



SERVICE BULLETIN

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LEAF; RANGE INFORMATION

**This bulletin has been amended. The Applied Vehicles section has been revised.
No other changes have been made. Please discard all previous copies.**

APPLIED VEHICLE: 2011-2012 LEAF (ZE0)

SERVICE INFORMATION:

The following information is intended to provide assistance in improving customer understanding of the unique characteristics of an electric vehicle and to clarify normal operation with regard to range. All of this information can be confirmed with the customer on the service drive.

1. It is the Certified Nissan LEAF Dealer’s responsibility to assure that customers understand normal electric vehicle operation at the time of delivery to avoid customer misunderstanding and to set appropriate range expectations. The dealer’s sales department is responsible for reviewing the “Nissan LEAF Customer Disclosure Form” with the customer which covers range. Information related to range from the disclosure form is included with this bulletin. This disclosure form is provided with the LEAF New Vehicle Delivery System folder in each vehicle.
2. Confirm if the vehicle is subject to Voluntary Service Campaign P1213, and if so, complete the VCM Reprogram per Service Campaign Bulletin NTB11-038. Improvements to the accuracy of the Driving Range Display are included with this reprogram. Note: The reprogram does not change the ultimate range capability of the vehicle.
3. With all doors closed (including rear hatch), front seat belts fastened, and the Power Switch in the “Ready” mode, confirm there are no warning lights on the dashboard. These specifically include the Master Warning Light (red/yellow triangle with “!” inside) and the EV System Warning Light (yellow vehicle outline with “!” inside). If none of these warning lights remain on and the vehicle has at least 2 segments of remaining charge, then all monitored systems and functions are normal.



Nissan Bulletins are intended for use by qualified technicians, not 'do-it-yourselfers'. Qualified technicians are properly trained individuals who have the equipment, tools, safety instruction, and know-how to do a job properly and safely. NOTE: If you believe that a described condition may apply to a particular vehicle, DO NOT assume that it does. See your Nissan dealer to determine if this applies to your vehicle.

4. Review the following with the customer:

- a. As stated in the Nissan LEAF Customer Disclosure Form, “range is dependent on a number of factors. Some of the factors affecting range are ambient temperature, weight - number of passengers and payload, air conditioning/heater usage, high speed or stop-and-go driving, topography, battery capacity, etc”. The Average Energy Economy provides an estimate of the actual customer driving behavior and conditions.
- b. To improve range, customers should monitor Average Energy Economy and modify driving behavior to increase this number (Refer to the “Power Economy” section of owners manual, page 5-19).The following behaviors have the biggest impact on improving Average Energy Economy and range:
 - Drive at slower speeds (including taking alternative routes see **NOTE**).
 - Minimize the use of A/C and heater. If use is necessary, use A/C-Heater Timer (Climate Control Timer) to precondition the car prior to driving. Use ECO mode instead of “D”.
 - Lift off the accelerator pedal earlier before a stop. This maximizes energy regeneration and reduces lost energy through braking.
 - Maintain tire pressure per the “Cold Tire Pressure” header on the “Tire and Loading Information” found in owners manual.

NOTE: Consider changing the “Setting Conditions for Route Calculation” in the Navigation System (see Navigation System Owner’s Manual) to either “Minimize Freeway” or “Shortest Route” to find more energy efficient routes.

5. Demonstrate how to access the actual Average Energy Economy display on the customer’s Trip Computer (see Owner’s Manual for explanation), obtain the value from the customer’s vehicle and refer to the table below:

Average Energy Economy	Estimated Range to 1 segment remaining (miles)*	Estimated Range to no remaining power (miles)
2.5	38 - 42	47 - 52
3.0	45 - 51	57 - 63
3.5	52 - 60	66 - 73
4.0	60 - 68	76 - 84
4.5	67 - 76	85 - 94
5.0	75 - 85	95 - 105
5.5	82 - 94	104 - 115
6.0	90 - 102	114 - 126



Gauge segments show 100% charged.

“Estimated Range to 1 segment remaining (miles)” refers to miles driven from 100% charge, to last segment remaining (highlighted in yellow).

* From fully charged (100% setting) to one remaining segment on the Li-ion Battery Available Charge Gauge (Located in lower meter display. See Owner’s Manual for explanation) on a new vehicle (no battery capacity loss) at 70 deg F ambient.

6. If the customer is using the Li-ion Battery Available Charge Gauge to estimate range (e.g. numbers of miles traveled per segment used), please inform the customer that the last segment at the bottom of the gauge has more capacity than the others. There is also reserve Li-ion battery capacity when there are no segments. The table above provides an estimation of the ultimate remaining range compared to estimated range to one remaining segment.

Excerpts from the “Nissan LEAF CUSTOMER DISCLOSURE FORM”

The distance you can drive (range) varies considerably depending on, for example: state of charge, weather, temperature, usage, age, topography, and manner of driving.

Range Estimates:

The range is dependent on a number of factors. Some of the factors affecting range are ambient temperature, weight - number of passengers and payload, air conditioning/heater usage, high speed or stop-and-go driving, topography, battery capacity, etc. When the battery is new, it is estimated that vehicle range with a fully charged battery under normal operation and various driving conditions will vary between 138 and 62 miles for the majority of people. These are estimates based on analysis and testing. Your individual style and location will dictate your individual range, which will vary initially. Also as the battery ages, capacity and range decline. There are an infinite number of range scenarios*, based on many variables. Here are just a few. (*The following scenarios are based on new battery life. Estimated range is based on specific variables studied through computer simulations. Individual mileage outside of estimated range scenarios will occur).

Ideal driving conditions: 138 miles

Speed:	Constant 38 mph
Temperature:	68 degrees
Climate control:	Off

Driving on a flat road at a constant 38 mph means less air resistance, and therefore less energy use. And at 68 degrees, there's no need for climate control, extending the range even further. The result: a range boost up to 138 miles.

Suburban driving on a nice day: 105 miles

Speed:	Average 24 mph
Temperature:	72 degrees
Climate control:	Off

The average speed in this scenario is 24 mph; common when commuting and running errands. The ambient temperature is 72 degrees and the climate control is off. Not using the air conditioner and driving at slower speeds mean less energy use and a little extra range.

Highway driving in the summer: 70 miles

Speed: Average 55 mph
Temperature: 95 degrees
Climate control: On

Averaging 55 mph on the highway, in 95 degree weather, with the air conditioning on high may produce range figures like this. Higher speeds require more energy to overcome air resistance. Running the air conditioner means energy that could be used to increase range instead goes to cooling the car.

Cross-town commute on a hot day: 68 miles

Speed: Average 49 mph
Temperature: 110 degrees
Climate control: On

Driving from a rural area into the city at an average 49 mph with the air conditioning on high may produce this range. Under these conditions, climate control combined with higher-speed driving produces increased energy consumption, hence the effect on range.

Winter, urban stop-and-go, traffic jam: 62 miles

Speed: Average 15 mph
Temperature: 14 degrees
Climate control: On

Though the average speed is only 15 mph with stop-and-go traffic, the 14-degree temperature means the heater is doing a lot of work so you spend considerable time and energy heating your car rather than moving forward. Despite these conditions, it would still take more than 4 hours to run out of charge!

Driving/Operating.

Driving the vehicle at constant speed and with smooth pedal modulation improves vehicle range. Nissan also recommends heating or cooling the cabin while charging just prior to driving. Vehicle range will be reduced by: (1) high speed driving (55+ mph), (2) aggressive driving (frequent or rapid acceleration) (3), severe conditions including heavy passenger/cargo load, uphill driving at a steep incline for extended periods of time, and (4) electrical use, especially heater or air conditioner use.

