

To determine the time to discharge your DieHard AGM battery (68 Ah capacity) at a constant current draw of 0.2 A, we need to account for the Peukert effect, which adjusts the effective battery capacity based on the discharge rate. For low currents like 0.2 A (much lower than the battery's 20-hour rating current of 3.4 A or the reserve capacity current of 25 A), the effective capacity increases, leading to a longer discharge time than a simple Ah / A calculation. Step-by-Step Calculation:

1. Identify known ratings:

- 20-hour Ah rating: 68 Ah, meaning it can deliver $68 / 20 = 3.4$ A for 20 hours until the voltage drops to 10.5 V.
- Reserve capacity: 120 minutes (2 hours) at 25 A to 10.5 V, equivalent to 50 Ah delivered.

2. Calculate the Peukert exponent (k):

- This empirical value describes how capacity changes with current. Using the two known discharge points:
 - Point 1: $I_1 = 3.4$ A, $t_1 = 20$ hours
 - Point 2: $I_2 = 25$ A, $t_2 = 2$ hours
- Formula: $k = \log(t_1 / t_2) / \log(I_2 / I_1) \approx 1.154$

3. Calculate discharge time (t) at 0.2 A:

- Using the 20-hour rating as reference:
 - Formula: $t = 20 \times (3.4 / 0.2)^k$
 - $3.4 / 0.2 = 17$
 - $17^{1.154} \approx 26.31$
 - $t \approx 20 \times 26.31 = 526$ hours

This assumes discharge to 10.5 V (the standard cutoff for lead-acid batteries like AGM). For comparison, the simplistic calculation without Peukert ($68 \text{ Ah} / 0.2 \text{ A}$) gives 340 hours, but it underestimates the time at low currents. Result in Practical Units:

- Approximately 526 hours, or 21 days and 22 hours.