AECS TRAINING

COURSE: Electric Vehicles
COURSE ID: EV2-2
DURATION: 2 Days

Electric Vehicles

EV Diagnostics & Maintenance: Part 2 (EV2-2)

It is important to be safe, confident and skilled working on EV's. Team AECS has spent MANY hours in research and development to create our cutting-edge EV Diagnostics & Maintenance: Part 2 training specifically for EV diagnosticians.

Introduction

In our EV Diagnostics & Maintenance: Part 2 training we discuss in detail:
HV Airconditioning: diagnostics, servicing of R134a aircon, and heat pump systems. Covering a small amount of R1234a aircon knowledge on late model EVs. We explain the difference between PAG and POE oil, plus how and why to change over service equipment from one type of oil to another. A full heat pump system is available for hands on training.

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Scantool communicating with the VCM

We cover the relation between PTC heater and heat pump, study air and refrigerant flow diagrams, and common faults. Including UV dye specifications and what is required for HV AC systems. A full HVAC service is covered step by step.

We analyse the LIN bus control of the HVAC system.

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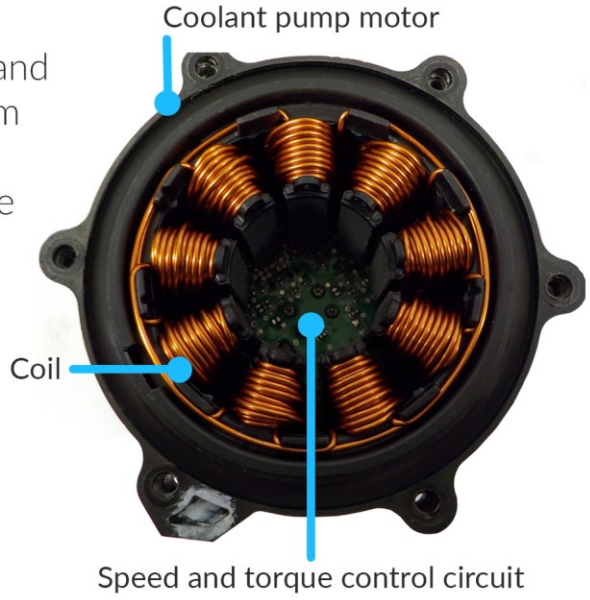
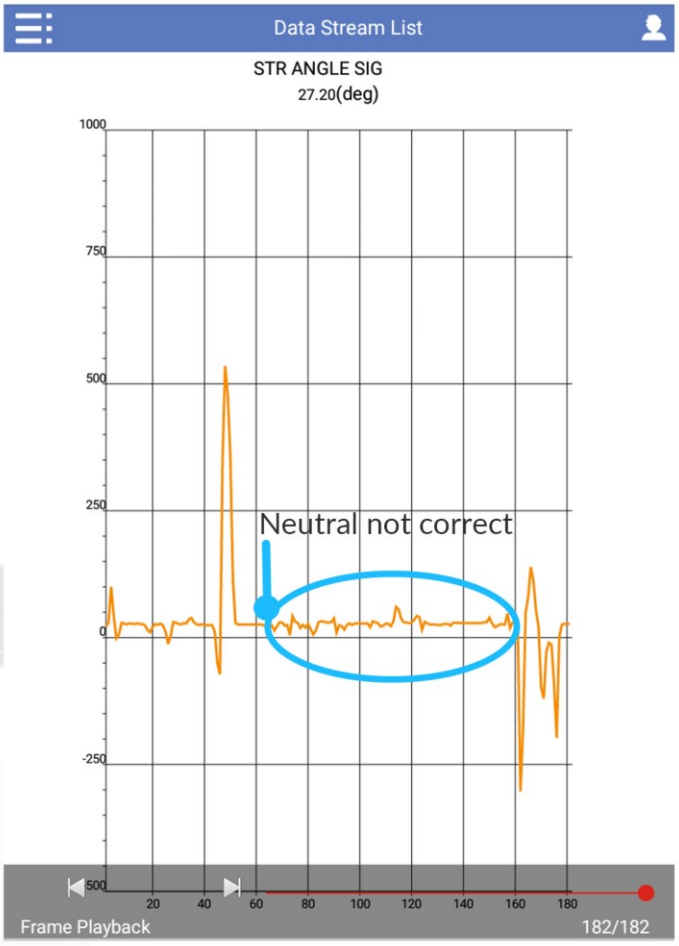
- Cooling and heating system; we look at Gen1 and Gen2 PTC heaters in detail, their control system and common faults. We also look at the PDM PTC control circuit and simple repairs inside the PDM.

- We look at the levitating coolant pumps and their control/feed back systems. How to measure and how to diagnose problems.



- Wheel alignment and stability control; We go from the simple proper understanding of grip, via wheel alignment to stability control in the EV. We look at all aspects. Firstly, from an EV battery SOH and SOC perspective, then from a diagnostics perspective.

  We cover toe (toe out on turns), camber, caster, set back and trust angle adjustments and effects on the drivability of the vehicle and the effects on the stability control systems. Including a look into the values and angles with a 3D alignment system or better. In the stability control section we will look at G force sensor function and calibration, in combination with the steering angle sensor and ABS sensor's functions.



Scan tool data

- We dive deep into live data recordings of faulty calibrated vehicles and the effects of the faulty calibration on the regenerative braking system and extra energy consumption.

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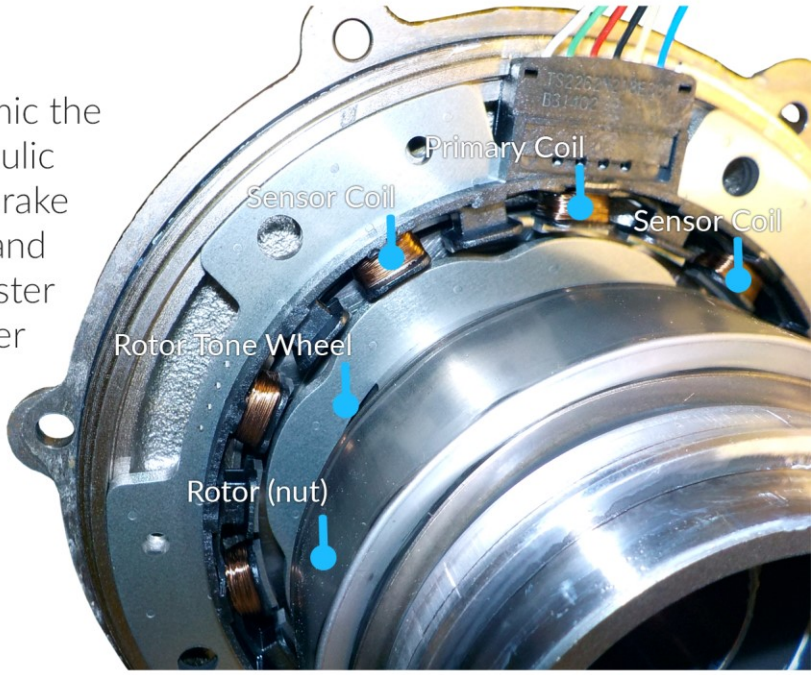
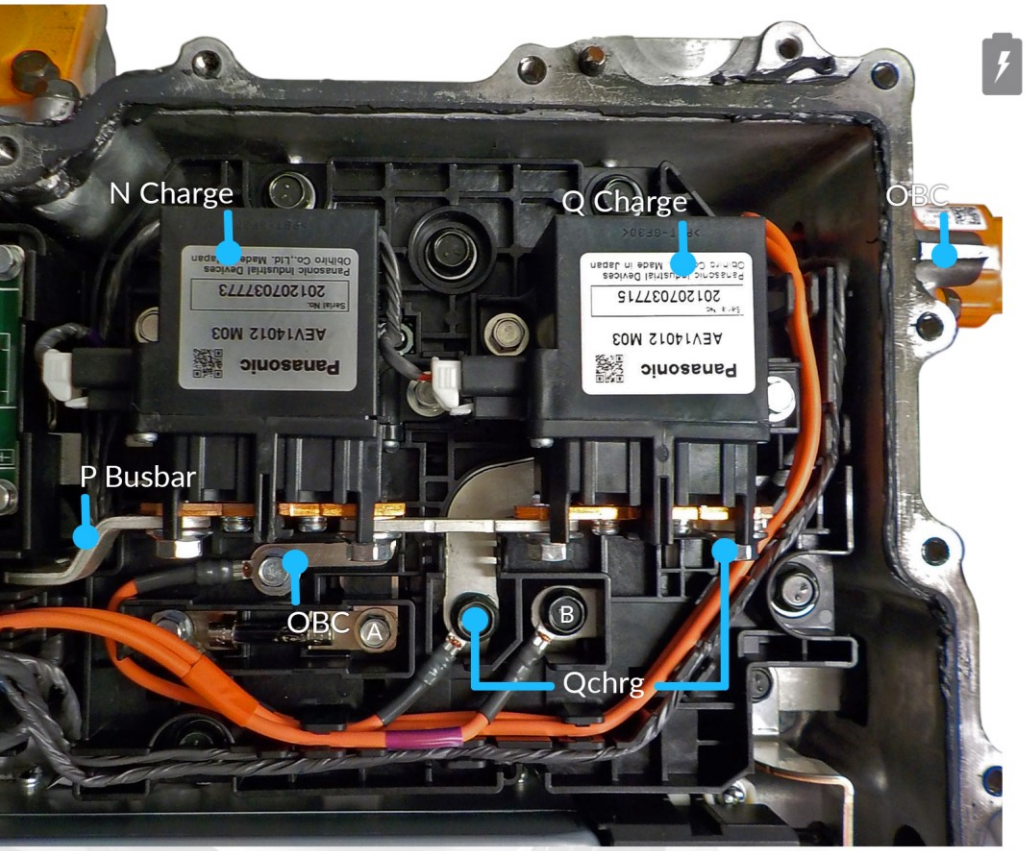
Regenerative braking; We look at dynamic the transition from electric braking to hydraulic braking and the effects of aftermarket brake parts. This includeds the stroke sensor and its function, and the 3 phase brake booster with its back up power supply. We cover briefly the software update which has been in the news (2018).

We cover the functions of the ABS modulator like EBD, VDC, TCS, BLSD and BAS.



Brake Booster Inside



PDM Detail

High voltage distribution; The role of the Power distribution module of the Leaf Gen1 (and Gen2) is described in great detail with hands on.

We show what you can and can't service. We show and explain how each item inside the PDM works for understanding and diagnostics.

We look at the Gen1 interlock system. The function of the quick and normal charge contactors is shown and their counters (plus how and why to reset the counters) are shown.

This 2 day training seminar will make you and expert and confident in EV vehicle diagnostics and maintenance. Some of the technology and diagnostics are also of great value to modern ICE vehicle maintenance.

The training is theory and hands on and is directly applicable in the workshop. This is not just sitting and looking at a power point presentation of technologies you won't see in the workshop for some time yet!

Pre-requisites:
It is necessary to have done - Hybrid/EV Safety (HVS1-1) or Hybrid/EV Diagnostics (EMS1-4).
It is advised to have done - EV Diagnostics & Maintenance: Part 1 (EV2-1)

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