

# The Pedal Assist System on the Lectric XP, Version 1.1

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## Conclusion

If I was using PAS1, I might as well turn the bike off. I'm not skilled enough to stay upright at this speed. The best range is at PAS2 with 39 miles. PAS3 and 4 have about the same range, which is half of what I estimated for PAS2. PAS5 may satisfy your need for speed, but it will all be over in about ½ hour. You should have covered about one-third of the range of PAS2.

Your mileage *will* vary.

## What is PAS?



### Pedal Assist System

First of all, I'm aware of two types of PAS. Either the motor assists your pedaling, or you assist the motor.

When the motor assists your pedaling, a sensor measures how much you are pushing down on the pedal and adds a bit more. When you assist the motor, you set a speed for the motor, and your pedaling adds what it can. There is even a term for pedaling while not helping the motor at all – “ghost pedaling.”

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You might have guessed that the first type of PAS costs more than the second. Having a sensor costs more than not having one. No surprise there. It should also not be a surprise that one of the reasons that the Lectic XP arrived at its amazingly low price was by not having that sensor.

I use PAS2 when I do my cardio. By monitoring my heart rate, I pedal as much as necessary to reach my training level. When I use my XP as a replacement for my car, I mostly run PAS3 except on this one steep hill where I drop down to PAS2.

Today I realized that I had never paid much attention to the various PAS levels and how they related to speed, current drain, and range. After an hour of riding, I think I have a better understanding.

I selected a relatively flat trail. For each PAS level, I noted the speed and current. In all cases, I ghost pedaled.

## PAS1

I can barely stay upright at this level. My speed was about 6.7 MPH, and the current drain was 2 amperes. The pace does fall as the battery voltage drops, but if I ignore that fact, I can project out this data to give an estimate for the range.

A fully charged battery should hold 10.4 ampere-hours (Ah). If I draw 2 amperes, I should be able to run for  $\frac{10.4 \text{ ampere-hours}}{2 \text{ hours}} = 5.2 \text{ hours}$ . If I could sustain 6.7 MPH, I would have gone 5.2 hours X 6.7 MPH = **35 miles**.

## PAS2

I was traveling at about 11.3 MPH with a current of 3 amperes. Using the same math as for PAS1, I estimate a range of **39 miles**.

## PAS3

I'm going 16.3 MPH and drawing 8 amperes. This gives me an estimated range of **21 miles**.

## PAS4

Now I'm flying at 22.6 MPH and drawing 13 amperes. My estimated range is 18 miles.

## PAS5

I've never been at this level before and only went there for the sake of science. My speed was 24 MPH, and my current was maxed out at 20 amperes. This gave me an estimated range of 12 miles.

I welcome your comments and questions.

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