

# On the Line

## Improving Your Battery Knowledge

### A Discharged Battery May Cause More Problems Than a No-Start Condition

When performing vehicle inspections are you checking the battery or just waiting until the customer complains of a no-start condition? In addition to a slow crank, a low battery voltage condition can create some major challenges with the vehicle's electronics and accessories.

#### WHY BATTERIES FAIL

Eighty percent of all battery failures are due to sulfation. Sulfation occurs when a battery drops below its full state of charge for extended periods of time. When this occurs, lead sulfate crystals form on the negative plates, reducing the battery's active material, which affects its capacity. Further, the sulfation affects the ability of the battery to accept a full charge.

Conditions that promote sulfation include:

- 1) Any condition that would promote an undercharge of the battery, such as charging system problems, excessive electrical demand, etc.
- 2) Batteries subjected to long periods of lay-up time between charges.
- 3) Heat in excess of 100°F will promote an increased discharge rate. This is especially a problem with tight battery mounting quarters and high underhood temperatures.
- 4) Low electrolyte level due to gassing or spillage.
- 5) Cold weather promotes increased starter amperage draw due to a thicker oil viscosity.
- 6) Parasitic current drain on the battery.
- 7) Attempting to use a battery designed for starting, lighting and ignition (SLI) as a deep-cycle battery. The plates in the SLI battery cannot take the excessive heat created from the discharging/charging cycles.

Previously, most starting systems would give some warning of a low voltage condition such as reduced cranking speed of the engine. With today's starting, ignition and fuel systems, little or no warning may be given of a pending problem. The engine starts fine and then suddenly a no-start condition occurs. High heat is the #1 battery killer. When you consider the cramped quarters beneath the hood, high underhood temperatures and a 90°F+ day, premature battery failure is certain. The excessive heat causes gassing, which results in electrolyte loss, plate corrosion and internal shorts. In hot climates, the average battery life is 36 months. Batteries fail in the

winter months due to the high amperage draw required to start a cold engine with thick oil, plus a battery is less efficient at colder temperatures.



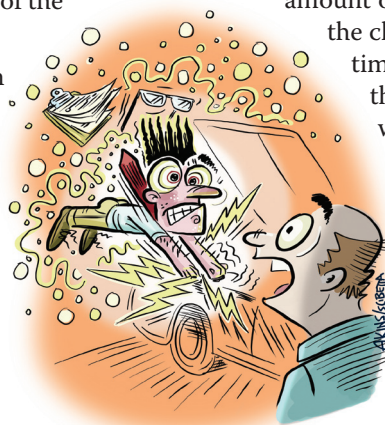
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#### PARASITIC CURRENT DRAIN

Parasitic drain can be defined as an electrical load or draw on the battery with the ignition switch in the off position. Some electrical devices are designed to draw current (usually not to exceed 30 ma.) from the battery while the ignition switch is in the off position—for example, the PCM, memory for the radio, seats, etc. This minute amount of current drain is usually not a problem, as the charging system replenishes the battery each time the vehicle is driven. Problems arise when the vehicle is not driven for long periods (3-4 weeks) of time. During this time the battery may become discharged to the point that a no-start condition may occur. When testing for a parasitic current drain, a 30 minute wait time is necessary to allow on-board computers sufficient time to power-down or go to sleep.

A battery can be compared to your bank account. If you write more checks than you make deposits...eventually the account is overdrawn. City or short trip driven vehicles equipped with a maze of electronics and creature comforts often encounter premature battery failure due to the battery never becoming fully charged, resulting in sulfation. Fast charging, over charging, deep discharges, heat, and vibration all promote premature battery failure. Conductance testers, preferably with a print-out, can easily identify batteries that are at the end of their life cycle. The test is quick, efficient and does not require a fully charged battery.

With electronic accessories such as keyless entry, push button start, etc., a low voltage condition can create some major anomalies with the vehicle's electrical system. On some vehicles, leaving the key fob within 25 feet of the vehicle may keep the computers awake, resulting in a discharged battery. Countless hours can be wasted searching for a system related problem when a low battery condition or a voltage drop during cranking was the culprit. Our next *On the Line* will illustrate some really unique symptoms due to low voltage and electrical interference. The examples are real world challenges that you must be prepared to deal with.



THE SERVICE ADVISOR IMPROPERLY CONNECTS THE BATTERY CABLES, BRINGING AN ABRUPT END TO HIS "KNOW YOUR BATTERY" DEMO