

Drivetrain Calculation – Electric Kettcar Conversion

Drivetrain configuration: [input]			
	Z1	Z2	I
Stage1: Motor → Intermediate shaft (belt)	22	64	2,90909
Stage2: Intermediate-shaft → axle (chain)	14	57	4,07143
total reduction: 11,8442			

Motor specification:		
Max Torque motor:	16	Nm
Max RPM motor:	6000	1/min
Tire circumference	1,29	m

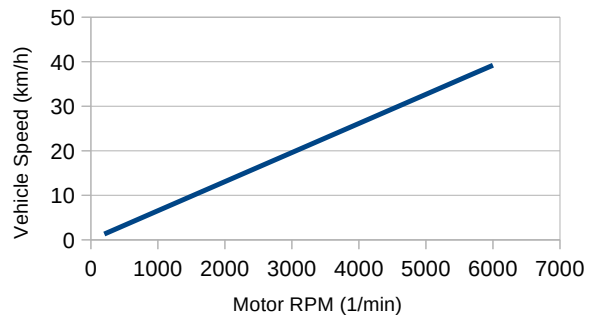
Notes Hardware
Chain size: 06B1; Belt size: 5M
06B1 available: z15, z18, z57
Motor → Intermediate shaft distance: min=118 max=145
Belt calculator: https://tools.maedler.de/maedler/
Z64 belt is the largest rim that still has guides

Calculated Speeds: [output]			
n motor	n shaft	n Axle	v km/h
200	69	17	1,3
500	172	42	3,3
1000	344	84	6,5
1400	481	118	9,1
3000	1031	253	19,6
4900	1684	414	32,0
5000	1719	422	32,7
5600	1925	473	36,6
6000	2063	507	39,2

slow

rated

no load



Notes Tests:
- 2025.02.25: Configuration: Belt: Z1=20, Z2=84 Belt=AT5-B25-545mm-Z109; Chain: Z1=18, Z2=57; 72V 50A Battery Result: Dives, top speed quite high, starting torque low, power could be slightly more (Note: issue with stuttering motor)
- 2025.04.04: Configuration: Belt: Z1=20, Z2=84 ; Chain: Z1=18, Z2=57; 72V 50A Battery; New controller Changes: Motor and Controller replaced, same ratio → better torque, reasonable topspeed ~28 km/h Result: Issue with belt wandering off z84 Pulley and squeaking a lot
- 2025.04.04: Configuration: Belt: Z1=22, Z2=64, Belt=AT5-B25-500mm-Z100 ; Chain: Z1=14, Z2=57 (final configuration) Changes: Larger pulley on motor (less bending/squeaking), smaller pulley with rim on shaft (prevent wandering), Ratio compensated with smaller sprocket Result: Still slight squeaking but stable performance, topspeed ~25 km/h