Off-Season Battery Maintenance: Maximizing Power, Performance, and Longevity with XS Power Batteries

By EPARTRADE | Featuring Jed Emert, Performance Sales Manager, XS Power Batteries
Hosted by Brad Gillie, SiriusXM, Ch. 90, Late Shift

As racing teams wrap up their competitive seasons, one of the most overlooked—but technically critical—tasks in motorsport preparation is battery maintenance. In a recent *Race Industry Now* technical webinar, **Jed Emert** of **XS Power Batteries** joined **Brad Gillie** of *SiriusXM Late Shift* to dive deep into the chemistry, storage methods, and charging best practices that determine whether a racing battery performs flawlessly—or fails—when the next green flag drops.

Understanding Battery Chemistry: AGM vs. Lithium

Emert began by comparing the two dominant technologies in modern racing: **AGM (Absorbent Glass Mat)** and **lithium-ion** batteries.

"Lithium offers better longevity, no doubt," Emert explained. "But that comes with a cost. In terms of pure power output, the difference isn't as massive as people think—it's the energy density and lifecycle efficiency where lithium really shines."

While AGM designs remain widely used across circle-track, drag, and off-road applications, lithium cells deliver **faster recharge cycles**, **lower internal resistance**, and **superior weight-to-power ratios**. Yet, Emert emphasized that proper care—not chemistry—ultimately defines reliability.

Storage Voltage and Temperature: The Science of Dormancy

During off-season storage, voltage and temperature become crucial variables.

"The key is keeping your battery between 12.6 and 12.8 volts for AGM, and roughly 13.2 for lithium," Emert said. "You don't want it sitting discharged—it leads to sulfation in AGM cells and long-term degradation in lithium packs."

Both chemistries should be stored in **cool, dry environments** between **50°F and 70°F**, with minimal humidity exposure. Extended storage above 90°F accelerates electrolyte breakdown, while freezing conditions can permanently damage lithium packs due to anode plating.

Emert advised racers to periodically **check open-circuit voltage every 30–45 days** and recharge whenever voltage dips by 0.2 V below nominal. “Think of it like tire pressure,” he noted. “If you don’t check it regularly, you’re setting yourself up for a surprise.”

The Role of Battery Maintainers

Many teams rely on plug-in maintainers during the off-season, but Emert cautioned against using generic trickle chargers.

“A lot of the problems we see come from over-charging,” he warned. “Our smart maintainers cycle the voltage—bring it up, hold, and let it fall back. That mimics real-world use and prevents over-saturation.”

For AGM batteries, XS Power recommends a **multi-stage automatic maintainer** that adjusts amperage based on internal resistance. For lithium, use **chargers with dedicated lithium profiles** that balance cells and include over-voltage protection.

Brad Gillie added a practical perspective from his own experience maintaining motorcycles: “When I plug in my maintainer after every ride, even if it’s just sitting a month, the bike always fires up like it ran yesterday. That’s the confidence racers need, too.”

Testing, Safety, and Race-Readiness

Before re-installation, Emert stressed the importance of **load testing**:

“It’s not just about voltage. You can have 12.8 volts and still have a weak cell. A simple load test will tell you if the battery can handle race-day amperage.”

He also emphasized **terminal inspection**—cleaning oxidation, checking cable torque, and applying dielectric grease. “Every 10 millivolts of resistance can cost you cranking power,” he said. “In racing, that’s the difference between firing and failing.”

Safety was another highlight: avoid welding near batteries, never jump-start lithium packs with high-amp boosters, and always transport spares in approved cases with terminal protection. “It’s not just performance,” Emert reminded the audience. “It’s safety and consistency.”

Looking Ahead: Smarter Energy for a Smarter Sport

As teams increasingly embrace **data acquisition** and **hybridization**, battery technology has become part of a broader performance ecosystem.

“Energy storage is no longer passive,” Emert concluded. “It’s an active component in performance strategy. Managing it correctly means winning races—and saving money in the long run.”

From ensuring the right storage voltage to selecting the right maintainer, the message was clear: **off-season preparation determines in-season reliability**. For racers who treat battery maintenance as seriously as suspension tuning or data analysis, reliability isn’t luck—it’s engineering discipline.

For more information, **watch the full webinar here.**