

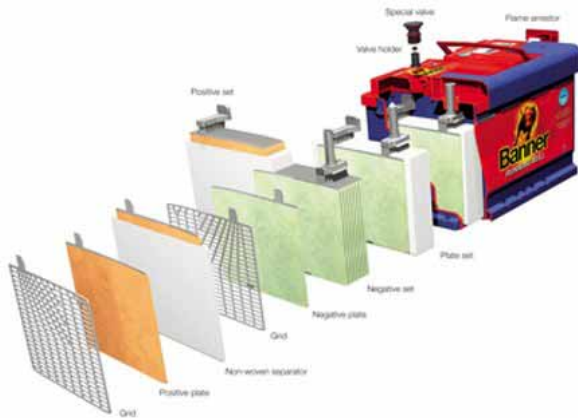
## Banner supplies BMW with AGM batteries for a hybrid project



- Micro-hybrid concept reduces CO2 emissions
- Special demand on the starter battery
- Banner AGM technology on a lead-acid basis
- Banner AGM batteries in the BMW 1 and 3 series from June 2007

AGM from Banner has been around for many years and it was Banner who were first to offer the Running Bull AGM to the aftermarket. So with this knowledge and experience it is no wonder that our business partner BMW trusts the Running Bull to supply power to their stop start system.

A start-stop system automatically shuts down and restarts an automobile's internal combustion engine to reduce the amount of time the engine spends idling, thereby improving fuel economy. This is most advantageous for vehicles which spend significant amounts of time-wasting at stop lights or frequently come to a stop in traffic jams. This feature is present in hybrid electric vehicles, but has also appeared in vehicles which lack a hybrid electric powertrain. For non-electric vehicles (called micro-hybrids), fuel economy gains from this technology are typically in the range of 5 to 10 percent.



Banner has been equipping the BMW 1 and 3 series with AGM technology batteries since June 2007. The use of AGM technology by BMW became necessary due to the

“Efficient dynamics” project series. This involved the introduction of a diversity of economy measures in the fuel consumption area and thus a reduction in standard CO2 emissions.

In this connection, BMW is also using a gentle hybrid concept (micro-hybrid), which places increased demands on the starter battery. The recovery of braking energy charges the battery during coasting. In the case of acceleration, the in-board network is supplied exclusively from the battery in order to ease the load on the dynamo. In addition, an automatic start-stop system is employed, which means that as soon as the vehicle is stationary, the engine switches itself off, before restarting automatically when the clutch is depressed to put the car into gear.

High starter battery cycle resistance is a prerequisite for the flexible use of energy and with its AGM battery, Banner has the perfect solution. AGM stands for Absorbent Glass Mat and the use of nonwoven glass mats in the battery design,

