eAPU® BATTERY INFORMATION

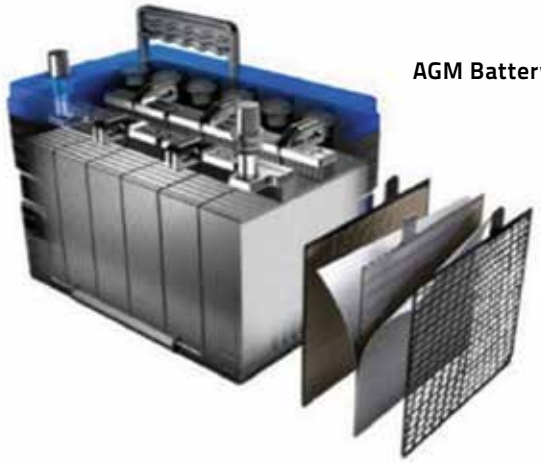
TYPES OF BATTERIES

AGM: Absorbed Glass Mat

- Electrolyte is absorbed in fiberglass-like mats between plates
- VRLA: valve regulated lead acid which requires no maintenance

FLA: Flooded Lead Acid

- Electrolyte is flowing loosely around the battery compartment
- Water caps or vents for maintenance refilling



AGM Battery

WHY DOES IDLE FREE SYSTEMS RECOMMEND USING AGM BATTERIES?

1. AGM Batteries charge faster which ensures longer APU runtimes

- Greater bulk charging rate for longer runtime from a fully charged battery pack
- When the alternator can deliver maximum power, charging time is reduced

Specification	AGM Battery	FLA Battery
Max Amps per Battery	35-40	20-25
Charge Time (hrs)	6	8+

2. AGM batteries are vibration resistant for a longer life

- The glass mat construction of AGM batteries resists plate breakdown which leads to greater long-term capacity
- FLA batteries degrade with long term exposure to vibration

3. AGM batteries require less maintenance

AGM Battery	FLA Battery
Check State of Charge	Check State of Charge
Clean Terminals	Clean Terminals
	Add Distilled Water
	Check water specific gravity
	Equalization Charge

STATE OF CHARGE: CHECK VOLTAGE TO ENSURE BATTERY HEALTH

- The state of charge is critical to battery life
- Preventive Maintenance schedule should include voltage checks
- **Note:** AGM batteries have higher voltage than FLA batteries at each state of charge
- Undercharged batteries are the leading cause of short runtime
- As shown in the table below, it is important to understand the voltage level that indicates the state of charge of AGM and FLA batteries

	AGM	FLA
Percentage Charge	**12 Volt**	**12 Volt**
100	12.84	12.73
75	12.54	12.43
50	12.24	12.10
25	11.94	11.73
0	11.64	11.50

Refer to Service Requirements document on the Dealer Portal for comprehensive maintenance guidelines.

Toll Free: 800-328-6108
Email: sales@phillipsandtemro.com
www.phillipsandtemro.com

APU BATTERY INFORMATION

UNDERCHARGING IS THE MAIN CAUSE OF SHORT RUNTIME. UNDERCHARGING IS CAUSED BY:

1. Poor electrical connections

- The voltage difference between the truck alternator and the APU should be < 0.5V with the truck running
- Check the following for loose or corroded contacts:
  - IFS connections
  - Battery terminals
  - Battery separator
  - Fuse connections
  - Truck battery connections
  - Damaged battery cables

2. Battery Separator Issues

- Perform battery separator maintenance
  - Clean contacts and confirm solid connection
  - Confirm wire integrity
  - Solid ground wire is necessary for the separator to close

3. Truck Battery Status

- Truck batteries must reach 13.2 VDC for the battery separator to close
- When a truck battery fails the APU batteries may not charge

4. Undersized Alternator

- Recommended Alternator Requirements:
  - 25 additional AMPs of alternator capacity per each AGM battery in your APU. (In most cases, a 270 AMP truck alternator will suffice)
  - The alternator has remote voltage reading capability (See Figures 1 & 2)
    - Enables higher charging voltage
    - APU batteries charge completely
    - APU batteries charge faster
    - Longer runtime
    - Longer battery life

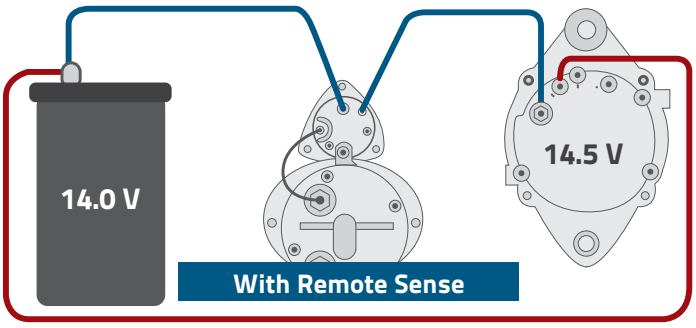


Figure 1

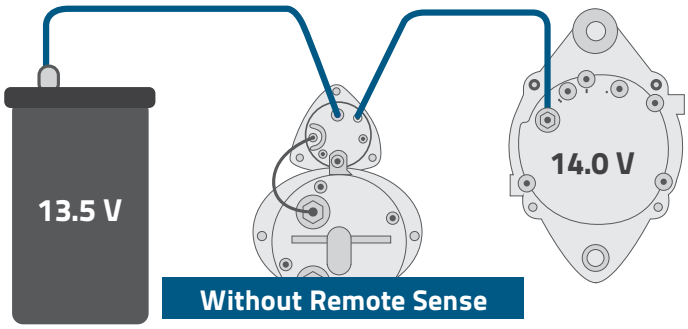


Figure 2

EXPECTED LIFE OF BATTERIES

AGM batteries, like all batteries, degrade over time. Expected life of an AGM battery is dependent on use or cycles. The AGM31 batteries that are specified with the Idle Free APU do perform for more cycles than other types of AGM batteries. Average life of these batteries is 2 years, but will vary depending on use.

9700 West 74th Street, Eden Prairie, MN 55344
Phone: 952-941-9700 ▪ **Toll-Free:** 800-328-6108 ▪ **Fax:** 952-941-2285
sales@phillipsandtemro.com ▪ customerservice@phillipsandtemro.com

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