

XOS Technical Service Bulletin

Bulletin No.: TSB-001-22

Date: 8/9/2022

SUBJECT: Short & Long-Term Storage Guidelines

Applicability: All 2021-2022 Xos SV05 Trucks

Service Category: Battery

Section: HV Battery Systems

Market: USA and Canada

Introduction:

Xos's fully-electric last-mile delivery vehicles are built to withstand daily use by customers and fleets. Occasionally, these unique vehicles are left idle for extended periods of time. During these idle periods it is necessary to manage and maintain the vehicle's battery-electric systems to ensure they are ready for use when put back into service. This bulletin provides guidelines for short and long-term storage. Adherence to these guidelines will prevent unnecessary downtime.

NOTE: Component replacement resulting from a failure to follow these guidelines will not be covered by Xos's New Vehicle Limited Warranty.

NOTE: Aftermarket modifications that are NOT electrically connected downstream of the low voltage master switch will affect battery performance.

Overview:

- Short-term storage when vehicles will be idle for 14 days, or less
- Long-term storage when vehicles will be idle for greater than 14 days
- Xos's onboard Battery Management System (BMS) operation will be explained

Short-Term Storage Guideline (14 Days or less)

- High Voltage (HV) battery State Of Charge (SOC) must be 65% or greater prior to storing the vehicle
- Low Voltage (LV) master switch may be left ON to allow the onboard BMS logic to monitor and maintain 12V and 24V SOC

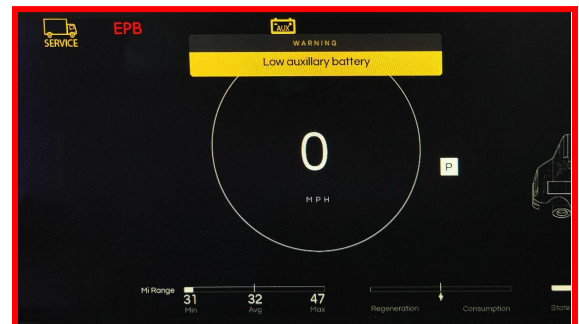
Long-Term Storage Guideline (More than 14 Days)

- HV battery SOC must be 30% or greater prior to storing the vehicle

- Low voltage master switch must be OFF to eliminate all battery drain for the duration of the storage
- 30 days maximum storage before routine checks and operation is required
 - Check tire pressures
 - Drive the truck as needed to eliminate tire flat-spotting
 - Inspect for overall operation, damage, fluid leaks and proper fluid levels

Onboard Battery Management System (BMS) Operation:

- System layout
 - Low voltage battery box is under the hood, passenger side
 - Low voltage master switch (Image 1) - Disconnects all systems from battery power
 - Low voltage shutoff solenoids - 12V and 24V automatic disconnect solenoids (Image 2) to preserve battery life
 - 12V shutoff voltage = 11V
 - 24V shutoff voltage = 23V
 - Instrument cluster will display “Low auxiliary battery voltage” (Image 3) in YELLOW
 - $12V < 12.3V$
 - $24V < 24.7V$
 - The RED “STOP” (Image 4) fault indicator will be illuminated at the following
 - $12V < 9V$
 - $24V < 18V$

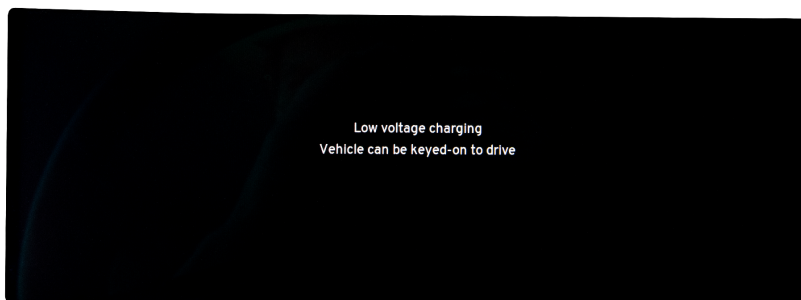


Onboard BMS Logic:

- Every two hours the vehicle performs a self-check of the 12V and 24V battery State of Charge (SOC)
- If the 12V and 24V batteries are below threshold the vehicle will enable high voltage systems to allow for DC-DC conversion of power from HV to LV (12V and 24V) to charge batteries.

NOTE: While the vehicle is performing a self-check of the 12V and 24 V battery State of Charge, the vehicle may appear as though it is in “Ready ON” status, but it cannot be driven without the key

- Instrument cluster will display “Low voltage charging. Vehicle can be keyed-on to drive” (Image 5)



- Headlight switch will be backlit
- Radio will be ON, and sound may be heard outside the vehicle
- HV battery SOC must be above 6% as indicated on the instrument cluster for the onboard BMS to operate. Once the HV battery SOC is 6%, or less, all batteries will begin to drain below operational voltages.
 - HV battery SOC will diminish as the vehicle wakes up to provide charging for the 12V and 24V batteries. It is crucial that Xosphere is utilized to monitor HV battery SOC
 - For authorized customers and fleets, the Xos Customer Experience Team will send alerts to the designated point of contact regarding low HV battery SOC
 - 12V and 24V batteries will need to be recharged or replaced when this occurs

NOTE: Replacement of 12V and 24V batteries resulting from failure to follow these guidelines is not covered by the Xos New Vehicle Limited Warranty and will not be reimbursed.