

febi 1000001



To fit: Hyundai Ioniq AE EV 2016-2019 88kw



Electrical Drive Motor Repair Kit

Problem

Whining noise from the front of the car, which gets louder under load.

Cause

Electric motor bearings have become worn and noisy in operation due to possible electrical corrosion.

Solution

Attention!

Only work on the high-voltage systems if you have been trained and are confident to do so and all safety guidelines are fulfilled.

Ensure that all test equipment and tools used are suitable for high-voltage circuits or components and use insulated gloves where necessary.

Follow the vehicle manufacturer's procedure to safely shut down the high-voltage system.

Before commencing work, place a high-voltage warning sign on the vehicle to warn others in the workshop that you are working on the high-voltage system.

Turn off the ignition and remove the ignition key, storing it away from the car, then disconnect the 12-volt battery.

The traction battery service plug is in the luggage compartment. (Fig.1) Wearing insulated gloves, remove the service plug and store it in a safe place, then wait at least five minutes to ensure the high-voltage capacitors in the inverter are fully discharged.



Figure 1

With the vehicle raised, remove the plastic covers and disconnect the inverter cable, then check the voltage at the high-voltage cabling plug terminals to ensure that the residual voltage in the circuit is under 30 volts before continuing. (Fig.2)

To remove the drive motor, first drain the coolant from the radiator, then remove the coolant pipes from the motor and allow to drain.

Disconnect the high-voltage orange wiring harness from the motor and the black sensor connector. Then remove the mounting, supporting the motor assembly with a transmission jack.

Once removed, locate and unscrew all the motor bolts which attach it to the transmission and separate the two major components, then carefully lower the motor from the vehicle and transfer it to a bench.

febi Electrical Drive Motor Repair Kit 1000001 consists of two gaskets, an oil seal and 'O' ring, and the motor bearings. The two bearings are identical in dimensions; however, one has steel ball bearings and the other is ceramic.

It is important they are fitted in the correct position on the rotor. The ceramic bearing is installed at the speed sensor end of the motor and the steel bearing is at the transmission side.

Support and place the motor assembly with the rotor position sensor side facing upwards on a bench, then ensuring appropriate support is provided, remove the four bolts and take off the upper cover.

Next, disconnect the three high-voltage cables. (Fig.3)

Remove all the bolts securing the end cover, noting the different lengths for reassembly, then carefully prize off the cover which is held in place with sealant.

Remove the high-voltage connectors from the stator along with the connecting block, then disconnect the wiring for the resolver and motor temperature sensors, separating the two cables.

Remove the resolver sensor from the motor, marking its position for reassembly, followed by the encoder. (Fig.4)



Figure 2



Figure 3



Figure 4

Next, remove the housing retaining bolts and, using a rubber mallet, evenly strike the housing to release the bearing and encoder from the rotor until the housing can be removed, then remove the gasket. (Fig.5)

Turning the motor over, remove the seal from the output shaft, then take out all the retaining bolts from the housing.

Supporting the motor housing, slide the rotor out of the stator and remove the gasket. (Fig.6)

Note: Care must be taken not to damage the highly magnetic rotor during removal.

To remove the bearing from the output shaft end, remove the circlip and then, using a hydraulic press, push the rotor out of the housing cover. (Fig.7)

Working on the bench, remove the three retaining bolts from the bearing plate and extract the bearing. (Fig.8)

Clean all mating surfaces and lightly oil the housing, then insert the new steel bearing by hand.

Refit the bearing plate and tighten the three bolts to 15 Nm, then press the new bearing on to the rotor.

Moving back to the bench, refit the output shaft circlip and install the new seal and 'O' ring included in the kit.

Turning it over, carefully slide the stator assembly with the new gasket over the rotor, ensuring the two parts align.

Then, working on the other part of the housing, press the old bearing out, then take the two assembled parts of the housing to the press and push the new ceramic bearing onto the rotor shaft, followed by the encoder. (Fig.9)



Figure 5



Figure 6



Figure 7



Figure 8

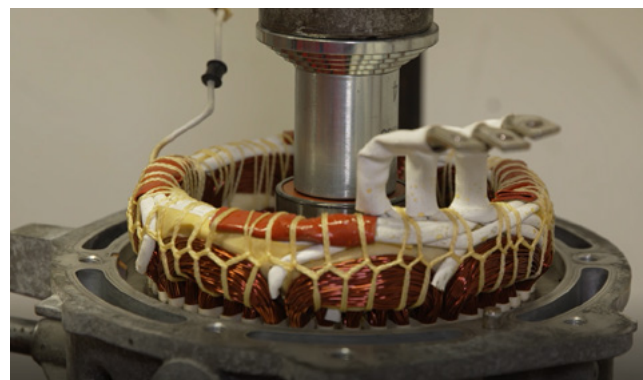


Figure 9

Install the housing with gasket over the new bearing, threading the wiring through the dedicated areas, then refit all the housing bolts, tightening to 42 Nm.

Refit the resolver and tighten the six retaining bolts, then rejoin the wiring to the temperature sensor and reconnect. Remount the high-voltage stator cable block and tighten the cables to 10 Nm.

Turn the motor on its side and install the housing bolts, tightening to 42 Nm, then return to working on the sensor cover.

Before assembly, ensure all mating surfaces are clean and free from old sealant. Apply new sealant and remount the sensor cover and evenly tighten all retaining bolts to 11 Nm, followed by tightening the three high-voltage cables to 10 Nm. (Fig.10)

Next apply sealant and refit the upper cover, tightening the bolts to 11 Nm.

Before installing the motor back into the vehicle, ensure the rotor turns freely and carry out an insulation test using a suitable meter.

Transfer the motor to a transmission jack and refit the motor to the transmission, tightening all retaining bolts. Refit all coolant hoses and wiring connectors to the transmission. Then reattach the high-voltage cable to the inverter and lower the vehicle.

Install the traction battery service plug and reconnect the 12-volt battery.

Fill the coolant system with fresh low-conductivity coolant, then carry out the bleeding process to expel the air using a suitable diagnostic tool. (Fig.11)

Once completed, lower the bonnet, switch on the ignition and engage drive. When the vehicle moves for the first time, a warning message will appear on the instrument display.

Check any system messages for the electrical vehicle, fault code P0C17 will be stored in the control unit. (Fig.12)

The vehicle requires to be driven at a speed of 20-50 kph until the resolver speed sensor has been calibrated. The fault message and code will automatically be erased if calibration has been successful.



Figure 10



Figure 11



Figure 12