**LSBW V4 Spreadsheet**

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| **Name** | **Photos** | **Functions** | **Solidworks**  **Model** | **Quantity** | **Need of**  **Manufacturing** | **Material** |
| **Steering shaft** |  | Transmit the force and the motion from the motor, via the rod tie, to the front wheels | [Steering shaft & shaft link x 2](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | [Purchase](https://shop.topkartusa.net/collections/steering-shafts-and-supports)  Custom: cut the purchased shaft and weld it with the **hexagonal shaft** | metal |
| **Hexagonal shaft** |  | Transmit the torque of the motor to the steering shaft, with a specific NEO1650 hexagonal end | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | Custom: the specific design could be modified | metal |
| **Deep groove bearing 6204 (5972K105)** |  | Support the steering shaft with appropriate rotation | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 2 | [Purchase](https://www.amazon.com/6204-2RS-Sealed-Bearing-20x47x14-Lubricated/dp/B07BN3X9BY?ref_=ast_slp_dp) | metal |
| **Magnet mount** |  | Mount the magnet at the end of the shaft | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | 3D printing  Assembled with a special resin glue | plastic |
| **AS5047P magnet** |  | Hall sensor magnet | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | Purchase with the hall sensor | metal |
| **NEO1650 – 100: 1** |  | NEO1650 BLDC with 100: 1 gearbox | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | [Purchase](https://www.revrobotics.com/rev-21-2100/) | metal |
| **BLDC mount** |  | Mount the BLDC to the frames | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | 3D printing | plastic |
| **Bearing mount** |  | Mount the bearing | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 2 | 3D printing | plastic |
| **t-slot frame 260mm** |  | Connect the LSBW with the chassis frame | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 2 | Purchase & custom | aluminum |
| **t-slot frame 60mm** |  | Support the LSBW frame vertically | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 6+ | Purchase & custom | aluminum |
| **t-slot frame 56mm** |  | Support the LSBW frame horizontally | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 6+ | Purchase & custom | aluminum |
| **Steering wheel frame** |  | Original chassis frame | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | - | metal |
| **3043T629** |  | U-bolts that connect the front chassis frame with LSBW frame | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 2+ | [Purchase](https://www.mcmaster.com/3043T629/) | metal |
| **8875T914** |  | Assemble with U-bolts for fastening the connection | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 4+ | And it’s [plate](https://www.mcmaster.com/8875T914/) | metal |
| **Sleeve front** |  | Limit the axial movement of the shaft | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | 3D printing | plastic |
| **Sleeve back** |  | Limit the axial movement of the shaft | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | 3D printing | plastic |
| **LSBW PCB** |  | LSBW ECU | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | custom | - |
| **AS5047P** |  | Hall sensor | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | purchase | - |
| **AS5047P mount** |  | Mount the hall sensor to the car | [link](https://github.com/mlab-upenn/gokart-mechatronics/tree/main/SBW%20-%20lower%20V7) | 1 | 3D printing | plastic |
| **Other components** |  | For fastening & assembling |  |  |  |  |

For earlier versions, please check the corresponding folders in the dev branch for further details.