



## Quick Tips!



VRLA is an acronym for **Valve Regulated Lead Acid**.  
Hawker® batteries are VRLA. An independent valve is located on top of each of the 6 cells. Each of those cells contain positive and negative plates that are made from **99.99% pure lead**.

Learn more here: [hawkerbattery.com/resources/#faqs](http://hawkerbattery.com/resources/#faqs)



## Answer to question from last issue:

Is there a calculation I can use to determine the “approximate recharge time” for pure-lead AGM batteries, like the Hawker® and Odyssey® brands? **Answer: YES!**

Approximate recharge time = bulk charge time x absorption charge time factor

**Specifically**, the approximate recharge time is:  $\frac{(((100\% - \%SoC) \times 0.01 \times XX \text{ Ah} \times 0.8 \times 1.05))}{\text{charge current}} \times 1.5 = \text{hours of charge}$

### Variables:

- 100% - %SoC = percent battery is discharged (e.g., 10%, 50%, 75%, etc.)  
(Note: SoC is State of Charge)
- XX Ah = battery’s rated amp hours at the C20 rate (e.g., 68, 100, 120, etc.)
- Charge current = amperage output of the charger

### Constants:

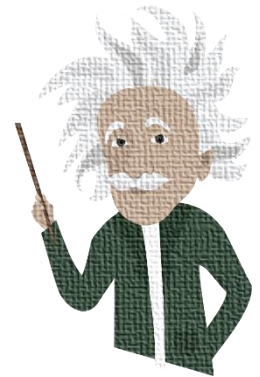
- 0.01 = converts the 100-%SoC to a decimal number
- 0.8 = bulk charge factor
- 1.05 = overcharge factor
- 1.5 = absorption charge time factor

### Assuming:

- Charger Output Voltage = 14.4 to 14.7VDC (for one 12V battery) (Ideal charge voltage = 14.4 VDC)  
<or>  
= 28.5 to 30.0VDC (for 12V batteries in 24V series or series-parallel) (Ideal charge voltage = 28.8 VDC)
- Battery Temp: = 68°F to 86°F (Ideal battery temperature = 77°F)

**Example 1:** For a 10% SoC Hawker ARMASAFE Plus 6TAGM battery and a 40A charge current:  
 $\frac{(((100-10) \times 0.01 \times 120\text{Ah} \times 0.8 \times 1.05))}{40} \times 1.5 = 3.4 \text{ hours minimum}$

**Example 2:** For a 25% SoC Hawker ARMASAFE Plus 6TAGM battery and a 10A charge current:  
 $\frac{(((100-25) \times 0.01 \times 120\text{Ah} \times 0.8 \times 1.05))}{10} \times 1.5 = 11.3 \text{ hours minimum}$



## Did you know:



**Cold Cranking Amps (CCA)** is a standard battery industry rating referring to the amount of cranking power that a fully-charged battery has for engine start when temperatures are very cold. Specifically, it’s the amount of amps that a nominal 12-volt battery can deliver at 0°F (-18°C) for 30 seconds while still maintaining at least 7.2 volts (that’s 1.2 volts per cell). For example, the Hawker® ARMASAFE™ Plus battery has a CCA rating of **1225 amps**.

**Training:** With winter just around the corner, is your motor-pool ready for battery problems? The simple solution to getting peak performance out of your battery is to get your people trained. How, you might ask? Call your Hawker® FSR for free onsite Battery Maintenance & Recovery Training at your location!



Next Issue:  
How do cold, very cold, and extremely cold temperatures affect my battery?

**Questions?** Visit our website at [www.hawkerbattery.com](http://www.hawkerbattery.com)  
Call us at **877.485.1472**



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