

Parasitic Draw Best Practices

Parasitic draw is a continuous current load on a battery, or battery pack, after the vehicle ignition has been turned off. This causes a drain on the battery and lowers the state of charge. Depending on the amount of the load (current) and the duration of the load, a battery can be drained to very low levels, which will impact the vehicle's ability to start.

When the vehicle is built, OEM equipped device loads are considered when designing the vehicle. OEM's may also incorporate Low Voltage Disconnects (LVD)/Load Shed with the idea of maintaining an acceptable state of charge to start the vehicle. This parameter is typically triggered at a set point such as 12.3V, or 12.1V. If the LVD is set incorrectly, batteries can be drained much deeper. However, not all parasitic loads are going to be disconnected in a LVD event, such as, but not limited to the following devices:

- Telematics
- CPAP circuits
- Utility lamps
- 12V power receptacles
- Cellular USB chargers

Additionally, aftermarket components like refrigerators, security camera systems, etc. can increase the parasitic load on a unit. Also, wiring shorts can cause excessive draw on the battery.

Fortunately, TMC understands the importance of limiting parasitic draw and has developed a Recommended Practice (RP140A) to help in evaluating it. If you are experiencing jump starts after vehicles have been sitting off, it is recommended you follow RP140A and determine if there are excessive loads that need to be addressed. The test can be conducted with a digital multimeter or a DC amp clamp. With the ignition off (wait 10 minutes after closing the door before measuring draw.), set the multimeter to DC Amps. Then measure the draw from the main ground cable going to the battery pack. Remove sources of suspected draw one at a time and check for the drop in parasitic draw.

*Please refer to TMC RP140A for full context testing and formulas for determining these effects on SOC.

As an example: Typical Weekend Parasitic Situation (Per TMC-RP 140A)

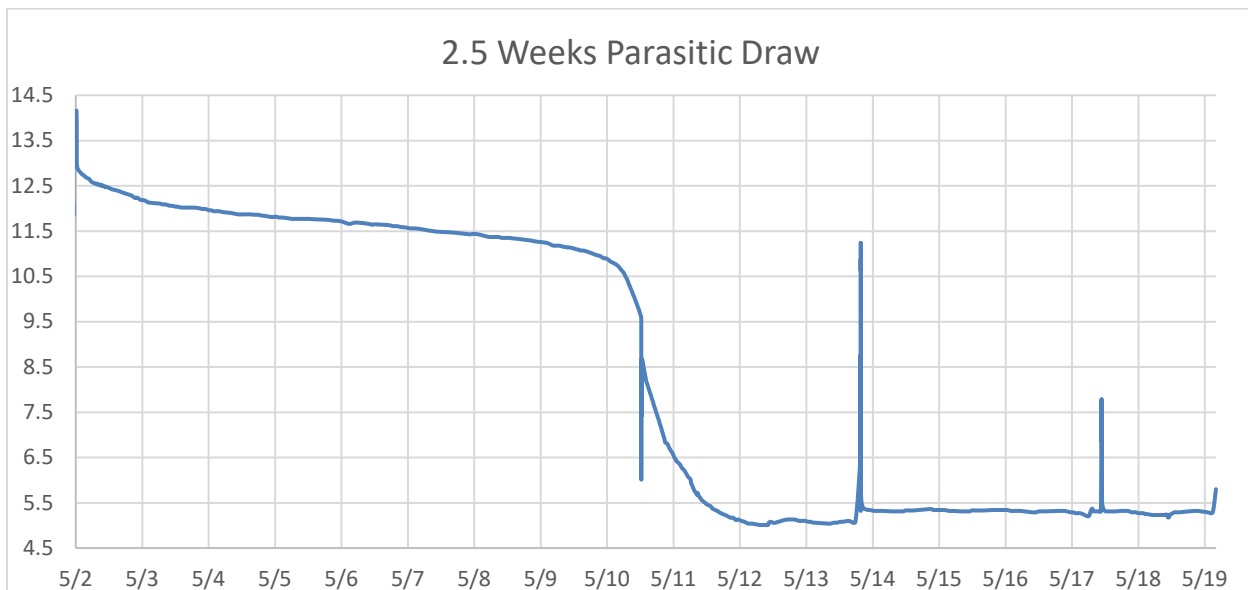
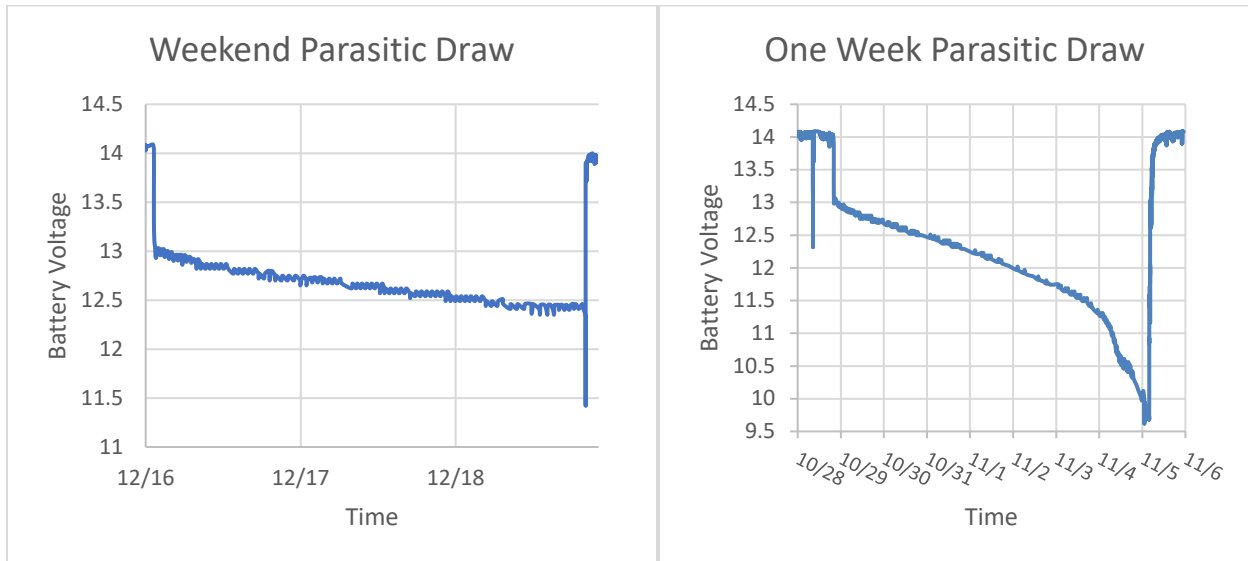
A 5-AMP total parasitic load comprising:

- 2-AMP satellite
- 3-AMP small cooler

A 5-amp parasitic load, multiplied by 60 hours, equates to a 300 AH discharge. A typical three battery system has 300AH. So, after 60 hours of discharge, the battery system will be completely discharged and at a 0% percent state of charge resulting in a no start.

Following are examples of various, real world, parasitic draw scenarios.

1. Weekend Draw – After 2 days, there was no impact.
2. One week Draw – After 7 days, battery voltage dropped < 10.5V (100% discharged under load). If this happens consistently performance and life will be impacted.
3. Two and ½ Week Draw – Voltages got dangerously low (single digits) and may not be able to be recharged. If this happens routinely, battery performance and life will be impacted in a short amount of time.



Once you understand vehicle parasitic draws, every attempt should be made to limit both the draw and the duration of the draw to help ensure batteries are kept in a healthy state of charge and provide expected performance and life.