

# INFORMATION BULLETIN



**MOTORIST  
ASSURANCE  
PROGRAM**

STANDARDS FOR AUTOMOTIVE REPAIR

IB 16 – July 2013

## INFORMATION BULLETIN

### AGM Battery Testing, Charging and Installation Tips

#### How do I properly test an AGM Battery?

A modern, electronic tester will prompt the user to identify the battery as either Absorbent Glass Mat (AGM) or Flooded Lead Acid (FLA). Identification of the battery type may be difficult, but is critical for accurate results. Look on the top of the battery for a label that indicates AGM or “Non-Spillable”; the side of the battery may have a cylindrical appearance (AGM spiral); or some AGMs have an external grid used to reinforce the battery case.

Proper setup of the test equipment is critical for proper diagnostics of AGM batteries. Modern, electronic battery testers may be used to test an AGM battery; however, the tester must have specific AGM Spiral or AGM Flat-Plate testing inputs to achieve accurate test results. Technicians must input accurate and proper battery APPLICATION, TYPE, RATING and VALUES into the battery tester.

A carbon-pile load tester may also be used to test an AGM battery, but accurate results require that the battery is adequately charged and has stabilized prior to performing any load test.

Open Circuit Voltage (OCV) is an indicator of State-of-Charge (SOC). Modern battery testers use this information to determine a good battery, recommend a charge-and-retest or recommend replacement of a failed battery.

#### How to Properly Charge an AGM Battery

AGM batteries require a battery charger specifically designed for use with AGM batteries. This is because conventional FLA 12v battery chargers can generate voltages (and voltage spikes) that are too high for safe AGM battery charging.

**Warning:** Improperly charging an AGM battery will damage the battery within minutes, greatly increasing your risk of exploding the battery. This is an extreme safety hazard that can cause serious personal injuries and damage the vehicle.

#### Open Circuit Voltage vs. State of Charge Comparison\*

% Charge	Open Circuit Voltage		
	Flooded	Gel	AGM
100	12.60 or higher	12.85 or higher	12.80 or higher
75	12.40	12.65	12.60
50	12.20	12.35	12.30
25	12.00	12.00	12.00
0	11.80	11.80	11.80

*NOTE: Divide values in half for 6-volt batteries.*

*\* The “true” O.C.V. of a battery can only be determined after the battery has been removed from the load (charge or discharge) for 24 hours.*

AGM batteries must be charged with highly- specific AGM charging algorithms, typically found in diagnostic or “smart” chargers. Identification of the battery type may be difficult, but is critical for safe and accurate charging. If you cannot identify the battery type, always use the AGM charge settings as a safety precaution.

Diagnostic chargers are designed to constantly monitor the battery's charge acceptance and temperature, and then vary the voltage and current delivered to the battery. Monitoring the battery and customizing the charger's response allows safe and quick charging without the risk of overcharging or venting the battery. When the charge rate is too high (as with any battery) excess hydrogen gas can build up in the battery. Under normal conditions, the build of pressurized gas is minimal and proper recombination of hydrogen and oxygen occurs, producing water to keep the mats moist. If the pressure increases above approximately 1.5psi, the gases are vented to atmosphere and will not be available for recombination, causing the glass mats to dry out - shortening the operational life of the battery.

REMINDER: Most currently-available wheeled battery chargers are not rated for AGM batteries. It is important to recognize that using a charger not rated for AGMs will not only severely damage the battery, but also poses an explosion hazard, potentially damaging the vehicle and causing personal injury.

## Proper Charge Rates for AGM Batteries

### *AGM Charge and Float Voltages at Various Temperature Ranges*

Temp. °F	Charge		Float		Temp. °C
	Optimum	Maximum	Optimum	Maximum	
≥ 120	13.60	13.90	12.80	13.00	≥ 49
110 – 120	13.80	14.10	12.90	13.20	43 – 49
100 – 110	13.90	14.20	13.00	13.30	38 – 43
90 – 100	14.00	14.30	13.10	13.40	32 – 38
80 – 90	14.10	14.40	13.20	13.50	27 – 32
70 – 80	14.30	14.60	13.40	13.70	21 – 27
60 – 70	14.45	14.75	13.55	13.85	16 – 21
50 – 60	14.60	14.90	13.70	14.00	10 – 16
40 – 50	14.80	15.10	13.90	14.20	4 – 10
≤ 40	15.10	15.40	14.20	14.50	≤ 4

### How do I properly install an AGM Battery?

The procedural steps to install an AGM battery are similar to FLA battery installation. Always utilize a battery replacement guide or data book to determine the manufacturer's battery requirements for the vehicle. The Battery Council International's (BCI) *Battery Replacement Data Book* is a good example. Install a battery that meets the manufacturer specifications, including battery type (FLA or AGM). Note: *Most guides or data books identify battery type utilizing a footnote reference. An AGM battery requirement may be referenced as either a VRLA or SLA battery*

**Warning: Typical Flooded Lead Acid (FLA) batteries should never be installed in applications designed for an AGM battery.**

Many AGM applications will have the battery mounted inside the passenger compartment. In these instances you may find a vent tube attached to the battery and routed to the outside of the vehicle through an opening in the body. It is extremely important to ensure the vent is routed properly. A buildup of explosive hydrogen gas can occur in the passenger compartment if the battery is improperly charged either by the onboard charging system or use of an incorrect charger connected to the remote-mounted battery lugs.

Always use a proper memory saver device to protect the on-board computer's memory (to maintain vehicle settings\* and stored information\*) before disconnecting the battery. \*For example, engine/transmission performance re-learn; security system lock-out; steering-angle sensor; driver seat and mirrors settings loss.

Ensure the ignition is off, interior lights are off, radio is off, and all doors are closed, as these electrical systems can rapidly drain a conventional 12v memory saver, resulting in the loss of vital settings or programming. Do not use a 9v battery or scan tool as a memory saver, and never disconnect the negative terminal with the engine running. Additionally, certain cars require battery "registration" through the OBD data link connector to complete the installation process.

Consider test-driving the vehicle to verify that all module programming, radio memory and driver's convenience settings were retained.



STANDARDS FOR AUTOMOTIVE REPAIR

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