

2022 CHEVROLET CORVETTE SERVICE MANUAL

- **SEARCH**

1. **Steering**

2. **Power Steering**

3. **Repair Instructions**

- 4.

Power Steering Assist Motor Replacement

Special Tools

GE-50576-A, Acoustic Belt Tension Tester

Equivalent regional tools: Special Tools

Removal Procedure

Caution:

Electrostatic discharge (ESD) can damage many solid-state electrical components. ESD susceptible components may or may not be labeled with the ESD symbol. Handle all electrical components carefully. Use the following precautions in order to avoid ESD damage:

- Touch a metal ground point in order to remove your body's static charge before servicing any electronic component; especially after sliding across the vehicle seat.
- Do not touch exposed terminals. Terminals may connect to circuits susceptible the ESD damage.
- Do not allow tools to contact exposed terminals when servicing connectors.
- Do not remove components from their protective packaging until required to do so.
- Avoid the following actions unless required by the diagnostic procedure:

Other List:attention-list2

- Ground the protective packaging of any component before opening. Do not rest solid-state components on metal workbenches, or on top of TVs, radios, or other electrical devices.

Caution:

During removal and installation, all EPS components including mechanical and/or electrical is extremely susceptible to damage. Dropping or prying on any EPS component may cause internal damage. If damage occurs or a part is dropped, the EPS component must be replaced.

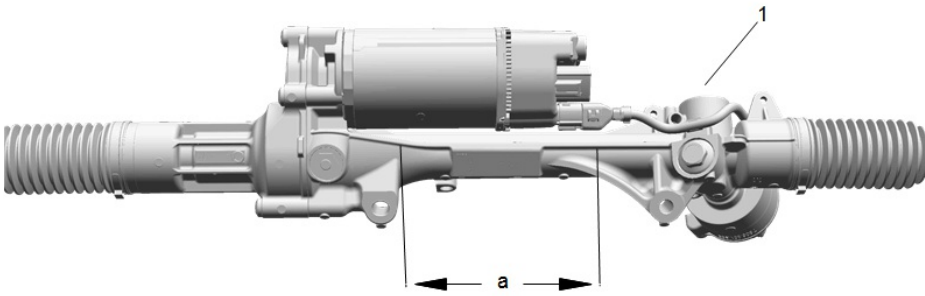
Caution:

Care must be taken during removal and installation of the Electronic Power Steering (EPS) components to not hit or break the EPS motor/controller module or module harness connectors. If the EPS motor/ controller module or module connectors are damaged, the complete component must be replaced.

Caution:

The torque sensor wiring harness is NOT repairable. Do NOT attempt to repair the torque sensor wiring harness under any circumstances. If the torque sensor wiring harness is damaged then the steering gear MUST be replaced.

1. Electric Belt Drive Rack and Pinion Steering Gear >> Remove - Electric Belt Drive Rack and Pinion Steering Gear Replacement



2. [Click here for full size](#)

3. **Caution:**

When positioning the rack and pinion steering gear in a vise, only clamp in the area specified. Failure to properly secure the rack and pinion steering gear in a vice, may result in damage. If the rack and pinion steering gear is damaged, it must be replaced.

4. **Note:**

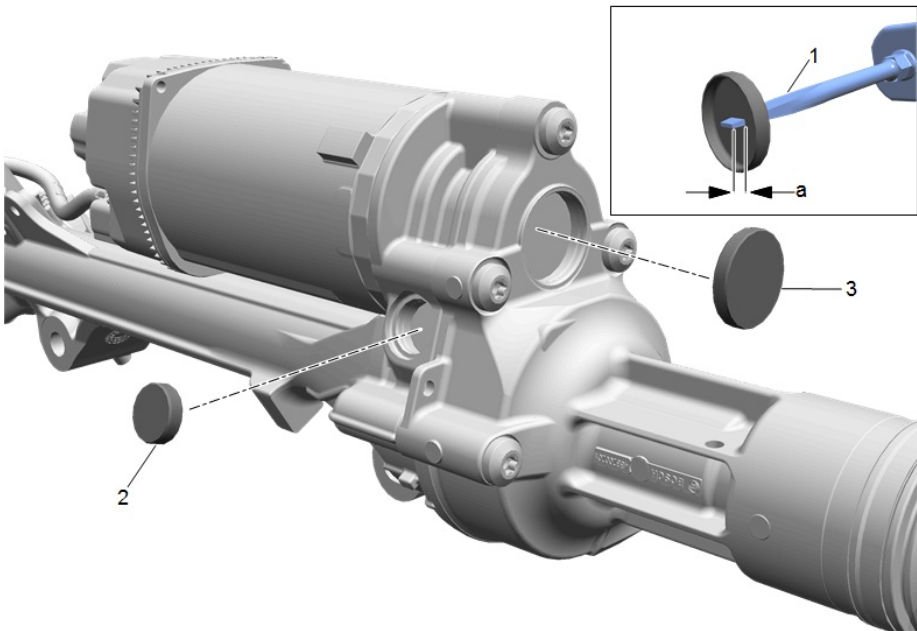
When installing the steering gear in a vise and clamping on the barrel of the steering gear housing, do NOT pinch the torque sensor wiring harness. If available, use a soft jaw vise.

5. Carefully clamp the electric belt drive rack and pinion steering gear in a vise within the area indicated (a).

6. **Caution:**

Do not attempt to use power tools for cleaning or disassembly/assembly of the Electric Belt Drive Rack and Pinion Steering Gear or Power Steering Assist Motor. Failure to follow all the steps properly will result in a failed component requiring complete replacement of the Electric Belt Drive Rack and Pinion Steering Gear.

7. Clean the gear with brake clean and a soft brush to remove dirt from the repair area and dry with compressed air. Adhesives, Fluids, Lubricants, and Sealers

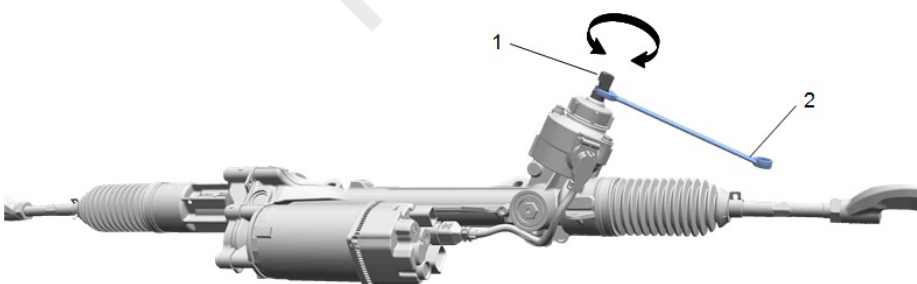


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9. Caution:

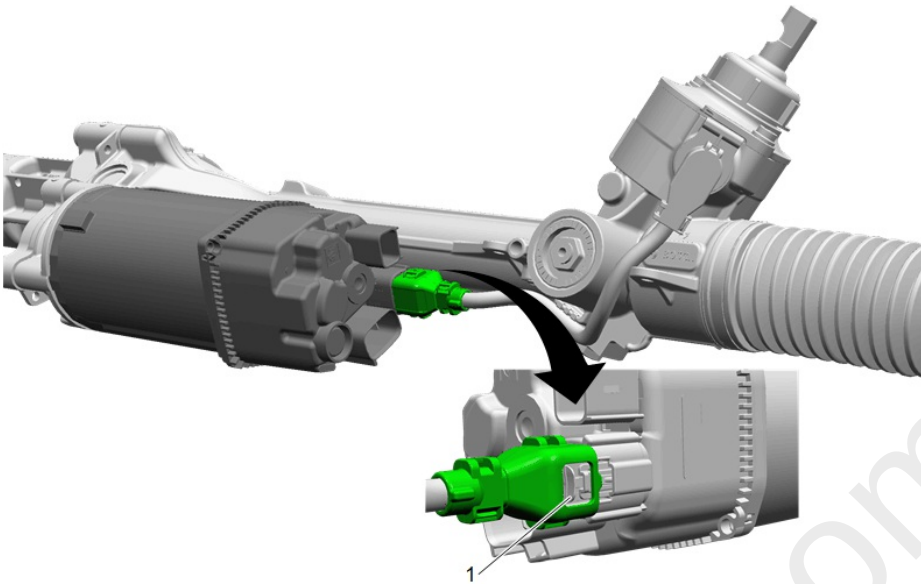
When removing the steering gear housing covers, use caution to not damage or pry on the sealing surface and do not pierce the cover more than $\frac{1}{4}$ inch or belt or belt gear damage can occur, resulting in complete electric belt drive rack and pinion steering gear replacement

10. Using a small flat bladed tool (1), pierce the center of the steering gear housing covers (2,3) no more than 6 mm (0.25 in) (a).
11. Remove and DISCARD the small (2) and large (3) steering gear housing covers.

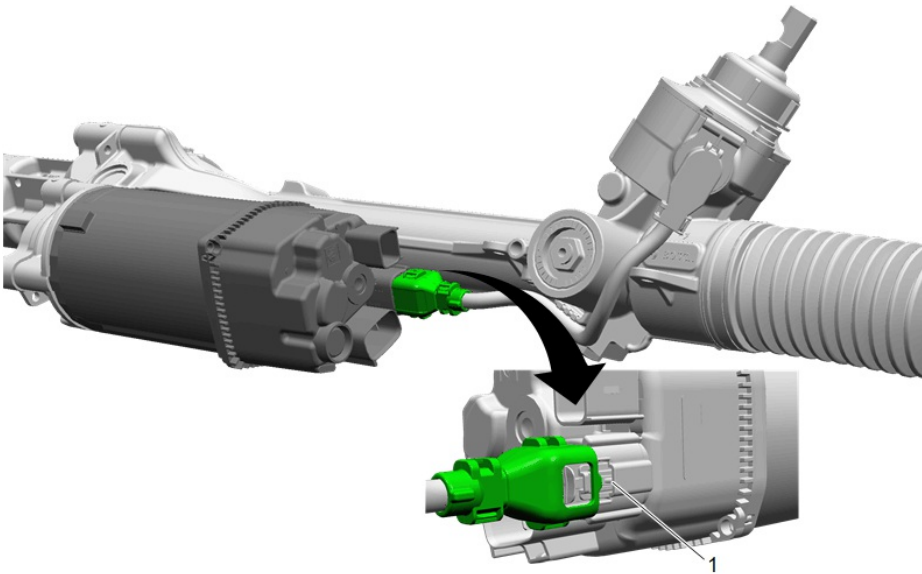


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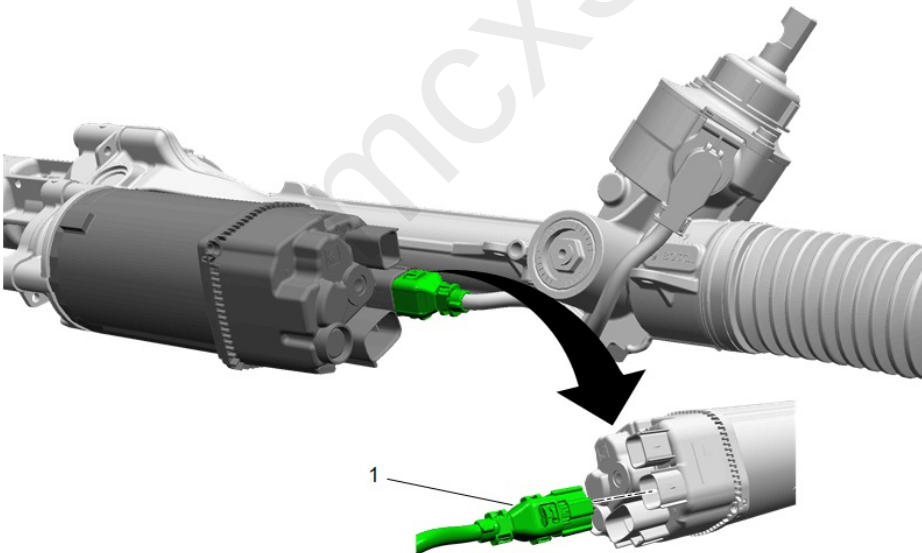
13. Use an appropriate sized open end wrench (2) to rotate the steering gear input shaft (1) and verify smooth rotation.
14. Visually inspect the steering gear belt through the large and small cover area while rotating the electric belt drive rack and pinion steering gear input shaft (1) to verify any damage to the belt. If there is evidence that the belt is damaged, stop the procedure and replace the electric belt drive rack and pinion steering gear.



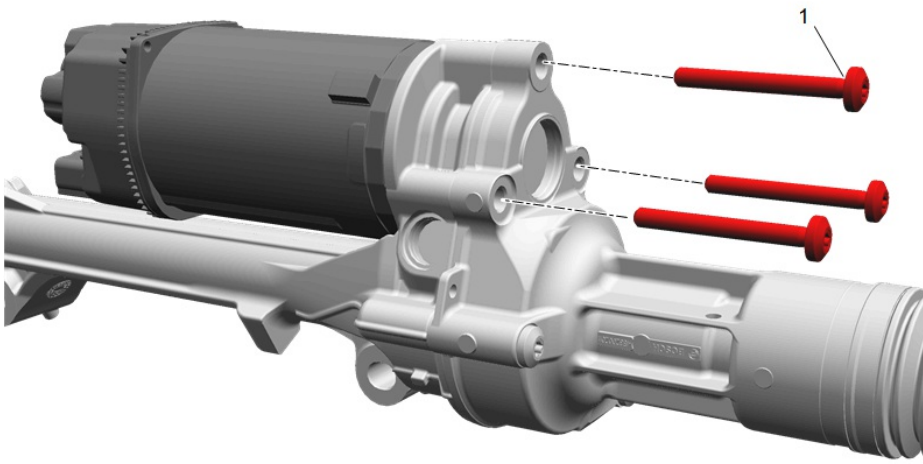
15. [Click here for full size](#)
16. Disengage the connector position assurance (CPA) (1) by using a small pick or small flat bladed tool and lightly pull towards you. The CPA will stop and not pull out of the cavity when disengaged. Do NOT try to pull the CPA out further as damage will occur. If the CPA is damaged, replace the entire electric belt drive rack and pinion steering gear.



17. [Click here for full size](#)
18. With a small flat bladed tool, depress the locking tab (1) towards the connector and lightly wiggle the connector body until disengaged. Do NOT attempt to pry anywhere else on the connector body or damage can occur.

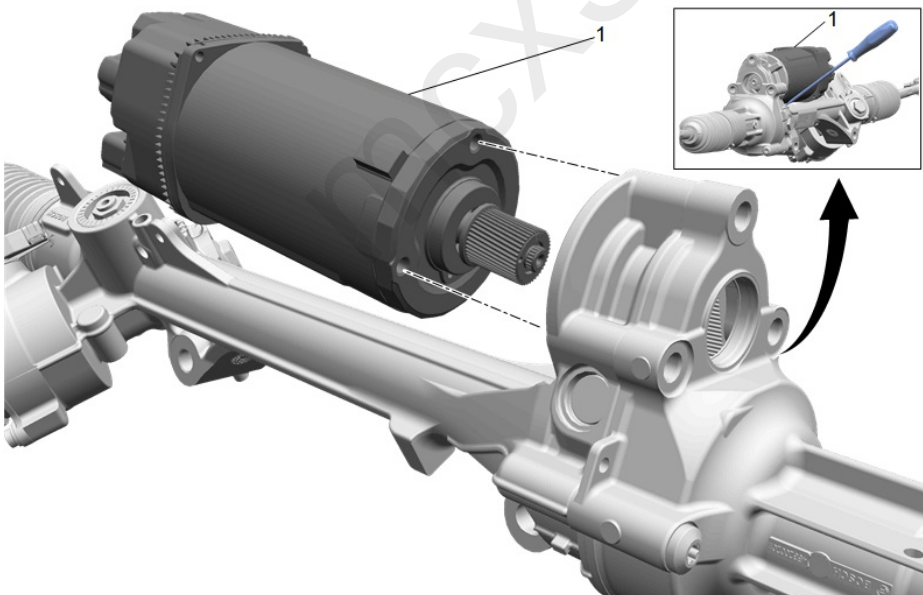


19. [Click here for full size](#)
20. Verify the electrical connector (1) is NOT damaged. If damage is noted, do NOT attempt to repair the electrical connector. Replace the entire electric belt drive rack and pinion steering gear.
21. Tape off the electrical connector to prevent debris from entering.



22. [Click here for full size](#)

23. Remove and DISCARD the 3 power steering assist motor bolts (1).

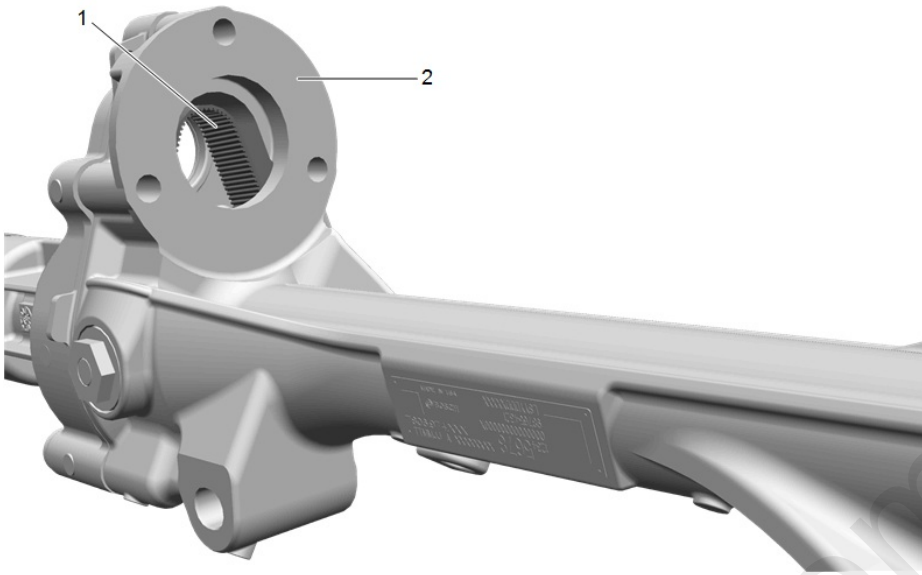


24. [Click here for full size](#)

25. Note:

- Prior to removal, note the orientation of the power steering assist motor to the electric belt drive rack and pinion steering gear.
- Do NOT apply pressure on or near the plastic electronic control unit (ECU).

26. Carefully remove the motor (1) from the housing using an appropriate size flat bladed tool to aid in the removal, ensuring that the belt slips off easily without damage.



27. [Click here for full size](#)

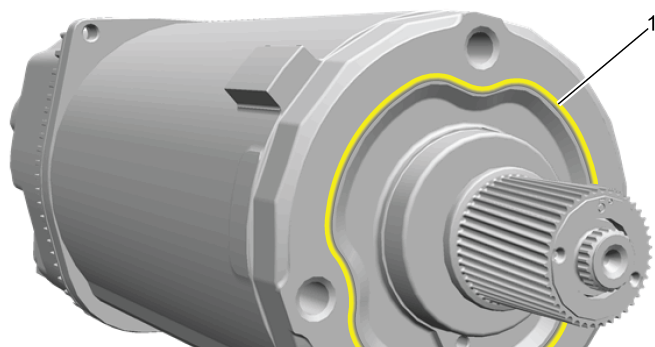
28. **Caution:**

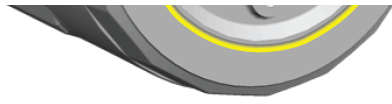
When cleaning the rack and pinion steering gear power assist motor sealing surface, ensure that no debris enters the belt cavity. Also ensure that no cleaning chemicals enter the belt cavity. If debris or cleaning chemicals enter the belt cavity, rack and pinion steering gear failure could occur and require replacement of the rack and pinion steering gear.

29. Inspect the belt (1) and cavity for belt debris. If the belt has signs of wear, or excessive amounts of rubber debris has been encountered, replace the electric belt drive rack and pinion steering gear.
30. Using low pressured compressed air blow any debris from the electric belt drive rack and pinion steering gear belt cavity. Do NOT use any cleaning fluid within the cavity as cleaning fluid could remove the grease on the rack ball located inside the cavity.
31. Place a clean lint free towel within the electric belt drive rack and pinion steering gear belt cavity.
32. **Note:**
- Do NOT use air tools to clean the power steering assist motor sealing surface.
33. Using a commercially available abrasive cleaning pad with a grit ranging between 320 and 400, clean the assist motor sealing surface (2) removing all corrosion and room temperature vulcanizing (RTV) sealant from the surface area. If the power steering assist motor sealing surface has been damaged, replace the electric belt drive rack and pinion steering gear.
34. Remove the lint free towel from the electric belt drive rack and pinion steering gear belt cavity and ensure no debris has entered the cavity.
35. Using low pressured compressed air blow any debris from the electric belt drive rack and pinion steering gear belt cavity. Do NOT use any cleaning fluid within the cavity as cleaning fluid could remove the grease on the rack ball located inside the cavity.

Installation Procedure

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2. Caution:

Only use General Motors approved room temperature vulcanizing sealant (RTV). Failure to use GM approved products may result in insufficient motor to gear sealing, allowing water intrusion which may lead to rack and pinion steering gear failure and require replacement of the rack and pinion steering gear.

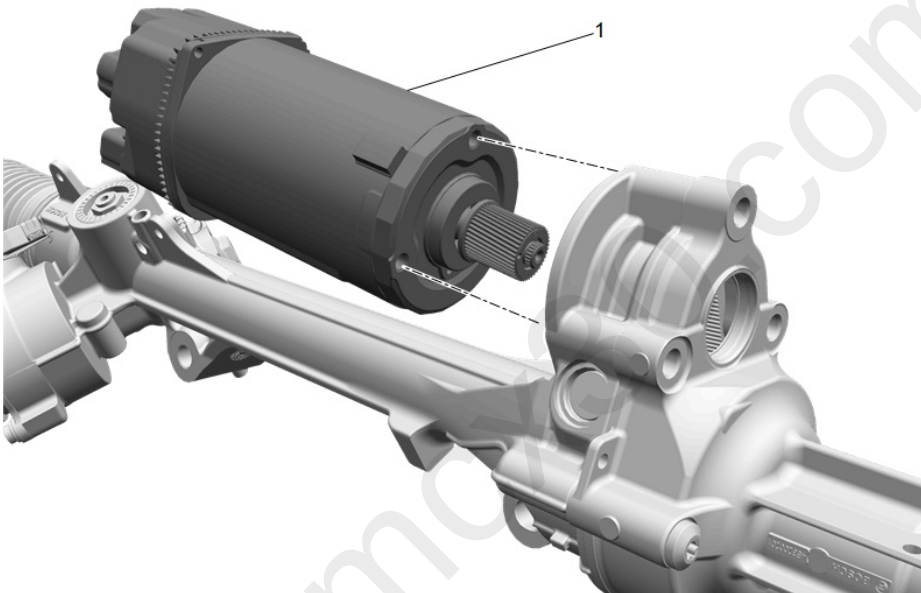
3. Caution:

Do not over apply room temperature vulcanizing sealant (RTV). Excessive RTV increases the chance of the RTV to come in contact with the belt or gear causing rack and pinion steering gear failure, requiring replacement of the rack and pinion steering gear.

4. Note:

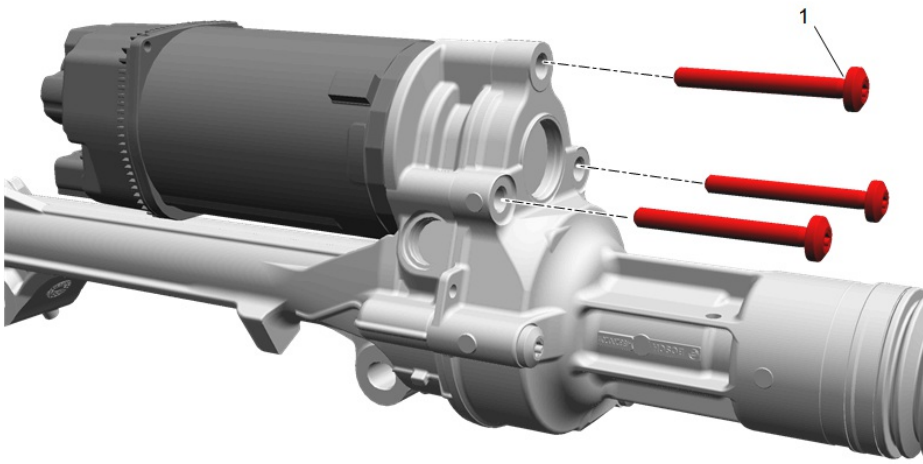
RTV cure time is 20 minutes and the following steps must be done within that time frame. Failure to complete within the 20 minute time frame will cause improper sealing of the motor to the electric belt drive rack and pinion steering gear sealing surface and steps 1 - 13 must be repeated.

5. Apply a 2.5 mm (0.10 inch) continuous bead of RTV to the motor assembly and follow the outline of the motor valley (1). Do NOT apply into the motor valley. RTV should be applied only to the outer edge of the motor valley outline. Adhesives, Fluids, Lubricants, and Sealers



6.
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7. Orient the power steering assist motor (1) to the electric belt drive rack and pinion steering gear as noted during the removal process.
8. Install the power steering assist motor (1) to the electric belt drive rack and pinion steering gear housing, ensure that the belt slips onto the motor gear easily.



9. [Click here for full size](#)

10. **Caution:**

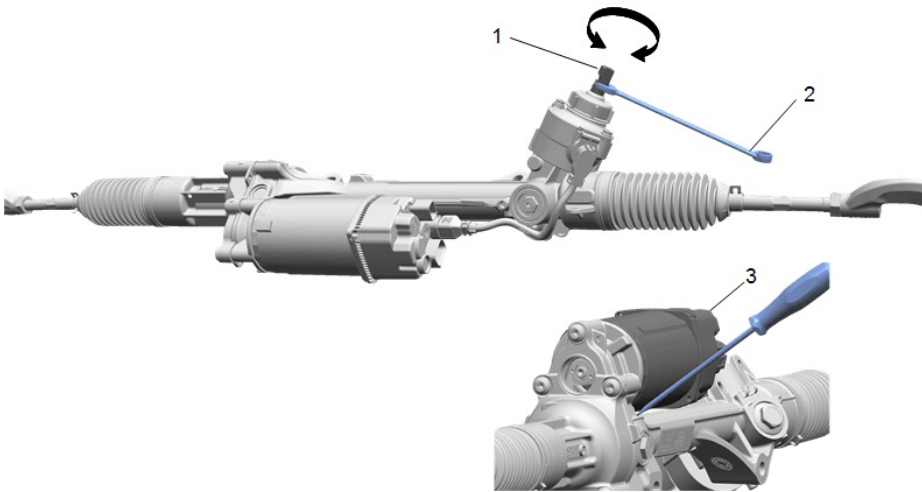
This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

11. **Caution:**

Refer to Fastener Caution.

12. Install by hand 3 NEW power steering assist motor bolts (1).

13. Pre-tighten the 3 power steering assist motor bolts (1) to a first pass of 3>N-m (27 lb in). Do NOT overtighten.

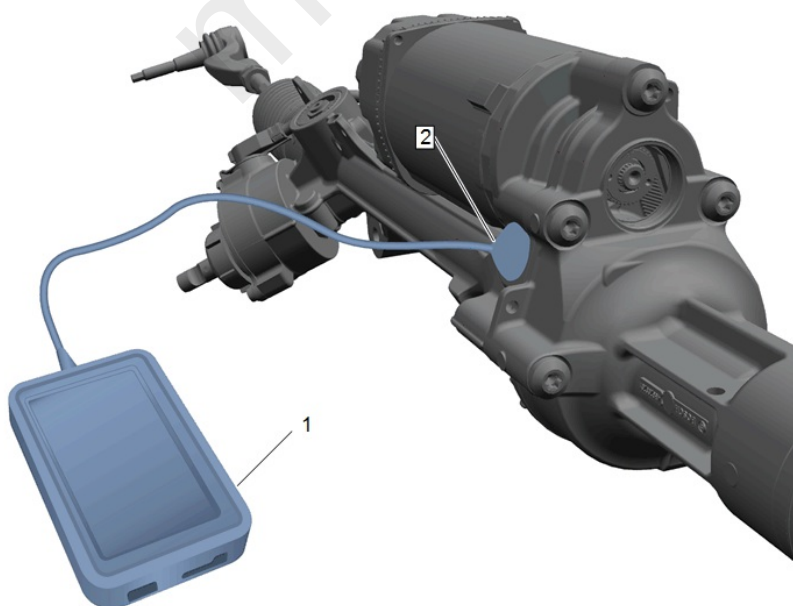


14. [Click here for full size](#)

15. **Caution:**

When adjusting tension to the steering gear belt, apply light pressure as close to the power steering assist motor mating surface as possible. Do NOT apply pressure to the middle or end of the power steering assist motor, doing so can result in damage to the motor assembly.

16. Using an appropriate sized flat balded tool, apply light pressure upwards on the power assist motor (3) while rotating the steering gear input shaft (1) with an appropriate sized open end wrench (2). Verify smooth rotation and that the steering gear belt is correctly seated within the gears.

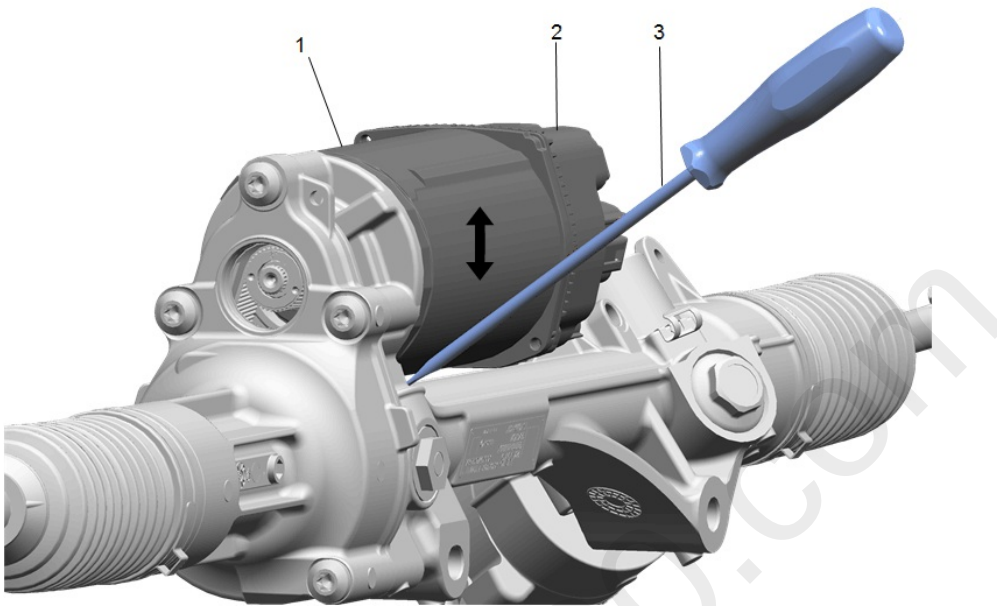


17. [Click here for full size](#)

18. Note:

During the next steps, keep garage noise away from work area at least 20 feet to avoid microphone interference. If the tool registers a frequency without strumming the belt, move to a quieter place.

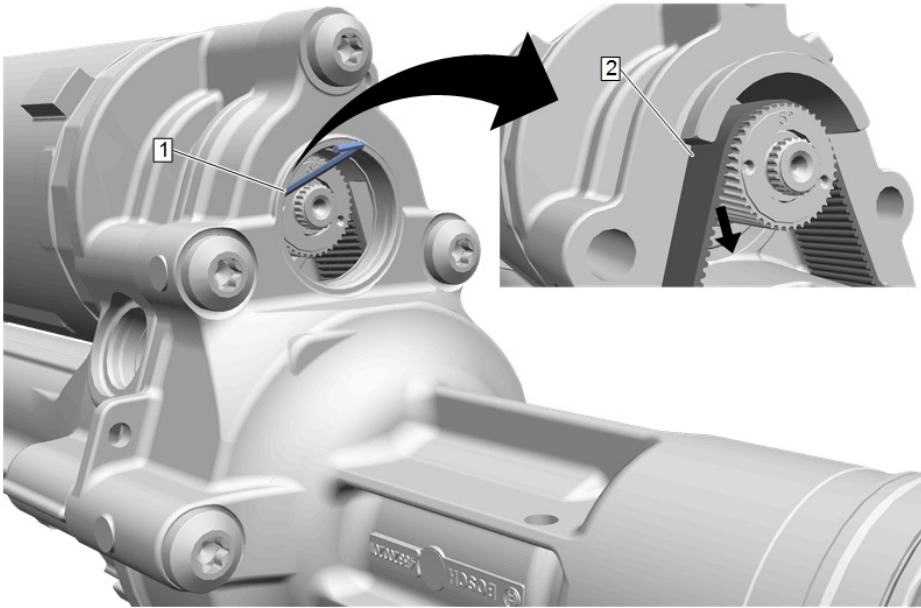
19. Place the frequency microphone (2) in the smaller cover hole and place the body of the *GE-50576-AA*, Acoustic Belt Tension Tester (1) on a flat surface or secure it to the steering gear housing and position the microphone (2) of the tester 6 mm (0.25 in) from the steering gear belt. Do NOT allow the microphone (2) to touch the belt or an inaccurate reading will occur. It is acceptable to allow the sides of the microphone (2) to touch the aluminum housing



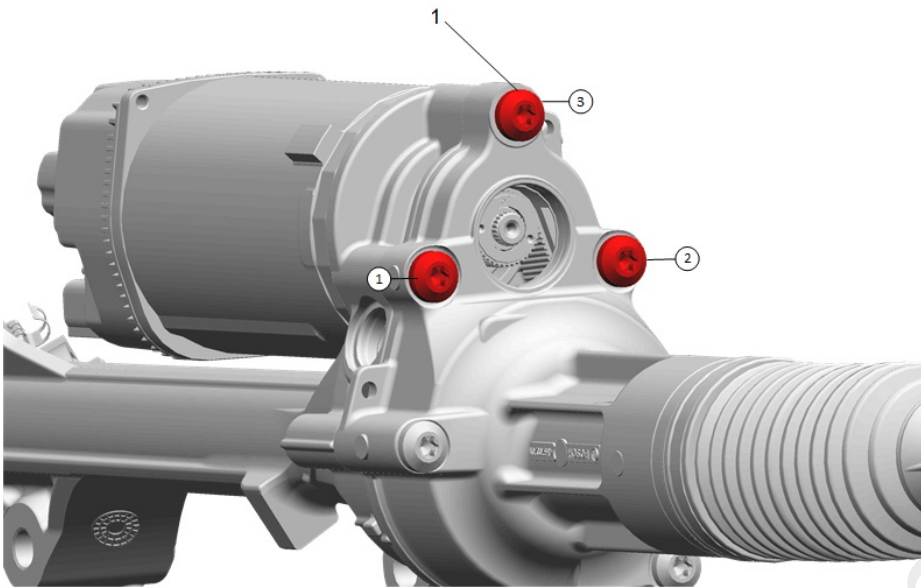
20.
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21. Adjust the electric belt drive rack and pinion steering gear belt until an average frequency reading between 340 - 420 Hz is achieved.

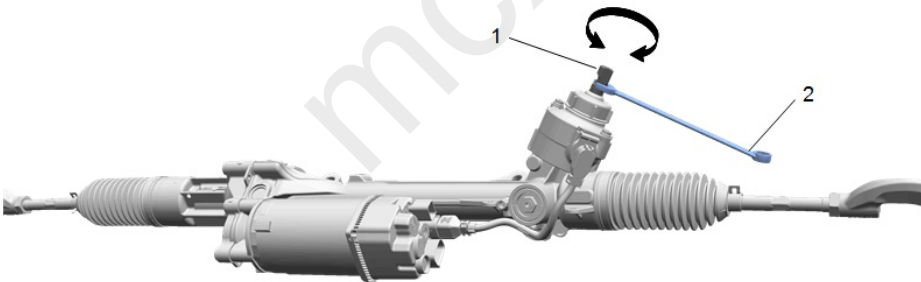
- 22.
- Do NOT apply pressure on or near the plastic electronic control unit (ECU) (2).
 - Use a flat bladed tool (3) to apply pressure upwards to the power steering assist motor (1) which will tighten the electric belt drive rack and pinion steering gear belt increasing the frequency reading.
 - Releasing the applied pressure on the power steering assist motor (1) will loosen the tension on the electric belt drive rack and pinion steering gear belt decreasing the frequency reading.
 - If the *GE-50576-AA*, Acoustic Belt Tension Tester does NOT register a reading, lessen the applied pressure as the frequency is too high for a reading.
 - It is advisable to apply pressure to a lower frequency around 300 to 320 Hz before tightening the motor fasteners.



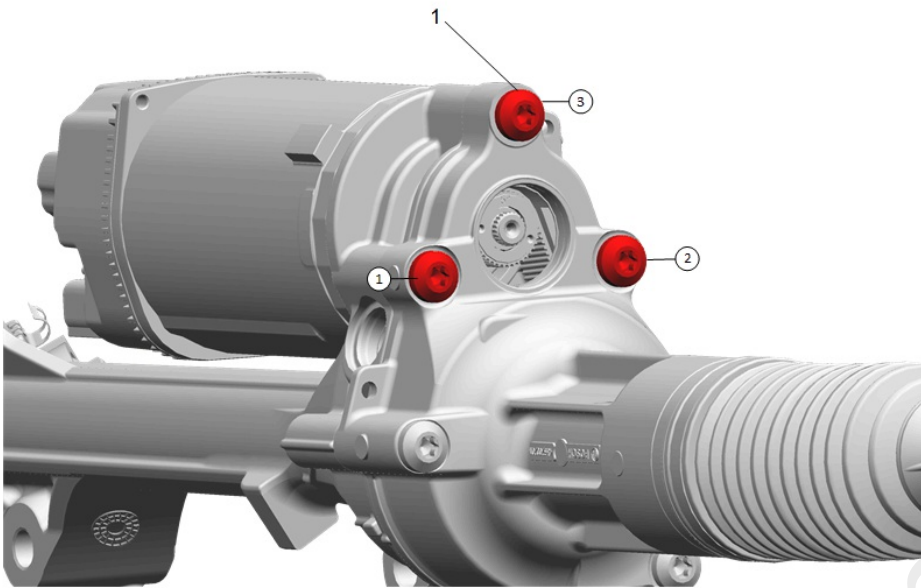
23. [Click here for full size Extra Item: video](#)
24. Using a small allen wrench (1), pluck the electric belt drive rack and pinion steering gear belt (2) three times to get an average belt tension measurement.
- 25.
- Ensure you grab the edge of the electric belt drive rack and pinion steering gear belt.
 - The electric belt drive rack and pinion steering gear belt (2) will make a small ping noise when strummed correctly.



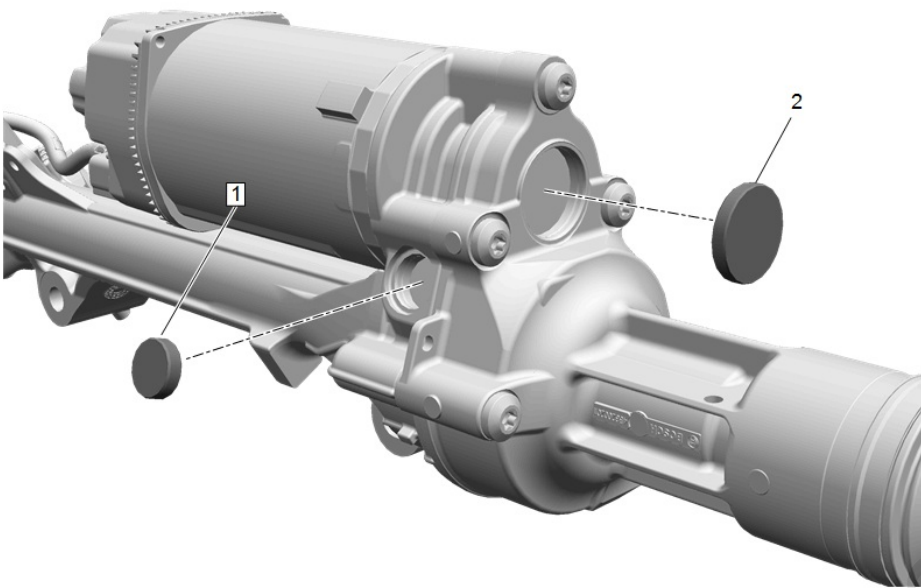
26. [Click here for full size](#)
27. Once a frequency reading between 340 - 420 Hz is achieved, tighten the 3 power steering assist motor bolts (1) to second pass of 6>N-m (53 lb in). Do NOT overtighten.



28. [Click here for full size](#)
29. Use an appropriate sized open end wrench (2) to rotate the steering gear input shaft (1) and verify smooth rotation. Ensure the belt is still seated within the gears.
30. Repeat steps 9 - 11 verifying the frequency reading is still between 340 - 420 Hz.



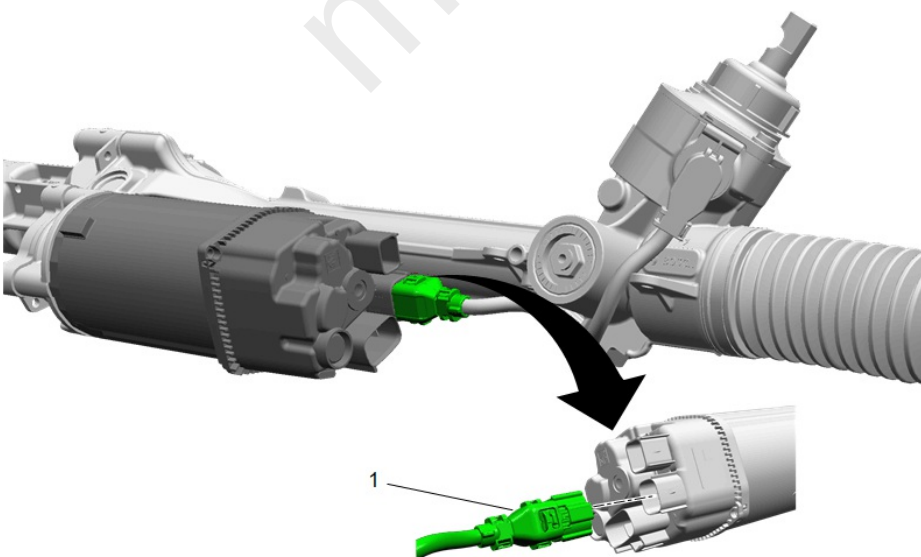
31. [Click here for full size](#)
32. Once the correct frequency is verified, tighten the 3 power steering assist motor bolts (1) in sequence shown to:
- 33.
1. Third Pass: 10N-m (89 lb in)
 2. Final Pass: 55 - 60 degrees
34. Verify the frequency reading is still within specifications.



35.
[Click here for full size](#)

36. Install NEW small (1) and large (2) steering gear housing covers:

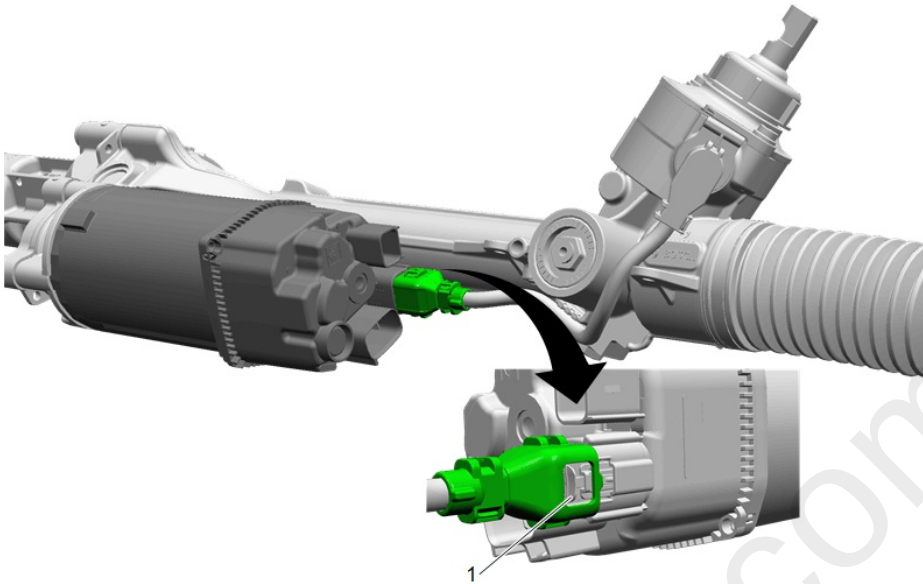
- 37.
1. Using an appropriately sized tool matching the diameter of the cover being installed, gently tap the cover into position within the steering gear assembly.
 2. Carefully tap the edge of the covers into position ensuring they are fully seated on the internal shoulder.



38.

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39. Remove the tape from the electrical connector (1) that was applied during removal.
40. Connect the electrical connector (1) to the power steering assist motor until the lock engages fully.
41. Pull back lightly on the electrical connector (1) to ensure the lock is engaged.



42.
[Click here for full size](#)
43. Engage the connector position assurance (CPA) (1).
44. Electric Belt Drive Rack and Pinion Steering Gear >> Install - Electric Belt Drive Rack and Pinion Steering Gear Replacement
45. Program the power steering control module. K43 Power Steering Control Module: Programming and Setup
46. Raise the vehicle until the wheels are off the ground. Lifting and Jacking the Vehicle
47. Start engine and verify no diagnostic trouble codes (DTC) are present. If DTC are present, correct the issue before proceeding. Diagnostic Trouble Code (DTC) List - Vehicle
48. Rotate steering wheel to the left until the lock position and hold tightly for 4 seconds.
49. Rotate steering wheel to the right until the lock position and hold tightly for 4 seconds.
50. Repeat steps 24 and 25.
51. Lower the vehicle.
52. In an area of adequate size and free of heavy traffic or pedestrians, drive the vehicle 16 - 24 km/h (10 - 15 miles MPH) turning the steering wheel right and left from the lock to lock positions.
53. Ensure the steering wheel turns easily and smoothly without binding or noises.