

Planning a Long-Distance Trip in an EV – or - Worldwide Harmonised Light Vehicle Test Procedure (WLTP), the BCP and planning a trip in an Electric Vehicle.

You probably don't remember there being much emphasis on the potential distance that could be covered on a tank of fuel for an internal combustion engine (ICE) vehicle, for non-commercial vehicles anyway. The owner would be given the fact that the tank capacity was so many litres, that for the particular vehicle 'indicative' consumption would be that 100km would take X litres and after that the owner needed to work things out for themselves.

For a trip, the owner would normally assume (with some justification) that steady driving at legal speeds would see less fuel used per 100km than the 'indicative' figure and fuel stops would be identified in terms of this reduced consumption, tempered by known 'gaps' in the availability of petrol at critical points along the journey. (For example, the 107 km without servos between Kingston in the South East and Millicent, when driving from Adelaide.)

Over time, car makers added low-level technology to help the driver avoid running out of petrol, initially it was the low-level light in the fuel gauge and later the kilometres until empty display on trip computer. Both these devices formalised the existence of the 'BCP' (Buttock Clenching Point) the low-level light when it came on and (conversely) when the Kilometres until empty display winks out! The moment these events occur the increasingly nervous search for a refuelling opportunity swings into action.

Enter the era of the Electric Vehicle (EV) and trip planning and forget everything above; except the BCP.

The EV owner is now presented with the 'range' for their vehicle as determined by the Worldwide Harmonised Light Vehicle Test Procedure (WLTP). This is a great number for legitimate comparison between vehicles. However, I would argue that it needs to be interpreted with some degree of caution when applied to planning a trip.

In possibly oversimplified terms, the WLTP looks at the rate of energy consumption under four (4) driving condition and speed scenarios, which I will para-phrase as City, Suburban, Country and Highway/Freeway. The WLTP figure is a construct from all four outcomes, but there is also an increasing interest in the outcome from the combination of Country and Highway (let's call that C&H).

A key point is that the C&H range is less than the WLTP figure – not more. One US study of around 30 different makes and models indicated that the C&H range was between 5% and 8% less than the WLTP figure. (The one exception was the Porsche Taycan – which might confirm something about Porsche drivers!) A key reason for the WLTP vs. C&H phenomena is that the 'stop' part of city and suburban 'stop and go' is allowing the regenerative braking systems in the EV to top-up the battery, while steady long-distance driving provides very little similar opportunity.

Even more sobering evidence is emerging from 'real world' tests. A recent European study, where 10 EVs were driven repeatedly around a 68km ring-road around Rome (at speeds up to 130kph), netted results where the most efficient result was a range 16% less than the WLTP. This was by an MG4, so let's stick with that figure for our purposes.

EVs also have the latest innovations in electronic driver support as part of their (so-called) 'infotainment' systems. This can allow the trip-computer function to interface with the navigation function in the Sat-Nav. An article in an Australian motoring magazine reported on a drive in a Tesla S, where the car advised the driver to stay below 85 kph to ensure reaching the identified

destination, then 80, then 75 ... In a UK magazine, the car's computer made the suggestion that the driver might consider turning the heater off. Further, in a similar vein to there being potential repercussions running a petrol tank dry, completely discharging an EV battery may not be the best idea either. Accordingly, the BCP is still alive and well. But what might that be?

It is perhaps instructive to note that when touching on re-charge times, articles often cite the time to go from 5% to 80%. For the purposes of this discussion, let us assume that 5% charge is considered the BCP for EVs. But what is the significance of the 80% figure.

To appreciate the thinking behind the 80% figure we need to note that, whereas for pouring petrol into a ventilated tank the rate of fill is unaffected by the volume of petrol already in the tank, recharging a battery is like blowing up a balloon. The more air in the balloon, the more effort is needed to inflate it further. In the case of the battery, the time to get the battery from 80% to 100% will roughly equal the time taken to get it from 5% to 80%. Consequently, there needs to be a really good reason for doubling your time at a recharge station to gain that extra 20%. Not only for your own purposes – but for the 2 or 3 cars queued up behind you. This brings us to two additional terms: 'Recharging Etiquette' (basically when you get to 80%, get on your way) and 'Recharge Rage' (emerging in drivers 'down the line' after hours of waiting, if you don't).

What does all this mean for either the advertised 800km WLTP for the forthcoming MG-C, or the here-and-now 320km WLTP for the ZS EV? Starting out with a full charge, a 16% reduction due to 'real-world' performance takes the figures to 672km and 268km respectively, a BCP of 5% on those figures reduces them to 638km and 255km. CBD Adelaide to CBD Melbourne is 727km, so our MG-C driver will be looking for a top-up around Ballarat and the ZS EV driver would want to live around Stirling in order to make Bordertown.

When it is necessary to press on the same day, the Recharging Etiquette factor potentially comes into play, at a starting range of 80% of the 'real world' figures of 672km and 268km, we are down to 537km and 215km; reduced by a further 5% of those numbers by the BCP impact, to 510km for the MG-C and 204km for the ZS EV. That would make Canberra the practical limit for a one re-charge trip in a day for the nominally 800km capable MG-C, but not Sydney. The ZS EV may have time for two top-ups, which would get it to get it to Melbourne with a slight lapse in Recharge Etiquette (90%).

EVs may be some time away from being 'focal' club cars, but as daily drivers and cars owned by others in Members' families, they will increasingly become embedded in our lives. As recharging facilities become more widespread and voltages increase allowing faster charging, some of the frustrations currently associated with trips in EVs will reduce. However, it will remain important to recognise the potential traps inherent in the published WLTP range and plan accordingly.

