

Schaeffler E-Axle RepSystem 2in1

Item no. 760 0001 10

Repair solution for e-axes

Disassembly and assembly

Tesla L2S (front, small drive unit)



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Disassembly and assembly Tesla L2S (front, small drive unit)

- The vehicle manufacturer's specifications and safety instructions must be observed when removing and installing the drive unit
- Work on electric vehicles may only be carried out in compliance with country-specific legal regulations
- Repairs may only be carried out by specialist staff and using suitable garage equipment
- The bearing seats and the seats of the shaft seals need to be cleaned
- Cleanliness must be ensured throughout the entire repair process
- When using a threadlocker, it is necessary to clean the threads beforehand
- The rotor and stator must not touch each other during the disassembly or assembly processes. Failure to comply with this may result in unwanted noise generation and malfunctions



- **Risk of fatal injury from electrical and magnetic fields**
Electrical and magnetic fields are created on the high-voltage system. There is a risk of death or serious injury due to malfunction of active implants (e.g. pacemakers, insulin pumps, hearing aids). Persons with active implants must not carry out any work on the high-voltage system



- Drain the transmission oil
- Replace the seal on the oil drain plug and tighten the plug to 28 Nm
- Remove the drive unit in accordance with the vehicle manufacturer's specifications
- Remove the attachment parts



- Remove the sticker from the high-voltage (HV) cover



- Remove the screws from the HV cover
- Remove the HV cover



- Remove the screws from the HV terminal



- Assemble the protective cardboard box for temporary storage of the power electronics

Important:

The power electronics must be protected against contamination.



- Position the drive unit with the power electronics side facing upward
- Remove the screws from the power electronics housing



- Lift the power electronics slightly
- Disconnect the plug connections for the two cables

Important:

To avoid contamination, always hold the power electronics with the electronics side facing downward. Do not rotate the power electronics. It is recommended that two people handle the power electronics



- Remove the seal on the power electronics
- Clean the sealing surfaces



- Place the power electronics on the protective cardboard box supplied and store temporarily



- Remove the screws from the phase guard
- Remove the phase guard



- Remove the snap ring from the sensor cable



- Remove the screws from the cover for the rotor position sensor
- Remove the cover



- Pull the sensor ring off the rotor shaft



- Remove the snap ring from the rotor shaft



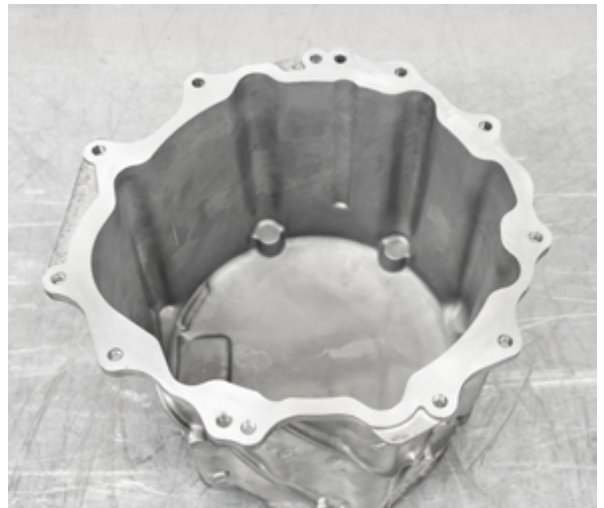
- Turn over the drive unit
- Remove the screws from the motor housing



- Use a suitable tool to lift the motor housing evenly upward without damaging the sealing surfaces



- Remove the sealing residue
- Clean the motor housing



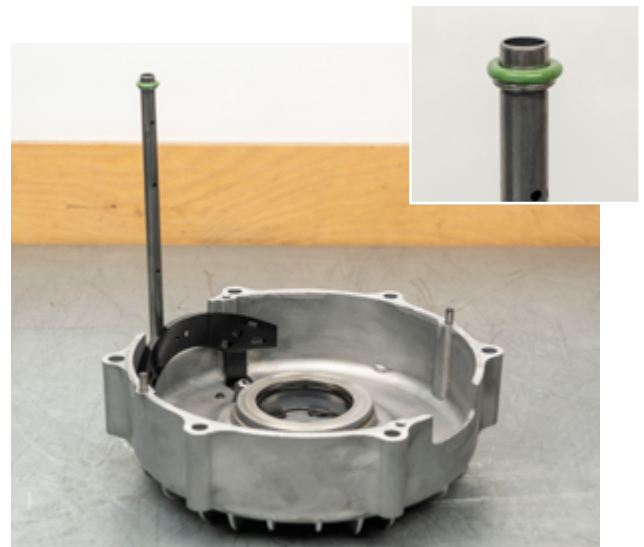
- Remove the screws from the stator cover
- Remove the stator cover



- Remove the seal from the oil guide

Note:

After removing the stator cover, the seal may be located in the housing.



- Remove the shaft spring



- Position the protective films between the rotor and the stator

- Remove the stator

Note:

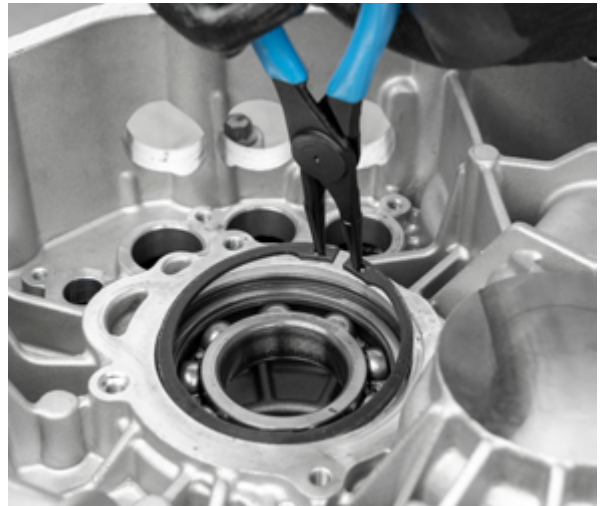
The rotor and stator must not touch each other during the disassembly process.
Take note of the cable routing.



- Press the rotor out of the housing



- Remove the snap ring



- Remove the bearing



- Remove the transmission housing screws



- Use a suitable tool to lift the transmission housing evenly upward without damaging the sealing surfaces



Determine the adjusting washer for the differential gear:

- Rotate the shaft ten times
- Place a suitable sleeve or similar on the bearing outer ring to support the depth gauge centrally
- Measure distance "A" between the sealing surface of the motor-side housing and the bearing outer ring
- Note distance "A"

Important:

The thickness of the sleeve must be omitted from the calculation.



- Remove the differential gear from the housing



- Remove the adjusting washer for the differential gear

Important:

The correct adjusting washer is not determined until a later work step and is then mounted



- Remove the screws on the locking plate for the output shaft



- Remove the output shaft



- Remove the screw for the oil circulation line



- Remove the O-ring



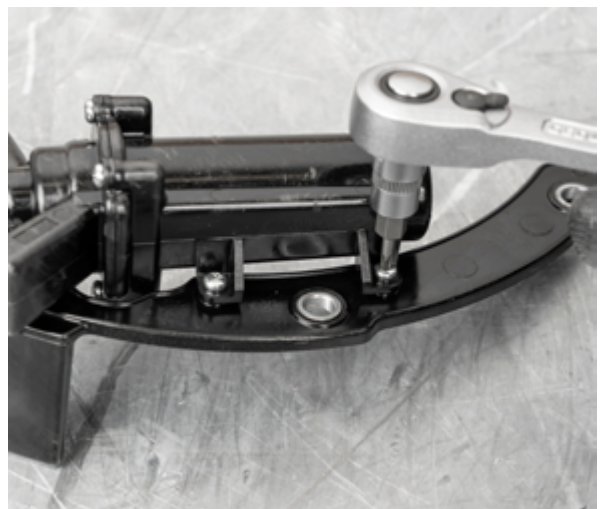
- Remove the screws from the plastic bracket for the oil filter
- Remove the plastic bracket



- Remove the magnet from the plastic bracket and clean the magnet



- Remove the screws from the side of the oil filter housing



- Remove the remaining screws from the oil filter housing



- Remove the oil filter



- Remove the two oil filter seals
- Clean the filter



- Remove the seal from the oil filter housing



- Clean the sealing surfaces
- Insert a new seal into the oil filter housing



- Install two seals onto the oil filter



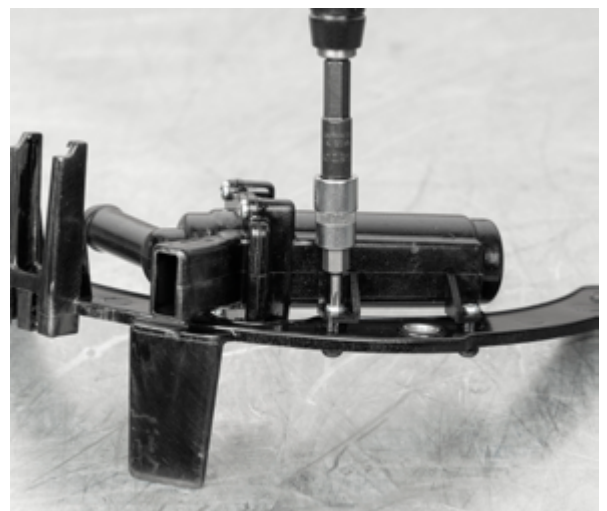
- Install the filter in the oil filter housing



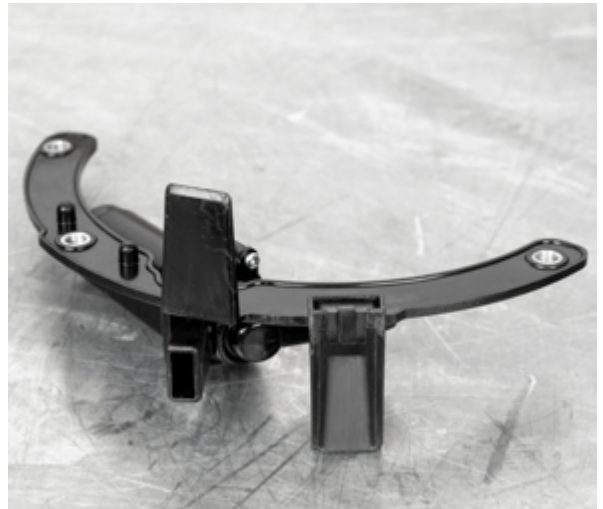
- Tighten the screws on the oil filter housing to 1 Nm



- Tighten the screws on the side of the oil filter housing to 1 Nm



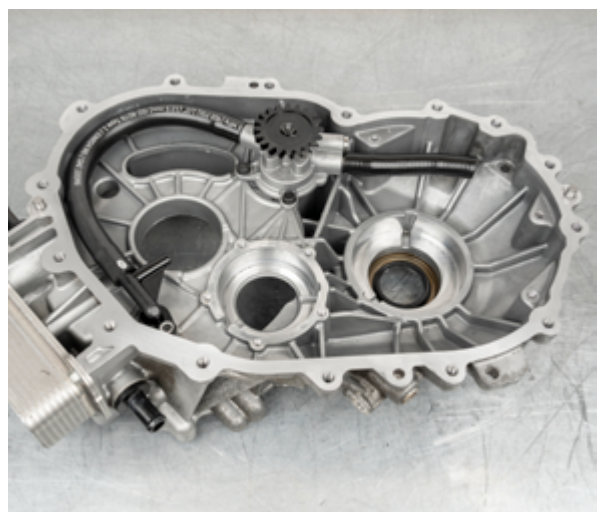
- Mount the magnet in the plastic bracket



- Remove the motor-side shaft seal on the differential gear



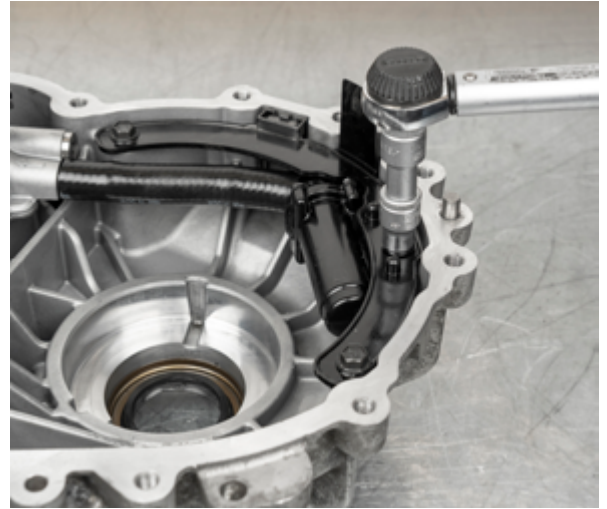
- Remove the sealing residue
- Clean the housing



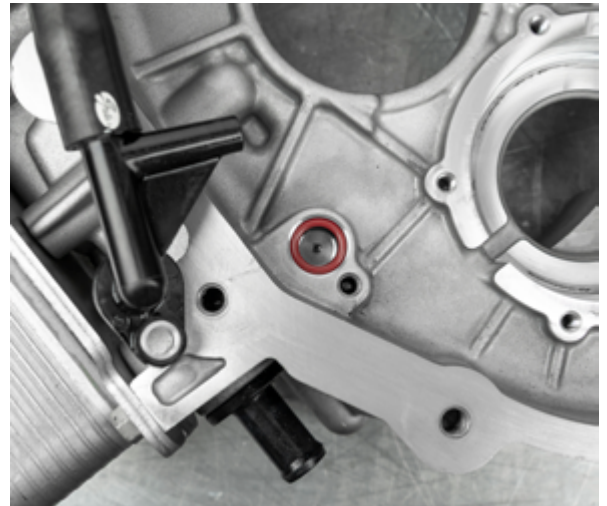
- Install the plastic bracket for the oil filter and tighten the screws to 11.8 Nm

Note:

Check that the hoses are correctly seated in the connectors



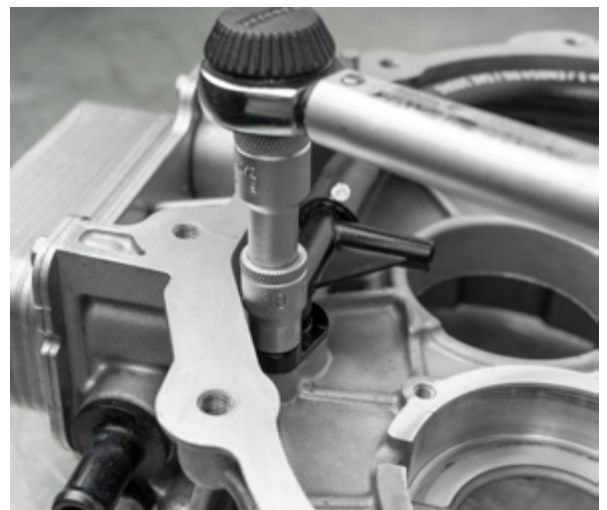
- Insert the new O-ring for the oil circulation line



- Tighten the screw for the oil circulation line to 11.8 Nm

Note:

Check that the hoses are correctly seated in the connectors



- Remove the slotted nut from the output shaft



- Pull the motor-side ball bearing off the output shaft
- Clean the output shaft



- Press the new motor-side ball bearing onto the output shaft

Note:

Make sure that the locking plate between the gear and the bearing is present.



- Fit the slotted nut onto the output shaft using a threadlocker, e.g. Loctite 243, and tighten to 120 Nm



- Mount the output shaft
- Insert the screws and tighten the locking plate to 11.8 Nm

Note:

The holes in the locking plate must be aligned with the threads in the housing.



- Remove the transmission-side ball bearing of the differential gear



- Remove the motor-side ball bearing of the differential gear
- Clean the differential gear



- Press on the new motor-side ball bearing



- Press on the new transmission-side ball bearing



- Mount the differential gear in the motor-side half of the housing



Determine the adjusting washer for the differential gear:

- Rotate the shaft ten (10) times
- Place a suitable sleeve or similar on the bearing outer ring to support the depth gauge centrally
- Measure distance “B” between the sealing surface of the motor-side housing and the bearing outer ring
- Note distance “B”

Important:

The thickness of the sleeve must be omitted from the calculation.



- Calculate the new adjusting washer
Height of new adjusting washer = A – B

Note:

Due to the size increments of the adjusting washers, the adjusting washer closest to the calculated value must be selected.



- Example:
Height of new adjusting washer = A – B
Dimension A = 76.78 mm (incl. existing adjusting washer, e.g. 0.3 mm)
– Dimension B = 76.40 mm (without adjusting washer)
= 0.38 mm
▣ 0.4-mm adjusting washer should be selected

Note:

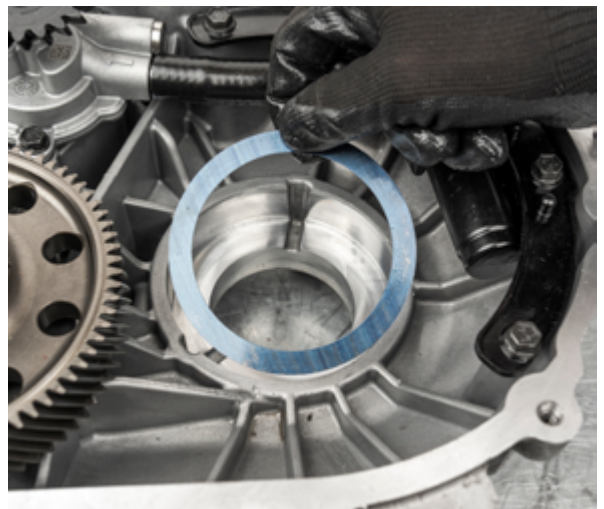
The part numbers for the adjusting washers are listed in the appendix.



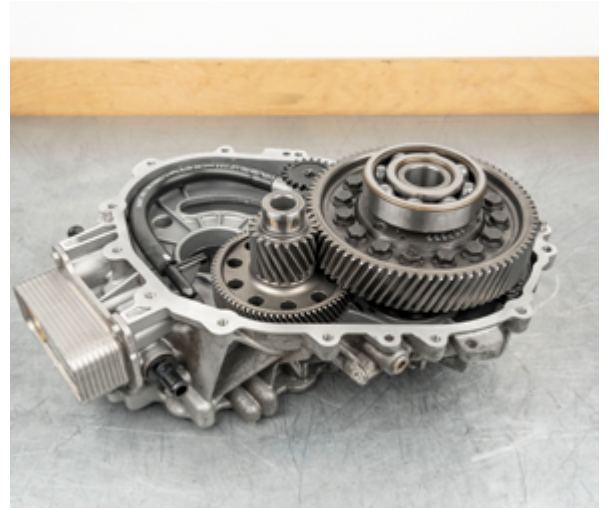
- Remove the differential from the motor-side half of the housing



- Insert the calculated adjusting washer into the motor-side bearing seat



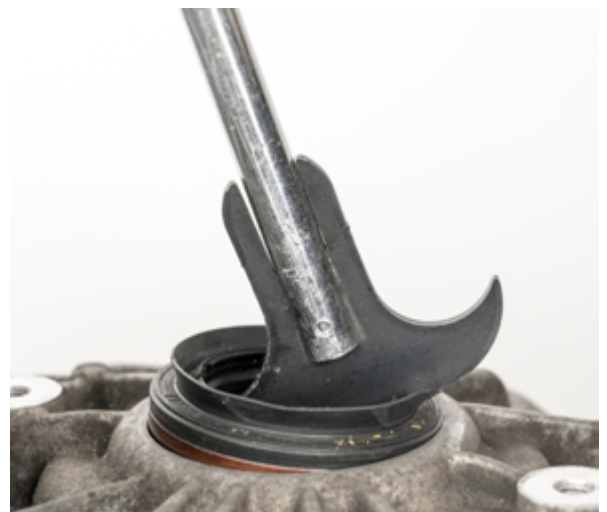
- Mount the differential gear in the motor-side half of the housing



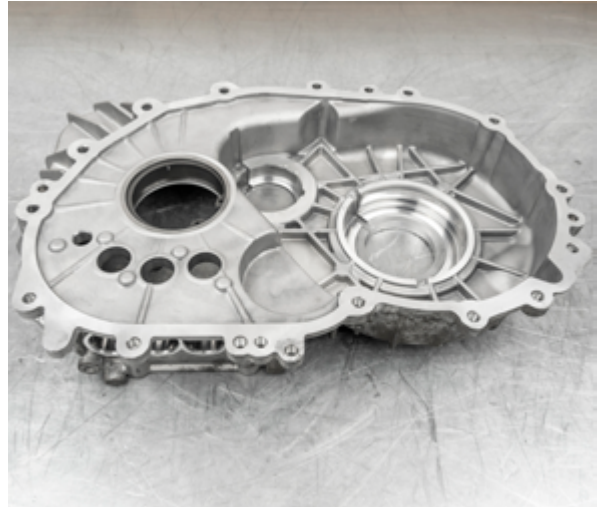
- Remove the cylindrical roller bearing for the output shaft in the transmission-side housing using a suitable internal extractor



- Turn the housing upside down
- Remove the transmission-side shaft seal on the differential gear



- Remove the sealing residue
- Clean the housing



- Press the new cylindrical roller bearing into the housing



- Clean the sealing surfaces with a suitable cleaner, e.g. Loctite SF 7063
- Apply a suitable sealant to the housing, e.g. Loctite SI 5970
- Mount the transmission-side housing

Note:

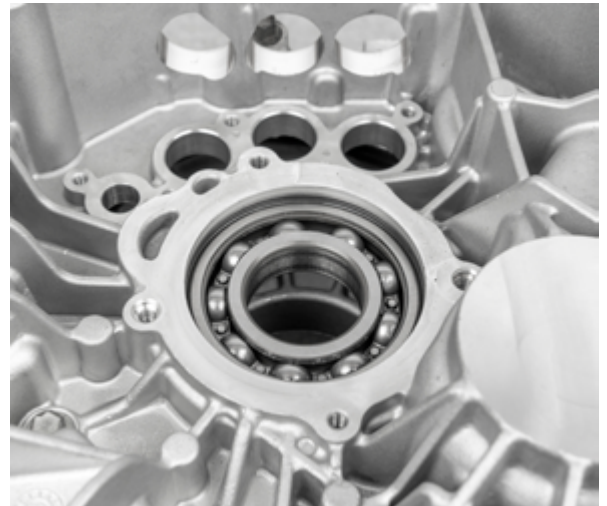
Ensure that the guide pins are correctly positioned in the housing.



- Insert the housing screws and tighten to 28 Nm



- Assemble a new ball bearing



- Insert the snap ring



- Rotate the transmission housing
- Mount the new motor-side shaft seal for the differential gear evenly in the housing

Note:

The upper edge of the shaft seal must be flush with the outer surface of the housing.



- Rotate the transmission housing
- Mount the new transmission-side shaft seal for the differential gear evenly in the housing

Note:

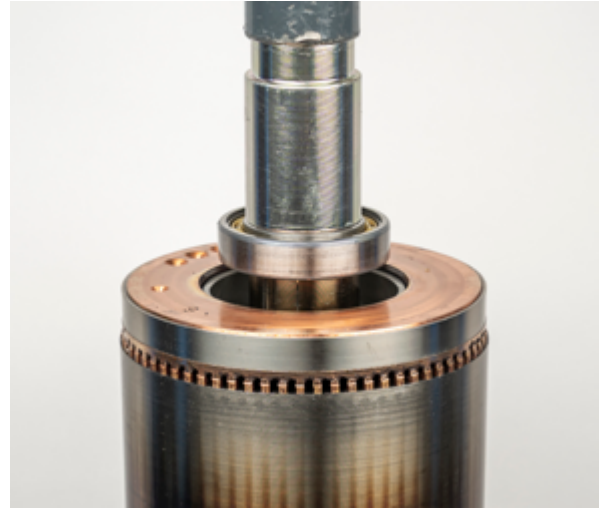
The upper edge of the shaft seal must be flush with the outer surface of the housing.



- Remove the bearing from the rotor shaft



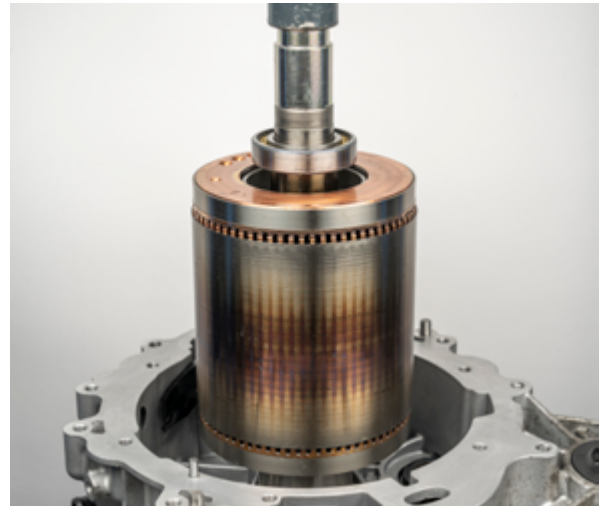
- Press on a new ball bearing



- Press the rotor shaft into the ball bearing in the motor housing

Note:

To prevent damage to the ball bearing, the bearing should be supported on the bearing inner ring with a suitable sleeve while pressing in.



- Rotate the transmission housing
- Insert the snap ring



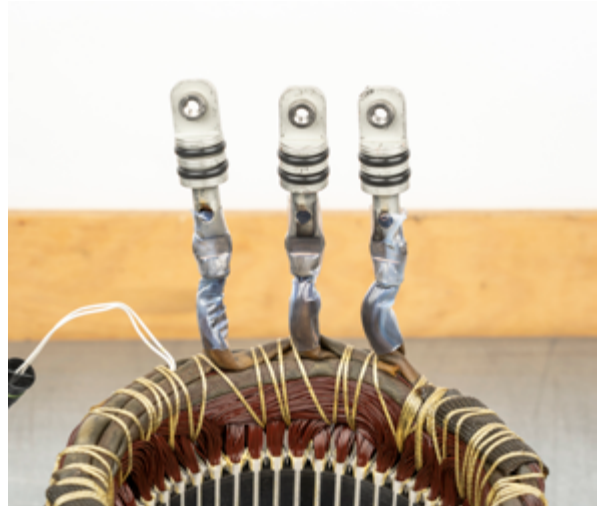
- Press the sensor ring onto the rotor shaft

Note:

To prevent damage to the ball bearing, the rotor should be supported while pressing in.



- Replace the six seals on the stator's HV connections



- Replace the seal for the sensor cable



- Apply protective films to the stator
- Install the stator
- Remove the protective films

Note:

The rotor and stator must not touch each other during the assembly process.

Take note of the cable routing.



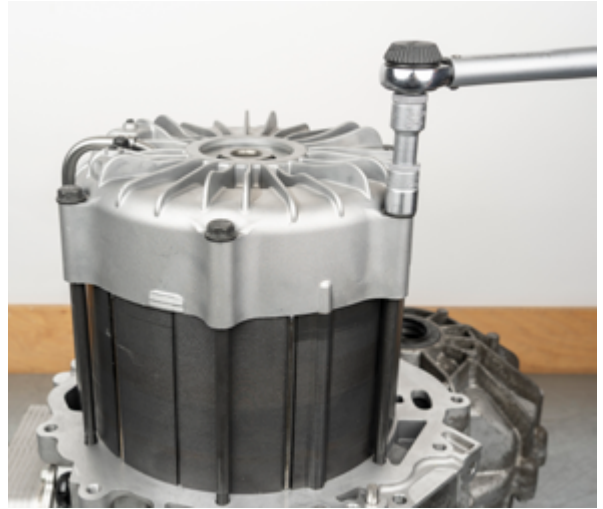
- Fit a new seal on the oil guide on the stator cover



- Position the shaft spring on the rotor shaft bearing



- Mount the stator cover
- Fit the screws using a threadlocker, e.g. Loctite 243, and tighten to 25 Nm + 90°



- Clean the sealing surfaces with a suitable cleaner, e.g. Loctite SF 7063
- Apply a suitable sealant to the housing, e.g. Loctite SI 5970
- Mount the motor housing

Note:

Ensure that the guide pins are correctly positioned in the housing.



- Tighten the screws of the motor housing to 28 Nm
- Position the drive unit with the power electronics side facing upward



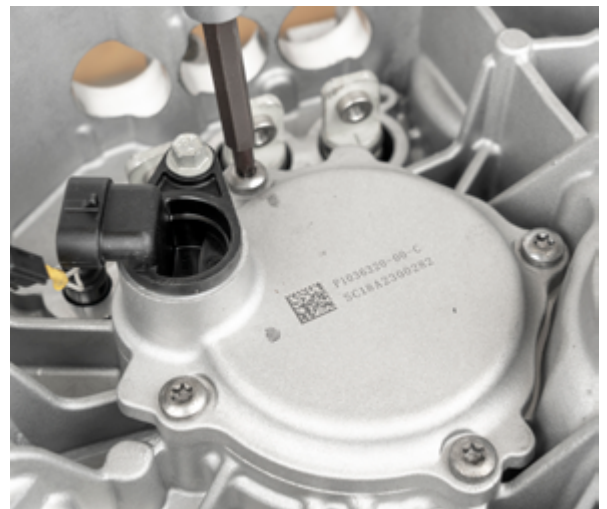
- Remove the seal from the cover for the rotor position sensor



- Clean the sealing surfaces
- Mount the new seal in the cover for the rotor position sensor



- Mount the cover for the rotor position sensor and tighten the screws to 11.8 Nm



- Fit the snap ring on the cable



- Remove the three seals from the phase guard
- Clean the phase guard and sealing surfaces



- Mount the new seals in the phase guard



- Mount the phase guard and tighten the screws to 6.8 Nm



- Clean the sealing surface on the transmission housing in the area around where the power electronics are located
- Remove the power electronics from the protective cardboard box
- Mount the new seal on the power electronics

Note:

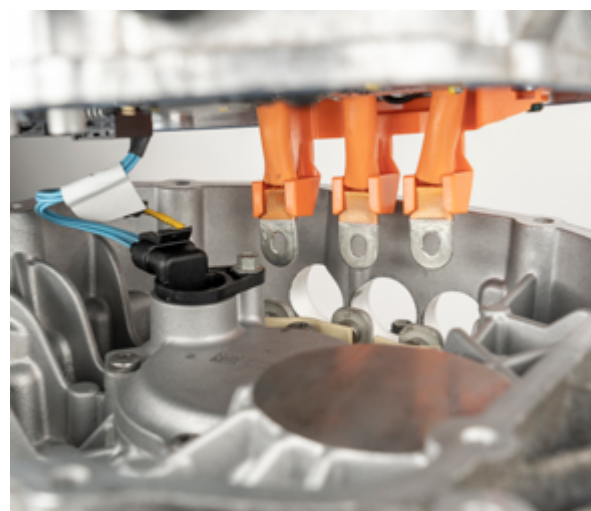
To avoid contamination, always hold the power electronics with the electronics side facing downward. Do not rotate the power electronics. It is recommended that two people handle the power electronics.

Important:

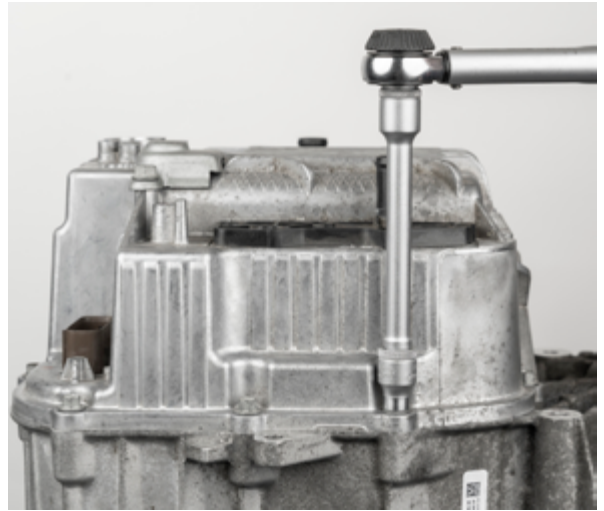
All contact surfaces on the high-voltage terminal must be cleaned before assembly.



- Attach the two plugs



- Assemble the power electronics and tighten the screws to 11.8 Nm



- Tighten the new screws on the HV terminal to 12.5 Nm
- Then loosen the screws by 180°
- Finally, tighten the screws on the high-voltage terminal to 5 Nm + 40°

Note:

The vehicle manufacturer stipulates that new screws are to be used. The corresponding part number can be found in the appendix.



- Remove the three seals from the HV cover
- Clean the HV cover and the sealing surfaces



- Mount the new seals on the HV cover



- Mount the HV cover and tighten the screws to 6.8 Nm



- Apply the new sticker to the HV cover



- Mount attachment parts
- Install the drive unit in accordance with the vehicle manufacturer's specifications

Transmission oil quantity: 1.75 liters

Oil designation: Mobil SHC 629

- Replace the seal on the oil filler plug and tighten the plug to 28 Nm



Appendix

Set of adjusting washers for differential gear bearing

Part number: 464 0031 10

Washer thickness:
0,10 mm
0,15 mm
0,20 mm
0,25 mm
0,30 mm
0,35 mm
0,40 mm
0,45 mm
0,50 mm
0,55 mm
0,60 mm

Appendix

The following spare parts can be obtained from the Tesla spare parts dealer.

1. Screw for the HV terminal

M6 screw

Tesla part number 1038934-00-A

