 <b>Tesla, Inc.</b> Service Bulletin		<h2>Replace Steering Rack Housing Bolts, Model X</h2>	
<b>SB-20-32-002</b> February 14, 2020			
<b>Classification</b>		<b>Section/Group</b>	<b>Mobile Service</b>
Recall Bulletin		32 - Steering	Cannot Perform
<b>Model Year</b>	<b>Model</b>	<b>Country/Region</b>	<b>Version</b>
2015 - 2016	Model X	All	Left Hand Drive (LHD)
<small>The model(s) and model year(s) listed are a general approximation of the affected VIN list. Refer to the VIN/Bulletin Tracker or Customer/Vehicle profile to determine applicability of this bulletin for a particular vehicle.</small>			

Recall Bulletin: Recall Bulletins are mandatory service procedures that must be carried out by Tesla-certified Service Centers. Recall work performed by uncertified technicians could lead to unsafe conditions or voided warranty provisions.

### Condition

Long-term exposure to high-corrosion environments might weaken the bolts that attach the power steering motor to the steering rack housing.

### Correction

Replace the bolts (x5) that attach the power steering motor to the steering rack housing and apply wax sealant.

**⚠ CAUTION:** If any of the bolts are found damaged or broken, or break during removal and cannot be removed, the steering rack must be replaced (refer to Service Manual procedure 32010102).

Correction Description	Correction	Time
Replace Bolts In Steering Rack Housing And Apply Wax Sealant	S012032002	0.90
Replace Steering Rack	S022032002	4.55

	Part Number	Description	Quantity
<b>Parts Required</b>	1500015-00-A	STEEL BOLTS FOR BOSCH STEERING GEAR-MX (set of 5)	1
	1008722-00-A	BOLT HF M8x30 PC109 ADH MAT	4
	1037743-00-A	BOLT PF M6x40 PC109 ECOFIX	2
	1465753-00-A	PFINDER AP 13/18 WAX CAN (1 can of wax sealant services approximately 20 vehicles. Shake the can before use.)	1
<b>If Necessary</b>	1467673-00-A	LHD STEERING GEAR W/ STEEL BOLTS + WAX	1
<small>These part numbers were current at the time of publication. Use the revisions listed or later, unless otherwise specified in the <a href="#">Parts Catalog</a>.</small>			
<b>Special Tools</b>	1483205-00-A	Kit, Steering Gear Bolt Extraction	
<b>Shop Supplies</b>	Alcohol wipes (1054788-00-A)		
	Nylon brush (1057223-00-A)		
	Paint pen, orange (1054783-00-A)		
	Brake cleaner aerosol:		
	<ul style="list-style-type: none"> <li>North America (1023297-00-A, 1023297-03-A)</li> <li>Europe, Middle East, Africa (1099802-00-A, 1023297-07-A)</li> <li>Asia Pacific (1023297-02-A, 1023297-04-A, 1023297-06-A)</li> </ul>		

## Procedure

**⚠ WARNING:** Examine all steering rack housing bolts during the beginning of this procedure. If any bolts appear damaged or broken, or break during removal and cannot be removed, the steering rack must be replaced (refer to Service Manual procedure 32010102).

**⚠ WARNING:** During the steps in this procedure, make sure only 1 steering rack housing bolt is removed from the steering rack at any time. Removing more than 1 bolt at a time could result in damage to the steering rack. This damage might lead to a loss of steering. If more than 1 bolt has been removed at the same time, the steering rack must be replaced.

1. Raise and support the vehicle on a 2-post lift (refer to Service Manual procedure 10000205).
2. Remove the RH front wheel (refer to Service Manual procedure 34015001).
3. Inspect all 5 steering rack housing bolts (steering gear to steering gear motor) (Figures 1 – 4):
  - If any bolts are damaged or broken, discontinue this procedure and replace the steering rack (refer to Service Manual procedure 32010102).
  - If all 5 bolts are present and undamaged, continue to the next step.

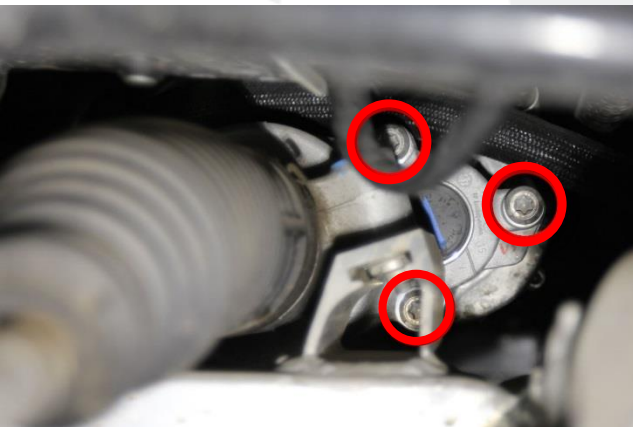


Figure 1 – Steering rack housing bolts 1, 2, and 3



Figure 2 – Steering rack housing bolt 4

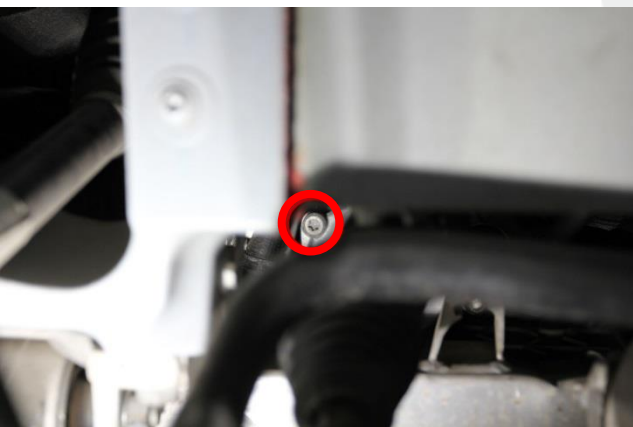


Figure 3 – Steering rack housing bolt 5

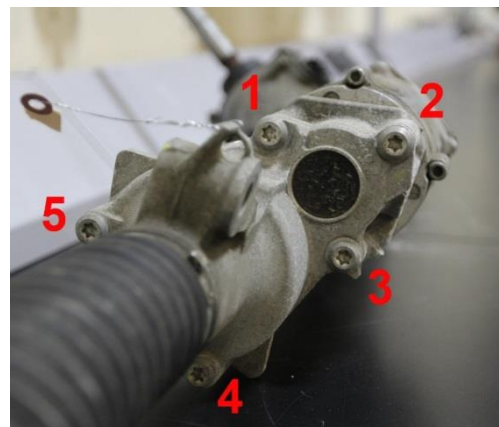


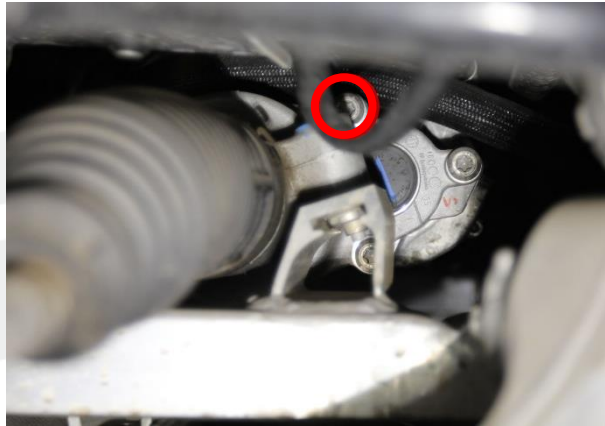
Figure 4 – Identification of all steering rack housing bolts (steering rack removed from vehicle)

4. Clean the area around the steering rack housing bolts with a shop towel, and then clear debris away with compressed air.

5. Remove and discard steering rack housing bolt 1 (Figure 5).

**⚠ WARNING:** Make sure only 1 steering rack housing bolt is removed from the steering rack at any time. Removing more than 1 bolt at a time could result in damage to the steering rack. This damage might lead to a loss of steering. If more than 1 bolt has been removed at the same time, the steering rack must be replaced.

**📄 NOTE:** If the steering rack housing bolt is sheared off or damaged during removal, use the Steering Gear Bolt Extraction Kit (1483205-00-A) to remove the bolt (refer to tool profile [TP-1483205-00-A](#)).

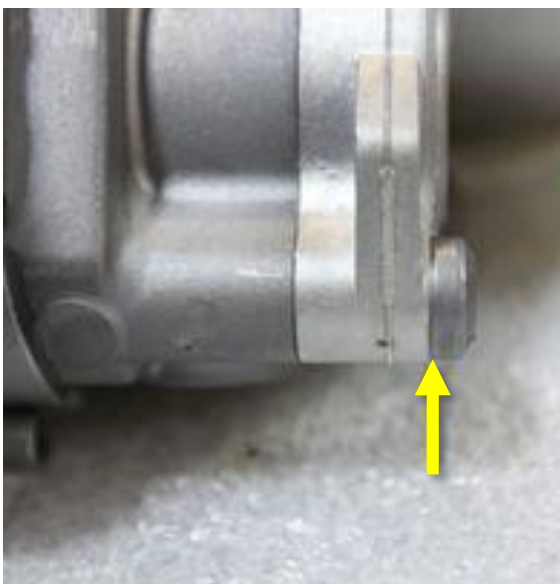


**Figure 5 – Steering rack housing bolt 1**

6. Inspect the removed bolt before discarding it to determine whether the threads of the steering gear housing are damaged.

**⚠ CAUTION:** If extraction is unsuccessful, or if the steering rack housing threads appear to be damaged, discontinue this procedure and replace the steering rack (refer to Service Manual procedure 32010102).

7. Install a new steering rack housing bolt 1 (torque 5 Nm) (Figure 5).
8. Inspect the bolt to make sure it is fully seated against the steering rack housing (Figure 6) before applying a 90-degree angle torque. If the bolt does not seat properly (Figure 7), remove the bolt and inspect the hole on the steering gear to make sure there is no debris or damage preventing the bolt from fully seating.



**✓ Figure 6**

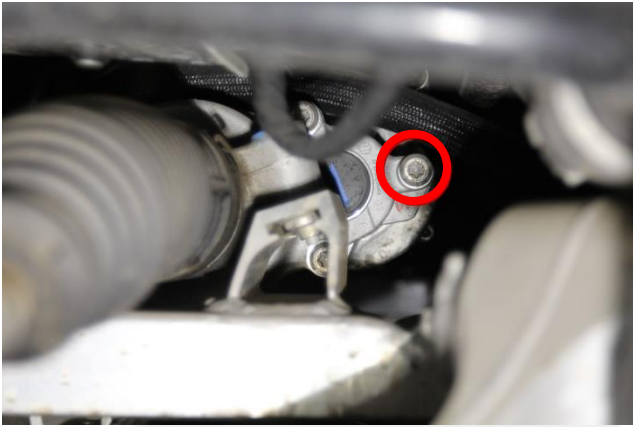


**✗ Figure 7**

9. Apply a 90-degree angle torque, and then mark the torqued bolt with an orange paint pen.

10. Repeat steps 5 – 9 for each of the remaining steering rack housing bolts 2, 3, 4, and 5 (Figures 8 – 11).

**⚠ WARNING:** Make sure only 1 steering rack housing bolt is removed from the steering rack at any time. Removing more than 1 bolt at a time could result in damage to the steering rack. This damage might lead to a loss of steering. If more than 1 bolt has been removed at the same time, the steering rack must be replaced.



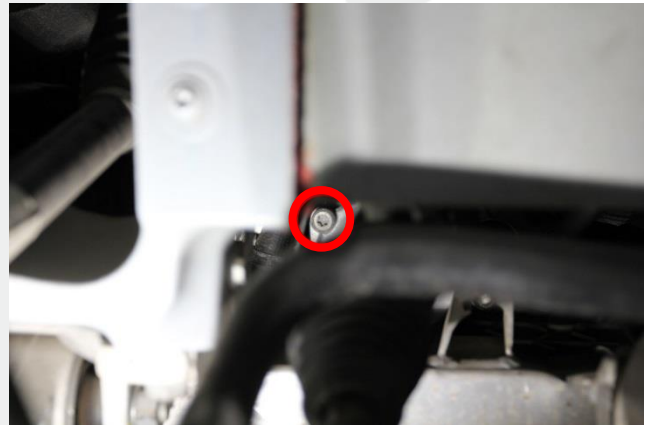
**Figure 8 – Steering rack housing bolt 2**



**Figure 9 – Steering rack housing bolt 3**



**Figure 10 – Steering rack housing bolt 4**



**Figure 11 – Steering rack housing bolt 5**

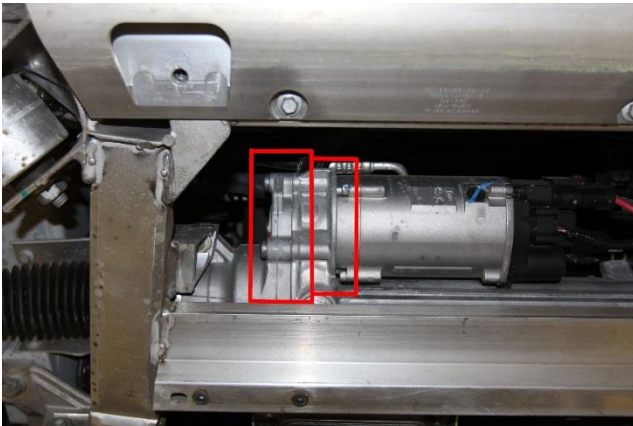
11. Remove the front aero shield panel (refer to Service Manual procedure 12030102).

12. Remove the front extrusion bash plate (refer to Service Manual procedure 30011402).

13. Remove the front skidplate (refer to Service Manual procedure 30011002).

14. Use a nylon brush and brake cleaner aerosol to clean the 5 steering rack housing bolts and the steering rack housing seams (Figures 12 and 13).

**⚠ CAUTION:** Do not use a steel or brass brush to clean the area around the steering rack housing bolts. Rust damage to the steering rack might result.

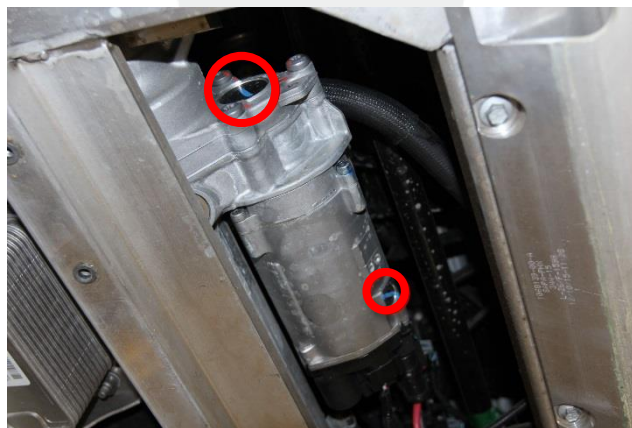


**Figure 12**



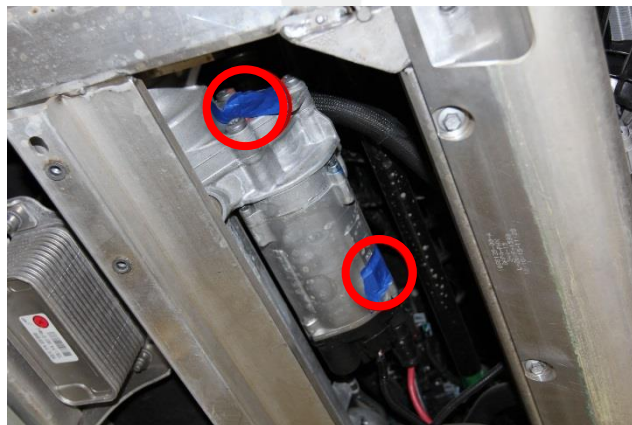
**Figure 13**

15. Use isopropyl alcohol (IPA) wipes to clean the sealing plugs (x2) on the steering gear (Figure 14) and allow the area to dry for at least 1 minute.



**Figure 14**

16. Cover the sealing plugs (x2) with masking tape (Figure 15).



**Figure 15**

17. Cover the components near the steering rack with shop towels to protect from drips during wax sealant application (Figure 16).



**Figure 16**

18. Shake well the wax sealant solution before use.

19. Apply the wax sealant to the steering rack housing bolts and steering rack housing seams (Figures 17 and 18). Make sure to apply wax sealant to the underside of the steering rack, as well as the motor housing. Completely cover the following areas with the wax sealant (Figure 19):

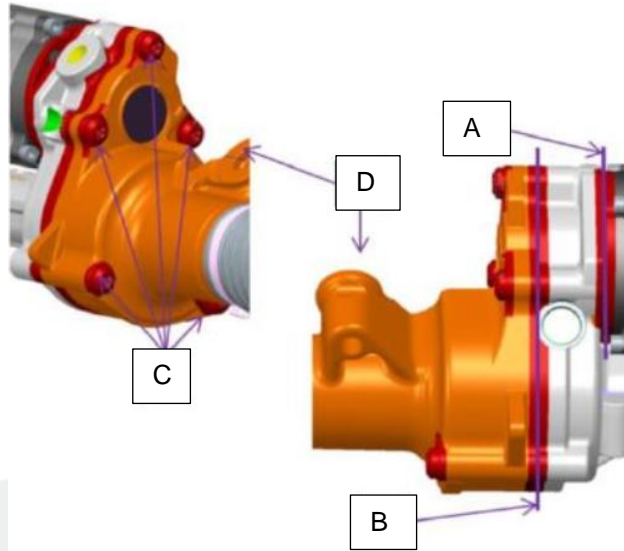
- A. The entire seam at the interface of the steering rack housing and the motor
- B. The entire seam at the interface of the steering rack housing and the gear cover
- C. All 5 bolt heads
- D. The open screw thread bore



**Figure 17**



**Figure 18**



**Figure 19**

20. Allow the first coat of the wax sealant to partially dry for 3 minutes.
21. Apply a second coat of wax sealant to the same areas described in step 19.
22. Close the lid on the wax sealant container when finished so that the contents do not solidify.
23. Remove the shop towels and wipe up any excess wax sealant.
24. Remove the masking tape covering the sealing plugs on the steering rack (Figure 15).
25. Install the front skidplate (refer to Service Manual procedure 30011002).
26. Install the front extrusion bash plate (refer to Service Manual procedure 30011402).
27. Install the front aero shield panel (refer to Service Manual procedure 12030102).
28. Install the RH front wheel (refer to Service Manual procedure 34015001).
29. Remove the vehicle from the lift.