

Model: M2

Development code: G87

Model code: 13DM

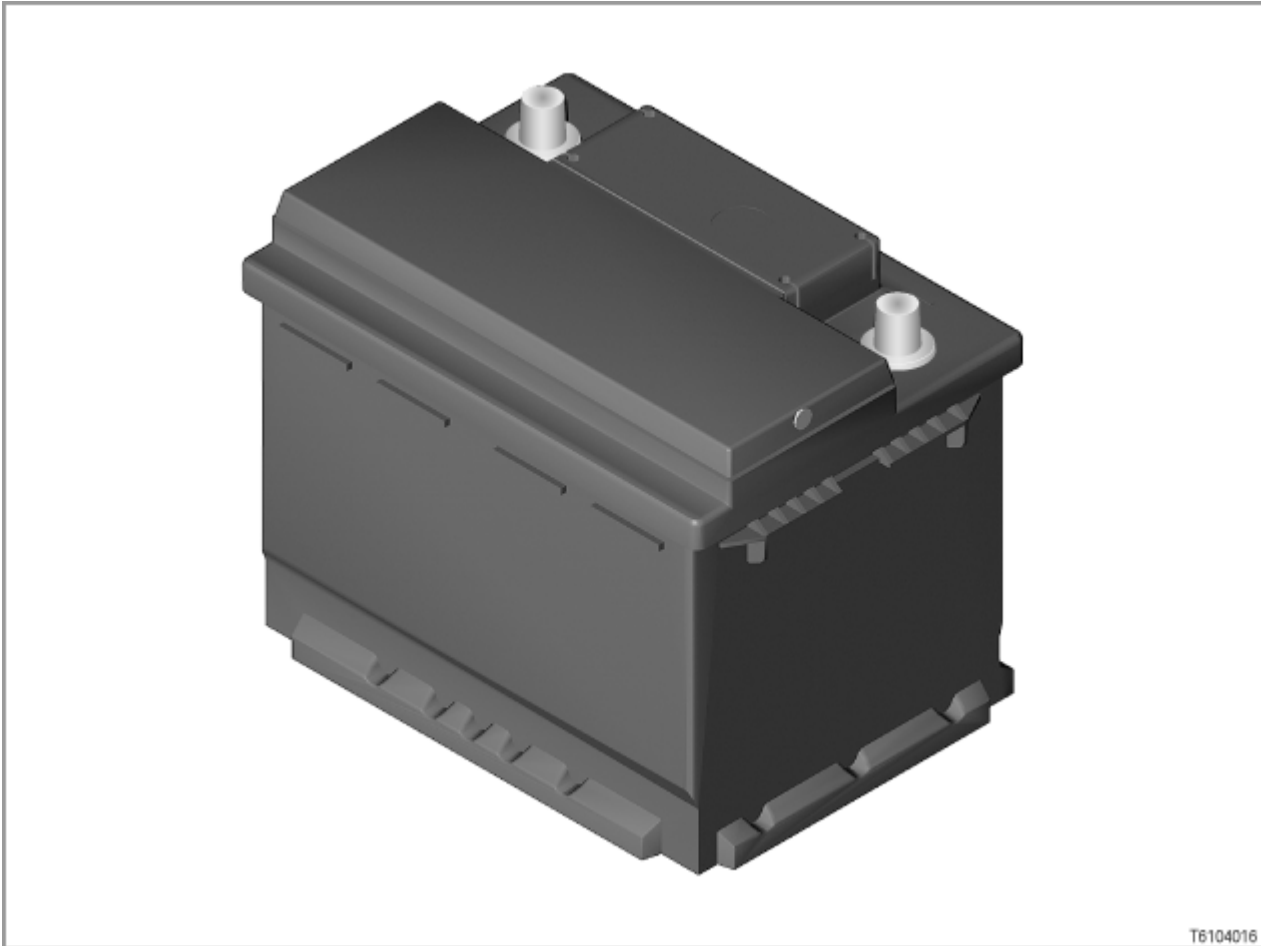
Lead type: 13DM

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[Additional information »](#)

## Notes on AGM battery

REP-ALG-RAF0161-6120AGM - V.20



### Introduction

In September 2002, the first so-called VRLA batteries, better known as **AGM batteries** came into use. (VRLA stands for **V**alve **R**egulated **L**ead **A**cid, i.e. lead-acid battery with pressure relief valve; **AGM** stands for **A**bsorbent **G**lass **M**at, i.e. absorbent chopped strand mat).

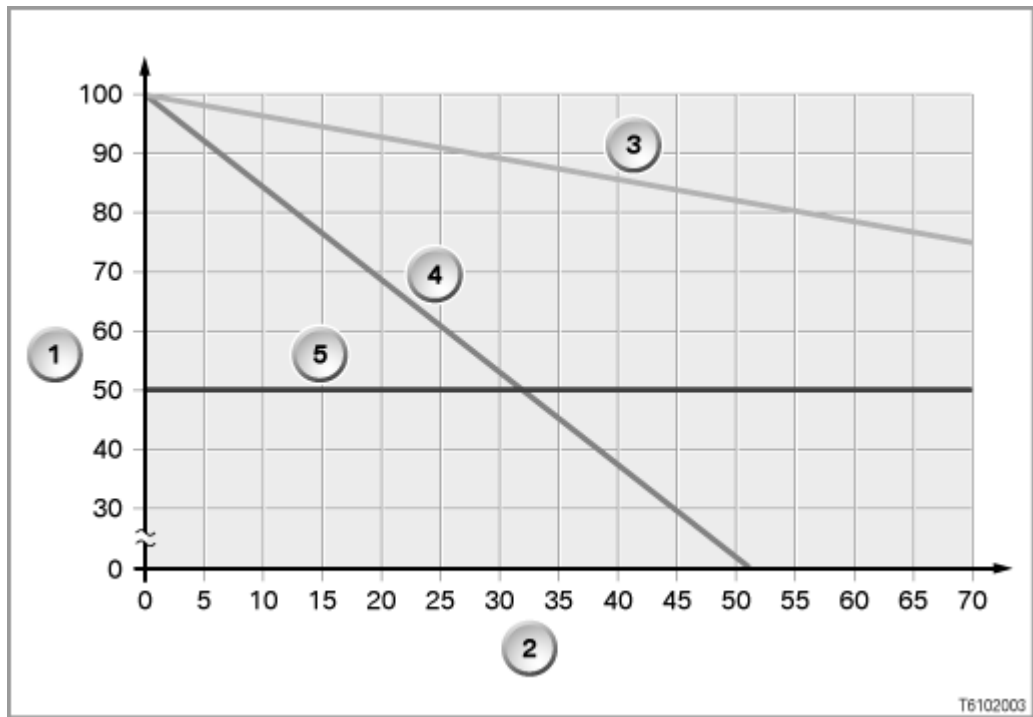
The constantly increasing energy demand of modern vehicle electrical systems calls for ever more powerful battery solutions. A modern luxury-class vehicle has some 100 actuator motors that have to be fed with electrical current. Added to these are safety, environmental and comfort elements which are

increasingly becoming standard features, such as e.g. ABS (ABS), Dynamic Stability Control (DSC), steering support (EPS), electronic chassis control, air conditioning and navigation system. Power consumption is considerable even when the vehicle is not in use.

The somewhat higher price compared with a battery of similar size is fully balanced by the following benefits:

- greatly longer service life
- improved starting reliability at low temperatures
- Safe starting of engines with high starting power requirements, for example high-performance diesel engines
- 100 % freedom from maintenance
- low risk in the event of an accident (reduced environmental risk)

### Service life of AGM batteries

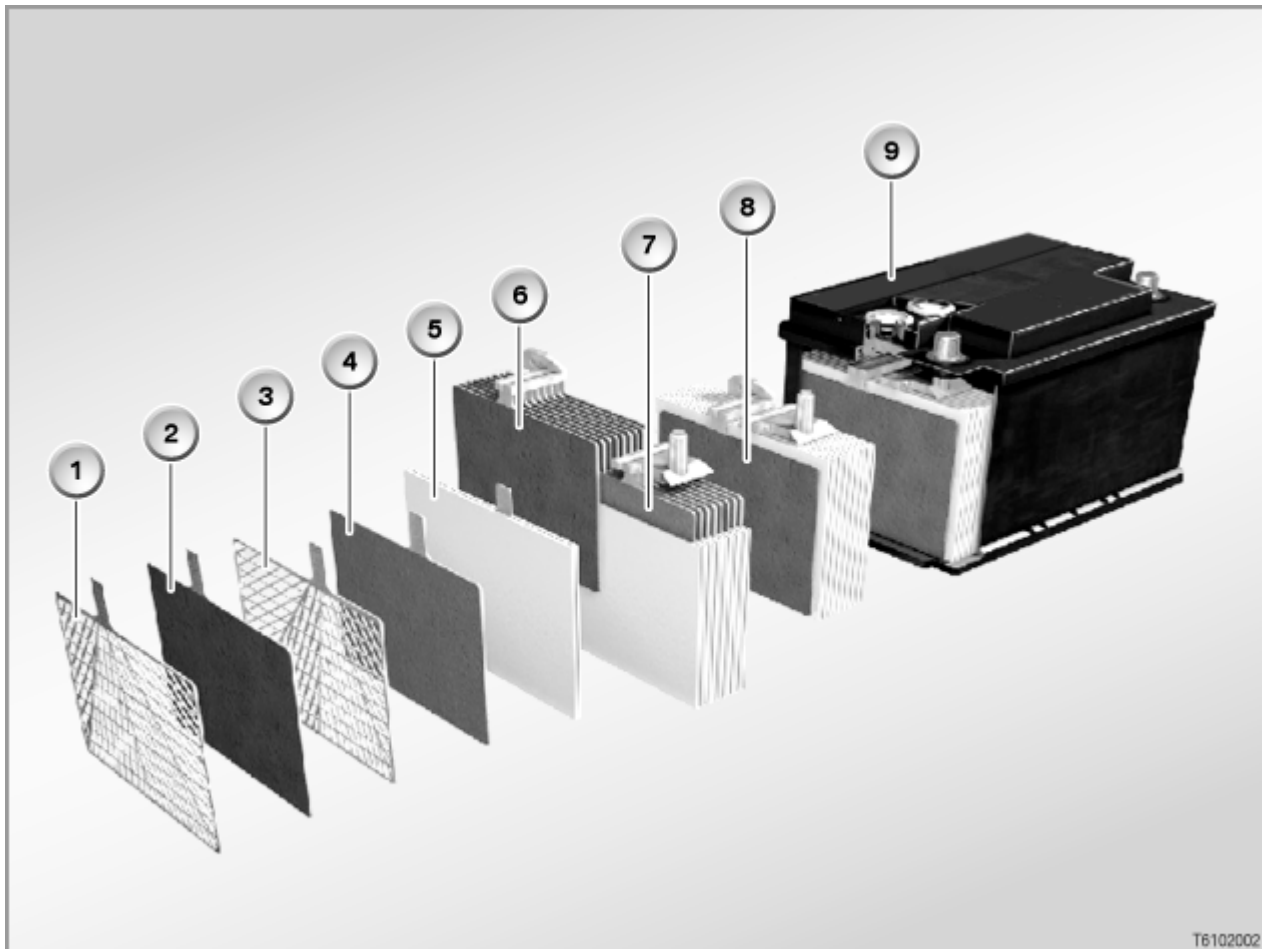


Index	Explanation	Index	Explanation
1	Available capacity [%]	2	Mileage [thousand km]
3	AGM battery	4	Lead-calcium battery
5	50 % capacity limit		

In contrast to conventional lead-calcium batteries, the sulfuric acid in a battery with fleece technology is not free-standing in the battery housing. Rather, 100% of the sulfuric acid is bound into the mats of the chopped strand mat (separators). For this reason, no battery acid can leak if the battery housing is damaged. In addition, the AGM battery is sealed to be airtight. This is possible because the gases are converted back into water by the permeability of the separators.

### Brief component description

The AGM battery has a black housing and the so-called "Magic Eye" is missing.



Index	Explanation	Index	Explanation
1	Positive grill with silver alloy	2	Positive plate
3	Negative grill	4	Negative plate
5	Separator made of chopped strand mat	6	Set of positive plates
7	Set of negative plates	8	Block of plates
9	Block box with base strips		

## Construction

The AGM battery differs from the conventional lead calcium battery as follows:

- larger plates: Larger plates allow a 25% larger power density.
- Separators made of chopped strand mat: These can cause an up to 3-times higher cycle stability to be reached. This improves the cold starting capability, the power consumption and service life.
- Airtight housing with pressure relief valve (please refer to "How it works"):  
The inspection plugs are sealed and can not be opened.
- Battery acid bound in chopped strand mat: Battery acid is not found free in the housing as before, but is bound 100% in the chopped strand mat. This gives increased security against acid leaks and thus reduces the environmental risk.

## How it works

The AGM battery differs from conventional batteries in its non-polluting and substance-retaining behavior during charging.

When a battery is charged, the electrolysis process emits the gases oxygen and hydrogen.

- In a conventional wet lead calcium battery, the two gases hydrogen and oxygen are dissipated into the atmosphere.
- In an AGM battery, the two gases are converted back into water: The oxygen which is created at the positive electrode during charging passes through the permeable glass fiber fleece to the negative electrode. At the negative electrode the oxygen reacts with the arriving hydrogen ions in the electrolyte to form water (oxygen cycle).

In this manner, the gas and thus also the electrolyte are not lost.

Only in the event of an excessively heavy build-up of gas, i.e. excessively high pressure build-up (20 to 200 mbar), does the pressure relief valve discharge the gas. In this process, the pressure relief valve does not allow any oxygen in the air to enter. Because the pressure in the battery is regulated by a valve, the AGM battery is also known as the VRLA battery (valve-regulated lead acid).

## **Notes for Service department**

It is necessary when handling an AGM battery to observe some particular points pertaining to battery changing and installation location.

## Charging

**Warning! Do not charge the AGM battery with > 14.8 V. Do not use rapid-charging programs!**

When charging removed batteries (so-called stand-alone batteries), do not exceed the maximum charging voltage of 14.8 V at room temperature. Also, for charging via the external start connection point, the maximum charging voltage of 14.8 V at room temperature must not be exceeded. The battery can be

damaged even if the AGM battery is only briefly charged with a charging voltage higher than 14.8 V. A charging voltage of more than 14.8 V is usually used in quick-charging routines.

#### Installation location

**Warning! Do not install the AGM battery in the engine compartment.**

The AGM battery must not be installed in the engine compartment on account of the high spatial temperature differences, otherwise its service life will be significantly shortened.

#### Housing

**Warning! Do not open AGM batteries.**

On no account may AGM batteries be opened, as the ingress of oxygen from the atmosphere would cause the battery to lose its chemical balance, rendering it unserviceable.