Velomobile Control & Telemetry System

Use Case Specification

Change Speed

Version 1.1

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Ver.** | **Description** | **Author** |
| January 15, 2009 | 1.0 | Initial Composition |  |
| February 3, 2010 | 1.1 | Post Review Revision | Shawn McGinnis |
| March 13, 2010 | 1.2 | Rainy Day Update QA | John Schmidt |

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# Change Speed

## Brief Description

When the rider changes their pedaling power the system will respond by increasing power assist.

## Requirements Trace

1.2.1, 1.2.2, 1.3.1

## Involved Actors

Rider – The rider must have physical access to the system.

Pedal Torque Sensor – Allows the ECU to know how much power the rider is providing.

# Flow of Events

## Basic Flow

This use case begins when the rider wants to change the speed of the Velomobile.

1. The rider will change the power to the pedals.
2. The pedal torque sensor will report a power change to the system.
3. The system will calculate the new assist level.
4. The system will check that the assist level is below set max power assist level.
5. The system will set the power assist to the new power level.
6. The system will display the new power level to the user.

# Preconditions

The ECU is in normal operating mode.

# Post Conditions

The power assist is at the riders new power assist level.

# Scenarios

## Happy Day

**Assumptions**: The power assist percentage is at 50%.

The rider increased their pedal torque to 150 watts.

The systems max power assist level is 350 watts.

**Steps:**

1. The rider increases their pedal torque to 150 watts.
2. The pedal torque sensor reads a value of 812.
3. The system will calculate the new assist level of 75 watts.
4. The system will see power is below set max power assist level of 350 watts.
5. The system will set the power assist to 75 watts.
6. The system will display “PAS: 75 watts”.

## Rainy Day

**Assumptions**: The power assist percentage is at 200%.

The rider increased their pedal torque to 200 watts.

The systems max power assist level is 350 watts.

**Steps:**

1. The rider increases their pedal torque to 200 watts.
2. The pedal torque sensor reads a value of 1020.
3. The system will calculate the new assist level of 400 watts.
4. The system will see power is above set max power assist level of 350 watts.
5. The system will set the power assist to 350 watts.
6. The system will display “Maximum Assist: 350 watts”.