



Winter driving in the All-New Mustang Mach-E

What can affect the Mustang Mach-E's driving range?

There are **three** main factors that can affect the driving range of the new Mustang Mach-E:

1. Heavy acceleration and high speeds -

- a. In any type of vehicle, accelerating fast will use more power and reduce range. This applies to Internal Combustion Engines (ICE) and Electric Vehicles (EV).
- b. Likewise, faster speeds create exponentially more wind and road resistance, impacting on range.

2. Climate and temperature -

- a. Extreme heat or cold temperatures outside have the potential to affect battery range, directly.
- b. Heating and cooling the inside of the vehicle for passenger comfort also has an impact.

3. Regenerative braking -

- a. Regenerative braking can capture and reuse more than 90% of the braking energy improving the efficiency of the battery and extending the battery range.

The Mustang Mach-E was tested in extremely cold conditions. However, all electric vehicles (EV's) have less energy in cold temperatures compared to warm temperatures due to battery cell chemistry. Also, extreme temperatures often result in the passengers using more functions or energy 'consumers' on their journey (heated rear window, heated seats, air conditioning, lights, etc.) resulting in more 'energy' being drawn from the battery.

The science bit...

Temperatures below 4°C cause the electrolyte fluid in a battery to become sluggish. This limits how much power is available to discharge and how fast the vehicle can charge. While your customers may not experience colder or extreme weather, we want you to be aware that in low temperatures your customers could see a reduction in range, which is normal. It is important that this is explained to customers.



Electric Vehicle Winter Driving Tips

The following tips will keep your customers safe, comfortable and relaxed about the range of their Mustang Mach-E, when driving in winter:

- Pre - condition or pre-heat the vehicle using the home charger and set departure times to warm the cabin and the battery while plugged-in (using the FordPass app or the SYNC 4A touchscreen).
- Whenever possible, park in a garage or undercover. Keeping the vehicle inside or sheltered will reduce the exposure of the battery to extreme temperatures and preserve range.
- If possible, always keep the Mustang Mach-E plugged in whenever it is parked. In cold weather, even trickle charging will help the car to keep the temperature of its battery optimised. If keeping the vehicle plugged in is not possible, try and find a parking space in the winter sunshine to improve ambient temperature.
- Rather than use heating and ventilation to warm up the whole cabin, use the heated seats and steering wheel as primary local heat sources for the passengers. These consume far less energy.
- Set the climate control to create a comfortable but moderate ambient temperature. It is more efficient to maintain a consistent temperature than it is to keep turning climate control on and off, heating up the cabin before letting it cool down again.
- If the vehicle is snow covered, brush all the snow off the vehicle before driving to eliminate extra weight and aerodynamic drag. (This may also be a legal requirement in your country.) Also ensure maximum visibility in the vehicle and that all their driving lights are clear.
- Ensure tyres are at the correct pressure. Under inflated tyres can affect the rolling road resistance and therefore increase drag, impacting on energy consumption. The wrong pressure will also affect the tyres' grip on snowy and icy roads. Recommend to the customer to have winter tyres, if required.
- Avoid using high-power, fast charging (DC) after short driving distances. The battery needs time to heat up, under normal driving conditions, to be able to accept high charge power. Not giving your battery time to condition will impact charging performance.
- If you need to charge the car at a high voltage DC charger in temperatures less than 10°C, the customer may notice charging takes longer. Shutting off the electric heater ("E-Heat") and climate control for the first 10 to 15 minutes of charging will allow the battery to warm-up. This will then improve the charging rate.
- Ensure all driving assistance features, such as traction control, are turned on. Also, place the vehicle in 'whisper' driving mode as this moderates the forces supplied through the wheels providing gentler acceleration and braking on treacherous roads, in adverse weather.
- Driving habits are learned by the Mach-E over time. This is used to inform the Mach-E's 'intelligent range' and give the driver accurate predictions. Summer driving behaviours transferred into the winter might initially result in poorer predictions. This can be alleviated by manually resetting their EV driving history at the start of winter and summer.



- NB: To reset driver history: click on the vehicle icon in the top left corner of the centre touchscreen ->Select Settings->Select Vehicle->Select EV Driving History Reset.
- The customer needs to be aware that the range prediction could be poor when first starting the car up with a cold battery. This will improve as the battery is conditioned (warmed-up) by use.

Finally, the Mach-E is a fantastic place to enjoy winter driving safely and comfortably. However, it is not always possible to account for everything that might go wrong in the treacherous driving conditions of winter. Remind your customers to pack the right accessories to ensure their safety and wellbeing.

