TOYOTA

Technical Service BULLETIN

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Title:

ABSORBED GLASS MAT (AGM) BATTERY INFORMATION

Models:

'01 – '08 Toyota

TSB

SS006-07

SPECIAL SERVICE TOOLS

Introduction

This TSB provides background on the differences and similarities between AGM (Absorbed–electrolyte Glass Mat) batteries and flooded lead acid batteries. It also explains charging procedures performed by the GR8 Battery Diagnostic Station (SST P/N 00002–MCGR8) and its ability to charge AGM batteries at higher current levels then a standard battery charger.

Applicable Vehicles

- **2001 – 2008** model year **Toyota** vehicles equipped with an **AGM battery**.

Required Tools & Equipment

SPECIAL SERVICE TOOLS (SSTs)	SUPPLIER	PART NUMBER	QTY
GR8 Battery Diagnostic Station* 	SPX/OTC	00002–MCGR8	1

* Essential SSTs.

NOTE:

The GR8 Battery Diagnostic Station (P/N 00002–MCGR8) supersedes the Automatic Trickle Charger (P/N 00002–YA122–01) and Fast Battery Chargers (Associated P/N ASE6003 and Christie P/N CAPPDQ). P/N 00002–YA122–01, ASE6003, and CAPPDQ are now obsolete.

Warranty Information

OP CODE	DESCRIPTION	TIME	OFP	T1	T2
N/A	Not Applicable to Warranty	–	–	–	–

Battery Comparison

Differences between AGM and flooded lead acid batteries:

- AGM batteries have thin, sponge–like, glass mat separators that absorb all liquid electrolytes.
- Flooded lead acid batteries have free, liquid electrolyte all around the plates and separators.
- Flooded lead acid batteries can easily release gas that is formed during a charge, while AGM battery life is diminished if gas is formed during charging.

Similarities between AGM and flooded lead acid batteries:

- Both share the exact same lead acid chemistry.
- Both share the same charge and discharge principles.
- Both are safely charged by vehicle charging systems.
- When discharged, both can be recharged at high current levels.

Battery Charging Information

Damage to AGM batteries becomes an issue when the charge rate is NOT monitored and controlled by the charger (i.e., quick chargers). The performance of an AGM battery can be irreversibly reduced if the charge rate remains too high, allowing the battery to overheat and vent. Once an AGM battery loses water (venting), the glass mats will become dry, causing the battery to lose conductance, power, and performance.

In most vehicle charging systems, the alternator limits the charging rate by limiting the output voltage (about 14.4V). For example, an AGM battery may be observed charging at 60A and 13.5V. As the battery recharges, the charging voltage will increase from 13.5V to approximately 14.4V (voltage will vary based on temperature, control sophistication, etc.), and the current will decrease from 60A to about 0A. The charging system voltage regulators prevent both AGM and flooded lead acid batteries from being overcharged and venting. By controlling the voltage, the charging rate (current) can be controlled.

The discontinued Special Service Tool (SST) Automatic Trickle Charger (SST P/N 00002–YA122–01) maintained a manual charging limit of 10A to accomplish a safe recharge rate for AGM batteries. This low amp charge was low enough to prevent the AGM battery from overheating and venting since the charger had no way of monitoring battery temperature/condition.

The GR8 Battery Diagnostic Station (SST P/N 00002–MCGR8) is a customized diagnostic fast charger that monitors battery temperature/conditions and contains custom charging rates for ALL model batteries used for Toyota and Scion vehicles. As such, it safely charges good batteries as fast as possible to a point where they can be returned to service and eliminates wasted charging time by quickly diagnosing bad batteries.

Battery Charging Information (Continued)

Based on the characteristics and performance measures of each individual battery (i.e., custom charging rate), the GR8 Battery Diagnostic Station will apply the fastest charging rate that is safe for that particular battery.

- When the GR8 Battery Diagnostic Station performance measurements indicate that an AGM battery qualifies for fast–charging, it will be charged at whatever current level it will accept, but the charging voltage will be controlled so that it does NOT exceed 14.4V, and the battery temperature will NOT exceed 135°F (57°C).
- When the GR8 Battery Diagnostic Station performance measurements indicate that an AGM battery does NOT qualify for fast–charging, the charge session will only continue if the battery qualifies for “Recovery” mode (part of which means, NO defects or other serious performance issues were found).

It is recommended that ALL Toyota and Scion vehicle batteries be charged using the GR8 Battery Diagnostic Station.

NOTE:
- **NEVER connect the GR8 Battery Diagnostic Station to remote battery terminals.**
- **ALWAYS connect the GR8 Battery Diagnostic Station DIRECTLY to the vehicle battery.**

For assistance on charging procedures, refer to the GR8 Instruction Manual or TSB No. PG001–06, *“Battery Maintenance for In–Stock Vehicles & Pre–Delivery”*.

The GR8 Instruction Manual can be found on the Technical Information System (TIS), *Diagnostics – Battery – “GR8 Instruction Manual”*.