



Service Bulletin

File in Section: 06 - Engine

Bulletin No.: 15-06-03-001D

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INFORMATION

Subject: Cold Weather and Long Stand Time Battery Maintenance and Testing Tips

Models: 2018 and Prior GM Passenger Cars and Trucks

Attention: This Bulletin also applies to any of the above models that may be Export from North America vehicles.

This Bulletin has been revised to update text under Absorbent Glass Mat (AGM) Battery. Please discard Corporate Bulletin Number 15-06-03-001C.

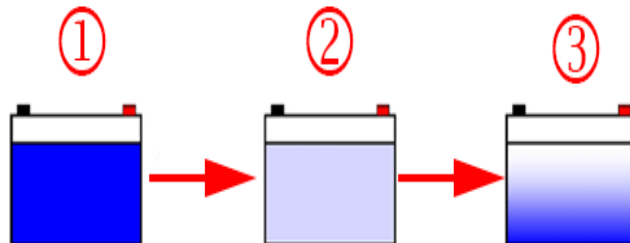
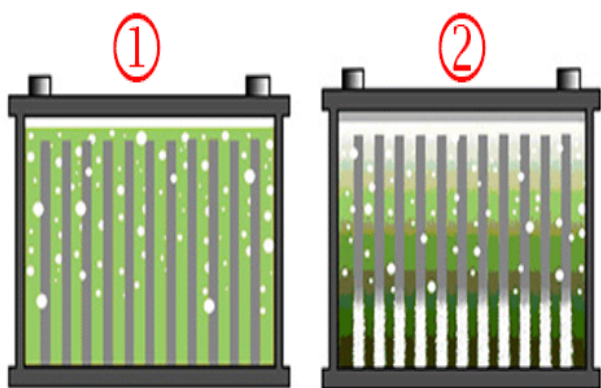
The following diagnosis might be helpful if the vehicle exhibits symptom(s), that include but not limited to, a slow or no crank condition that may be caused by a discharged battery.

Below is information that may be useful on diagnosing batteries that have set for a long period of time and/or set in cold weather climates and testing those batteries.

Effects of Long Stand Time

Inside the battery, the electrolyte is generally composed of 35% Sulfuric Acid and 65% water. When a lead acid battery is inactive (not actively discharged and charged), the acid, being heavier than water, will settle toward the bottom. This leaves a low acid concentration near the top, and higher concentration at the bottom, this condition is referred to as acid stratification (Figure 1). Since it is the concentration of the sulfuric acid that lowers the electrolyte freeze point, the upper levels of the acid (with low acid concentration) in this state can begin freezing at or near 0°C (32°F).

Note: Stratification does not affect AGM type batteries.



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- (1) = Normal Battery
- (2) = Stratified Battery

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- (1) = Acid density is high.
- (2) = Acid density is low.
- (3) = Acid density is not distributed evenly.

In a low state of charge (SOC), lead sulfate will form on the battery plates. This creates what is known as the "Sulfated Battery" condition. The lead sulfate insulates the plate's reactive material, which reduces capacity and decreases the battery's ability to accept a charge. Sulfation begins to occur below 80% state of charge in as little as two weeks. The longer the battery is left in a low state of charge, the more lead sulfate forms. Batteries that have been deeply discharged for periods longer than 60 days may be permanently damaged.

Note: Long stand time causes sulfation, which may result in customer no start events due to reduced battery capacity. Thus, it is imperative to maintain (charge) the battery every 30 days to ensure the battery state of charge (SOC) remains greater than 80%.

Notice: Batteries that are deeply discharged will take an extended time to recharge. Batteries that are cold (below freezing) can falsely fail testing. Batteries that are cold and deeply discharged must first be warmed prior to testing & charging.

Cold Battery Testing – Battery Temperature at Less Than 0°C (32°F)

When an automotive 12 Volt battery is cold, (below freezing) its capacity starts to reduce. This can be observed in the voltage level of the battery, as well as measured cold cranking amps. A cold battery is also resistant to charging. The colder the battery, the more these characteristics are affected.

Depending how cold a battery is, it can fail testing using any type of battery test equipment, including the EL-50313 (GR8).

Important: It is impossible to calculate the core temperature of a battery, so using external surface temperature is not reliable. Warm the battery a minimum of 12 hours prior to testing. Longer warming times will be needed depending how cold the battery is.

Note: Cold batteries are resistant to charging even when in use on the vehicle. They will not recover quickly in subfreezing temperatures. Releasing a new vehicle with a battery in a low state of charge puts the customer at risk to a no crank event.

Battery Charging and Testing Tips

The majority of these tips apply to new vehicles in inventory or relatively new batteries (less than 12 months old).

Batteries tend to recharge in the same manner as they were discharged and temperature affects charge time:

- Cold Battery = Slow Recharge
- Slow Discharge = Slow Recharge
- Fast Discharge = Fast Recharge

Note: If you suspect that a battery may be frozen, inspect the case for cracks prior to charging. Do not charge a frozen battery.

Always warm a cold battery temperature to above 4°C (40°F) prior to testing.

The EL-50313 (GR8) has a built in algorithm to limit the length of time needed to recharge a battery. Because cold batteries are resistant to charge, or it is deeply discharged, it may calculate longer than reasonable time to recover the battery and fail it. If you are working with a newer battery that is most likely simply discharged, select Manual Charge, Limit Current, 10 Amps, for 120 Minutes. Once that is complete, perform another Diagnostic Charge.

Note: AGM batteries are sensitive to overcharging. Maximum charging voltage should be limited to 14.5V.

Caution: Do not continue charging when battery temperatures are above 49°C (120°F).

If a newer battery fails testing, allow it to rest overnight and retest. It will often "soak" in the charge and test good after a 12–24 hour rest.

Note: If the tool responds with "Unsafe to Charge" or "Shorted Cell" message do not proceed.

Correct battery cold cranking amperage (CCA) ratings and type are critical for proper test results when using the EL-50313. Access to the battery specification label which contains the CCA rating and type may be difficult without component removal. Refer to the latest version of PI1098 Battery Test Cold Cranking Amperage (CCA) for Original Equipment Batteries and Testing Tips in SI.

Absorbent Glass Mat (AGM) Battery

Many GM vehicles are now equipped with a 12 Volt Absorbent Glass Mat (AGM) battery.

This battery is similar to current vehicle lead acid flood batteries, except it uses glass mats that absorb electrolytes that are pressed between the plates instead of immersing the plates in electrolytes. This allows for a smaller, lighter battery with the same amount of power that is less susceptible to heat. The maximum permissible voltage allowed for the absorbent glass mat battery is 14.5 Volts at room temperature.

The AGM battery requires different charging voltages than conventional lead acid batteries. The essential tool EL-50313 Midtronics® GR8 Battery Charger/Tester has this algorithm built in. The EL-50313 Midtronics® GR8 Battery Charger/Tester is the preferred charger for use during a PDI, calibration updates or any other repairs that requires the use of a battery charger. You MUST select AGM when prompted or damage to the battery will result. Make sure to select the proper battery type: AGM and CCA during charger set up. Incorrectly selecting "flooded" battery may cause unnecessary battery replacements.

Refer to the latest version of 15-06-03-002 in SI for battery type and CCA rating if the battery label is unavailable.

Storage Tip

Transport Mode – This is designed to help vehicles that are not being used (In Transport or Storage) use less battery energy. Vehicles with this feature are generally shipped from assembly with this mode on. While in inventory we recommend that this feature be on. Refer to the latest version of Bulletin 11-08-49-001 for instructions on how to turn the mode on/off.

If you need additional information regarding warranty coverage, please review GM Service P&P Manual, Article 2.8.1 - Battery Charge and Test” and “GM

Transportation, Vehicle Storage and PDI Policy Manual, Article 2.1.2(b) - Battery Care.” This is also outlined in the latest version of Bulletin 03-06-03-004.

