

Uve's Electric Vehicle Calculator

Vehicle Information

Instructions: Either use the selector for each field, or enter the correct values directly for each of the fields below. Gear ratios below should be ratio from wheel to engine, including both transmission and differential. For listed vehicles, only drag coefficient and curb weight are valid

Type of Vehicle: "aerodynamic small car (rear wheel drive)"

- drag Coefficient: 0.33
- frontal area (sq. ft.): 19.37
- Initial Curb weight: 2500
- drive efficiency: 0.9
- Gear Ratio (1st): 13.925
- Gear Ratio (2nd): 8.42
- Gear Ratio (3rd): 5.55
- Gear Ratio (4th): 4.03
- Gear Ratio (5th): 3.00
- Relative Wind Factor: 0

Note: Relative Wind Factor can be set to 1.6.

Tire size: 185 / 70 R 14

- revolutions/mile: 865.1125935567848

Misc Information

- rolling resistance: .00615

Note: The rolling resistance assumes that normal tires are not used. If this is the case, rolling resistance should be .015.

- brake and steering: .003

Weight removed: 600

You can enter the battery voltage or you can enter the number of batteries and click on "calculate voltage".

Total battery voltage: 144 or Number of batteries per string: 12

calculate voltage

number of battery strings: 1

Electric Components

Instructions: Either use the selector for each field, or enter the correct values directly for each of the fields below.

motor: ADC FB-4001A

If your motor is not listed above, the values below for a, b, c, d, k, and n can be determined from the [motor page](#) if you have a set of curves for the motor.

- Voltage
- Weight
- HorsePower
- Maximum RPM
- Motor a
- Motor b
- Motor c
- Motor d
- Motor k
- Motor n

battery: Concorde 12105

If your battery is not listed above, the values for Pukert's capacity and Pukert's exponent can be determined from the [battery page](#).

- Voltage
- Weight
- Pukerts exponent
- Pukerts Capacity
- Maximum Current
- Internal Resistance

controller: Curtis 1231C-7701

- min voltage
- max voltage
- max current
- Weight:
- Efficiency:

charger: Zivan

- min voltage

- max voltage
- max current
- weight

Environmental Conditions

Percent Incline: %

Wind:

vehicle Weight

Instructions: The only field below you can change is the Misc weight. The web page will calculate all other fields. Then click on the calculate button.

Number of Batteries

Battery weight

Charger weight

Controller weight

Motor weight

Misc weight

Weight added

Total vehicle Weight

Drag Calculations

Rolling force (lbs)

Incline Force

Tire Torque multiplier

Total Battery Resistance

speed	10	20	30	40	50	60	70	80	90
Still Air Drag (lbs)	<input type="text" value="1.634808"/>	<input type="text" value="6.539232"/>	<input type="text" value="14.71327"/>	<input type="text" value="26.15693"/>	<input type="text" value="40.87020"/>	<input type="text" value="58.85309"/>	<input type="text" value="80.10560"/>	<input type="text" value="104.6277"/>	<input type="text" value="132.4194"/>
Relative Wind Factor	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Relative Wind Drag (lbs)	0	0	0	0	0	0	0	0	0
Total Drag Force (lbs)	31.0886	35.9930	44.1671	55.6107	70.3240	88.3069	109.559	134.081	161.873
Drag torque (ft-lbs)	30.1984	34.9624	42.9023	54.0183	68.3103	85.7782	106.422	130.242	157.238
Required HP	0.921167	2.13297	3.92605	6.59106	10.4186	15.6993	22.7239	31.7830	43.1672

Charge Time

Instructions: Click on the calculate button.

depth of discharge	charge time
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

acceleration

Instructions: Select the gear, enter the starting speed, enter the finish speed, then Click on the calculate button.

gear: 1st

starting speed:

finish speed:

time:

top speed

Instructions: Click on the calculate button.

1st gear Limitation:

2nd gear Limitation:

3th gear Limitation:

4th gear Limitation:

5th gear Limitation:

Results 1st gear

Instructions: Click on the calculate button.

speed	10	20	30	40	50	60	70	80	90
Motor Torque(ft-lb)	2.409609	2.789740	3.423290	4.310262	5.450653	6.844465	8.491697	10.39235	12.54642
Motor Rpm	2007.782	4015.564	6023.346	8031.128	10038.91	12046.69	14054.47	16062.25	18070.03
motor amps	38.21870	42.00676	47.93593	55.61807	64.71230	74.95273	86.14103	98.13030	110.8105
motor volts	10.51922	23.72345	41.97176	67.09585	100.3417	142.4053	193.5145	253.5289	322.0388
Battery volts	143.8658	143.6670	143.3261	142.7451	141.8020	140.3495	138.2107	135.1649	130.9160
Battery amps	2.941563	7.301573	14.77641	27.51862	48.20172	80.05325	126.9574	193.7504	286.9279
Range (miles)	397.5265	271.9486	177.5488	113.6550	73.32372	48.35622	32.73931	22.72122	16.08269

Results 2nd gear

Instructions: Click on the calculate button.

speed	10	20	30	40	50	60	70	80	90
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Motor Torque(ft-lb)	3.985013	4.613673	5.661440	7.128313	9.014293	11.31938	14.04357	17.18687	20.74928
Motor Rpm	1214.041	2428.082	3642.124	4856.165	6070.206	7284.248	8498.289	9712.330	10926.37
motor amps	52.87286	58.11337	66.31595	76.94365	89.52487	103.6917	119.1699	135.7562	153.2985
motor volts	9.540340	21.38045	37.45279	59.10837	87.08212	121.5756	162.3895	209.0595	260.9742
Battery volts	143.8316	143.5846	143.1672	142.4676	141.3526	139.6675	137.2311	133.8199	129.1284
Battery amps	3.691633	9.108805	18.26143	33.60329	58.05573	95.01059	148.4392	223.2469	326.1294
Range (miles)	304.0677	209.4854	138.2924	89.78789	58.87366	39.50650	27.22444	19.22256	13.82708

Results 3rd gear

Instructions: Click on the calculate button.

speed	10	20	30	40	50	60	70	80	90
Motor Torque(ft-lb)	6.045731	6.999482	8.589067	10.81448	13.67573	17.17282	21.30574	26.07450	31.47908
Motor Rpm	800.2291	1600.458	2400.687	3200.916	4001.145	4801.374	5601.604	6401.833	7202.062
motor amps	69.18617	76.04358	86.77698	100.6837	117.1467	135.6846	155.9385	177.6423	200.5971
motor volts	8.640026	19.22705	33.31622	51.86287	75.22655	103.3021	135.6867	171.8267	211.1256
Battery volts	143.8004	143.5109	143.0297	142.2378	140.9999	139.1655	136.5629	132.9824	128.1350
Battery amps	4.375729	10.72424	21.27699	38.64355	65.78983	106.0193	163.0926	241.6124	347.9157
Range (miles)	248.7990	172.7768	115.4716	76.13727	50.79617	34.71243	24.36205	17.51045	12.81124

Results 4th gear

Instructions: Click on the calculate button.

speed	10	20	30	40	50	60	70	80	90
Motor Torque(ft-lb)	8.326008	9.639486	11.82861	14.89339	18.83383	23.64992	29.34166	35.90905	43.35209
Motor Rpm	581.0672	1162.134	1743.201	2324.269	2905.336	3486.403	4067.471	4648.538	5229.605
motor amps	85.05286	93.48291	106.6778	123.7738	144.0123	166.8017	191.7004	218.3816	246.6007

motor volts	7.892104	17.44675	29.92861	46.01485	65.83641	89.14155	115.4735	144.3075	175.1365
Battery volts	143.7755	143.4542	142.9277	142.0755	140.7665	138.8602	136.1985	132.5914	127.7757
Battery amps	4.914415	11.96767	23.51365	42.19715	70.89924	112.7143	171.0840	250.1883	355.7944
Range (miles)	216.9455	151.7982	102.6245	68.63001	46.50517	32.29267	23.02495	16.80440	12.47715

calculate

Results 5th gear

Instructions: Click on the calculate button.

speed	10	20	30	40	50	60	70	80	90
Motor Torque(ft-lb)	11.18460	12.94904	15.88977	20.00680	25.30011	31.76972	39.41563	48.23782	58.23631
Motor Rpm	432.5562	865.1125	1297.665	1730.225	2162.781	2595.337	3027.894	3460.450	3893.005
motor amps	102.8935	113.0915	129.0545	149.7365	174.2204	201.7900	231.9115	264.1893	298.3275
motor volts	7.163714	15.72545	26.69387	40.52485	57.19735	76.39505	97.67781	120.5962	144.7505
Battery volts	143.7535	143.4047	142.8423	141.9480	140.5975	138.6635	136.0052	132.4541	127.7781
Battery amps	5.397383	13.05415	25.38655	44.99834	74.60580	117.0250	175.3225	253.1977	355.7413
Range (miles)	194.2281	137.0044	93.75111	63.61747	43.79115	30.89373	22.36951	16.56897	12.47935

calculate

The calculations above were derived from information contained in the book 'Build your own electric vehicle' by Bob Brant. I would highly recommend that you read this book if you wish to understand how this ev calculator works. If you would like to see the equations used above, [click here](#).

Disclaimer: The results above are approximations, your actual results may vary. Information in this web page are as accurate as I can make them, but I do not guarantee anything.

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If you would like to see any other calculations made or have found any errors in the calculations, let me know. [Email](#)

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