reVolt SYSTEMS

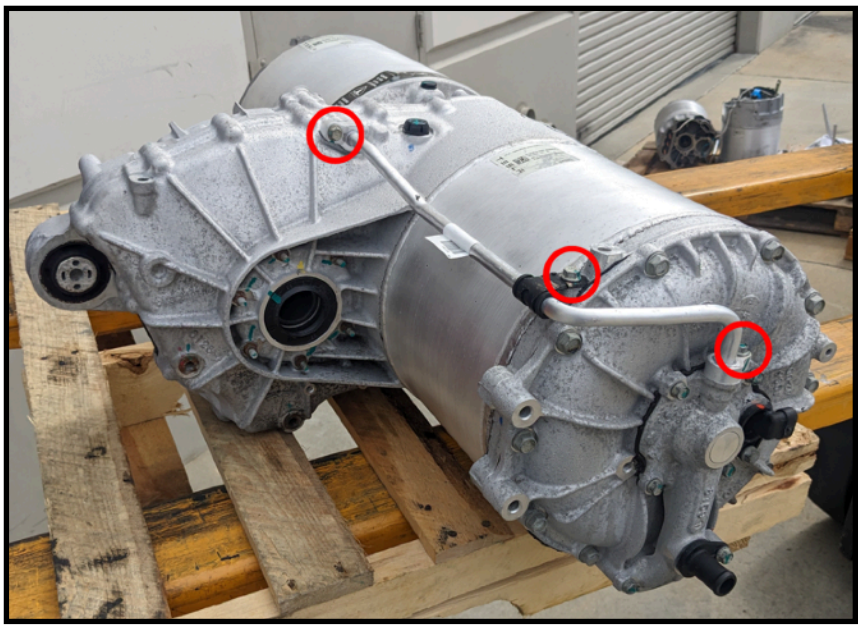
Revolt Systems Rotor Seal Bypass Manifold “The Fix”
(Affects all Tesla Large Drive Units)

This procedure addresses the notorious rotor seal issues present in all Tesla Large Drive Units (LDU). The seal and sealing surface degrade and allows coolant to leak into the stator windings and inverter. This causes isolation issues, inverter failure and in some cases complete motor seizure. If the rotor seal has not yet leaked, this kit will eliminate all risk of rotor seal failure in the future.

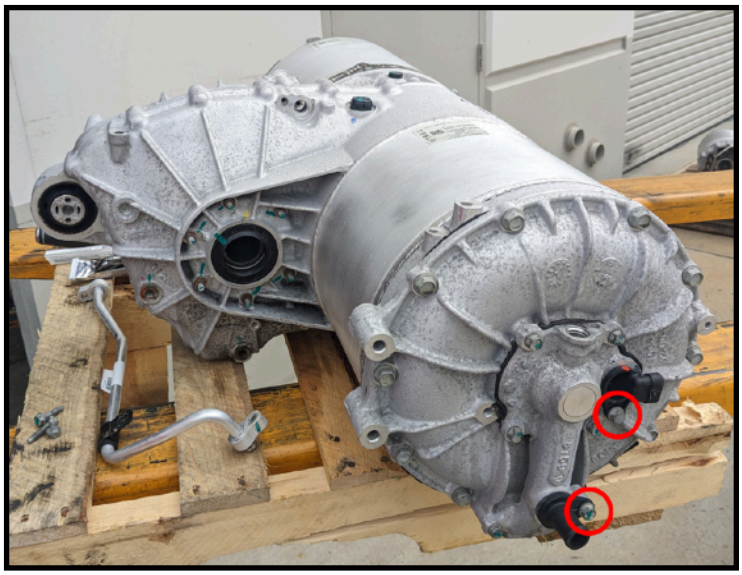
The purpose of the seal is to allow heated coolant from the rotor to pass through the external coolant line across to the gearbox to heat up the transmission fluid and reduce condensation in cold environments. In almost all applications this is unnecessary as anything but the shortest driving distances will heat up the transmission sufficiently to fulfill the same purpose. This kit eliminates this redundant feature, and therefore eliminates the Achilles heel of these otherwise extremely reliable motors.

Tools Required:
10mm socket/wrench
Small pry bay
5mm drill bit (or standard equivalent)
Silicone sealant (Permatex Ultra Black 82180 recommended)
O-ring grease

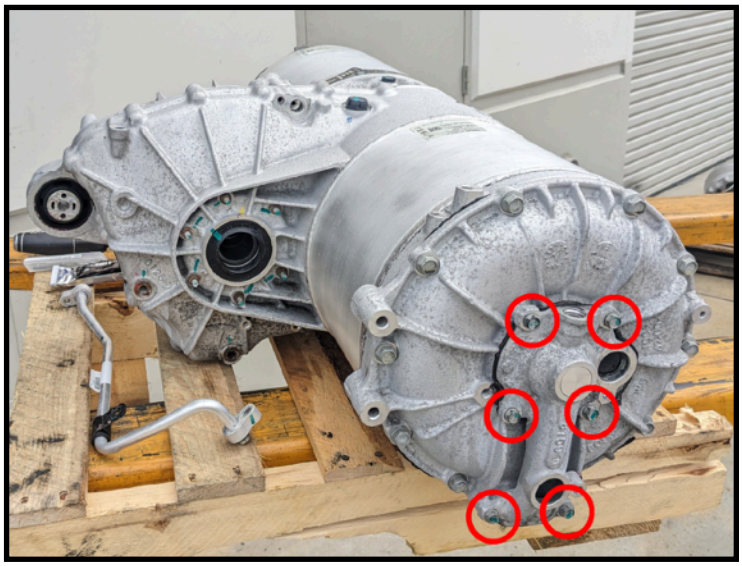
With the LDU removed from the vehicle, first remove the three 10mm bolts securing the external coolant line and remove the coolant line. Carefully remove an o-ring from the coolant line and set it aside. You will use it later on the blanking piece.



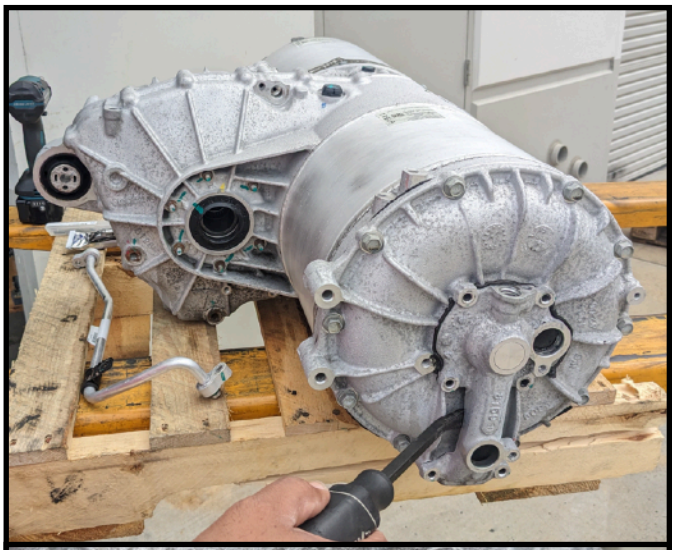
Remove the two 10mm bolts securing the encoder and coolant fitting and remove both components from the LDU. These components will be re-used.



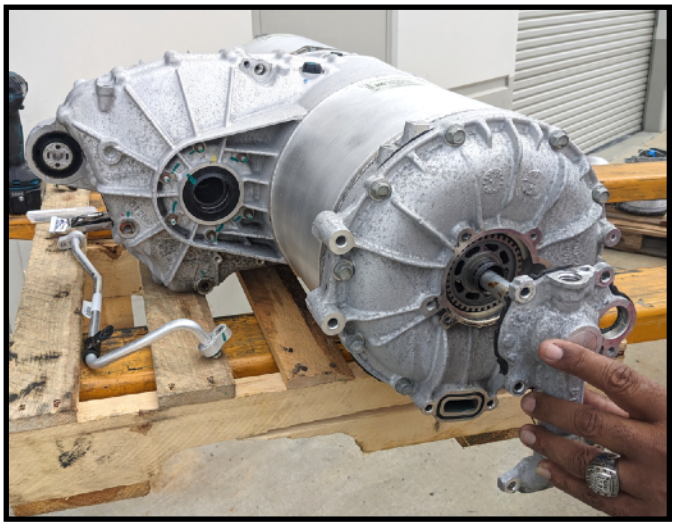
Remove the six 10mm bolts securing the rotor seal manifold.



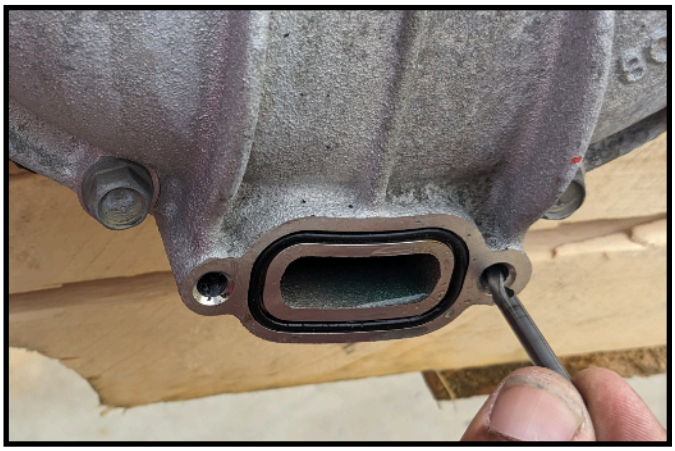
Use a pry-bar to carefully remove the rotor seal manifold. There are two convenient pry points shown in these photos, but take care to pry it off evenly and as square as possible to the drive unit.



A small amount of coolant will be present when the manifold is removed. This is normal. If you find rust and corrosion on the encoder wheel and rotor bearing, this is an indicator that the rotor seal has already begun leaking. In this case your motor may be salvageable or it may need to be rebuilt. Revolt Systems works with several specialists who are able to rebuild these motors. If you believe your rotor seal has been leaking, contact info@revoltsystems.com with photos and your location, and we may be able to refer you to a rebuilder.

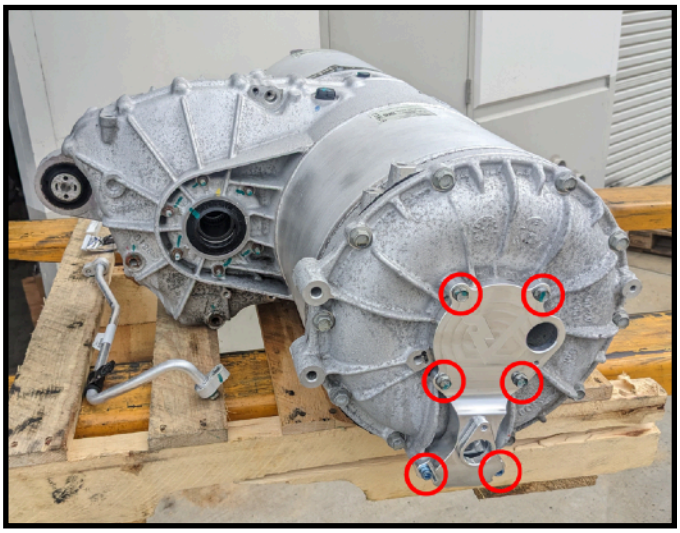


The two lower bolt holes are usually full of silicone from factory assembly. If left in place, this will cause the bolts to bind during reassembly and strip out the threads. Use a 5mm drill by hand to remove the silicone from these holes. Do not use a power drill as you risk damaging the threads. Inspect the o-ring on the drive unit and ensure it is free from any debris and that it is seated in its groove. Do not apply any silicone sealant to the o-ring.

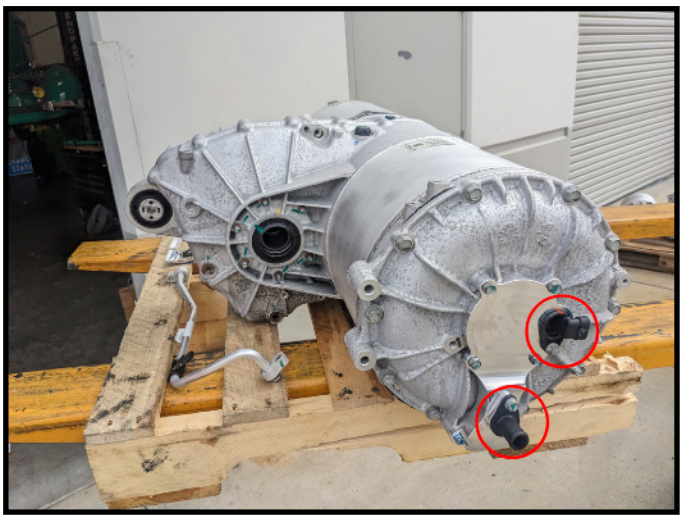


Apply a thin bead of silicone sealant around the new Rotor Seal Bypass Manifold as shown. Apply a thin film of o-ring grease to the new Rotor Seal Bypass Manifold as shown.

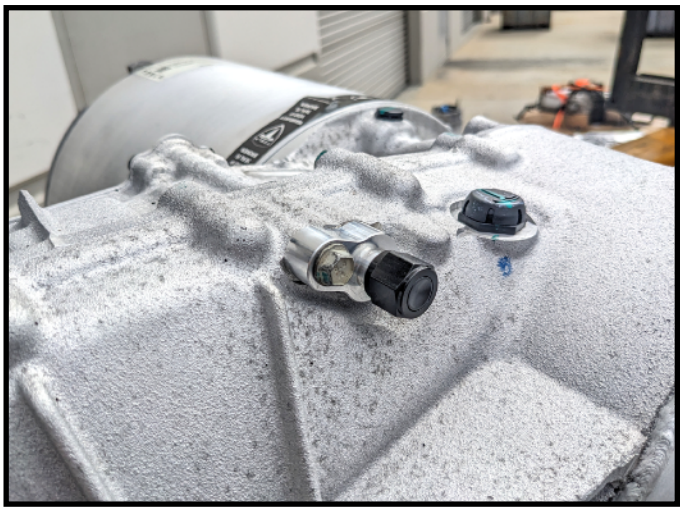
Install the new Rotor Seal Bypass Manifold, taking care to seat it correctly first time to avoid dislodging the o-ring. Loosely screw in all the 10mm bolts. Once all bolts are in position, torque them to 8Nm in a criss-cross pattern. **If the bolts start to get tight before they are fully seated, STOP, and see if the bolt hole still has old silicone stuck in it. These threads are easily stripped, especially the lower two.**



Apply a small amount of o-ring grease to the encoder and water fitting o-rings and install them in the new Rotor Seal Bypass Manifold. Torque the bolts to 8Nm.



Take the o-ring from the external coolant line and install it on the new block-off piece. Apply a small amount of o-ring grease to the o-ring. Install the block-off piece as shown and torque the bolt to 8Nm. Ensure the black AN cap is torqued appropriately.



**The Fix is now complete!**