



GROUP
ELE

MODEL
2019MY~ Niro
EV (DE EV)

NUMBER
234 (Rev 1, 05/13/2021)

DATE
April 2021

TECHNICAL SERVICE BULLETIN

SUBJECT:

DRIVE UNIT INSPECTION & REPLACEMENT FOR EV MOTOR RUMBLE NOISE

* NOTICE

This bulletin has been revised to include additional information. New/revised sections of this bulletin are indicated by a black bar in the margin area.

This bulletin provides the procedure to inspect and repair the EV motor drive unit and reduction gear on some 2019MY~ Niro EV (DE EV) vehicles produced from December 5, 2018, which may exhibit an abnormal rumble noise while driving (refer to noise sample videos below). The rumble noise may be heard repeatedly when the traction motor is operating, while driving slowly in "D" range, or when slowly accelerating/decelerating between 0~25 mph. To correct this concern, follow the procedure outlined in this bulletin to inspect and repair the traction motor and/or reduction gear.

Refer to the videos below for examples of abnormal motor and reduction gear noise.

[Video: Abnormal
Motor Noise in Vehicle](#)



[Video: Abnormal
Reduction Gear Noise in Vehicle](#)



Note: Be careful to not mistake the abnormal noises for the normal noise of the EV motor in the vehicle. *Refer to the video below for an example of normal EV motor noise.*

[Video: Normal
Motor Noise](#)

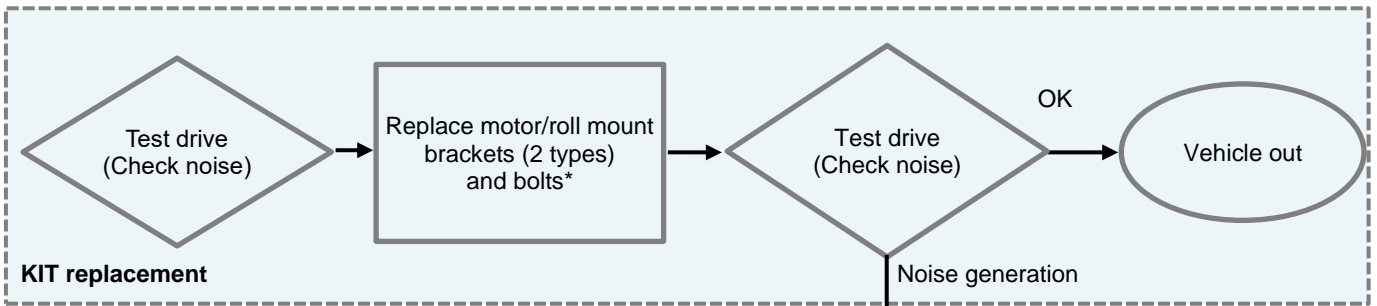


Printed TSB copy is for reference only; information may be updated at any time.
Always refer to KGIS for the latest information.

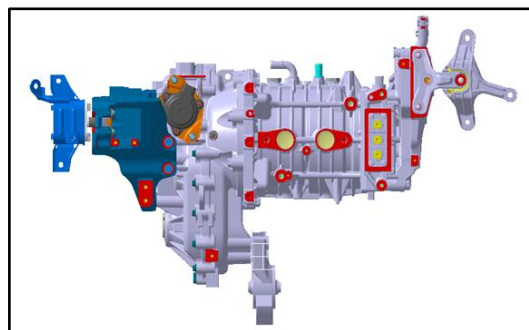
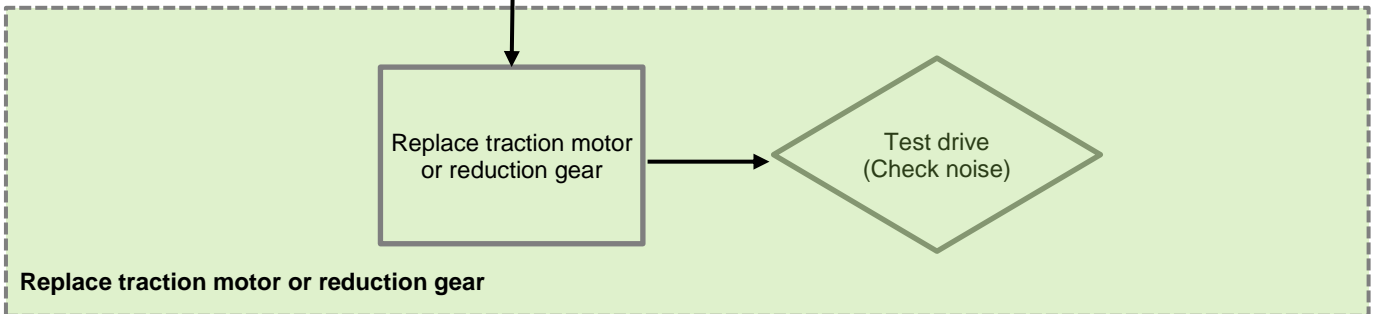
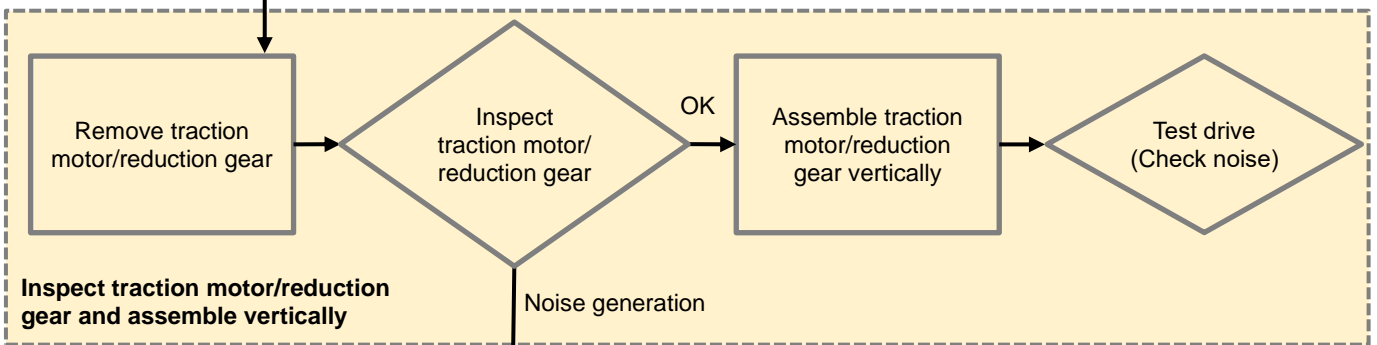
Circulate To: General Manager Service Manager Parts Manager
 Service Advisors Technicians Body Shop Manager Fleet Repair

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Flow Charts:



*Use Kit A or Kit B depending on production date. Refer to Parts table for details.



Drive Motor & Reduction Gear Assembly

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Preparation Procedure:

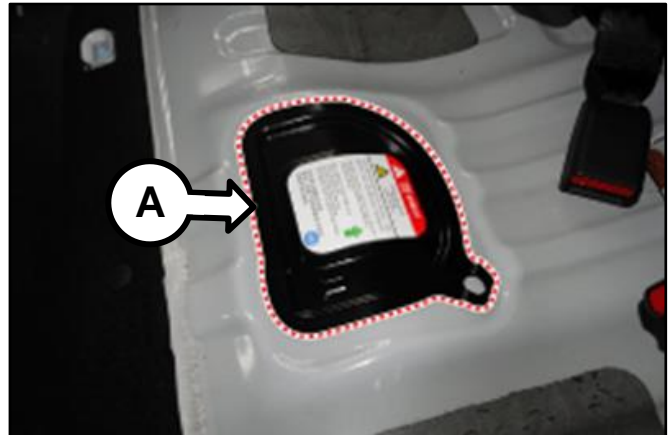
BEFORE beginning work:

- Refer to all safety precautions found in the applicable Shop Manual on KGIS, “General Safety Information and Caution”
- Disconnect the negative (-) battery terminal.
- Perform the high voltage shut-off work by referring to the “**General Information → High Voltage Shut-off Procedures**” in the applicable Shop Manual on KGIS.

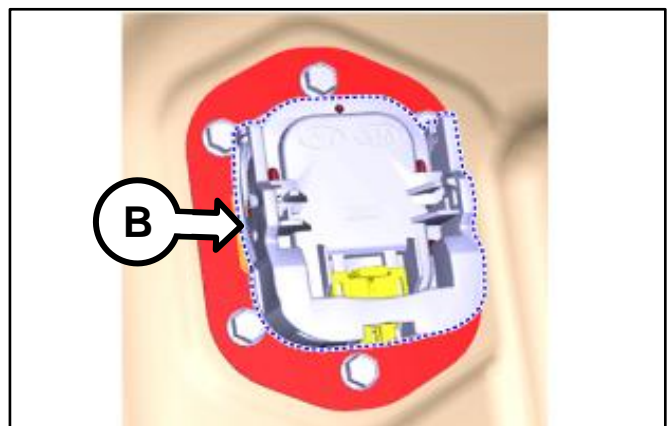
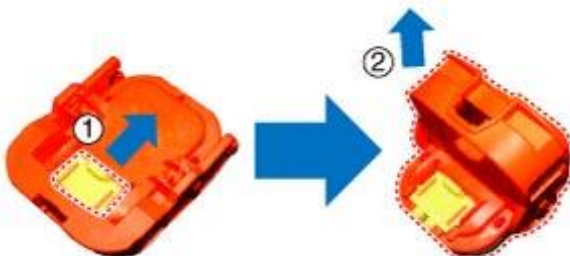
WARNING

- **When working on the high voltage system, make sure that you are familiar and comply with the “Safety Precautions, Cautions and Warnings” in the applicable Shop Manual on KGIS.**
- **If you do not comply with the instructions, serious accidents due to electric shock or leakage may occur.**
- **When working on the high voltage system, make sure to cut off the high voltage first according to the “High Voltage Shut-off Procedure” in the applicable Shop Manual on KGIS.**
- **Be sure to wait for 5+ minutes for the capacitor inside the inverter to discharge after removing the service plug.**

1. Remove the service plug.
 - 1) Turn OFF the ignition switch and disconnect the negative (-) cable of the 12V auxiliary battery.
 - 2) Remove the trunk luggage board and the rear seat, referring to the “Body (Interior and Exterior) → Rear Seat → Rear Seat Assembly → Repair procedures” chapter in the applicable Shop Manual on KGIS.
 - 3) Remove the service plug cover (A).



- 4) Remove the service plug (B), in the order shown below.



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2. Measure the voltage (C) between the high voltage terminals to check that the inverter capacitor is discharged, referring to the “**General Information → High Voltage Shut-off Procedures**” chapter in the applicable Shop Manual on KGIS.

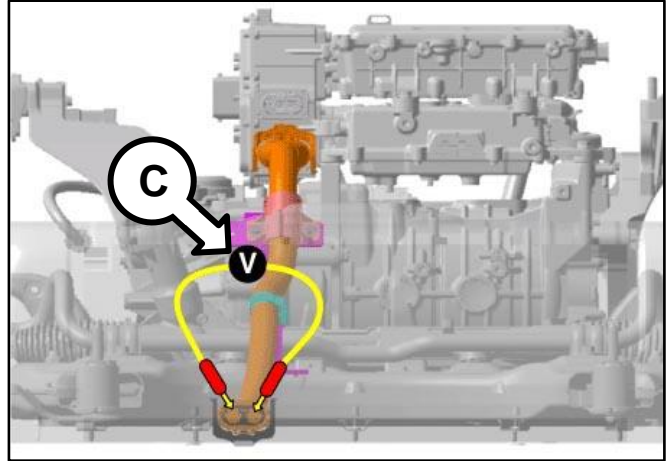
⚠ WARNING

BEFORE measuring voltage, be sure to wait for more than 5 minutes for the capacitor inside the inverter to discharge after removing the service plug.

- **30V or Below:** High Voltage Circuit Normal Cut-off
- **Over 30V:** High Voltage Circuit Failure

⚠ WARNING

If a voltage reading of 30V or greater is taken, check the service plug removal status. Although the service plug is removed, there could be a serious problem in the high voltage circuit. If this occurs, perform a DTC troubleshooting inspection first. **DO NOT TOUCH** any part related to the high voltage system.



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Roll Mount/Motor Support Bracket & Bolt Replacement Procedure:

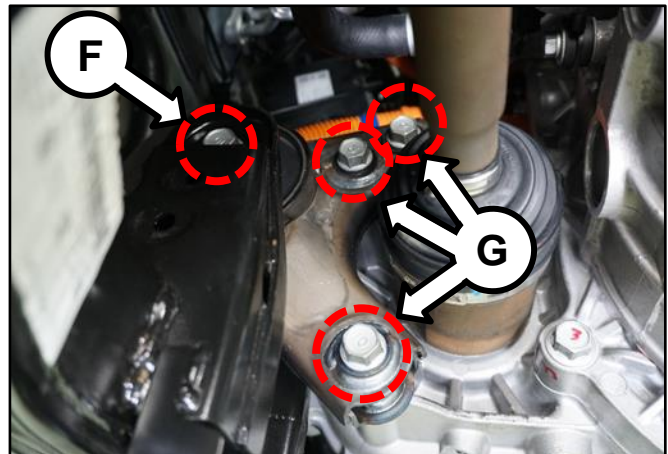
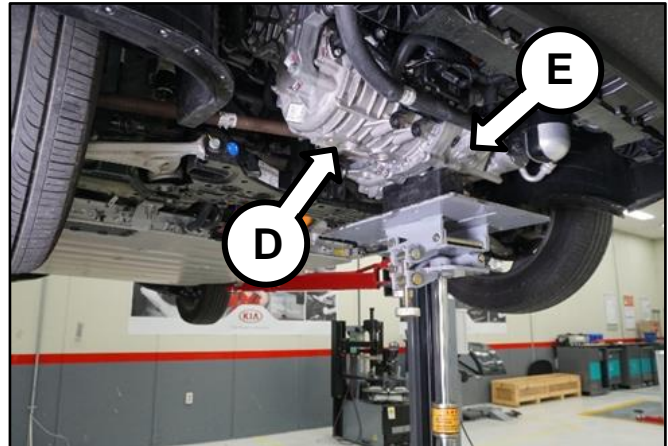
1. Remove the under cover by referring to the “Traction Motor System → Motor & Reduction Gear → Under Cover → Repair procedures” chapter in the applicable Shop Manual on KGIS.

2. Support the drive motor (D) / reduction gear (E) assembly with a jack.

Note: For more details on removal and disassembly steps, refer to the following chapters in the applicable Shop Manual on KGIS:

- “Traction Motor System → Motor & Reduction Gear → Motor & Reduction Gear Mounting → Repair procedures”
- “Traction Motor System → Motor & Reduction Gear → Motor & Reduction Gear Assembly → Repair procedures”

3. Loosen the roll mount bracket retaining bolts (F and G) and remove the roll mount bracket.



4. Replace the roll mount bracket (H) with the new improved part.

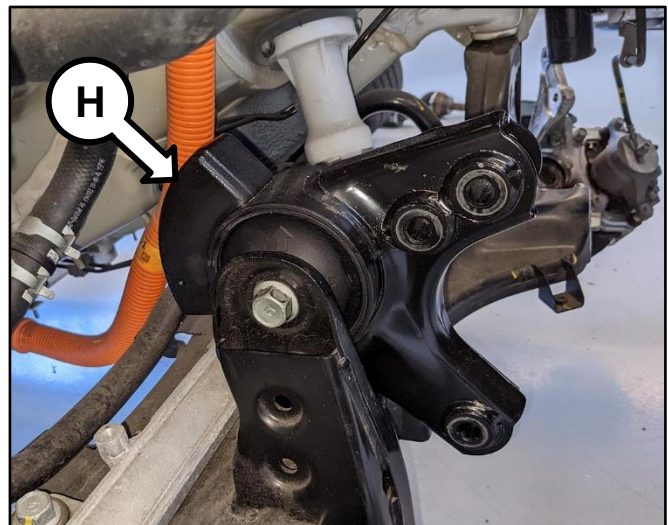
Torque specification:

- Bolt (F): 79.6 – 94.1 lb.ft
(107.9 – 127.5 N.m, 11.0 – 13.0 kgf.m)
- Bolt (G): 47.0 – 61.5 lb.ft
(63.8 – 83.4 N.m, 6.5 – 8.5 kgf.m)

Old Part



New Part



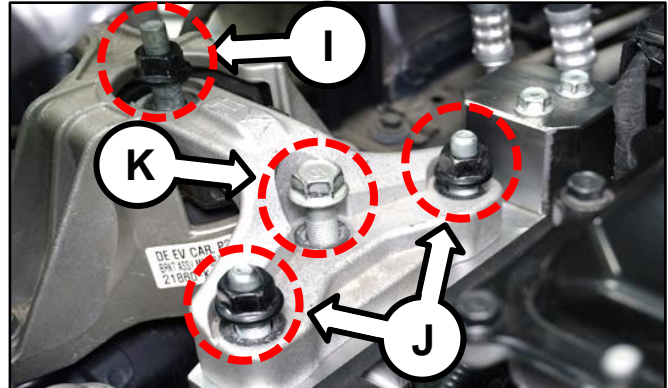
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5. Lower vehicle on lift and place a jack under the motor.
6. Loosen the three (3) motor support bracket nuts (I, J) and bolt (K) and remove the motor support bracket.

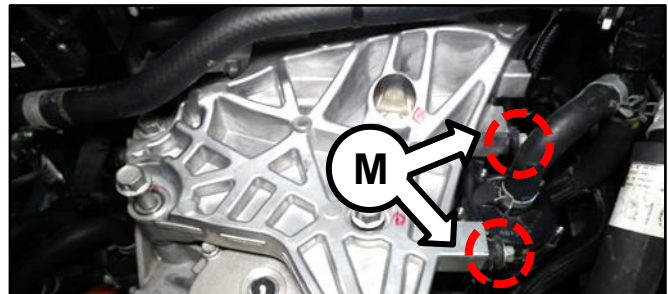
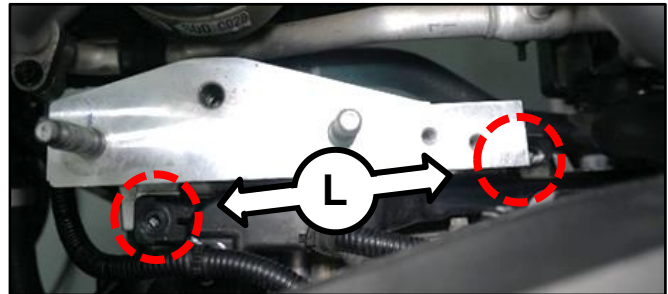
Torque specification (for reinstallation):

- Nut (I): 57.9 – 72.4 lb.ft
(78.5 – 98.1 N.m, 8.0 – 10.0 kgf.m)
- Nut (J), Bolt (K): 43.4 – 54.3 lb.ft
(58.9 – 73.6 N.m, 6.0 – 7.5 kgf.m)



7. Loosen the two (2) wire harness retaining bolts (L) and the two (2) Electric Water Pump (EWP) retaining bolts (M).

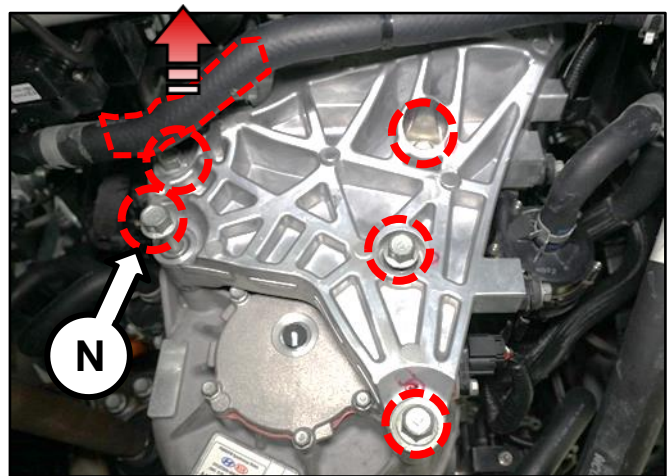
Detach the wire harness and EWP from the motor support bracket.



8. Loosen the five (5) motor support bracket retaining bolts (N).

Note:

- Lower the jack supporting the motor and loosen the bolt on the upper-left side.
- Move the water hose and hold it up while accessing the upper-left bolt.



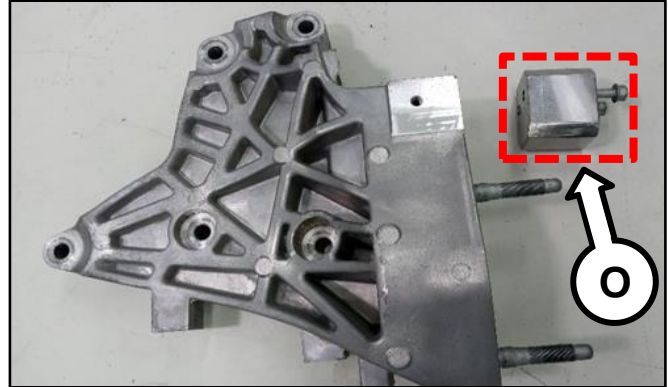
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- 9a. Remove the mass (O) from the new motor support bracket.
- 9b. Install the new motor support bracket to the vehicle.

Torque specification:

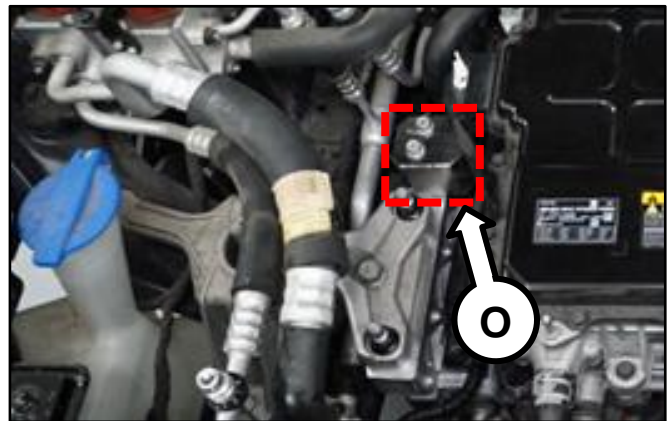
- Bolts (N): 57.9 – 72.4 lb.ft
(78.5 – 98.1 N.m, 8.0 – 10.0 kgf.m)



10. Install the mass (O) to the upper side of the new motor support bracket as shown.

ⓘ IMPORTANT

Install with the mass protrusion pointing towards the motor.

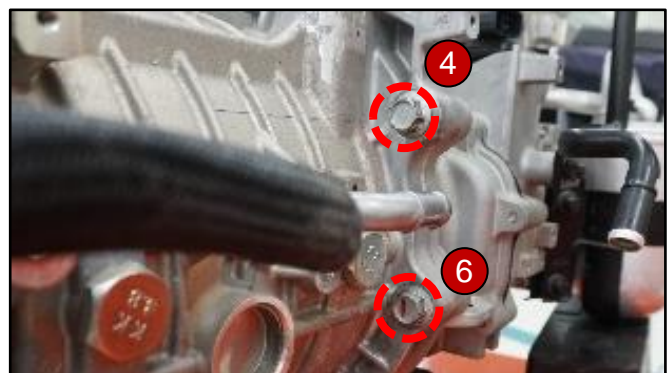
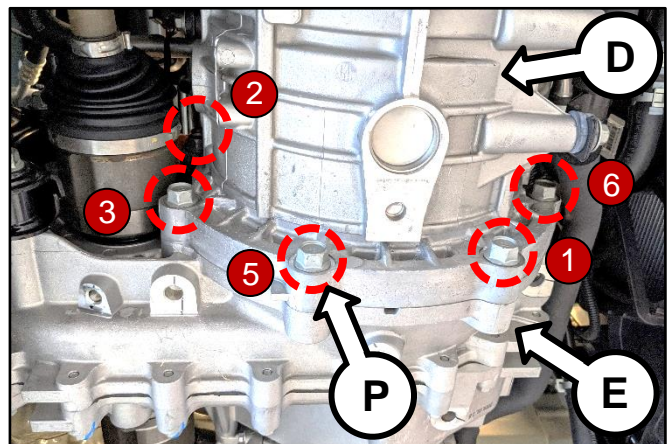


11. Raise the vehicle on the lift.

Remove the six (6) drive motor (D) and reduction gear (E) connecting bolts (P).

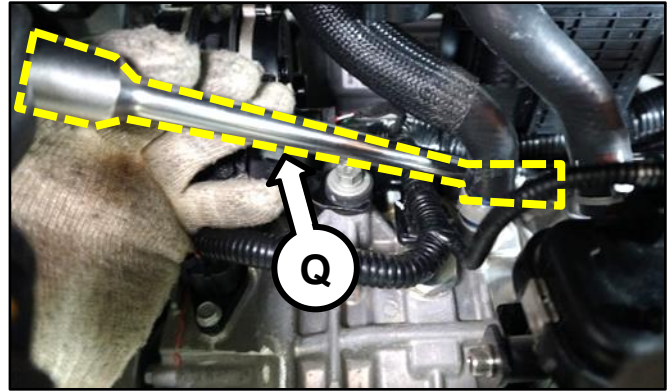
* NOTICE

Bolts are numbered in order of tightening sequence when reinstalling.

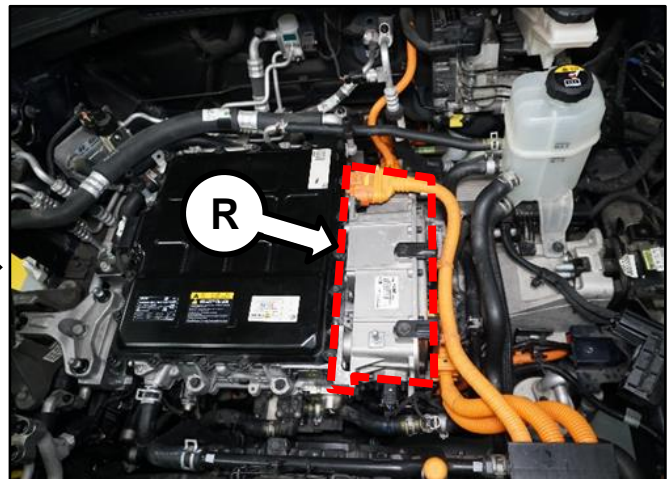
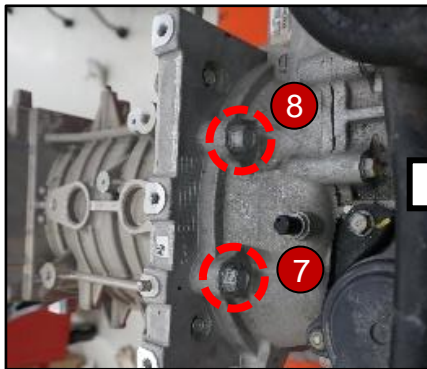


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12. Use a universal joint and extension (Q) when loosening bolts No.4 and No.6.



13. Remove the junction box (R) when removing bolts No.7 and No.8.



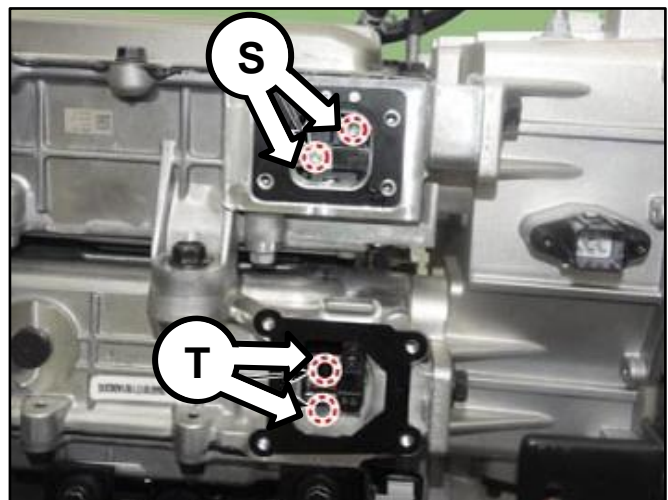
Note: Refer to the “Battery Control System → High Voltage Distributing System → High Voltage Junction Box → Repair procedures” chapter in the applicable Shop Manual on KGIS.

14. When removing the junction box, use a 4mm Allen wrench for the OBC bolts (S), and 10mm Hex wrench for the EPCU bolts (T).

ⓘ IMPORTANT

- Comply with the specified torque when reinstalling.
- Pay special attention to tighten bolts in the correct position, not slanted.

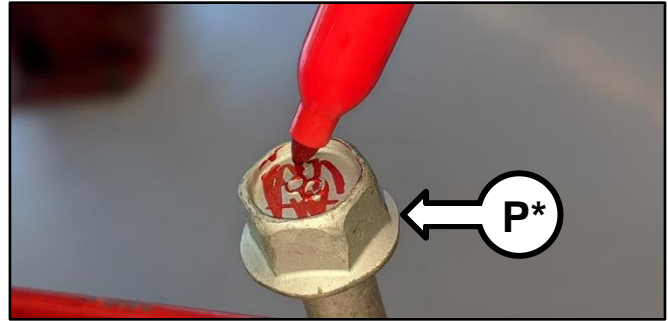
- Torque specification:**
- Bolts (S): 2.9 – 4.3 lb.ft (3.9 – 5.9 N.m, 0.4 – 0.6 kgf.m)
 - Bolts (T): 6.5 – 7.2 lb.ft (8.8 – 9.8 N.m, 0.9 – 1.0 kgf.m)



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15. Mark the new drive motor and reduction gear connecting bolts (P*) with a red Sharpie (or similar marker) as shown to distinguish them from the old ones.



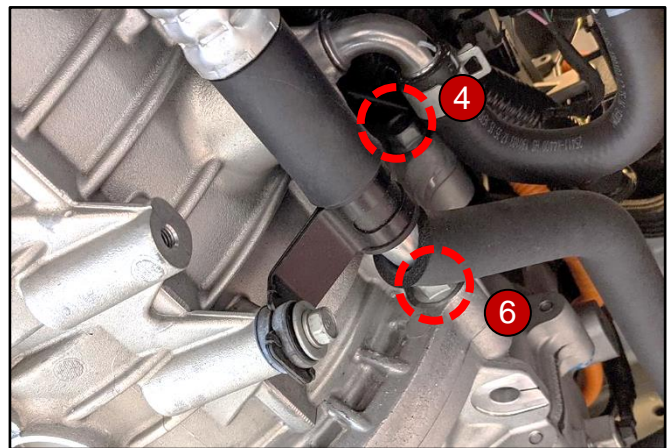
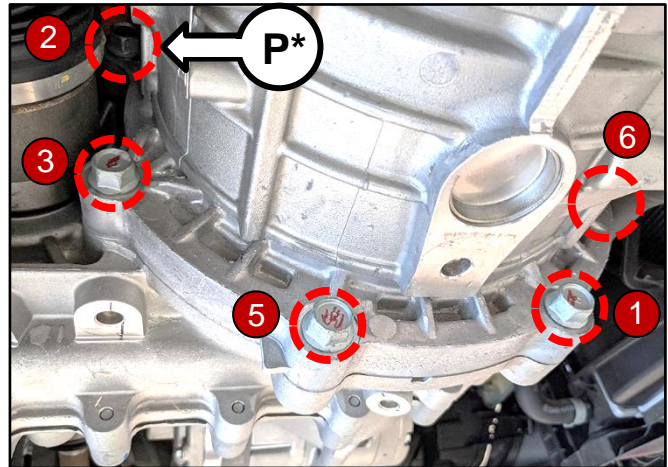
16. Reinstall the motor and reduction gear using the new bolts in reverse order of removal.

Note: Tighten to the specified torque in the numbered order shown.

Torque specification:

- 65.8 – 71.6 lb.ft
(89.3 – 97.1 N.m, 9.1 – 9.9 kgf.m)

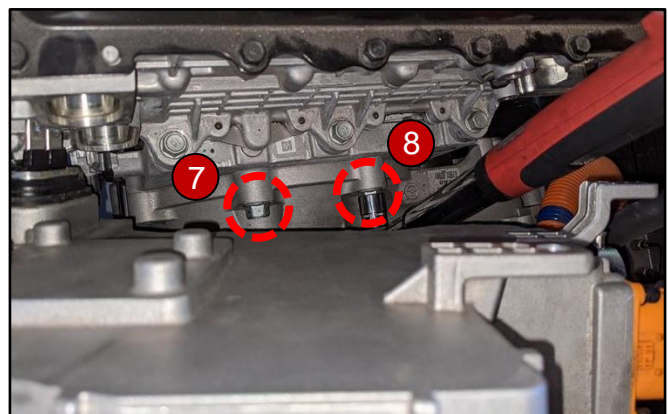
Note: Tighten bolts 1 - 6 from underneath vehicle.



Note: Tighten bolts 7 and 8 from above.

Torque specification:

- 65.8 – 71.6 lb.ft
(89.3 – 97.1 N.m, 9.1 – 9.9 kgf.m)



17. Assemble all parts in reverse order of disassembly.
18. Test drive vehicle **at least 2 times**, and verify normal noise/operation.
 - If the noise is no longer present, the repair is complete.
 - If there is still a rumble noise from the EV motor, proceed with the **'Motor and Reduction Gear Removal Procedure'** outlined below.

Motor and Reduction Gear Removal Procedure:

1. Remove the motor and reduction gear assembly from the vehicle by referring to the "Traction Motor System → Motor & Reduction Gear → Motor & Reduction Gear Assembly → Repair procedures" chapter in the applicable shop manual on KGIS.
2. Proceed to the **'Motor and Reduction Gear Inspection and Vertical Reassembly'** procedure on page 10.

SUBJECT:

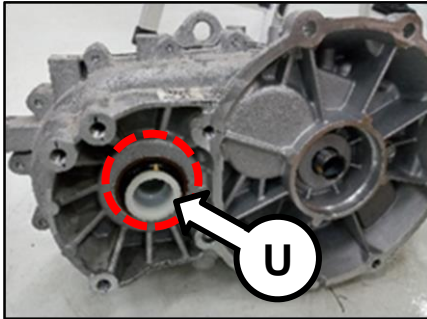
DRIVE UNIT INSPECTION & REPLACEMENT FOR EV MOTOR RUMBLE NOISE

Motor and Reduction Gear Inspection and Vertical Reassembly:

1. With the removed drive motor/reduction gear assembly on a table, disconnect the drive motor from the reduction gear.

* NOTICE

Plug a cap (U) into the drive shaft hole to prevent oil from spilling out.



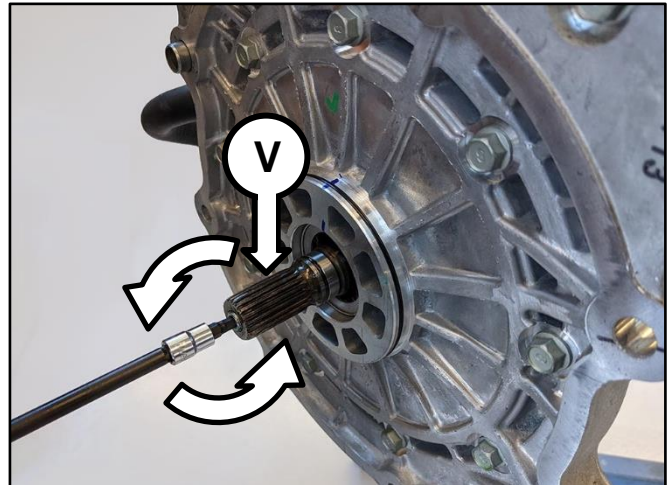
Drive Motor Noise Inspection:

1. Rotate the drive motor shaft (V) to check for a rumble noise.
 1. Connect a 5mm hexagon tip to the taper plug at the end of the shaft.
 2. Start a counterclockwise rotation by gently turning with your hands.
 3. Use a power tool to increase the speed of rotation.

⚠ CAUTION

Strong initial torque may damage the taper.

DO NOT use an air impact wrench.



DRIVE UNIT INSPECTION & REPLACEMENT FOR EV MOTOR RUMBLE NOISE

2. Once speed increases, after turning with the power tool for more than 5 seconds, disengage the tool and allow to spin on its own.

Listen for an abnormal noise.

Refer to the sample video links to the right for normal and abnormal noise in the drive motor shaft.

- If there is an abnormal noise, replace the drive motor.
- If no abnormal noise is heard, proceed to the '**Reduction Gear Noise Inspection**' on page 12.

❗ IMPORTANT

If ordering a replacement motor for vehicles built before 5/13/2019, refer to [PS639](#), "**Traction Motor – Gear Drive Assembly Connecting Bolt Spec Change**".

[Video:
Motor Noise -
NORMAL
\(out of vehicle\)](#)



[Video:
Motor Noise -
ABNORMAL
\(out of vehicle\)](#)

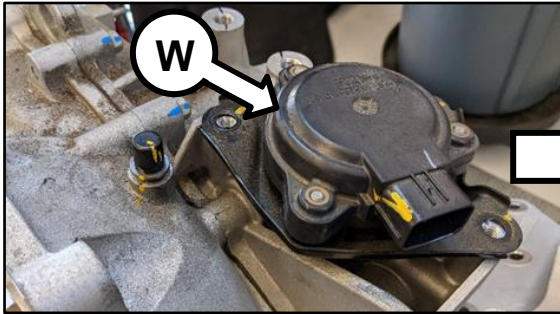


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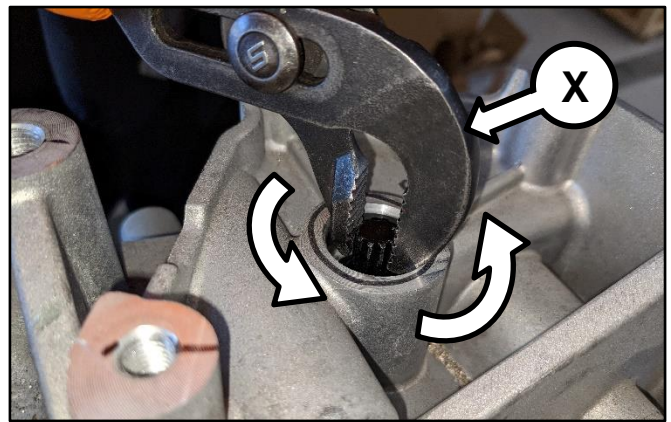
DRIVE UNIT INSPECTION & REPLACEMENT FOR EV MOTOR RUMBLE NOISE

Reduction Gear Noise Inspection:

1. Remove the inhibitor switch/SBW (W).

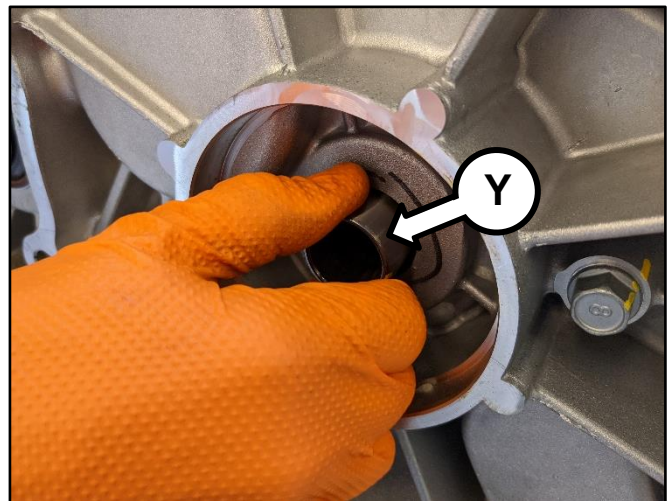


2. Change the switch to the Neutral "N" stage by turning counterclockwise using a set of channel lock pliers (X), or similar tool, until a "click" is heard.



3. Rotate the reduction gear input shaft (Y) by hand to check for noise and/or jamming.

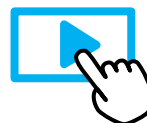
- Normal: Shaft can be turned freely by hand, and no abnormal noise or significant vibration is felt when rotating in any/one direction.
- Abnormal: Noise or jamming when rotating in any/one direction.



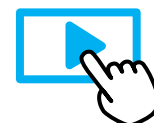
Refer to the sample video links to the right for normal and abnormal noise in the reduction gear shaft.

- If an abnormal noise and/or jamming occurs, replace the reduction gear.
- If no abnormal noise is heard, proceed to '**Reduction Gear Vertical Reassembly**'.

[Video:
Reduction Gear Noise -
NORMAL
\(out of vehicle\)](#)



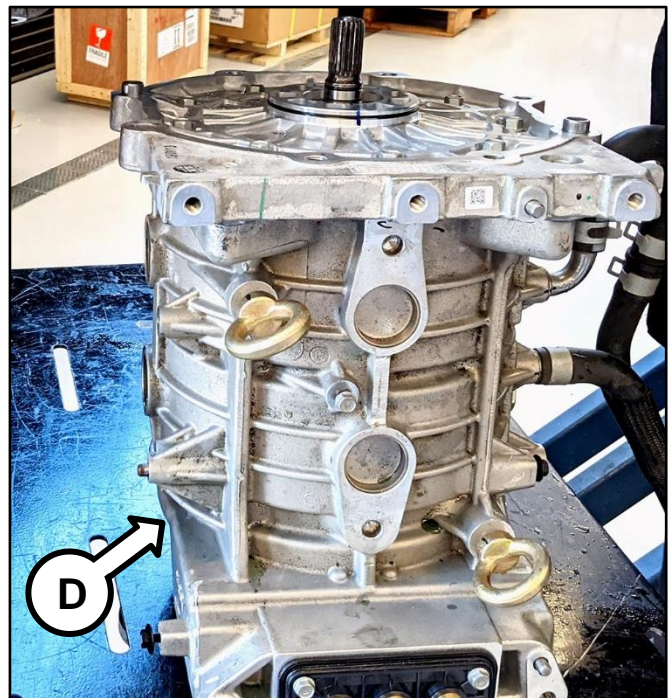
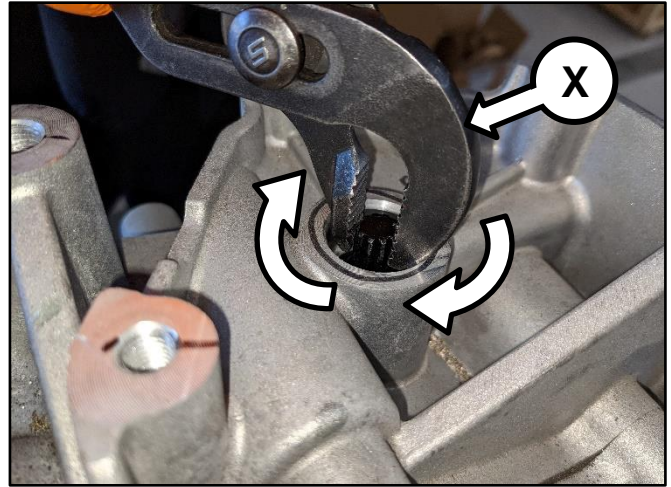
[Video:
Reduction Gear Noise -
ABNORMAL
\(out of vehicle\)](#)



DRIVE UNIT INSPECTION & REPLACEMENT FOR EV MOTOR RUMBLE NOISE

Reduction Gear Vertical Reassembly:

1. Before reinstalling the inhibitor switch (W), change the setting back to the Park "P" position by turning clockwise with a set of channel lock pliers (X), or similar tool.
2. Reinstall the inhibitor switch (W).
3. Place the drive motor (D) vertically on a table with the shaft pointing upwards, as shown.



CAUTION

This step must be performed by two technicians working together to rotate the drive motor assembly.

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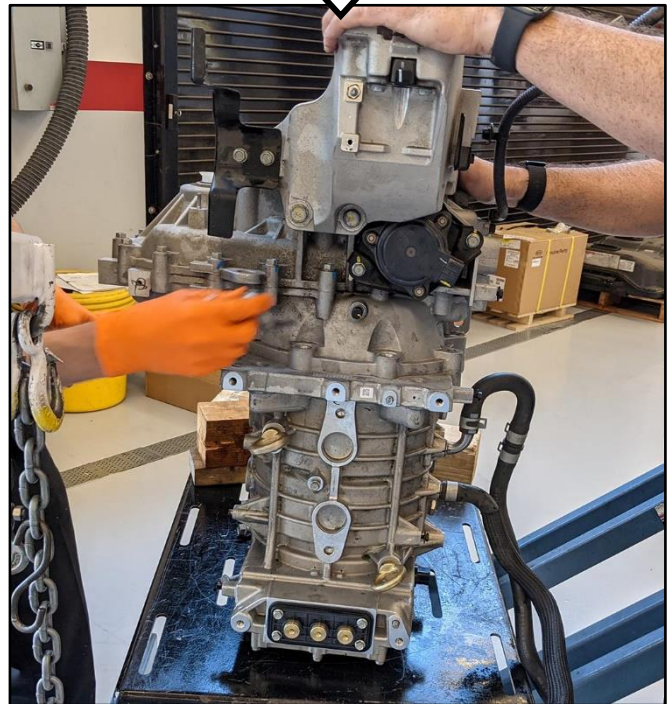
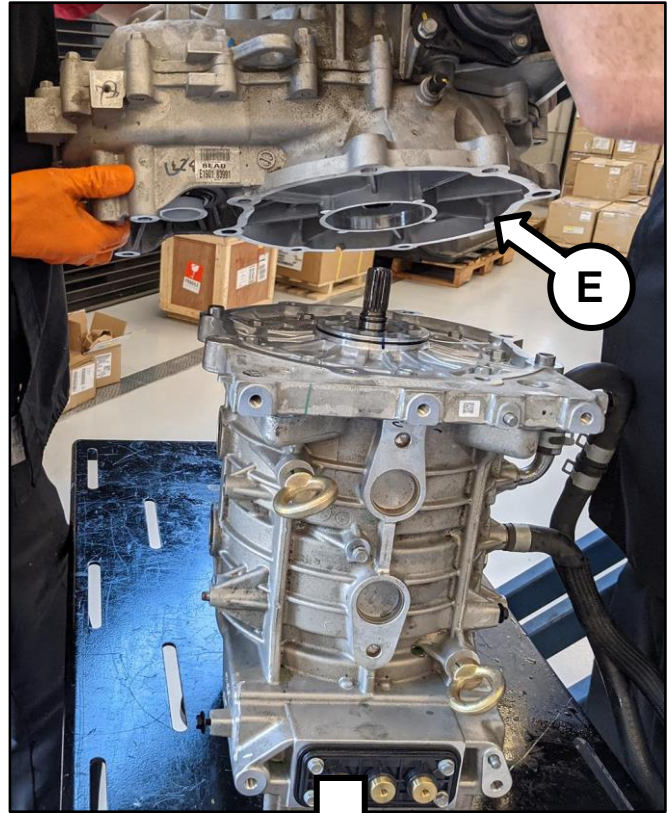
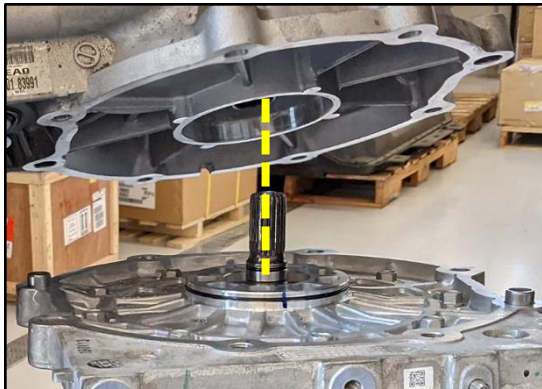
4. Install the reduction gear assembly (E) onto the top of the drive motor.

⚠ CAUTION

This step must be performed by two technicians working together to lift the assembly.

❗ IMPORTANT

- Ensure that the spline of the lock bushing (two locations) and the shaft are aligned.
- Be careful not to damage the drive motor shaft spline.



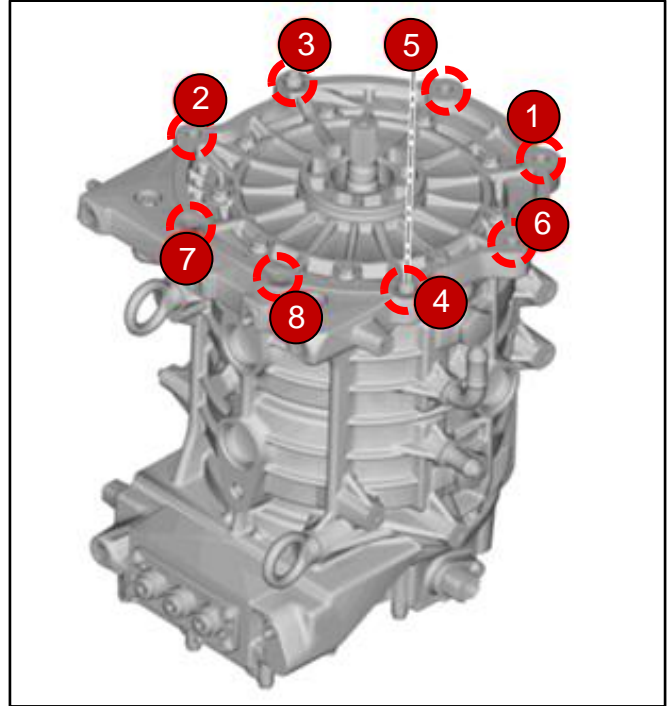
DRIVE UNIT INSPECTION & REPLACEMENT FOR EV MOTOR RUMBLE NOISE

5. Install the new bolts and torque bolts in the order shown.

Torque specification:

- 65.8 – 71.6 lb.ft
(89.3 – 97.1 N.m, 9.1 – 9.9 kgf.m)

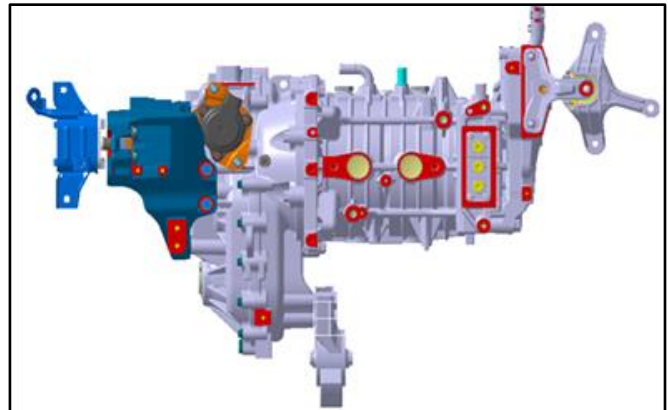
Note: Drive motor shown separated from reduction gear to illustrate bolt location and sequence only.



6. Assemble all parts in reverse order of removal.

Note: Refer to the following chapters in the applicable Shop Manual on KGIS:

- “Traction Motor System → Motor & Reduction Gear → Motor & Reduction Gear Mounting → Repair procedures”
- “Traction Motor System → Motor & Reduction Gear → Motor & Reduction Gear Assembly → Repair procedures”



7. Test drive the vehicle **at least 3 times** to verify the abnormal noise is no longer present and confirm normal vehicle operation.

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AFFECTED VEHICLE RANGE:

Model	Production Date Range
Niro EV (DE EV)	From December 5, 2018~

REQUIRED PART:

Part Name	Part Number	Qty.	Comments	
Kit A	Motor/Roll Mount Bracket and Bolts	36930 0E700FFF	1	Vehicles produced <u>before</u> 5/13/2019
Kit B	Motor/Roll Mount Bracket and Bolts	36930 0E710FFF	1	Vehicles produced <u>on or after</u> 5/13/2019
Traction Motor Assy*	36500 0E710**	1	Vehicles produced 12/05/2018 - 4/15/2020	
Traction Motor Assy*	36500 0E712**	1	Vehicles produced from 4/15/2020	
Gear Drive Unit Assy*	44500 18EA0	1	Vehicles produced 12/05/2018 – 02/02/2021	
Gear Drive Unit Assy*	44500 18EA1	1	Vehicles produced from 02/02/2021	

***Only** replace the Traction Motor or Gear Drive Unit Assy (Reduction Gear) if determined necessary per Repair Procedure.

If ordering a replacement motor for vehicles built **before 5/13/2019, refer to [PS639](#), “Traction Motor – Gear Drive Assembly Connecting Bolt Spec Change”.

Kit A Contents:

Part Name	Part Number	Qty.	Comments
Motor Support Bracket + Mass	36593 0E700FFF	1	All Vehicles
Roll Mount Bracket	21930 K4100FFF	1	
Bolts for Kit A	11404 12506FFF	8	Vehicles produced <u>before</u> 5/13/2019

Kit B Contents:

Part Name	Part Number	Qty.	Comments
Motor Support Bracket + Mass	36593 0E700FFF	1	All Vehicles
Roll Mount Bracket	21930 K4100FFF	1	
Bolts for Kit B	11404 12506FFF	4	Vehicles produced <u>on or after</u> 5/13/2019
	11404 12756FFF	4	



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WARRANTY INFORMATION:

N Code: Q55 C Code: ZZ1

Claim Type	Causal P/N	Qty.	Repair Description	Labor Op Code	Op Time	Replacement P/N	Qty.
W	36500 0E710	0	Kit Replacement (Test Drive 2x)	36930F00	3.2 M/H	36930 0E700FFF (Kit A)* or 36930 0E710FFF (Kit B)*	1
			Kit Replacement & Inspection, Motor/Reduction Gear Reinstallation (Test Drive 3x)	36930F01	8.8 M/H		
			Kit Replacement & Inspection, Motor Replacement (Test Drive 3x)	36930F02	8.8 M/H	36930 0E700FFF (Kit A)* or 36930 0E710FFF (Kit B)*	1
						36500 0E710 or 36500 0E712	1
			Kit Replacement & Inspection, Reduction Gear Replacement (Test Drive 3x)	36930F03	8.8 M/H	36930 0E700FFF (Kit A)* or 36930 0E710FFF (Kit B)*	1
						44500 18EA0 or 44500 18EA1	1
			Kit Replacement & Inspection, Motor/Reduction Gear Replacement (Test Drive 3x)	36930F04	8.8 M/H	36930 0E700FFF (Kit A)* or 36930 0E710FFF (Kit B)*	1
						36500 0E710 or 36500 0E712	1
						44500 18EA0 or 44500 18EA1	1

*Refer to Parts table for details on which Kit to order for each vehicle.

