



DC Fast Charge Effects on Battery Life and Performance Study – 40,000 Mile Update

Four model year 2012 Nissan Leaf battery electric vehicles were instrumented with data loggers and are being operated over a fixed on-road test cycle. Each vehicle is charged twice daily, with two vehicles charged at AC Level 2 (L2), and two DC fast charged (DCFC) with a 50kW charger. The traction battery packs are removed and tested when the vehicles were new, and at 10,000 mile intervals. Battery tests include constant current discharge capacity, electric vehicle power characterization, and low peak power tests¹. The testing will continue to at least 50,000 miles at which point the battery testing results will determine if testing continues in additional 10,000 mile increments. This fact sheet summarizes the measured changes in capacity at 10, 20, 30, and 40 thousand miles relative to baseline test results.

	1011 L2	4582 L2	2183 DCFC	2078 DCFC
Baseline (New)	23.31	23.59	23.38	23.24
10,000 Miles	21.75	22.3	21.97	21.93
20,000 Miles	21.53	21.51	21.64	21.07
30,000 Miles	19.99	20.2	19.42	19.33
40,000 Miles	18.10	18.34	17.53	17.37

Table 1 - C₃ Energy capacity² (kWh)

	1011 L2	4582 L2	2183 DCFC	2078 DCFC
0-10k Miles	28.6	28.6	32.7	32.5
10-20k Miles	22.7	22.5	27.6	27.3
20-30k Miles	35.7	36.0	39.8	39.5
30-40k Miles	38.2	38.4	40.8	40.6

Table 2 – Average pack temperature during charging (°C)

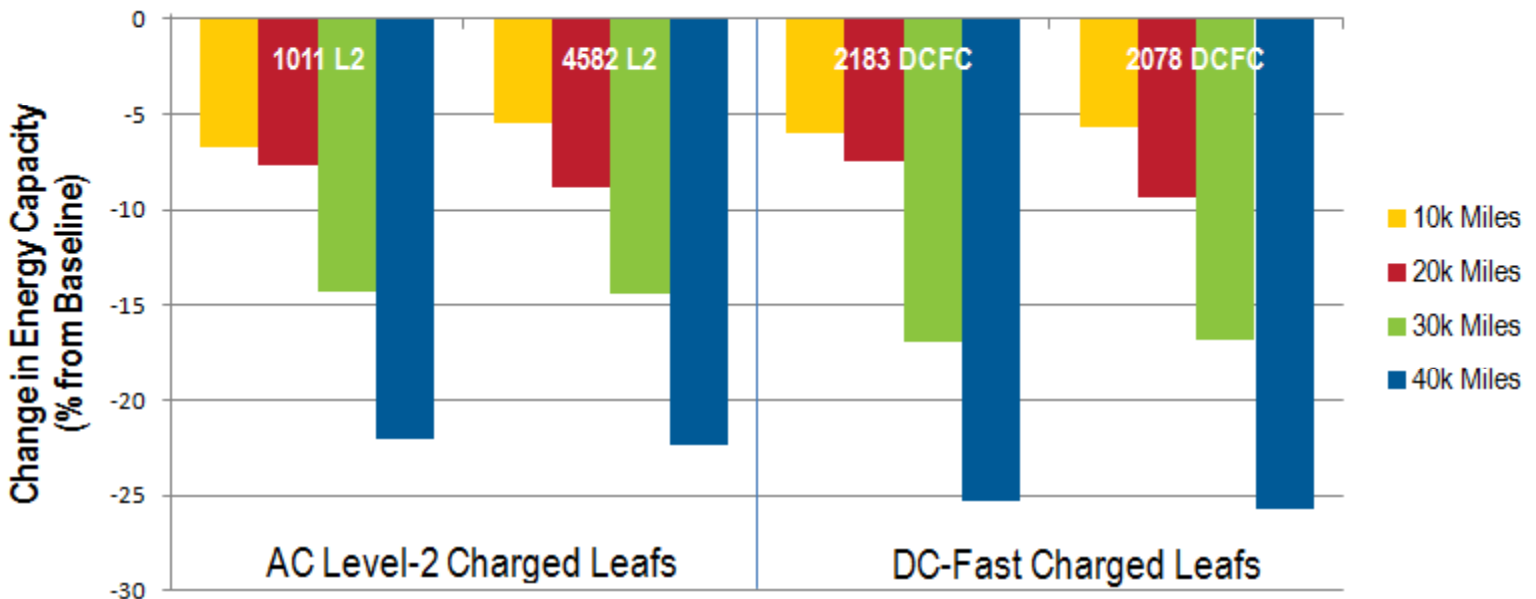


Figure 1 – Percent change in C₃ energy capacity from baseline

1. Capacity and Peak Power tests based on tests from [USABC Electric Vehicle Battery Test Procedures Manual Revision 2](#). Electric Vehicle Power Characterization test adapted from the *Hybrid Pulse Power Characterization Test* from the [FreedomCAR Battery Test Manual for Power-Assist Hybrid Electric Vehicles](#).
 2. C₃ capacity reported is the mean value of 3 tests performed sequentially.