MASERATI

EXCELLENCE THROUGH PASSION

Circular Letter MAS000663

October 24th, 2016

SUBJECT: Guidelines for Battery Maintenance and Charging

Dear Dealer Network,

To help preserve a vehicle's battery life, it is important to maintain and recharge the battery when necessary. Please see the suggested guidelines below for battery maintenance and charging.

Visual assessment

Visually inspect the battery. Check the terminals for damage or corrosion and ensure they are properly secured. Poor contacts may prevent proper operation and adversely affect battery life. Make sure that the battery housing is not damaged, and that the battery is properly secured in the battery compartment.

Always avoid operating the battery at low state of charge. Allowing a battery to go below 50% of charge level for a long period of time could lead to sulfation, and reduce the battery's capacity and starting current. Also, the battery could become prone to freezing.

It is recommended to regularly check the battery state of charge and increase the frequency of the checks when the car is held in stock or primarily used for short distance trips.

Battery types

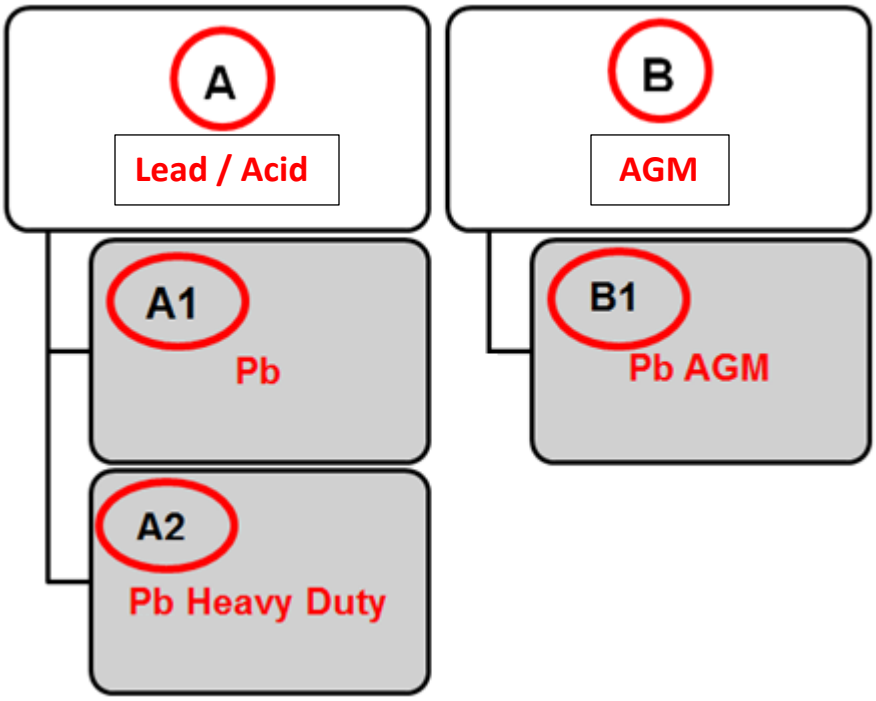
The 2 types of Batteries used in Maserati vehicles (depending on the year and model type) can be:

- A –Lead acid
- B –AGM (Absorbed Glass Mat).

Lead acid batteries can be broken down into:

- A1 – Pb for standard applications.
- A2 – Pb Heavy Duty for Start&Stop applications.

Overview



Checking the Battery State of Charge

Battery condition, along with the starting and recharging circuits can be checked using the **Picoscope** application on the **Maserati Diagnosi**. **Select the proper battery specifications according to the information printed on the battery label (type, rated voltage, starting current and test temperature) before beginning the tests.**

The battery must be installed in the car and charged sufficiently to start the engine.

The check sequence is as follows:

1. Connect MDVMM to the diagnosis computer, run the PicoDiagnostics software and select "Test battery".
2. Connect a standard test cable with BNC connector to channel A of MDVMM; use two crocodile clamps to connect test cable to the battery positive and negative poles. (Fig.1)

3. Connect the 200/2000A ammeter clamp to channel B of MDVMM and clamp it around the battery positive or negative cable (Fig.1) to measure the starting and recharging amperage.

Fig.1

4. Ensure "12V" car circuit is selected.
5. Press "Start" on the screen and then start the engine.

The program will analyze voltage and current data from the battery during starting as well as recharging. Results are shown on a graph display (Fig.2), along with a readout listing. (Fig.3)

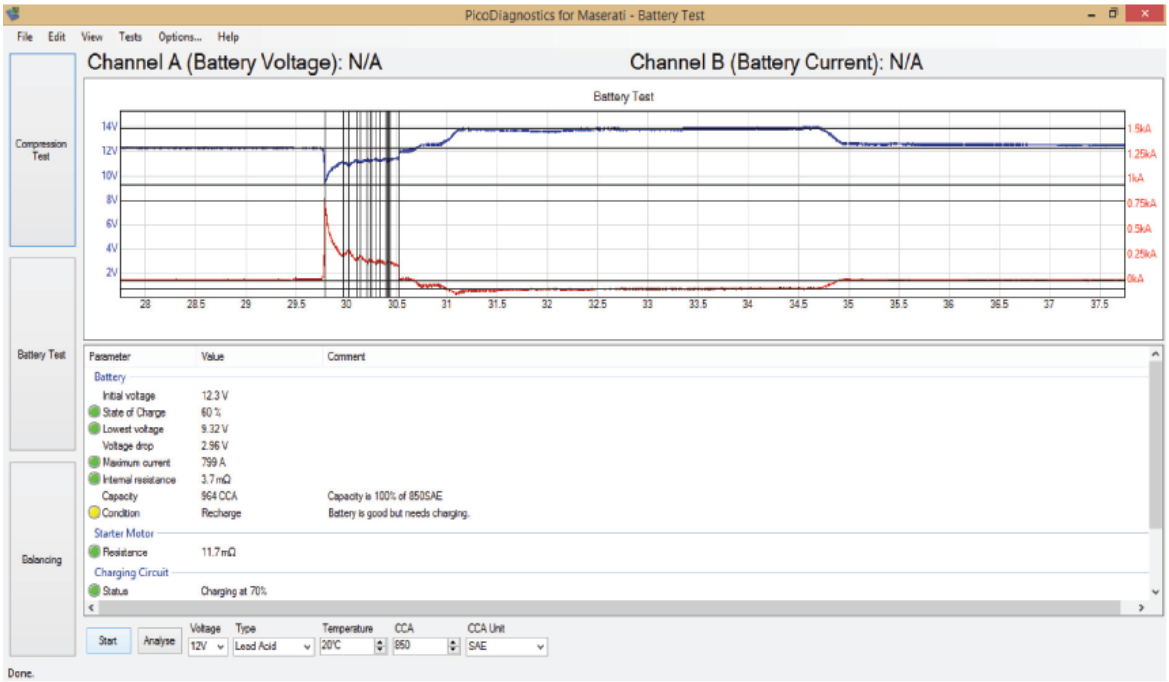


Fig.2

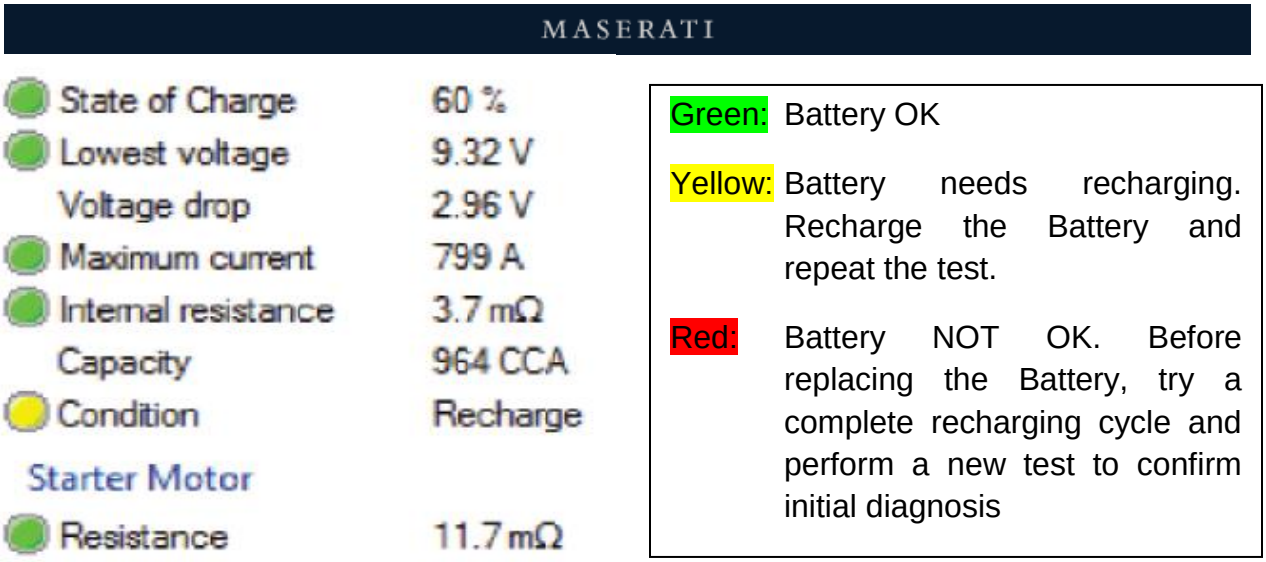


Fig.3

If the State of Charge is correct but the Capacity (CCA, Cold Cranking Amps) is low, check the battery connections. A loose connection could create additional resistance in the circuit.

If the State of Charge is low (as shown above), run a complete recharge cycle and repeat the test.

Important: When recharging a battery, use a charger suitable for the various types of batteries currently on Maserati vehicles. Always select the correct battery specifications and comply with recharging times and methods recommended by the manufacturer of the charger being used.

RECHARGING THE BATTERY

Ensure the battery charger being used meets or exceeds the minimum requirements listed below.

Parameter/Condition	Minimum Requirement
Operating condition	The charger must be capable to operate outdoors and be weather resistant
Operating Temperature	0ºC to +50ºC (32ºF to +150ºF)
Storage Temperature	-20ºC to +70ºC (-5ºF to +155ºF)
Power supply voltage	120V AC – 60Hz /15A
Type of batteries to recharge	Lead Acid, AGM Spiral, AGM
Charging Mode	Automatic / Manual
Test Standard	IEC, EN1, EN2, SAE, DIN
Safety Features / Protection	Charger must NOT work if: - Not connected to a battery - Not properly connected to a battery (reversed polarity)
Cable length	Over 1.5 metres (5 feet or longer)
Compliance to	- CEN/CENELEC EN 45014 - ISO/IEC, UL
Information on ID label	- Trademark - Voltage (V) - Charging current (A)
User documents	Recharge instructions and relevant warnings

Note: When recharging a battery, using a battery charger that fails to meet or exceed the above minimum requirements may not result in proper battery recharging. Damage to the vehicle's electric/electronic components could occur, and a subsequent repair to correct said damage is not warrantable item.

WARNING: The recharging process generates hydrogen, a potentially hazardous gas.

Always be sure to follow these precautions when recharging a battery:

- Recharge the battery in a well-ventilated environment.
- Never attempt to recharge a battery that has been frozen.
- Ensure that the charging area is away from any sparks and/or open flames.

If it is necessary to complete a warranty claim for a battery replacement, we will require a Blue On Line Report. Open the BOL as “Request for Authorization of Claim” and attach both Pico-Diagnostics test results: the initial test result and the test result after a failed recharging attempt.

For more information on battery chargers and recharging AGM batteries, refer to Maserati Tech Tips 27 sent 9/24/2012. (Also attached at the end of this bulletin.)

If you have any questions contact your ABM or Maserati Technical Support.

Thank you for your continued support and cooperation.

Maserati North America, Inc.
Aftersales Department

Maserati Tech Tips 27

Date: September 24, 2012
Bulletin No.: Tech Tips 27

MASERATI

Subject: AGM Battery Information and Charging Procedure

When charging an AGM (Absorbent Glass Mat) Batteries there are several procedures that need to be followed and understood.

Warning when Charging a Battery there is a creation of hydrogen gas which is explosive/flammable when exposed to open flames/or sparks. Caution must be used when working around a battery on Charge.

Type of Charger:

1) Conventional battery wheel around chargers are not recommended as they do not have smart technology for voltage and current regulation necessary to properly and safely recover or recharge and AGM Battery

2) There are now specific chargers manufactured for use on AGM or Gel Cell batteries that have microprocessor controls built in to achieve the correct charge rates.

Midtronics GR8 Tester/Charger

Snap-On-Battery Charger Plus Smart Charger Only

AGM Information: The AGM battery can discharge less than a conventional wet cell battery however they still discharge when sitting idle on a shelf or in a vehicle with loads applied. This is where the failure begins, the AGM battery mats begin sulfation; that is where lead sulfate forms from the excess water in the battery solution. The Lead Sulfate attaches to the Absorbent Glass Mats Reducing surface area and potential of the battery. Therefore, a weak battery unable to perform its task is produced and needs to be recharged.

AGM Recharge Procedure:
In order to achieve absorption from the battery, the lead sulfate needs to be broken down; that is achieved by applying the correct voltage and amperage to the battery. That load is based on its current state of charge and internal resistance. This is measured by "Smart Battery Chargers" and the micro-processor helps manage the voltage and amperage outputs.

1) The Charger needs to be able to achieve a voltage output of 14.4 voltages and sustain that rate for the duration of the batteries Absorption Period and able to produce amperage that is beginning around 10-15Amps. The charger then needs to be able to decrease automatically its outputs as the internal resistance decreases. The Absorption of the AGM battery is about 96% of the capacity.

2) After the Absorption Period a smart charger will automatically switch to a float rate which is around 13.2V for the remaining 4% of the batteries potential at decreased amperage between 2-5 Amps.

3) The key is not allowing an AGM battery to discharge too great, a discharged AGM battery even as minimal of 10.5 volts will require a Smart Battery Charger instead of a battery tender to initiate the Absorption State of the battery and properly charge it. A "battery maintainer/tender" is used to maintain a battery's voltage around 12.2-12.5 volts; whereas a Smart Battery Charger is used to correctly recover a discharged battery.

4) Batteries that are being stored on a shelf or in a vehicle should be placed on a Smart Tender that will apply small amounts of voltage and current to the battery while monitoring the state of charge to prevent over or undercharging. While ensuring that the battery does not go below 12.2 volts.

5) Maserati Offers a Battery Maintainer which is available to be installed on our entire vehicle fleet and is designed to properly tend to the AGM Designed Batteries requirements. The part number is "Maserati battery maintainer, P/N 940000030"