

Lead-acid battery voltage as a function of temperature and state of charge

% of Charge	Electrolyte temperature, deg F																
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
0%	11.68	11.71	11.73	11.76	11.78	11.80	11.83	11.85	11.88	11.90	11.92	11.95	11.97	12.00	12.02	12.04	12.07
10%	11.76	11.78	11.81	11.83	11.86	11.88	11.90	11.93	11.95	11.98	12.00	12.02	12.05	12.07	12.10	12.12	12.14
20%	11.84	11.86	11.88	11.91	11.93	11.96	11.98	12.00	12.03	12.05	12.08	12.10	12.12	12.15	12.17	12.20	12.22
30%	11.91	11.94	11.96	11.98	12.01	12.03	12.06	12.08	12.10	12.13	12.15	12.18	12.20	12.22	12.25	12.27	12.30
40%	11.99	12.01	12.04	12.06	12.09	12.11	12.13	12.16	12.18	12.21	12.23	12.25	12.28	12.30	12.33	12.35	12.37
50%	12.07	12.09	12.11	12.14	12.16	12.19	12.21	12.23	12.26	12.28	12.31	12.33	12.35	12.38	12.40	12.43	12.45
60%	12.14	12.17	12.19	12.21	12.24	12.26	12.29	12.31	12.33	12.36	12.38	12.41	12.43	12.45	12.48	12.50	12.53
70%	12.22	12.24	12.27	12.29	12.32	12.34	12.36	12.39	12.41	12.44	12.46	12.48	12.51	12.53	12.56	12.58	12.60
80%	12.30	12.32	12.34	12.37	12.39	12.42	12.44	12.46	12.49	12.51	12.54	12.56	12.58	12.61	12.63	12.66	12.68
90%	12.37	12.40	12.42	12.44	12.47	12.49	12.52	12.54	12.56	12.59	12.61	12.64	12.66	12.68	12.71	12.73	12.76
100%	12.45	12.47	12.50	12.52	12.54	12.57	12.59	12.62	12.64	12.66	12.69	12.71	12.74	12.76	12.78	12.81	12.83

Formulas:

$$V = (\%chg + 15.5151)/1.3065 + temp_correction$$

$$temp_correction = (T - 80) \cdot 0.0024$$

where %chg is between 0 and 1 and T is electrolyte temperature in degrees F.