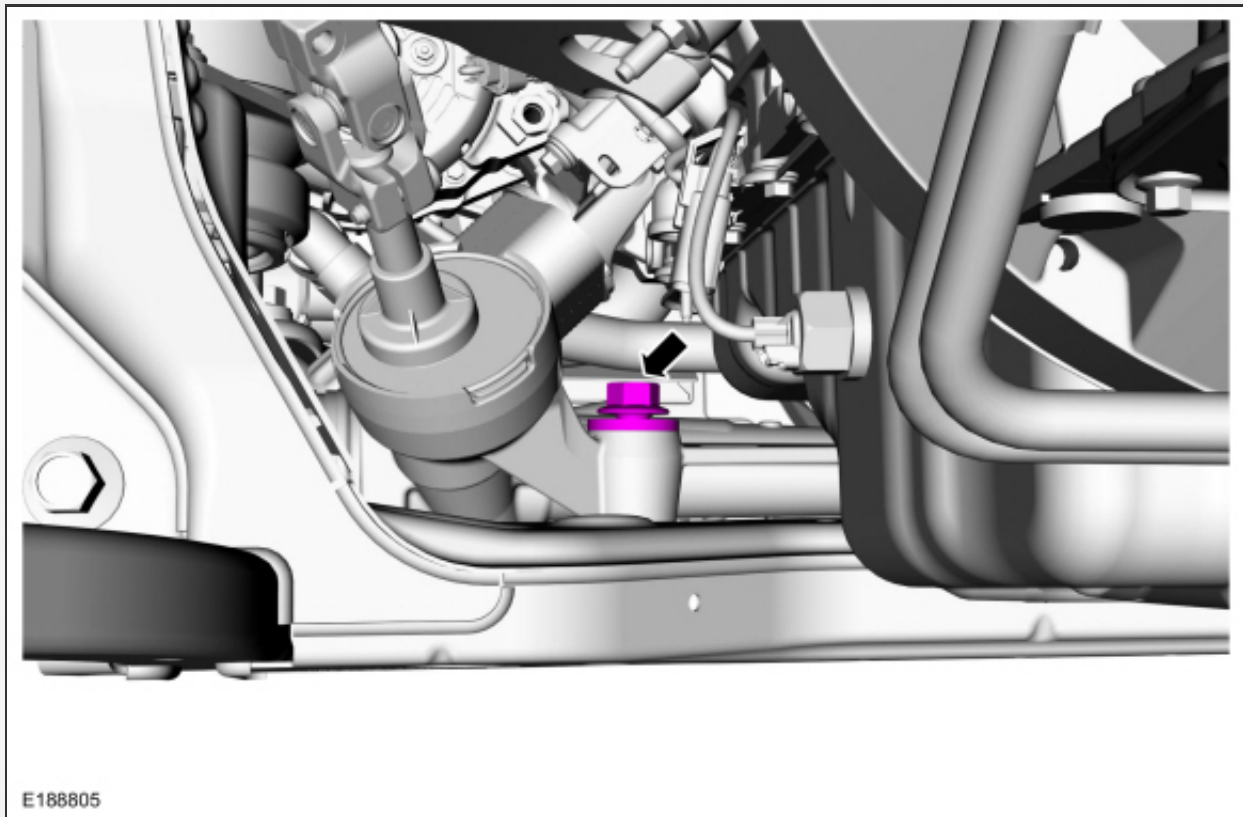


7. Tighten the new RH steering gear bolt.
Torque: 148 lb.ft (200 Nm)



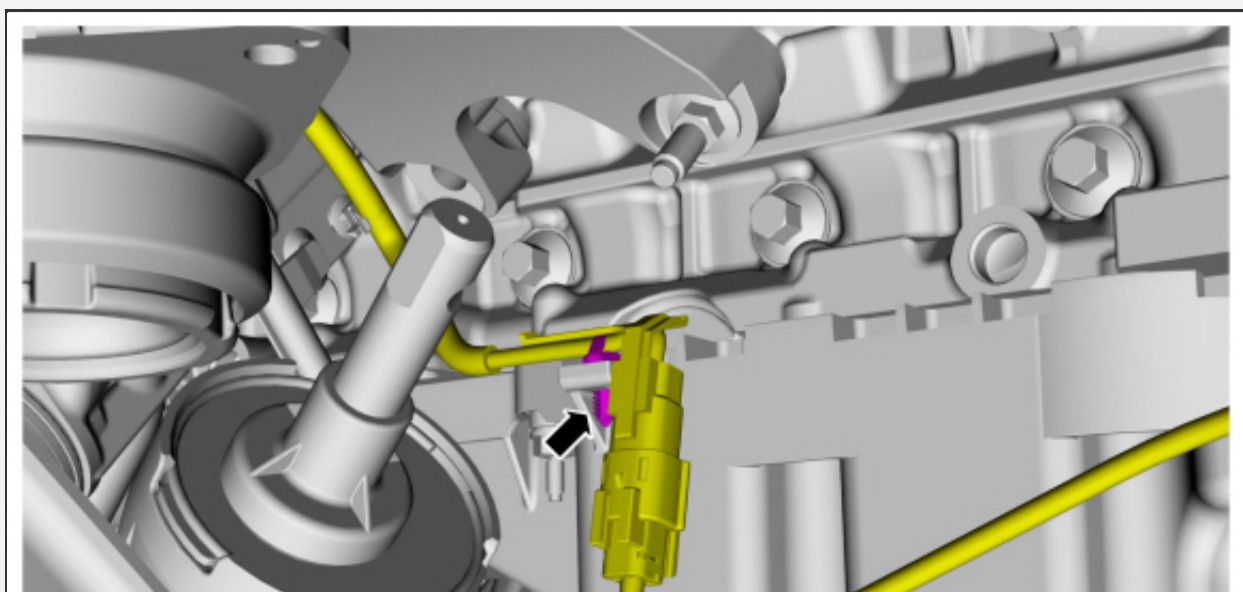


8. Tighten the new LH steering gear bolt.
Torque: 148 lb.ft (200 Nm)



5.2L 32V Ti-VCT

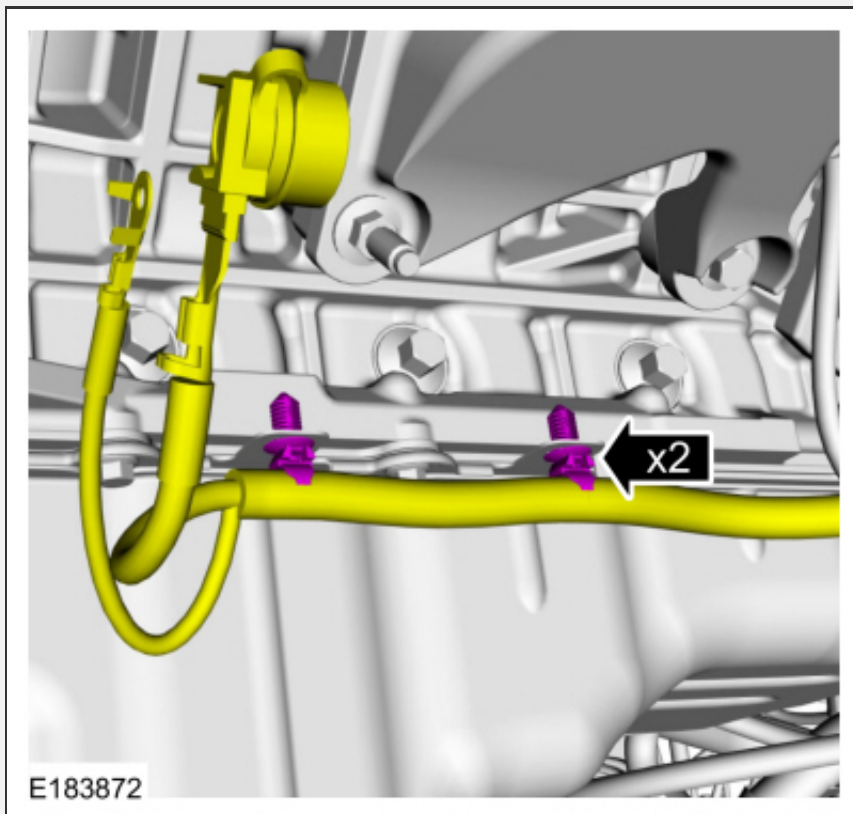
9. Position the O2 sensor wire harness and attach the harness retainer to the oil pan.





5.0L Ti-VCT V8 (308kW/418PS)

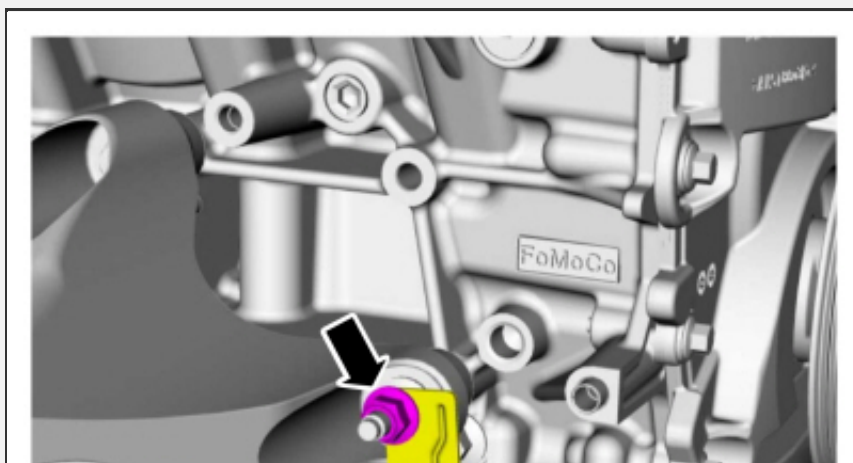
10. Attach the wire harness retainers to the oil pan.

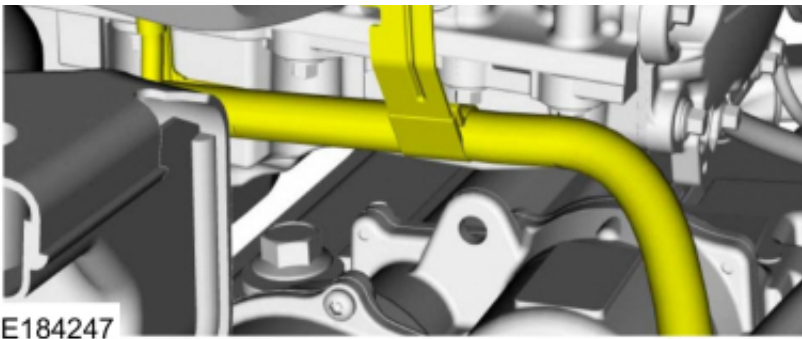


6-Speed Manual Transmission - MT82

11. Position the bracket for the wire harness and install the nut on the front of the RH engine mount bracket stud bolt.

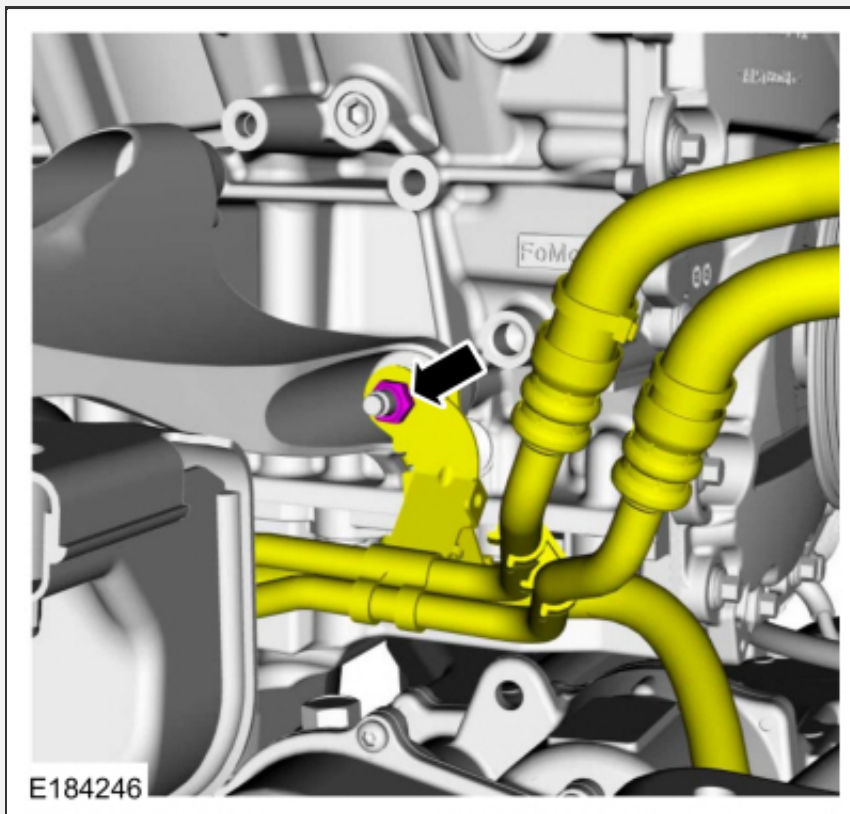
Torque: 35 lb.ft (47.5 Nm)





6-Speed Automatic Transmission - 6R80

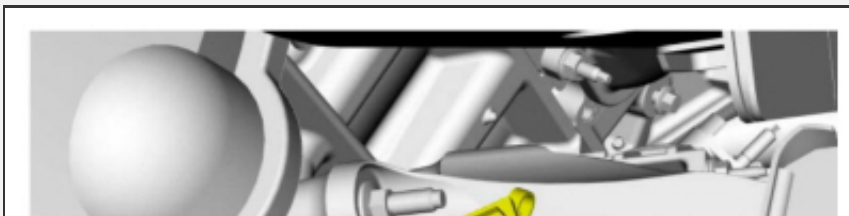
12. Position the brackets for the transmission cooling tubes and wire harness and install the nut on the front of the RH engine mount bracket stud bolt.
Torque: 35 lb.ft (47.5 Nm)

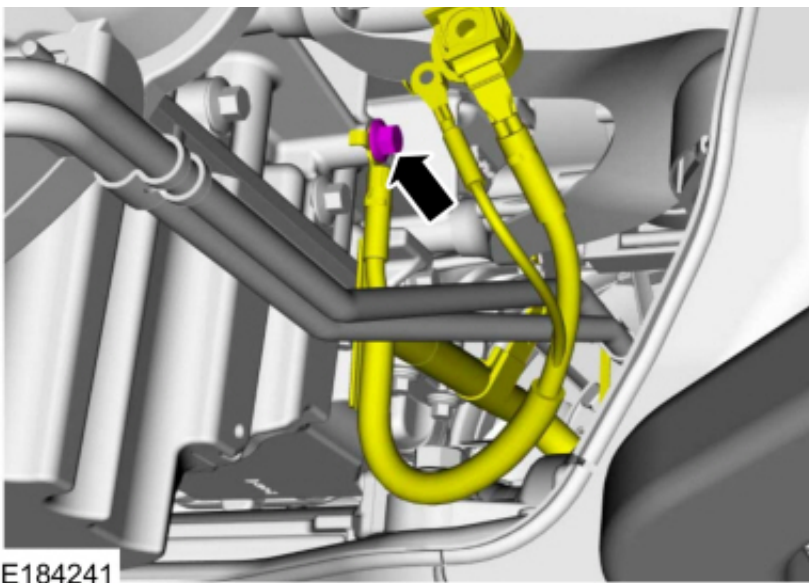


3.7L Duratec (227kW/301PS)

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

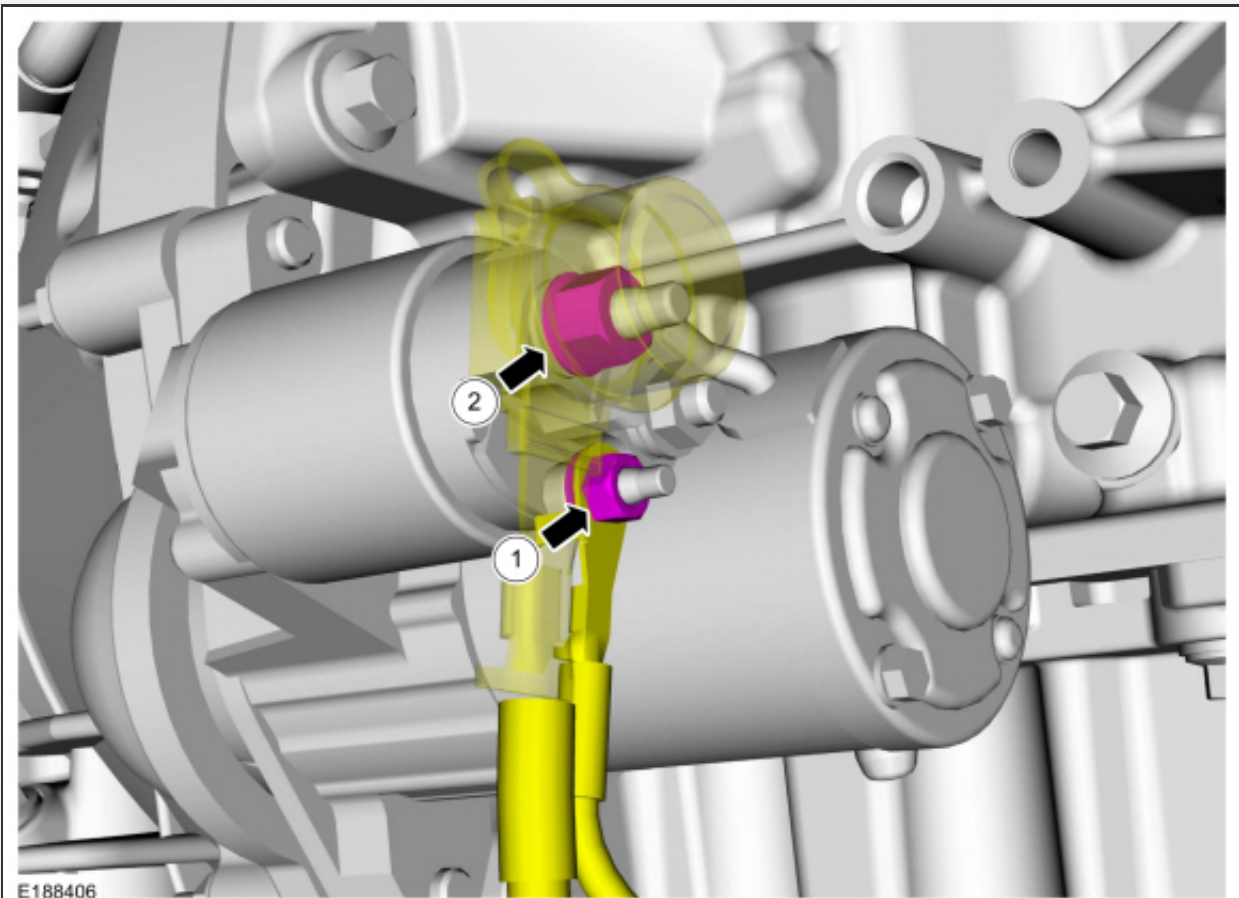
Position the ground wire and install the bolt to the RH side of the engine.
Torque: 35 lb.ft (47.5 Nm)





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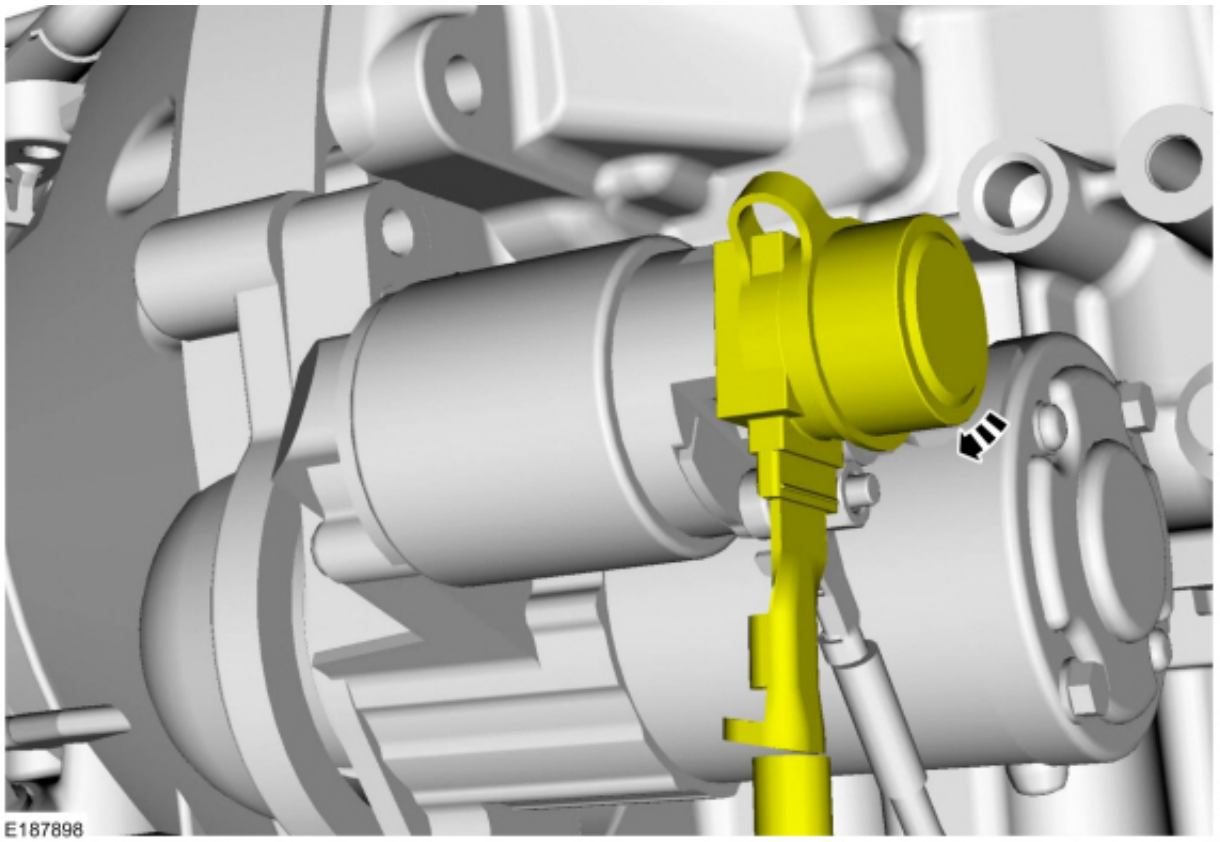
14.
 1. Connect starter motor solenoid wire and install the starter motor solenoid wire nut.
Torque: 53 lb.in (6 Nm)
 2. Connect the starter motor solenoid battery cable and install the starter motor solenoid battery cable nut.
Torque: 106 lb.in (12 Nm)



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15. Close the starter motor solenoid battery cable cover.



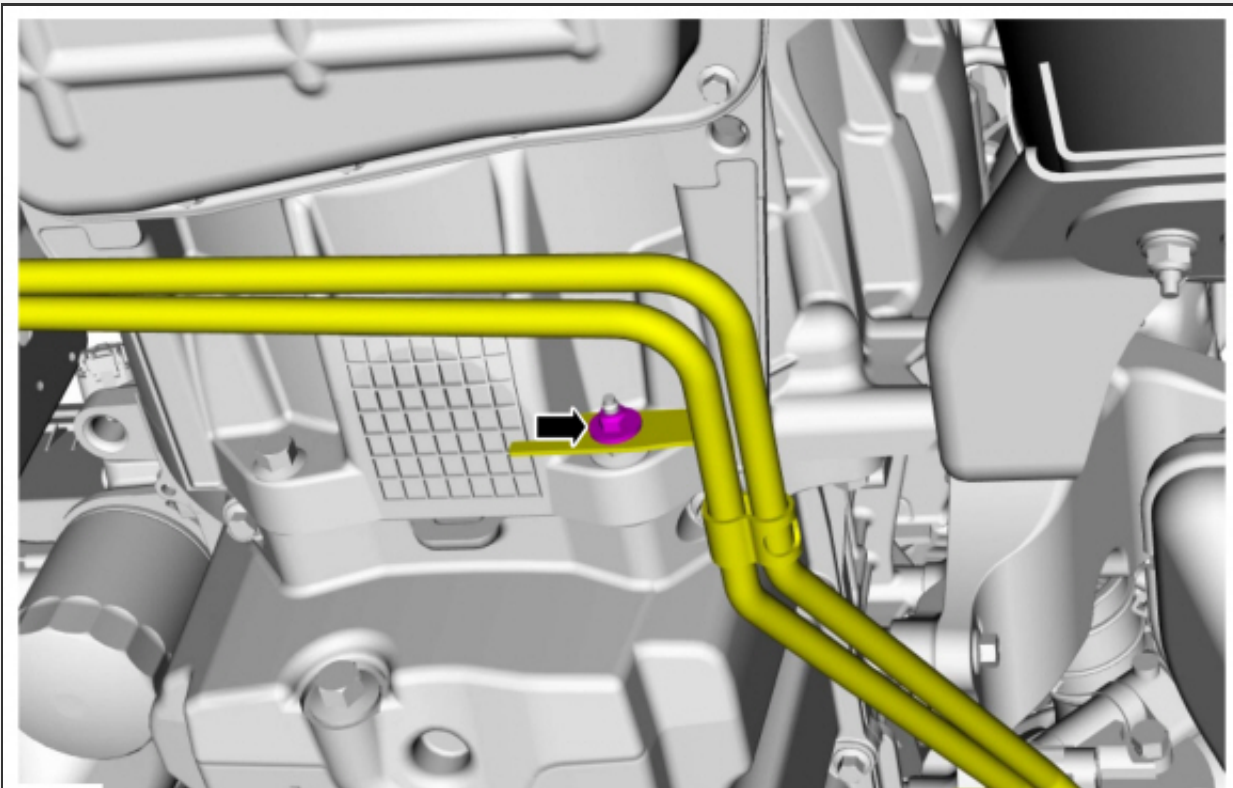


2.3L EcoBoost (231kW/314PS)

16. **NOTE:** *If equipped with 2.3L EcoBoost and automatic transmission.*

Position the tubes and install the transmission fluid cooler tubes bracket-to-transmission nut.

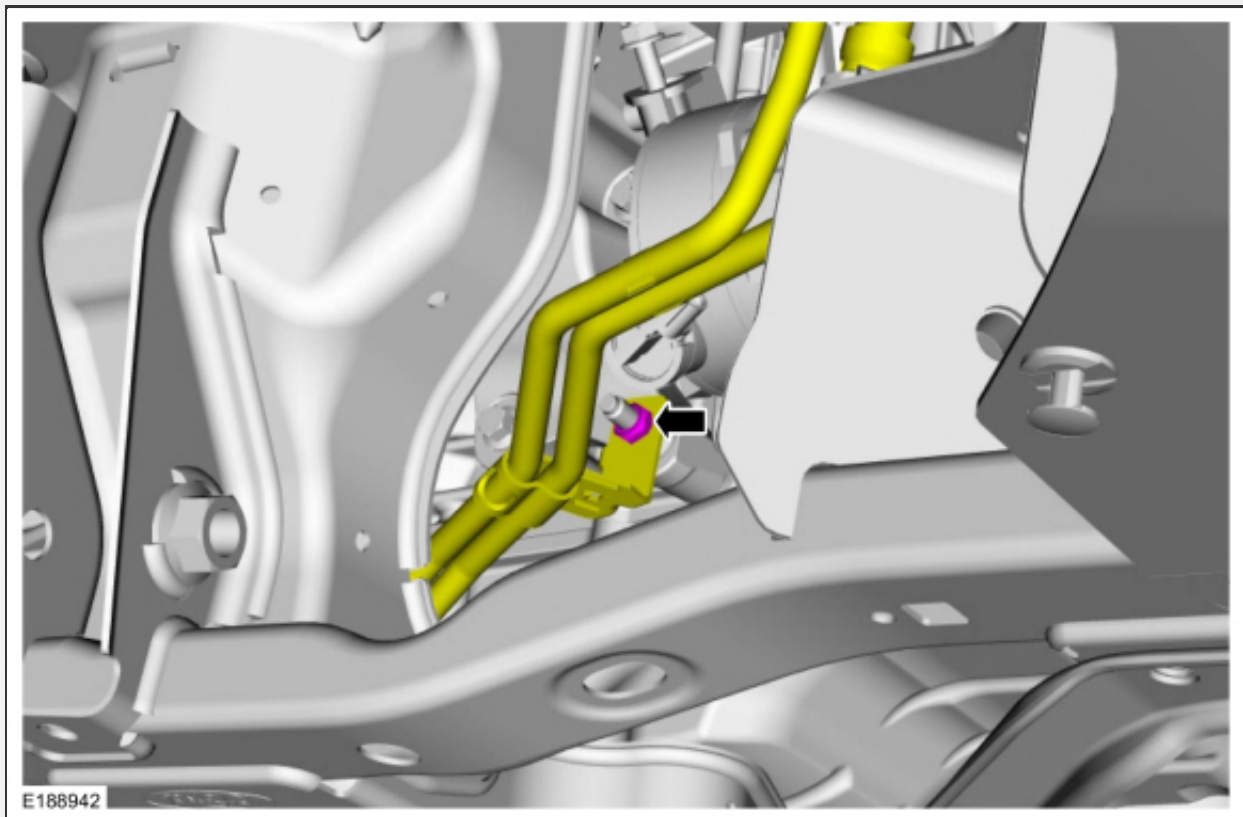
Torque: 124 lb.in (14 Nm)



17. **NOTE:** *If equipped with 2.3L EcoBoost and automatic transmission.*

Install the transmission fluid cooler tubes bracket-to-engine mount nut.

Torque: 35 lb.ft (48 Nm)



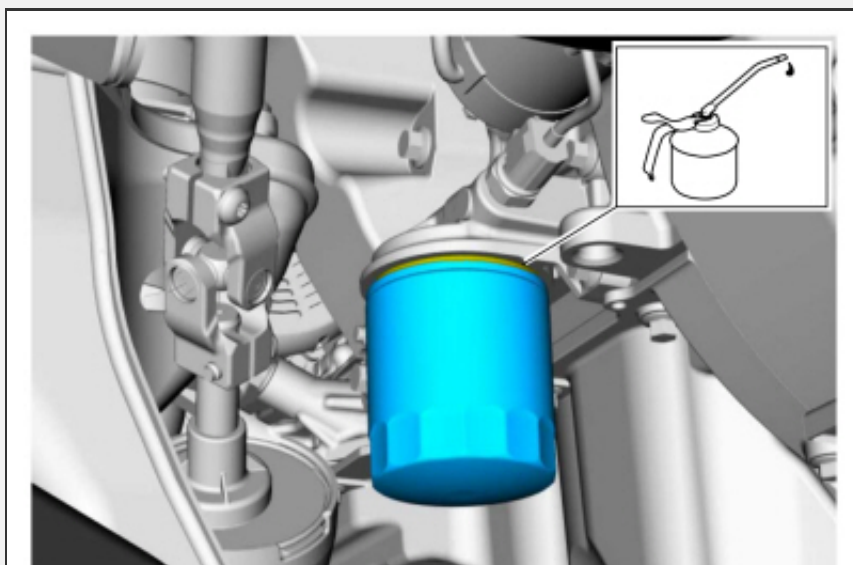
18. Install the new engine oil filter.

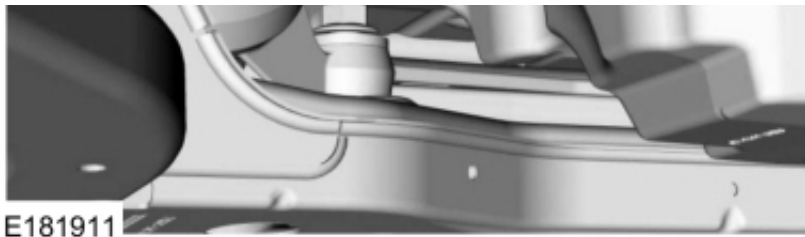
Material: Motorcraft® SAE 5W-30 Synthetic Blend Motor Oil / XO-5W30-QSP (WSS-M2C946-A)

Torque:

Stage 1: 71 lb.in (8 Nm)

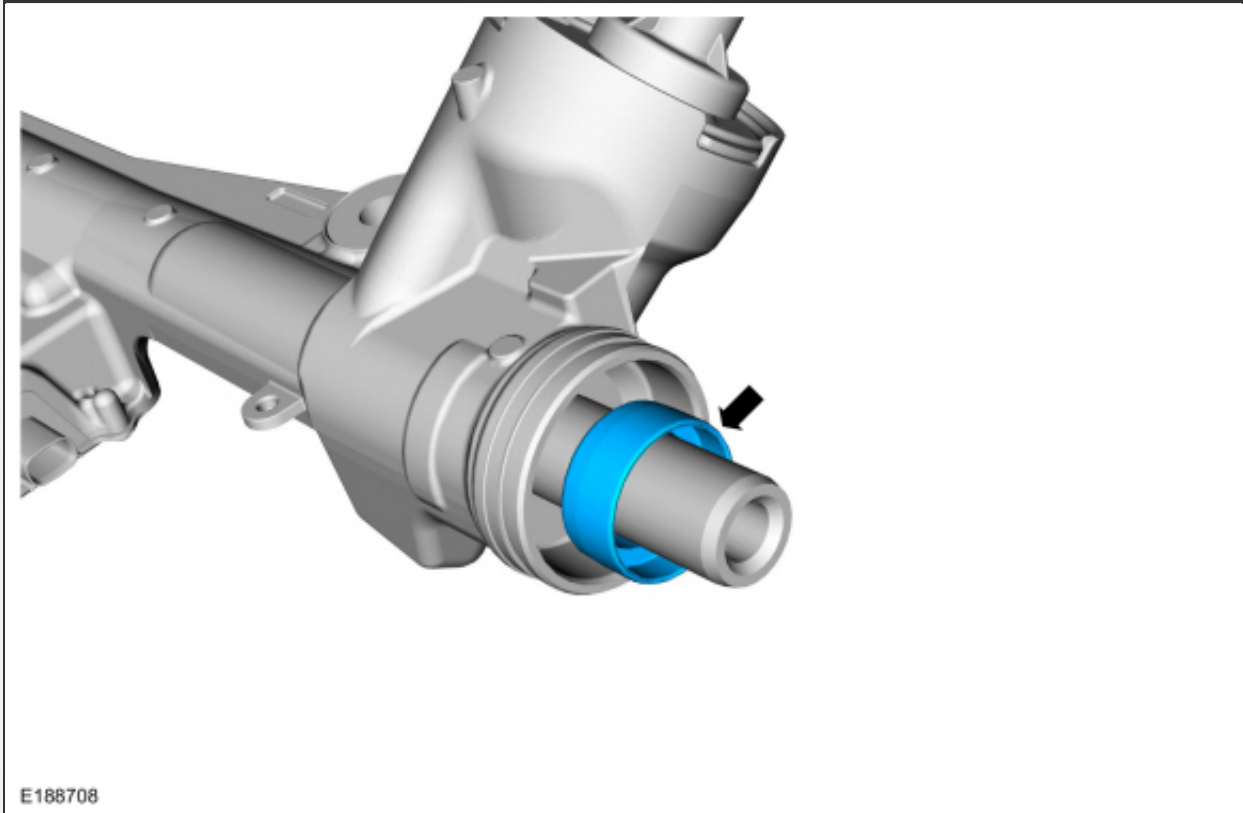
Stage 2: 180°



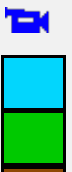
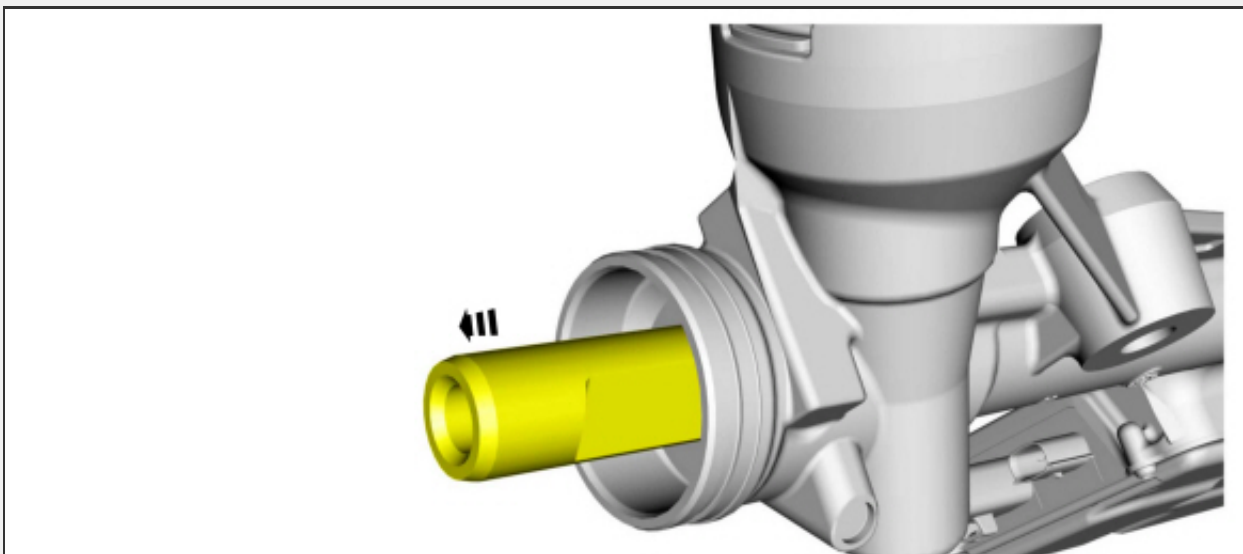


All vehicles

19. On both sides.
Position the new steering stop.



20. Position the steering rack completely to the LH side.



E189515



21. **NOTICE:** Hold the steering gear rack while tightening the inner tie rod. Failure to hold the rack securely could result in steering gear damage.

NOTICE: The steering gear rack holding tool must be reversed to install the RH tie rod or damage to the rack and/or special tool may occur.

NOTE: *The holding tool can only be used on the LH side of the steering gear.*

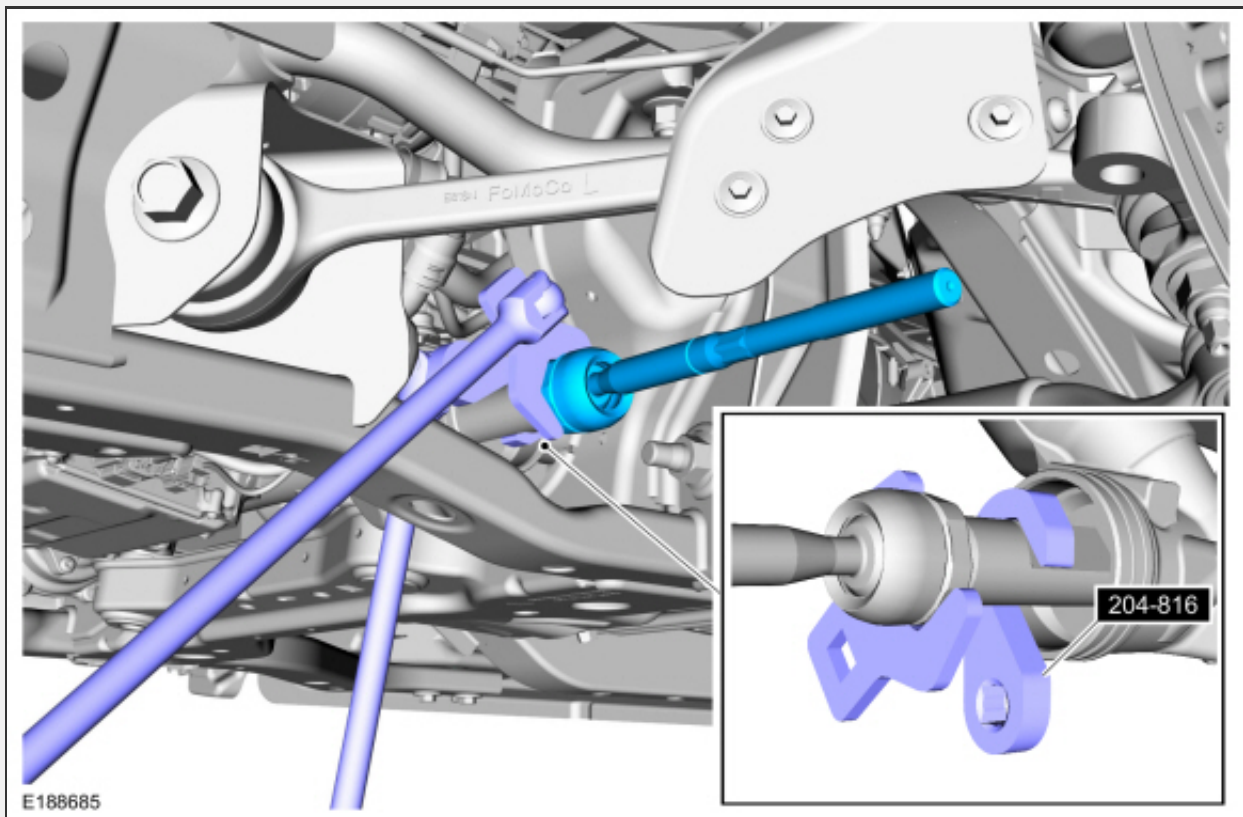
NOTE: *LH side shown RH side similar.*

On both sides.

Using the special tool to hold the rack and an appropriate size crows foot wrench or open end wrench, install the inner tie rod and steering stop.

Use Special Service Tool: [204-816 Rack Holding Tool](#).

Torque: 89 lb.ft (120 Nm)



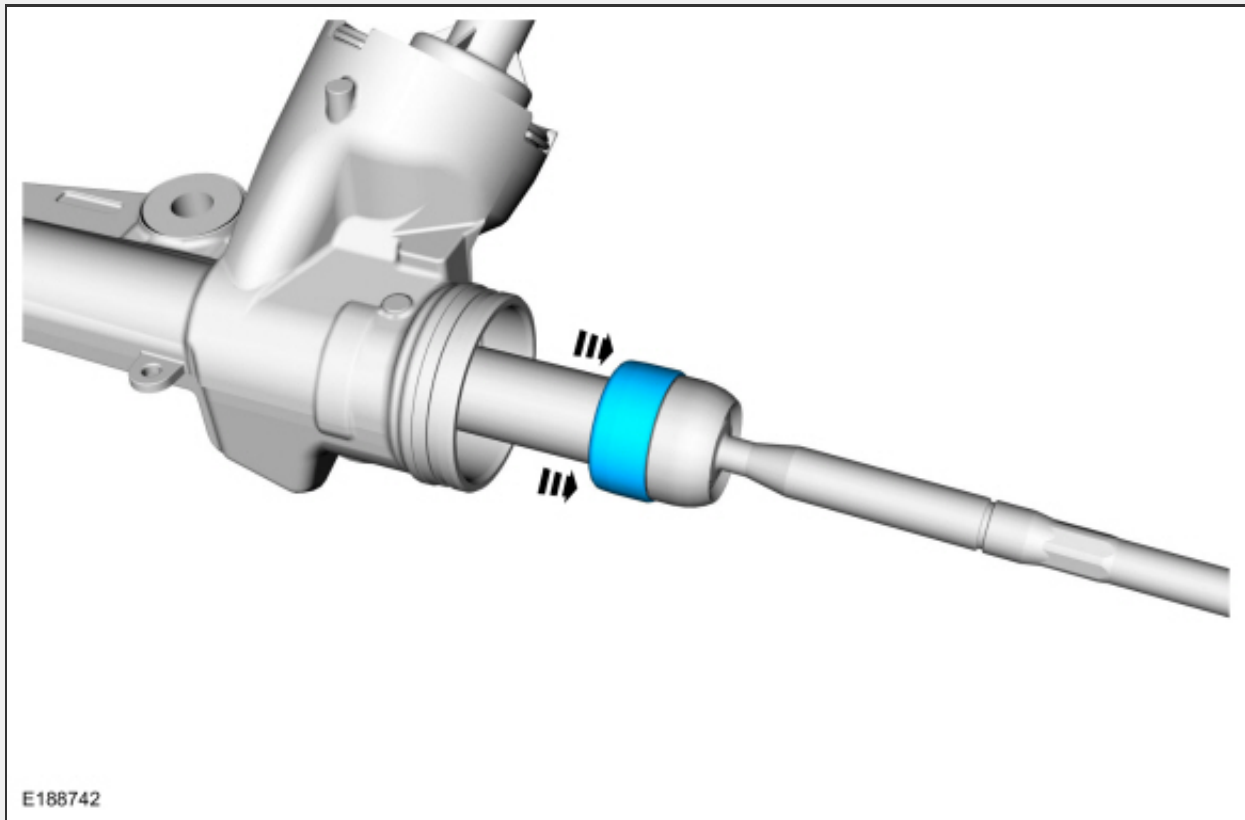
22. **NOTICE:** Install the steering stop using hand force only. Striking the steering stop may cause damage to the stop.

NOTE: *An audible click will be heard when the steering stop seats onto the inner tie rod.*

Make sure that the steering stop is fully seated and cannot be separated by hand.

On both sides.

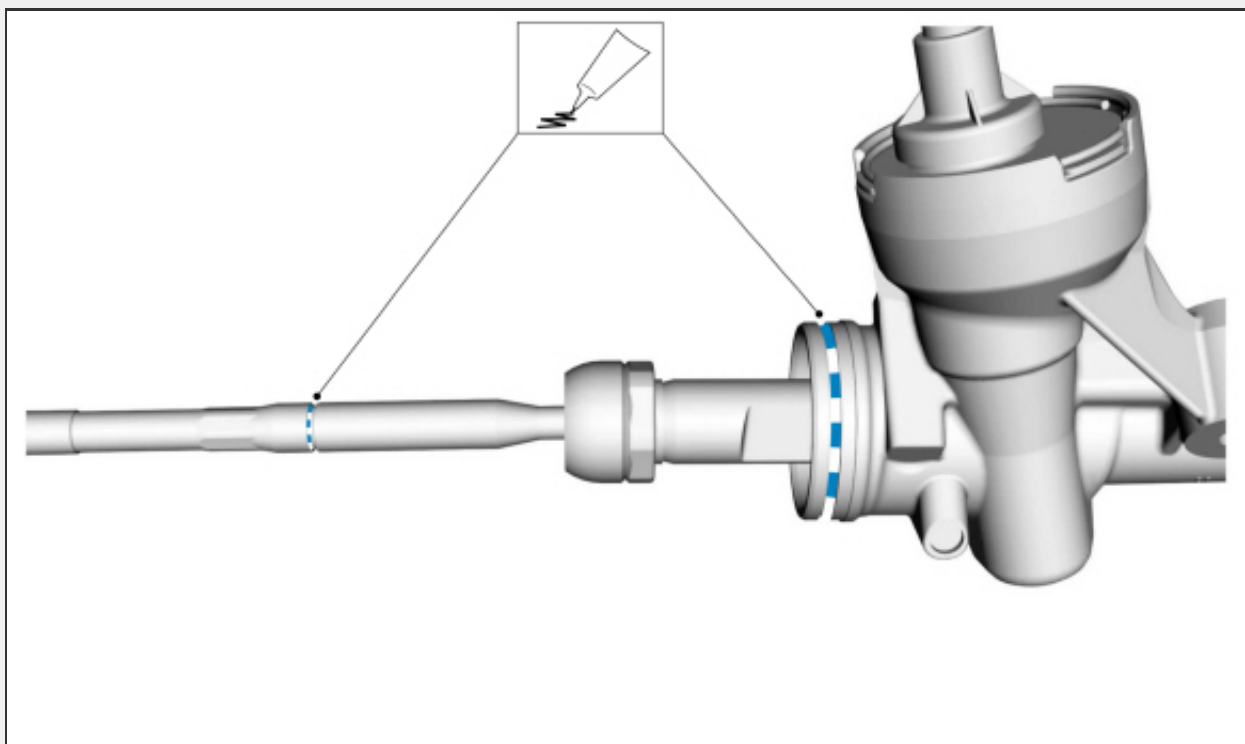
Install the steering stop onto the inner tie rod using hand force only.



23. On both sides.

Apply the specified grease to the steering gear-to-bellows boot mating surface and bellows boot groove on the inner tie-rod.

Material: Motorcraft® Premium Long-Life Grease / XG-1-E1 (ESA-M1C75-B)



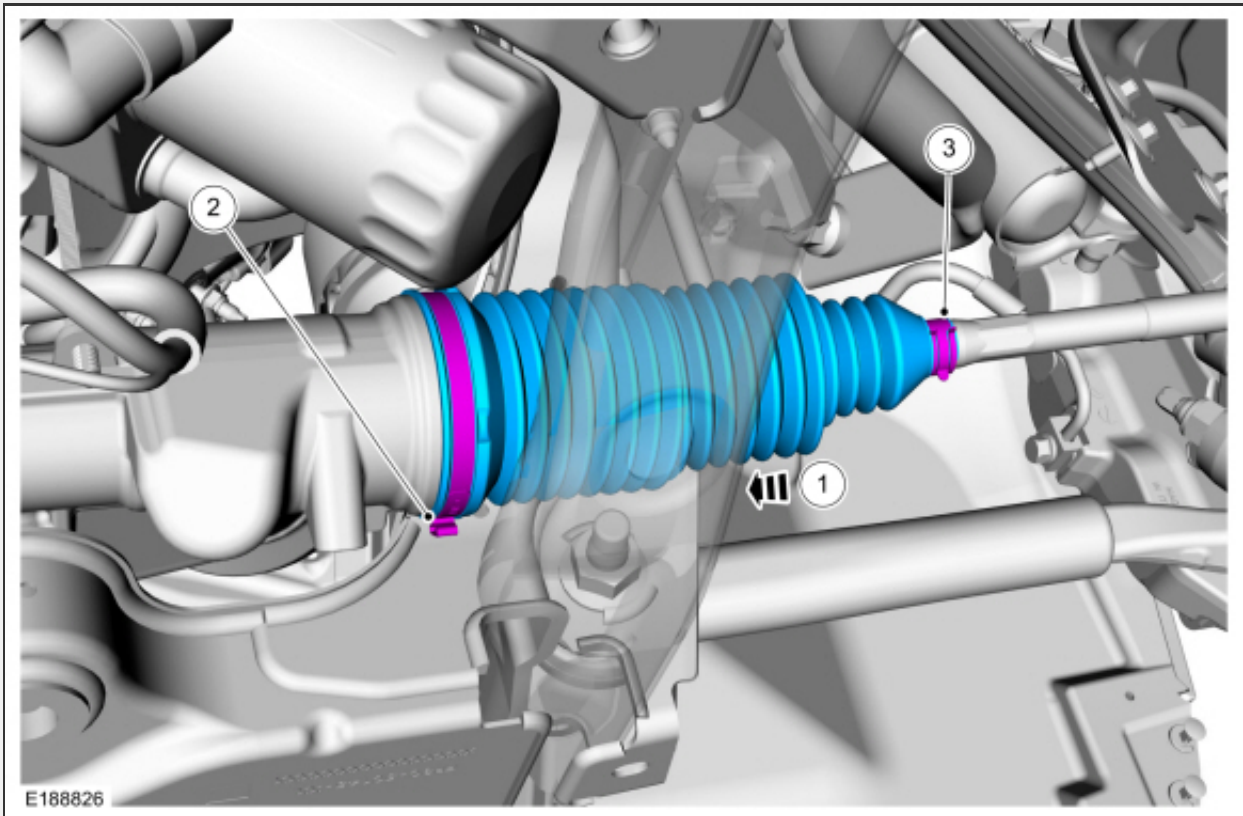


24. **NOTE:** LH side shown, RH side similar.

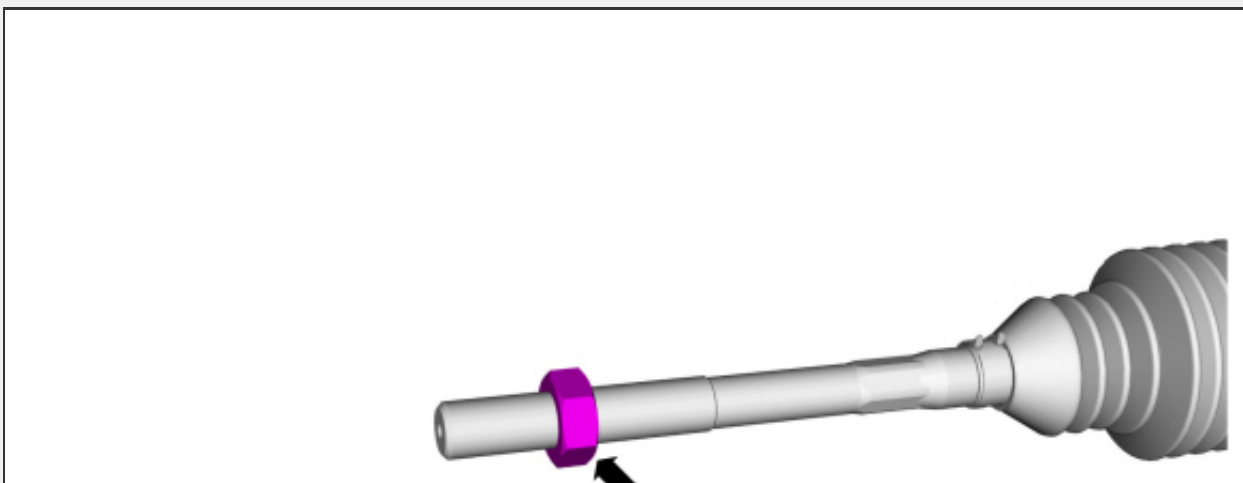
1. **NOTE:** Make sure the steering gear bellows boot is positioned correctly over the steering gear housing bead and the groove in the inner tie rod.

On both sides. Install the new steering gear bellows boot.

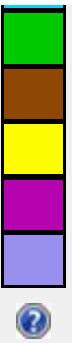
2. On both sides. Install the new inner bellows boot clamp.
Use the General Equipment: Boot Clamp Pliers
3. On both sides. Install the new outer bellows boot clamp.



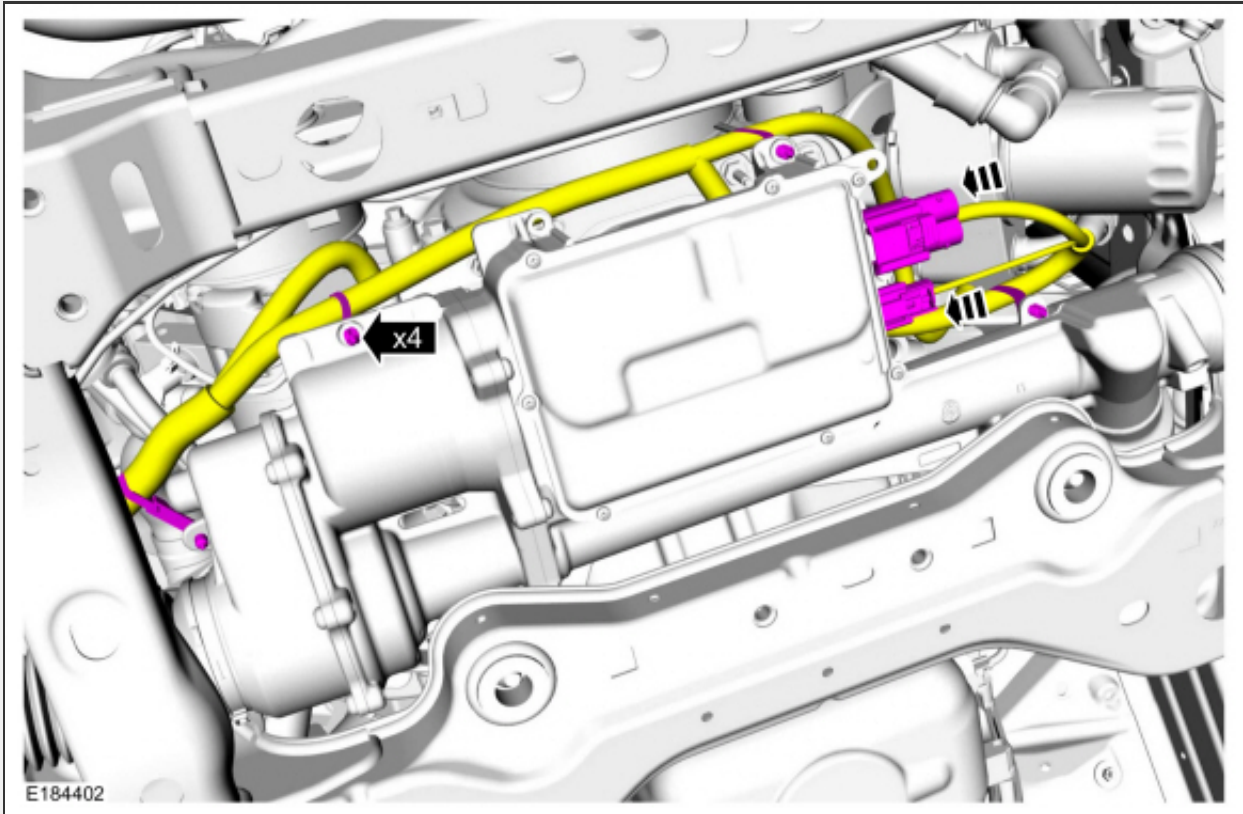
25. On both sides.
Thread the tie-rod end jam nut onto the inner tie rod.



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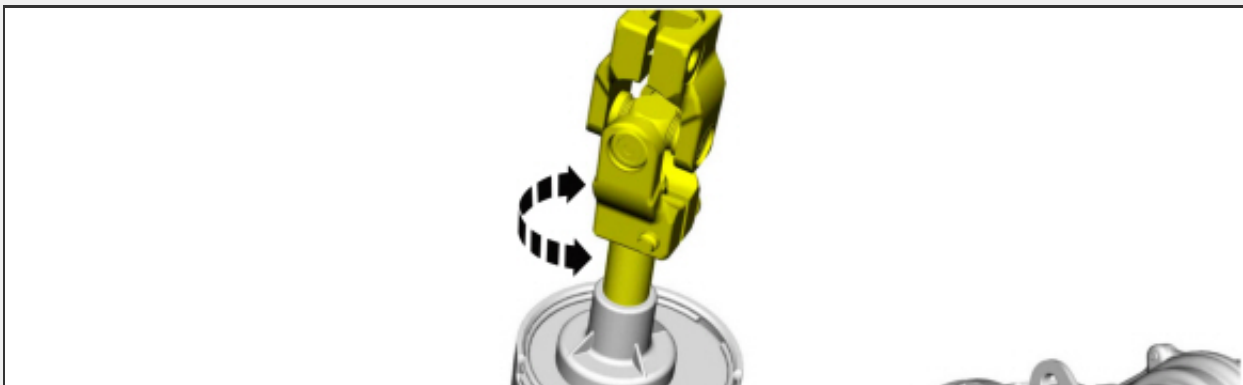


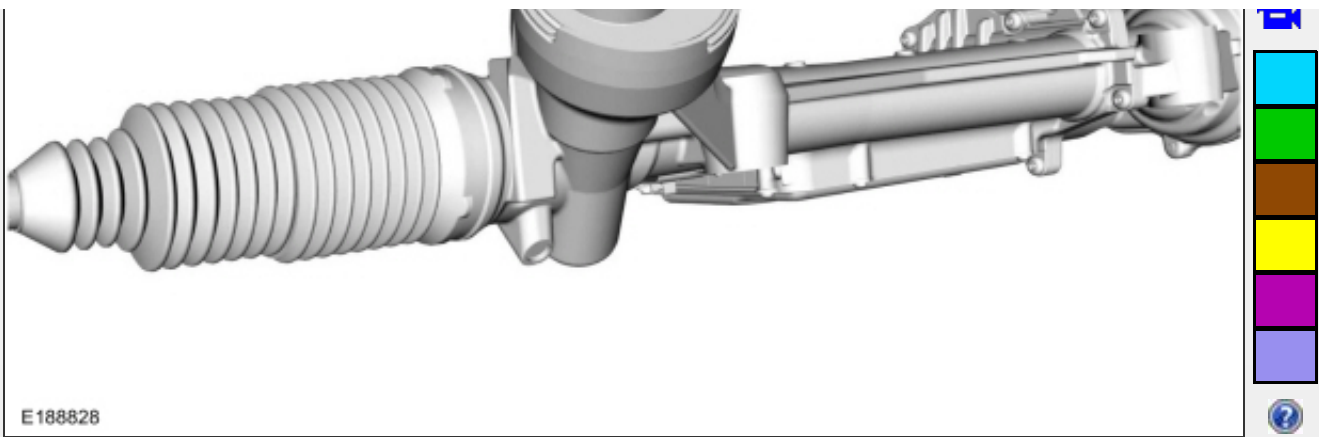
26. Position the EPAS gear wiring harness, clip the 4 wiring fasteners and connect the 2 electrical connectors.



27. **NOTICE:** Make sure steering gear is centered before connecting the steering column shaft. Damage to the steering gear and/or clockspring may result.

Turn the steering gear input shaft completely to the right then completely to the left and return to the center position.

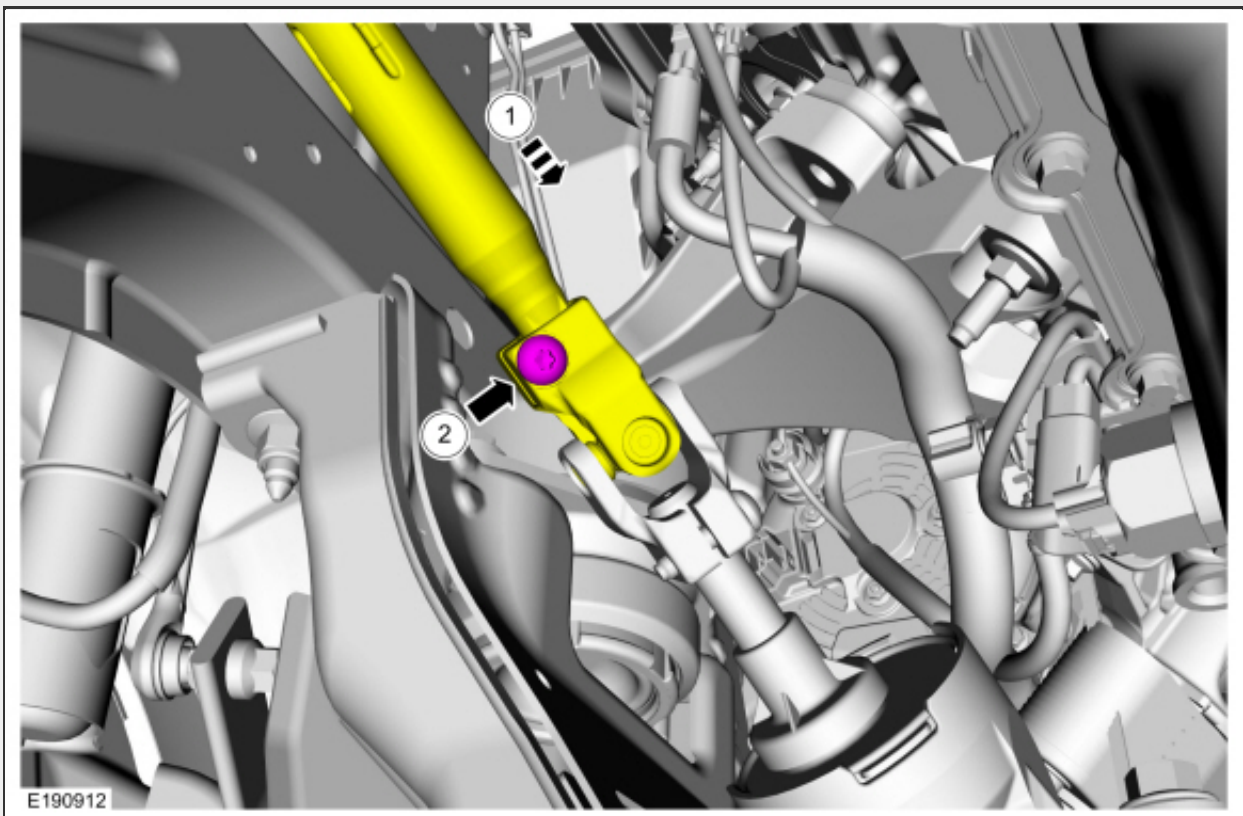




28. **NOTICE: DO NOT hammer, pry or force steering column and column shafts during installation or removal. Failure to follow this instruction may cause damage to steering components that could lead to loss of steering control during vehicle operation and could result in serious personal injury or death.**

NOTICE: DO NOT attempt to remove or install the steering column lower coupler 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)



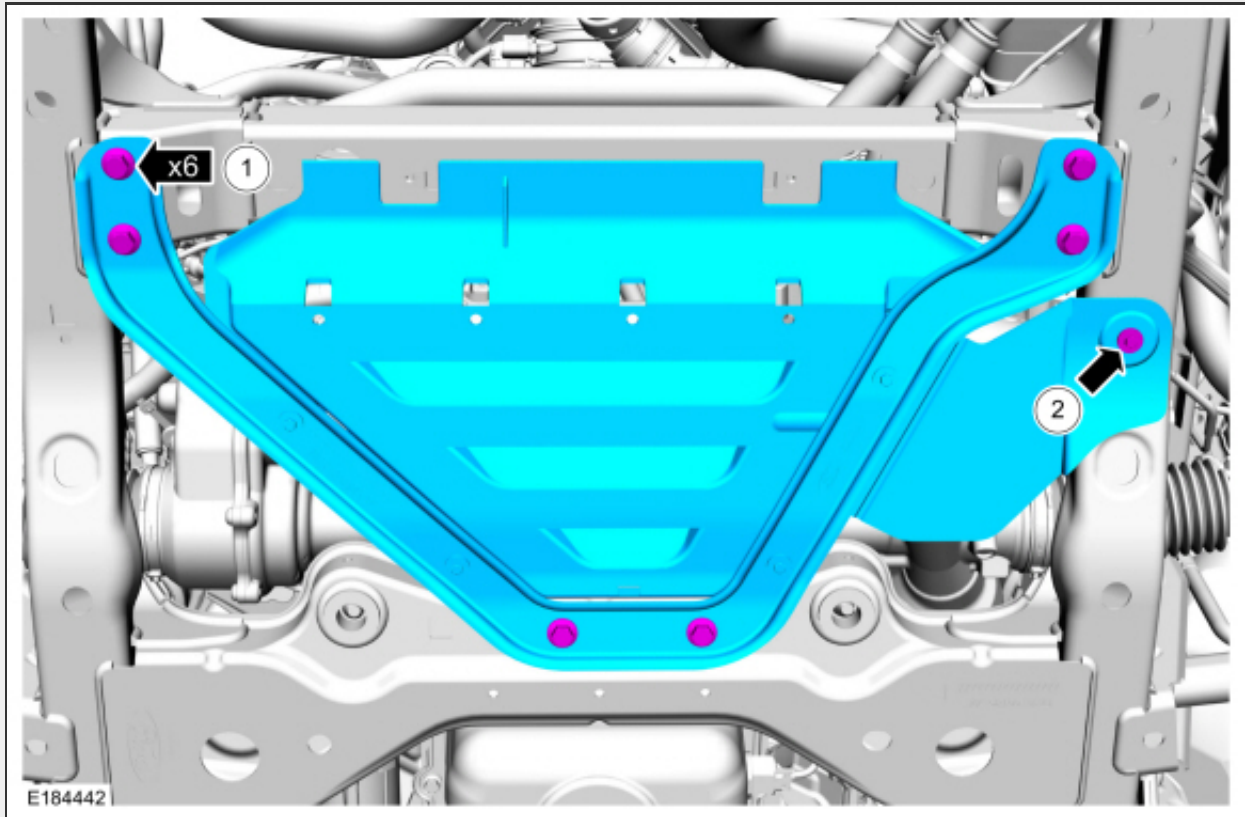
29. Inspect the steering column lower shaft.

Refer to: [Steering Column Collapsed Check](#) (211-04 Steering Column, General Procedures).

30. 1. **NOTE:** *If equipped.*

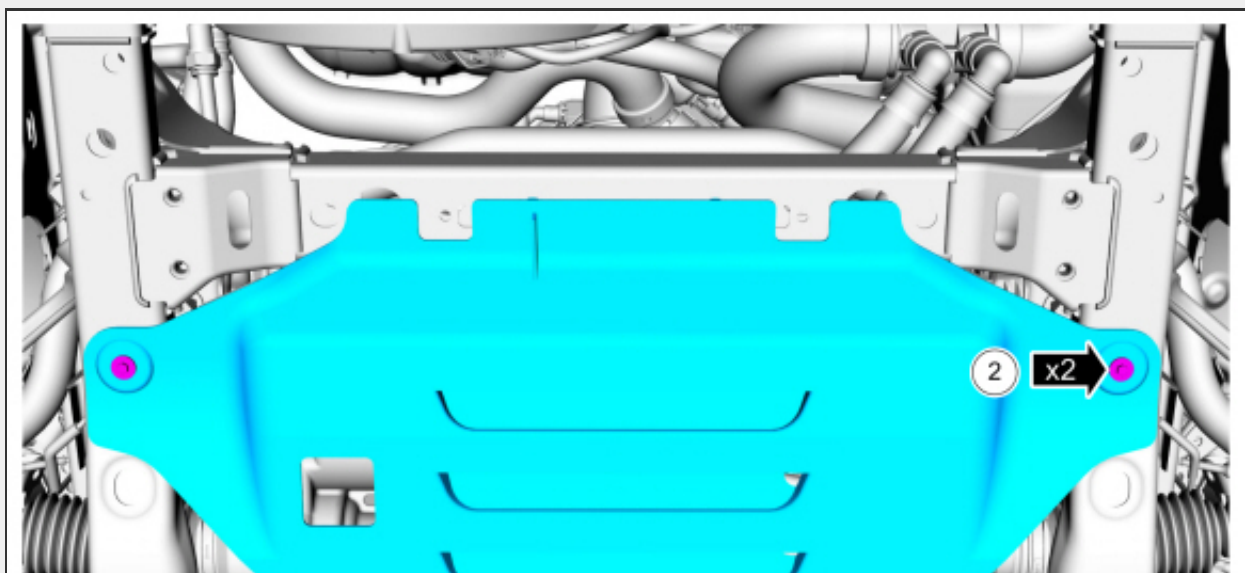
Position the V-brace and underbody shield and install the 6 V-brace bolts.
Torque: 46 lb.ft (63 Nm)

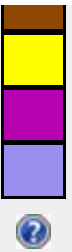
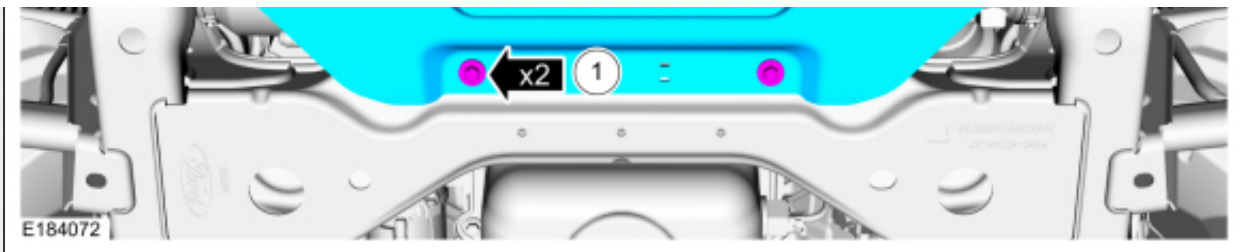
2. Install the underbody shield bolt.



31. **NOTE:** *If equipped.*

1. Position the underbody shield and install the 2 rearward underbody shield bolts.
2. Install the 2 remaining underbody shield bolts.





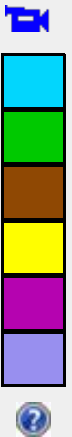
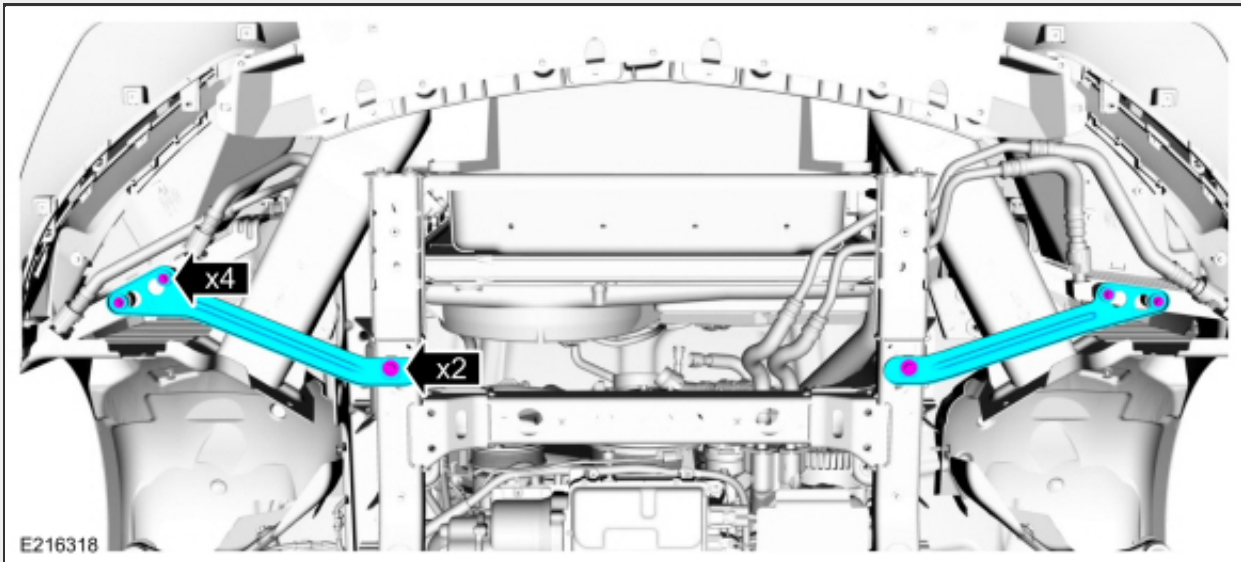
32. **NOTE:** *If equipped.*

Install the 2 support brackets and the bolts.

Torque:

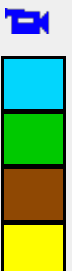
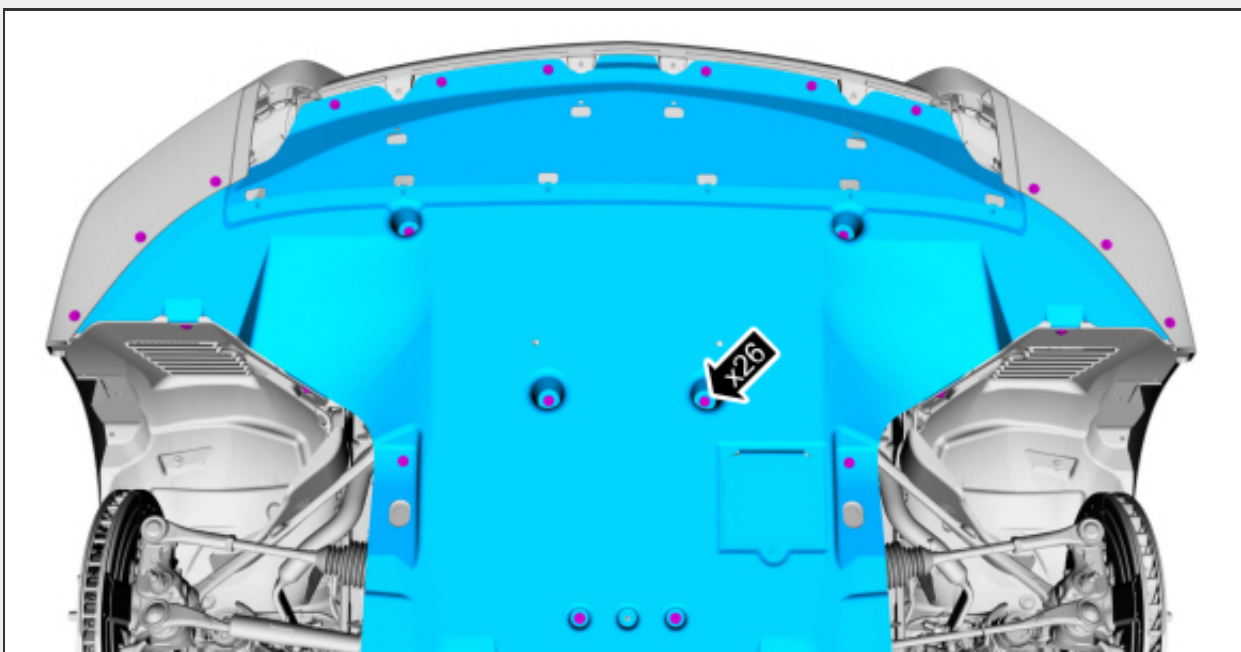
Bracket to subframe bolts.: 22 lb.ft (30 Nm)

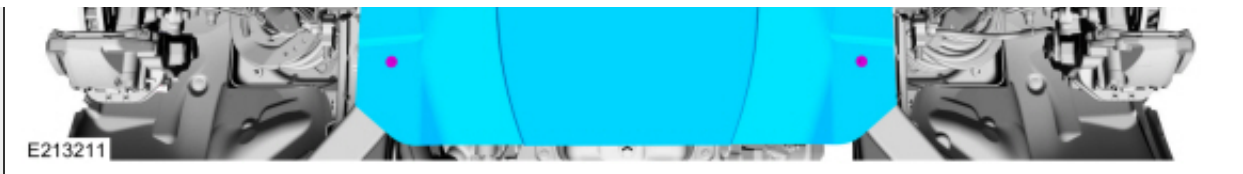
Bracket to cooler bolts.: 93 lb.in (10.5 Nm)



33. **NOTE:** *If equipped.*

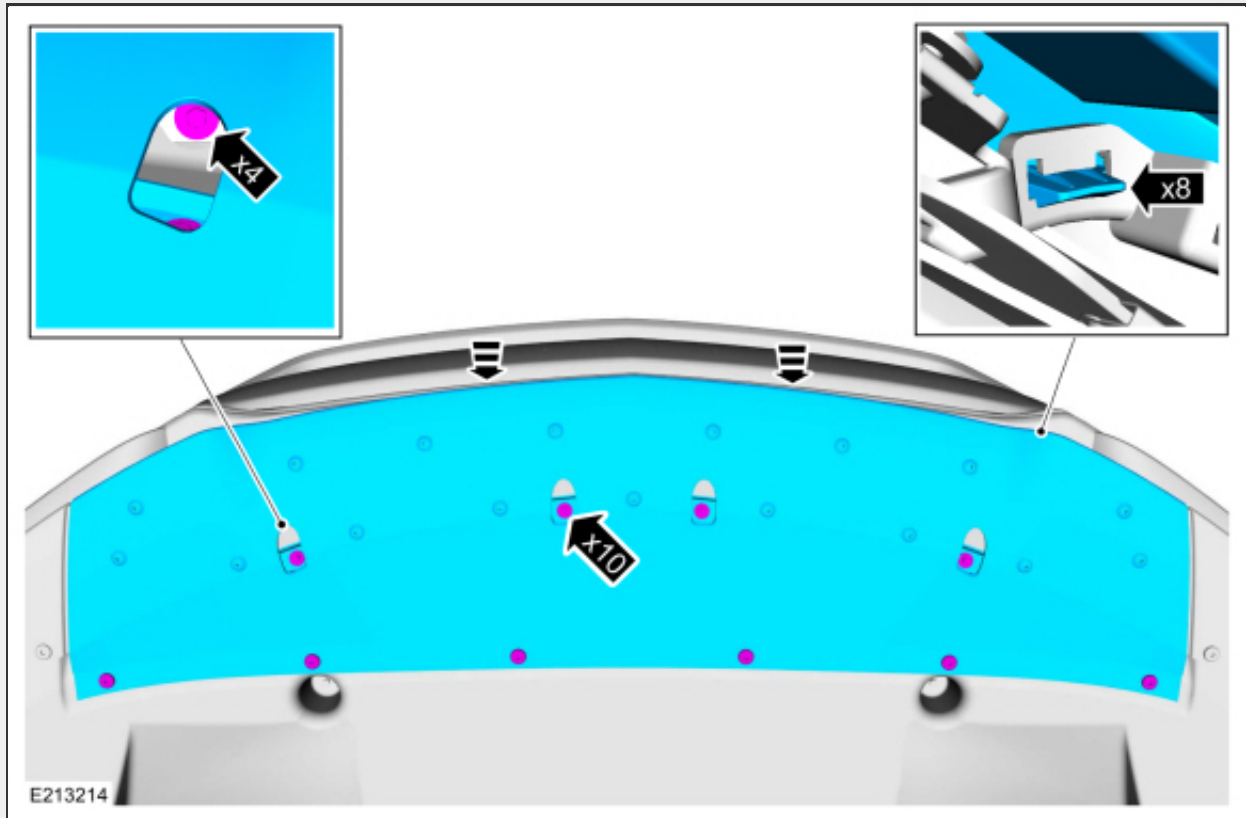
Position the underbody shield and install the bolts.





34. **NOTE:** *If equipped.*

Position the underbody shield and install the bolts.

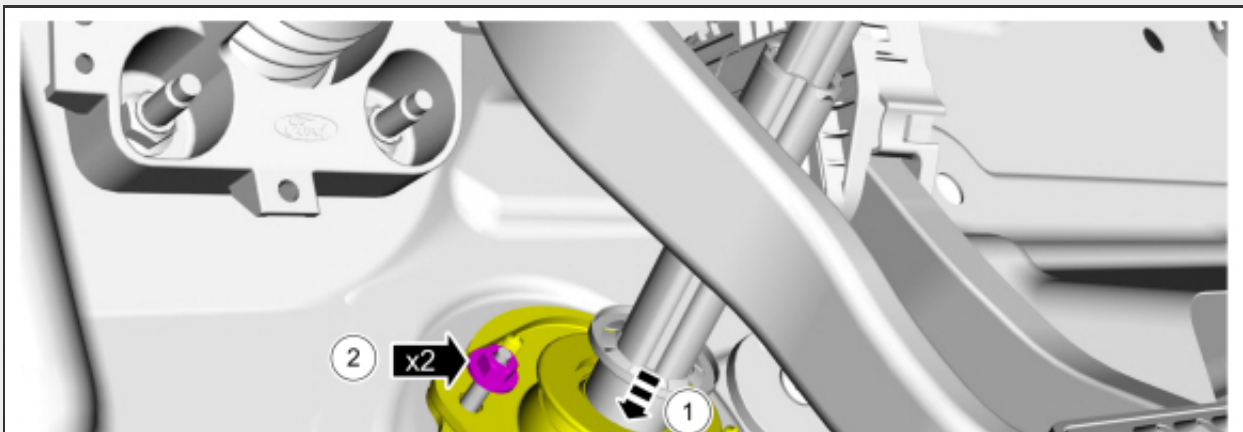


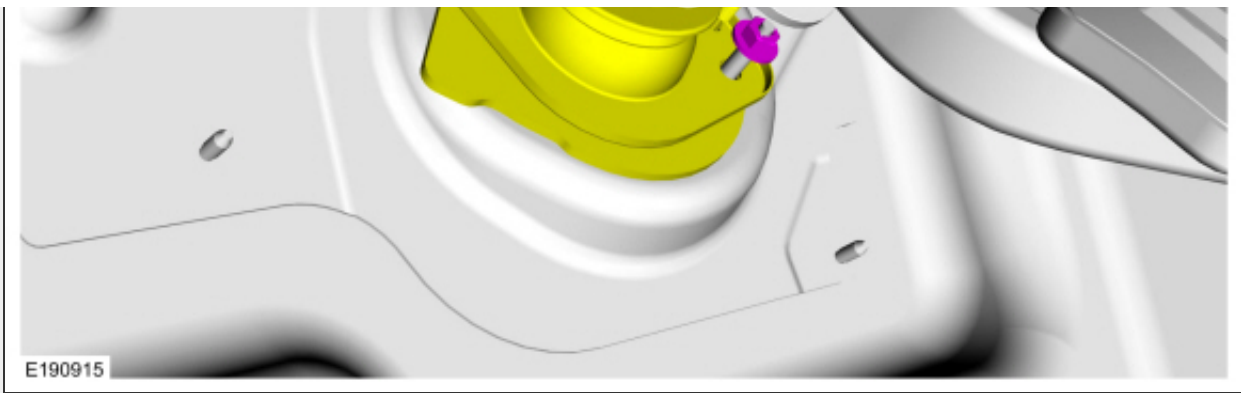
35. On both sides.

Install the tie rod end.

Refer to: [Tie Rod End](#) (211-02 Power Steering, Removal and Installation).

36.
 1. Position the steering column dash seal.
 2. Tighten the steering column dash seal nuts.
Torque: 80 lb.in (9 Nm)





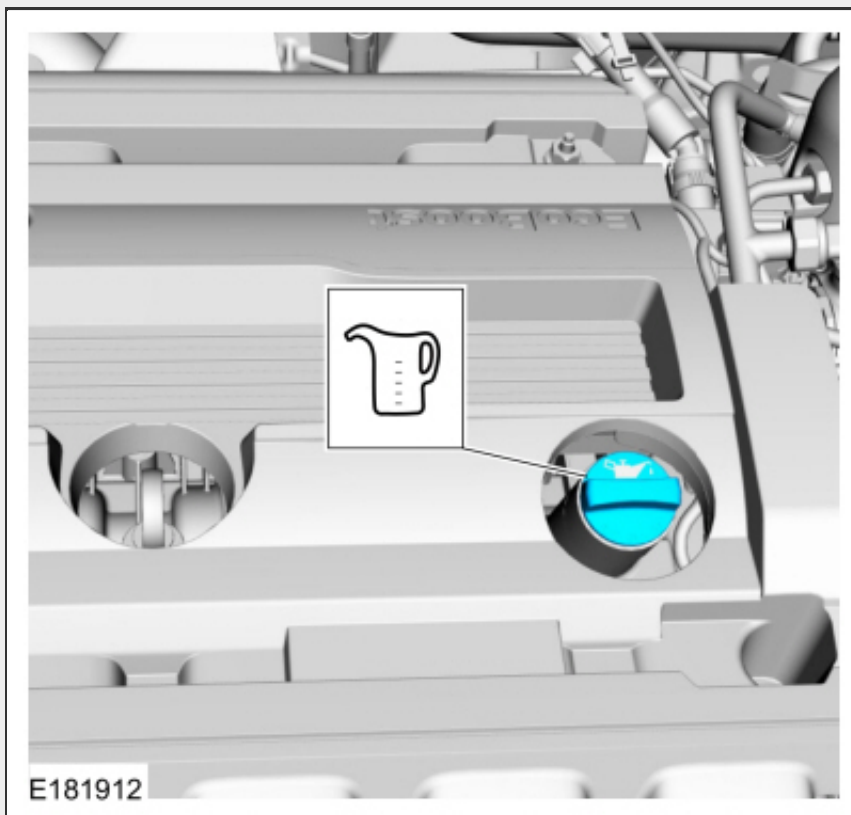
37. Turn the steering wheel lock-to-lock to assure the steering stops are fully seated.

2.3L EcoBoost (231kW/314PS)

38. Fill the engine with clean engine oil.

Refer to: [Specifications](#) (303-01A Engine - 2.3L EcoBoost (231kW/314PS), Specifications).

Material: Motorcraft® SAE 5W-30 Synthetic Blend Motor Oil / XO-5W30-QSP (WSS-M2C946-A)



All vehicles

39. When installing a new steering gear, it must be configured (using vehicle as-built data or module configuration information retrieved earlier in this procedure). Connect a scan tool and follow the scan tool instructions.

Refer to: [Module Configuration - System Operation and Component Description](#) (418-01 Module Configuration, Description and Operation).

40. Check and if necessary adjust front toe.

Refer to: [Front Toe Adjustment](#) (204-00 Suspension System - General Information, General Procedures).