

XOS Technical Service Bulletin

Bulletin No.: TSB-007-24

Date: April 15, 2024

Subject: Motor Mount Swap as Remedy for Driveline Noise

Applicability: All 2021-2022 Xos SV05, SA01 Trucks

Service Category: Chassis

Section: Mounting Structures

Market: USA and Canada

Introduction:

In the event that the Xos stepvan produces a repeatable, loud growling noise during driving, coasting or braking from the driveline, please follow this instruction to replace the motor mounts and center the electronic parking brake (“EPB”) rotor.

Repair Procedure Overview:

1. Confirm affected VIN from service case.
2. Allocate material for replacement and resolution.
3. Replace the motor mounts.
4. Confirm torque ratings and perform torque markings on motor mounts.
5. Center the EPB rotor
6. Confirm torque ratings and perform torque markings on rotor

Vehicle Applicability:

Model Year	Model
2021 - 2022	SV05, SA01





Warranty Information:

Model	Operation Code	Operation Description	Time (Hours)
SV05	270170	Motor Mounts Replacement	6

Parts Information:

Part Number	Description	QTY
RM01-MB-A0104	Driver side front motor mount	1
RM01-MB-A0105	Driver side rear motor mount	1
RM01-MB-M0107	Passenger side front motor mount	1
RM01-MB-M0106	Passenger side rear mount	1
HD20-HH-M0020	Motor mount fasteners	16
VN00-MB-A0009	Rubber isolator (reuse existing part)	4
HD20-HH-M0029	Isolator bolt (reuse existing part)	4
HD30-HH-M0013	Isolator nut (reuse existing part)	4
VN00-PB-N0360	Loctite 243	AR
HD20-HH-M0111	Bolt (motor flange to EPB rotor)	10
HD40-HH-M0010	Washer (motor flange to EPB rotor)	10
HD20-HH-M0112	Bolt (driveshaft yoke to EPB rotor)	9

Tools:

Tool	Quantity	Exhibit
Large Alignment Pins	2	
Small Diameter Alignment Pins	2	
Torque Wrench	2	
Adjustable Wrench	2	
16mm Socket	1	
1 1/8" Socket	1	

13mm Socket	1	
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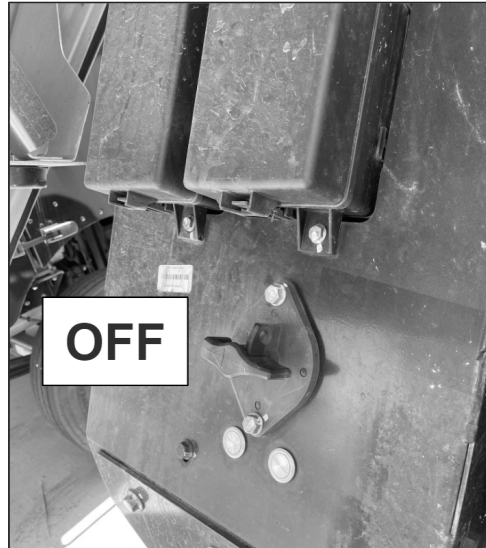
Procedure:

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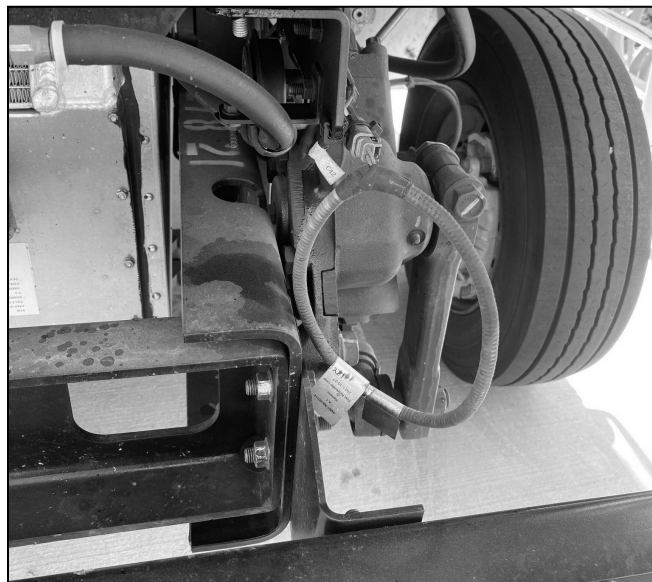
- A. Vehicle Preparation**
- B. Motor Mount Removal**
- C. Motor Mount Replacement**
- D. EPB Rotor Centering**
- E. Vehicle Startup**
- F. Vehicle Testing**

A. Vehicle Preparation

1. Update the vehicle to the latest software revision
2. If possible, drive 5 miles to understand the current condition of the vehicle and to have current telematics data
3. Power down the vehicle using the power switch under the hood



4. Remove the first responder loop under the hood to disconnect the high voltage interconnect loop (HVIL) external disconnect. The high voltage interconnect loop is a low voltage safety circuit that runs throughout the high voltage system. Disconnecting the first responder loop from the vehicle will disconnect power to the low voltage circuit, thus opening the contactors and removing power from the vehicle.



B. Motor Mount Removal

1. Raise the vehicle to an appropriate height to begin working on the motor assembly.
2. Before loosening or removing any fasteners, support the motor from underneath using a lift or transmission jack.
 - a. **Note:** Ensure to provide additional support to the front of the motor using a wood block or something similar to prevent the motor from rolling from side to side. Tip the motor slightly backwards in the vehicle to prevent unexpected movement. The lifting device will also need to be flexible enough to move the motor from side to side between the frame rails to aid in mounting bracket removal and installation.



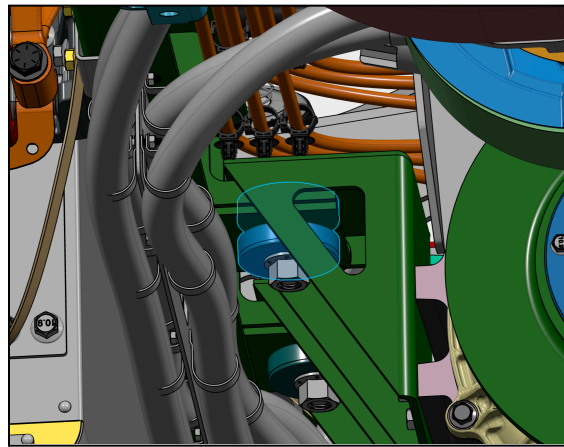
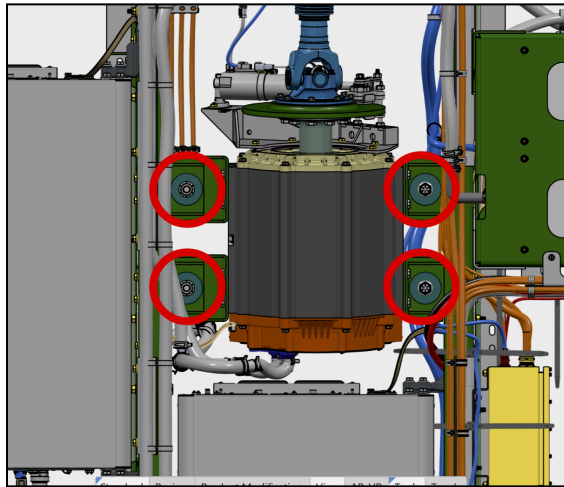
3. Disconnect the electrical connection(s) to the Electronic Park Brake (EPB) so that they are not pulled during this procedure (image shows EPB 2.0).



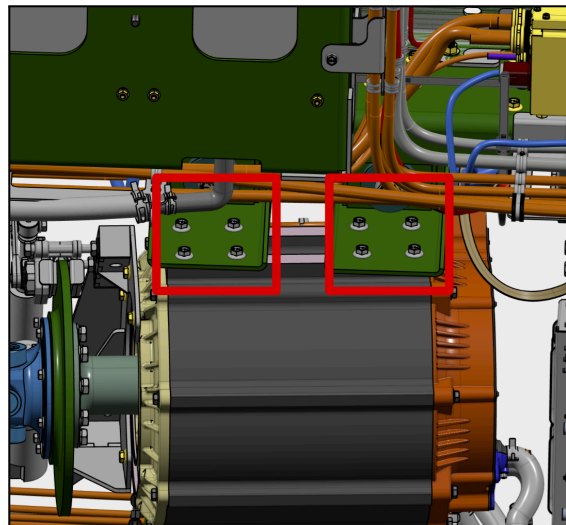
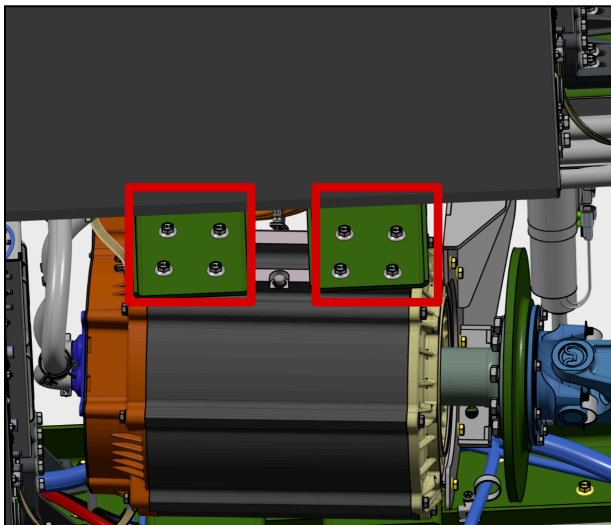
4. With the motor properly supported, start by loosening (4x) isolator bolts with a $1 \frac{1}{8}$ " socket that connect the motor mounts to the frame-side brackets. There are (16x) total bolts to be removed across the (4x) brackets.



5. Remove (4x) isolator bolts and bottom isolators. Raise the motor slightly to allow access to remove the (4x) upper isolators that are located between the motor mounts and frame-side brackets. Keep all isolators, bolts and nuts for reinstallation.



6. Using a 16mm socket, remove the (8x) bolts that secure the two mounting brackets to the side of the motor. A total of 16 bolts will be removed (8x per side). Retain bolts for reinstallation.



7. The four motor mounts will now be free to be removed.
 - a. **Note:** Removal of the mounts will require moving the motor assembly to one side and possibly up and down to allow adequate clearance. Take care to keep the motor steady on its support and be aware of cables and hoses that will be in your work area. It is recommended to remove the passenger side brackets first and then remove the driver side brackets last.



8. Once the motor is removed, all four motor mounts can be discarded. The motor should be positioned as close to the passenger side as possible to begin the next section. Take caution when moving the motor on its support and be aware of other items in your work space.

C. Motor Mount Replacement

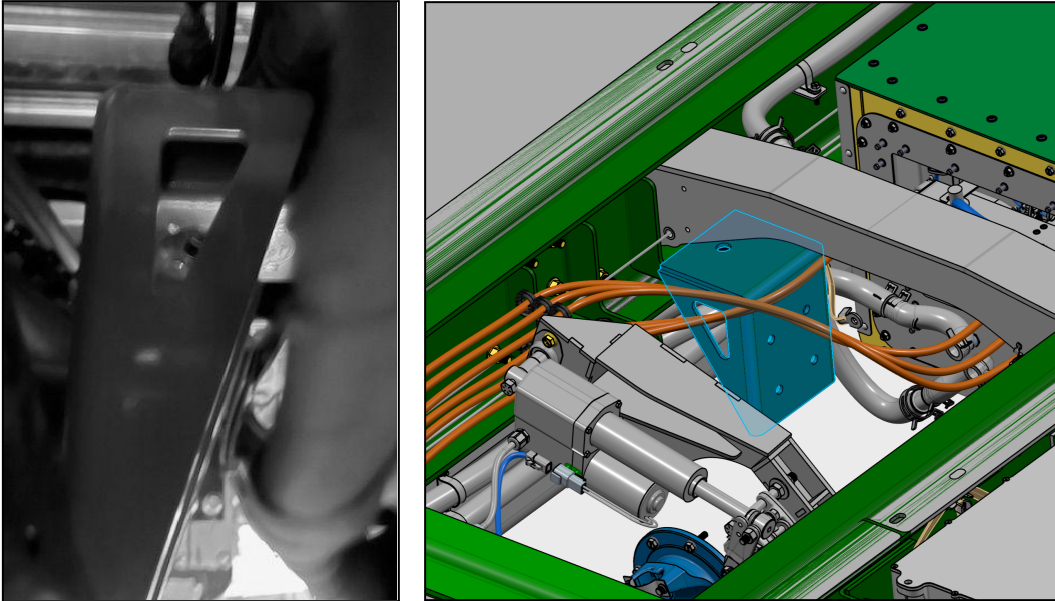
1. Locate the four (4) new motor mounts.
 - a. **Note:** All four brackets are different and have specific locations to mount on the motor. You will notice that the driver side brackets are wider at the top than the passenger side. These must be installed per these instructions or the assembly will not operate as designed.



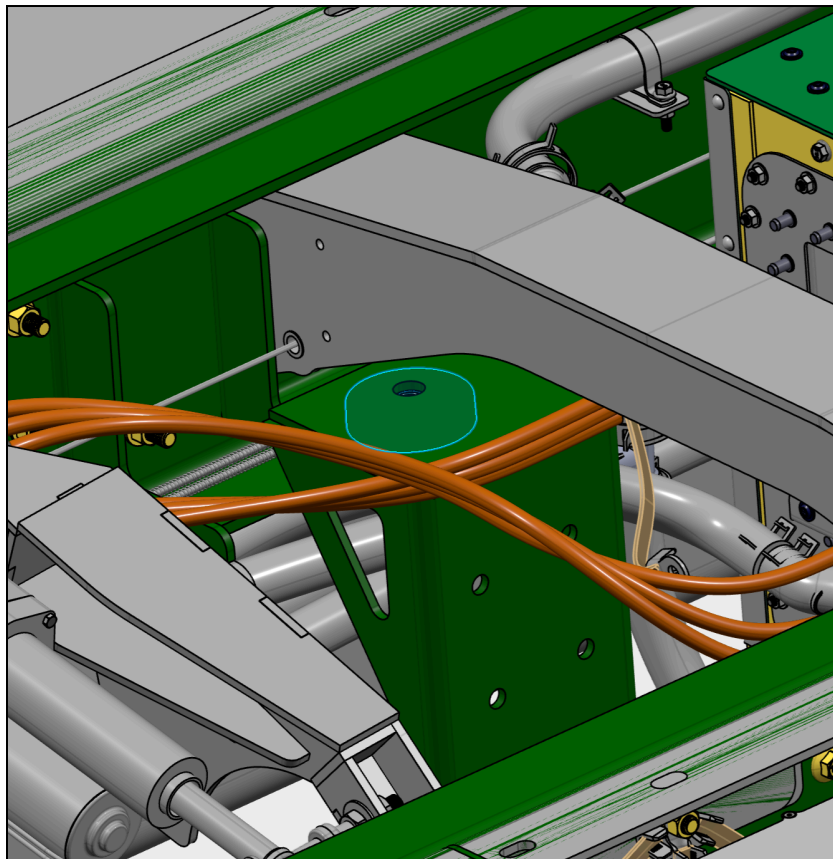
2. Start by installing the thicker, driver side brackets first



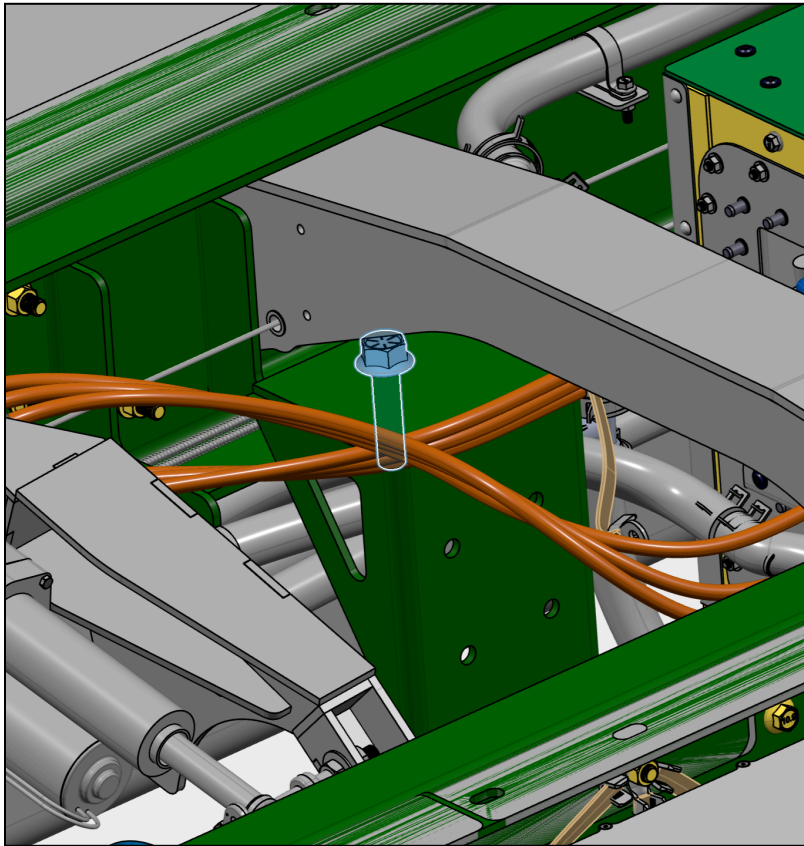
- Carefully maneuver the driver side front bracket (**RM01-MB-A0104**) over the frame side bracket so that it hangs loosely in place. Again, you may have to move the motor to get clearance.



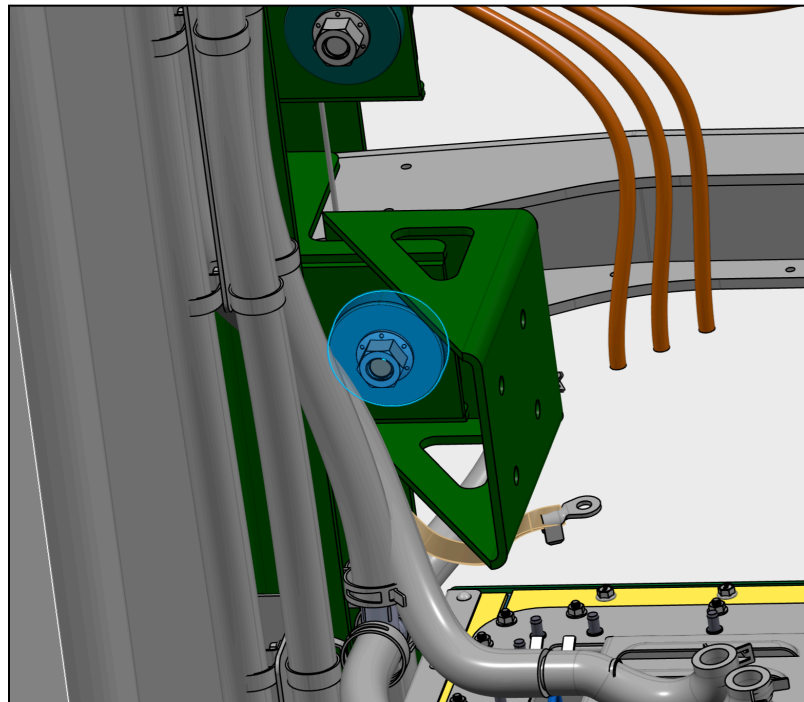
- Next raise the motor mount and insert the upper half of the isolator (**VN00-MB-A0009**) between the motor mount and frame side bracket.



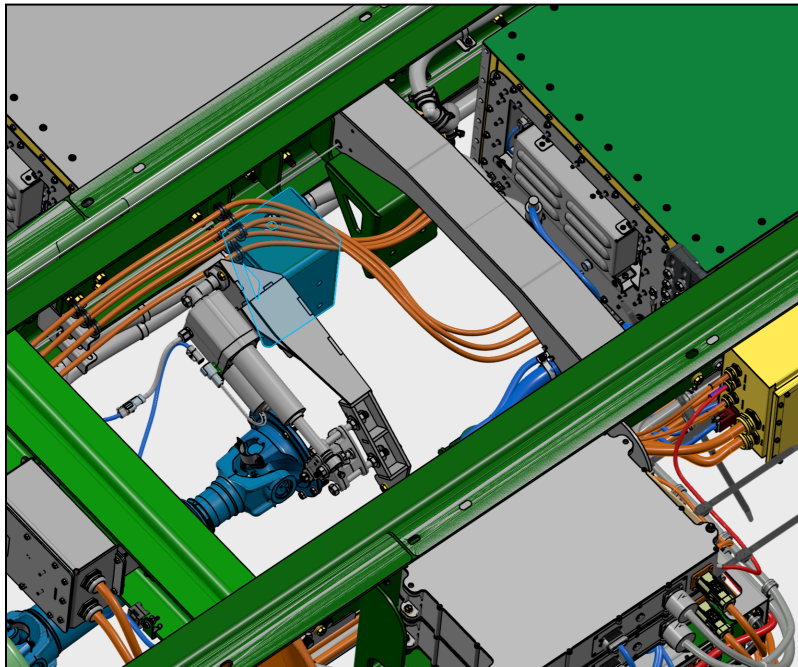
11. Insert the Isolator bolt (**HD20-HH-M0029**) from above the mounting bracket.



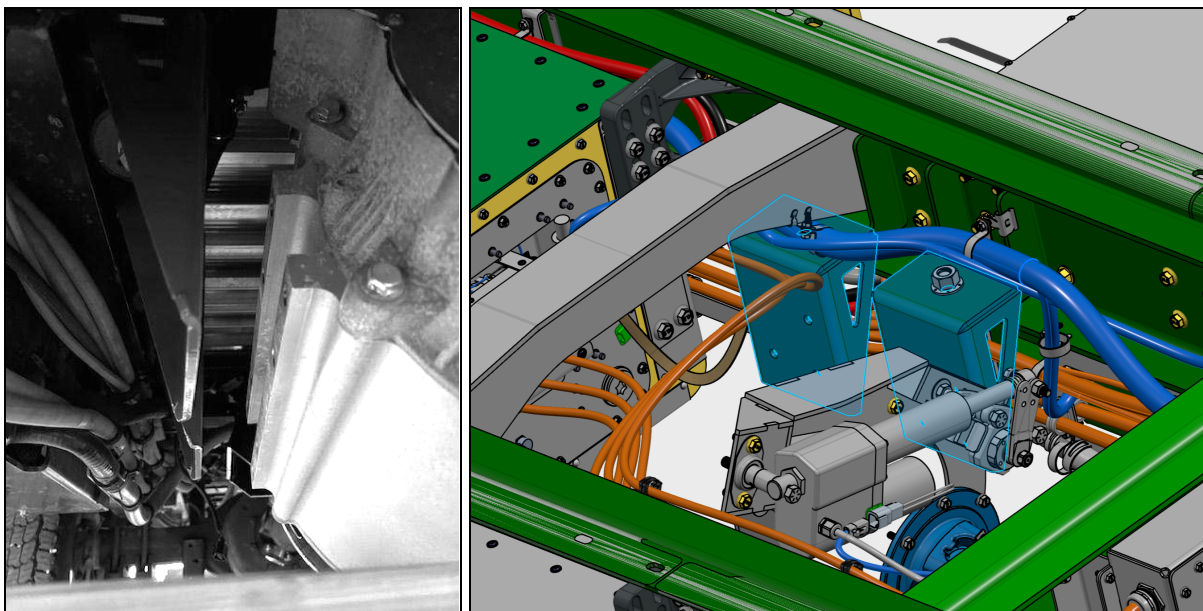
12. Install the lower half of the isolator (**VN00-MB-A0009**) and hand-tighten the nut (**HD30-HH-M0013**) with a 1 1/8" socket to keep the assembly together.



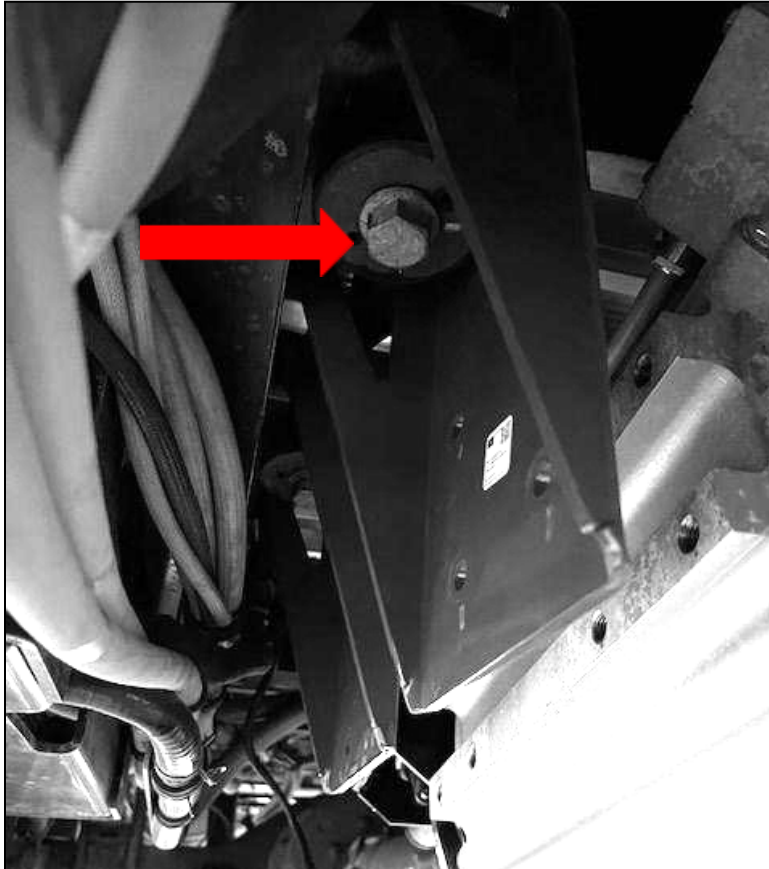
13. Repeat steps 9-12 for the rear motor mount (**RM01-MB-A0105**) on the driver side. Leave the isolator fastener hand tightened until final positioning.



14. Repeat steps 9-12 on the passenger side. Install the front mount (**RM01-MB-M0107**) first and then the rear mount (**RM01-MB-M0106**), installing the isolator (**VN00-MB-A0009**) between the motor mounts and frame side brackets.



15. For the passenger side, it is easiest to install the isolator bolts (**HD20-HH-M0029**) from the bottom, rather than the top. Insert the bolt (**HD20-HH-M0029**) into the bottom half of the isolator (**VN00-MB-A0009**) and insert from the bottom up using the nut (**HD30-HH-M0013**) on the top to secure. Again, hand tighten both isolator fasteners before starting the next step.



16. With the top isolator fasteners loose, begin to insert the four (4) M12 fasteners (**HD20-HH-M0020**) into each bracket to secure the bracket to the motor. Use Loctite 243 (**VN00-PB-N0360**) on all fasteners before inserting them into the motor. Once all four fasteners are started in each bracket, move to the driver side and repeat the process.
- Note:** You may need to move the motor up and down to get the holes in the brackets to align with the holes in the motor housing. Take extreme caution of pinch points whenever moving the motor.



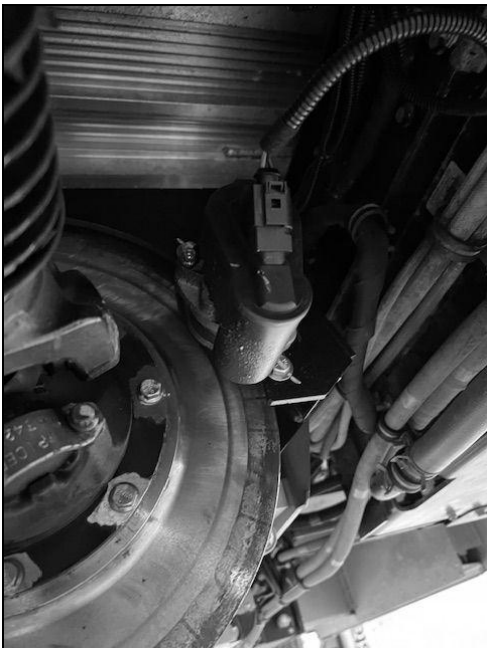
17. Once all 16 fasteners are inserted, torque each to 70 ft-lbs using a 16mm socket.



18. With all the motor mounts secure to the motor, slightly lower the motor using the lift so that the motor mounts are firmly sitting on the frame side brackets.
19. Using an impact wrench and a backing wrench, tighten all isolator bolts. Torque each isolator bolt to 300 ft-lbs.

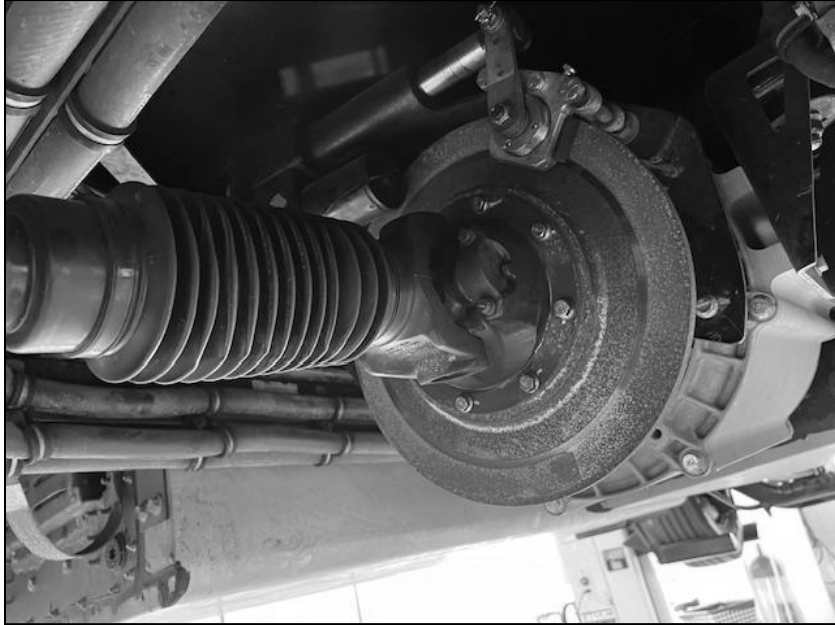


20. At this point, the motor is secured and the lifting device can be removed.
21. Reconnect the electrical connectors to the EPB.

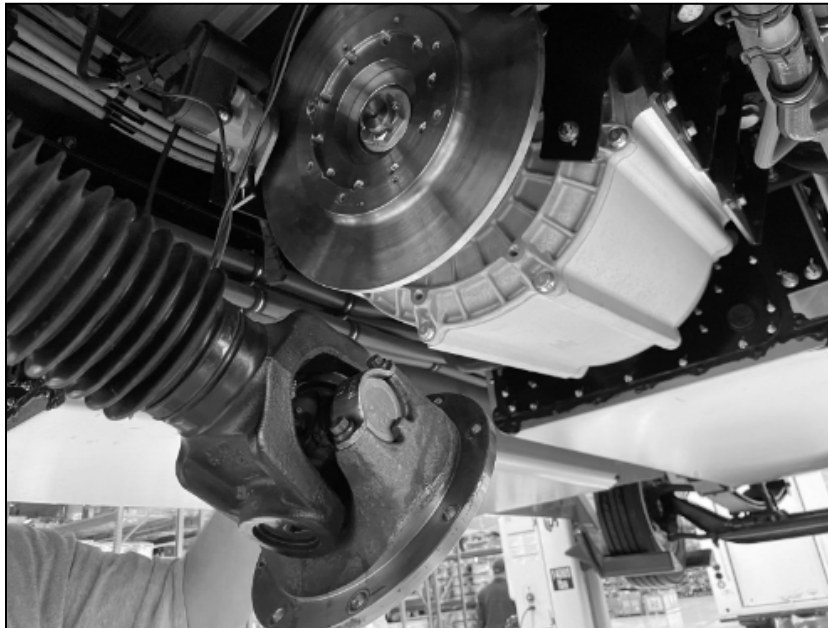


D. EPB Rotor Centering

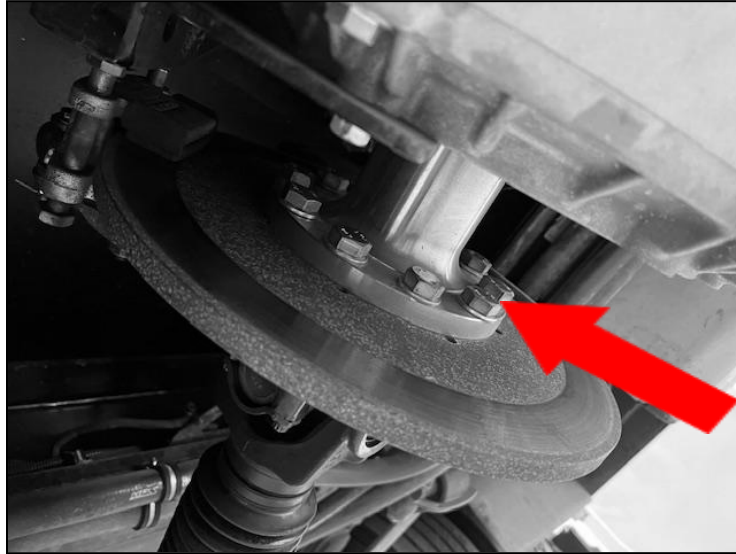
1. Confirm that Xos Safety Recall REC-002-23 work has been completed. If not, complete that recall first (See TSB 002-23).
2. Chock wheels if repair is being done on the ground.
3. Turn the vehicle off and set both the manual and the electronic park brake.
4. Remove the (8x) bolts that hold the driveshaft yoke to the rotor.



5. Lower or support the driveshaft out of the way to allow clear access to the brake rotor.

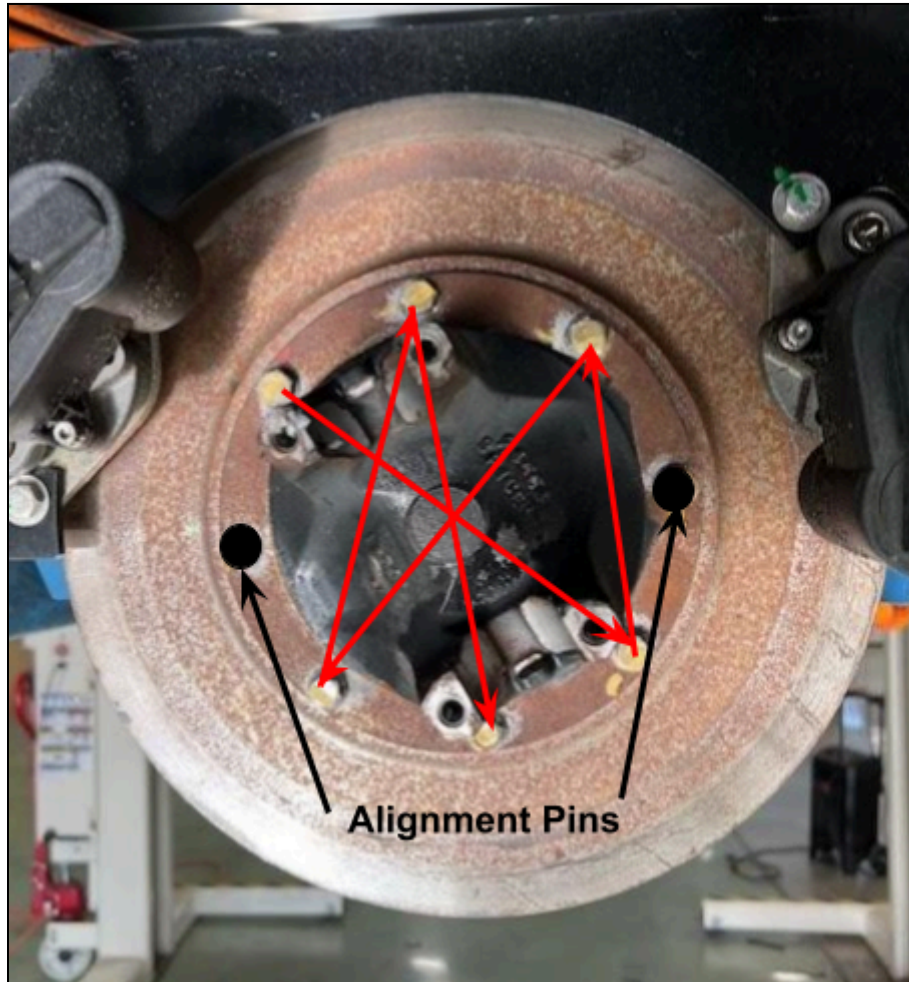


6. With the Electronic Park Brake (EPB) still activated, remove 8 of the 10 motor flange side bolts and washers, leaving 2 installed but loosened. This will keep the rotor attached to the motor flange.



7. Next, start the vehicle and shift to neutral. This will release the EPB and allow the rotor to be free for alignment. Confirm that the manual park brake is still engaged and that the tires are still chocked if the procedure is being done on the ground.
8. Using the two large alignment pins, insert them into the rotor from the motor flange side, taking care to have them inserted approximately 180 degrees from each other. Hand tighten the alignment pins until the shoulder of each pin is against the rotor's surface. This will align and center the rotor with the motor flange.
9. Apply Loctite (**VN00-PB-N0360**) and insert (6x) of the motor flange bolts (**HD20-HH-M0111**) with (6x) washers (**HD40-HH-M0010**) into the open holes and hand tighten them.
10. Remove the original 2 bolts with washers that were left in before the alignment pins were inserted. Apply Loctite (**VN00-PB-N0360**), reinsert them and hand tighten.

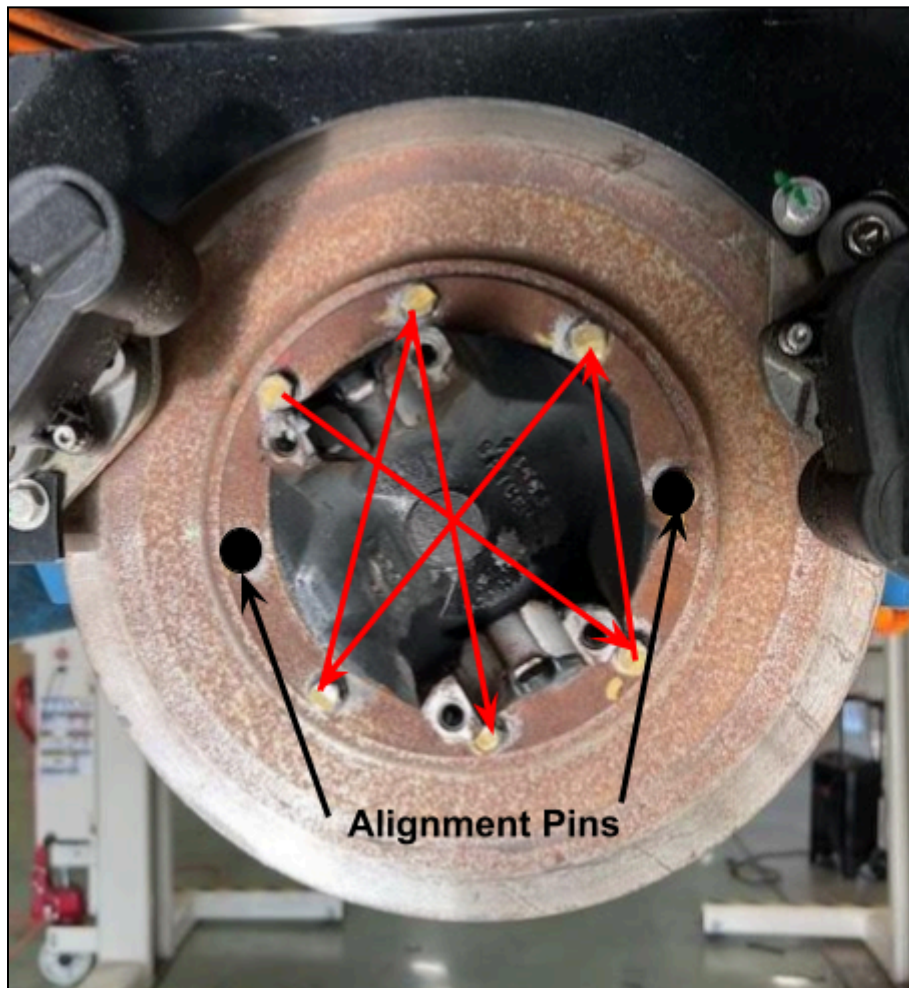
11. Now shift the vehicle into park and turn off the truck. This will cause the EPB to engage on the brake rotor.
12. Torque the bolts in a star pattern, skipping the two alignment pins. Torque to **200 Nm**.



(Driveshaft side shown - driveshaft removed)

13. Now remove the two large alignment pins and replace the final 2 bolts with washers. Apply Loctite (**VN00-PB-N0360**) and torque to **200 Nm**.
14. With EPB still engaged, attach the driveshaft yoke to the brake rotor using the two small alignment pins. Hand tighten until the shoulder of the pin contacts the face of the brake rotor. Place the pins 180 degrees across from each other.
15. Using Loctite (**VN00-PB-N0360**) insert (6x) of the motor flange bolts (**HS20-HH-M0112**) into the open holes and hand tighten them.

16. Torque the bolts in a star pattern, skipping the two alignment pins. Torque to **50 Nm**.



(Driveshaft side shown - driveshaft removed)

17. Now remove the two small alignment pins and replace with the final 2 fasteners. Apply Loctite (**VN00-PB-N0360**) and torque to **50 Nm**.

18. The vehicle is now ready for operation. Cycle the EPB several times and conduct a test drive to validate the operation of the system.

E. Vehicle Startup

1. Confirm that the fire responder loop is plugged in under the vehicle hood
2. Turn on the power switch to the "ON" position under the vehicle hood
3. Key-on the vehicle and attempt a high voltage bus diagnostic (HVBD)

F. Vehicle Testing

1. Once the vehicle is on and ready to drive, do final checks before releasing to the customer
2. Record the date and time at this moment, this will be our start time in Viriciti. All faults prior to this time will be ignored: Date: _____ Time: _____
3. Drive 20 miles and note if driveline growling noise is still present. Note if it has improved or been eliminated.
4. Confirm Positive and Negative Isolation are both above 2200 kOhms ($R_p > 2200$ kOhms, $R_n > 2200$ Kohms)
5. Review telematics for any anomalies
6. FRE team approves vehicle for release to the customer