Banner

TECHNICAL GUIDE

made in AUSTRIA

Banner Batterien
THE POWER COMPANY

Banner has been manufacturing batteries for over 60 years. The power packs with the buffalo symbol number among the world's most respected, technologically advanced, quality products. The independent, family-owned Banner company, supplies leading automotive manufacturers such as Audi, VW, Daimler-Chrysler and MAN with batteries as original equipment.

Production at the Austrian factory in Linz ensures constant, certificated top quality in accordance with ISO 9001, QS 9000 and VDA 6.1. With old battery collection and 100% recycling, Banner makes a valuable contribution to environmental protection. Banner products are equally as reliable in the extreme cold of northern Scandinavia, as in the sweltering heat of Africa and Asia.

Banner Power Page in the world wide web!

Detailed information concerning Banner and its products, as well as the latest news and special offers, can be found on the Banner Power Page.

Pop in the next time you're surfing on the Internet!

www.bannerbatteries.com

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Advantages of a Banner battery

1. **Minimum water consumption due to:**
   - Lead/calcium or hybrid technology
   - Use of the purest materials

2. **Longer service life and high levels of operational safety due to:**
   - Computer-optimised electrode design
   - Bonding of the plates to the base (= protection against vibration) the original equipment specification
   - Use of microporous bag separators
   - Optimised, positive electrodes, which exceed the demand of first fitters

3. **Improved charging during short journeys due to:**
   - Optimised negative electrodes

4. **Increased start performance due to:**
   - Central lug position
   - Reduced interior resistance

Construction of a Banner battery

1. Handle can be folded down into the top.

2. Centric lug position. Increased start performance through optimised power conductance.

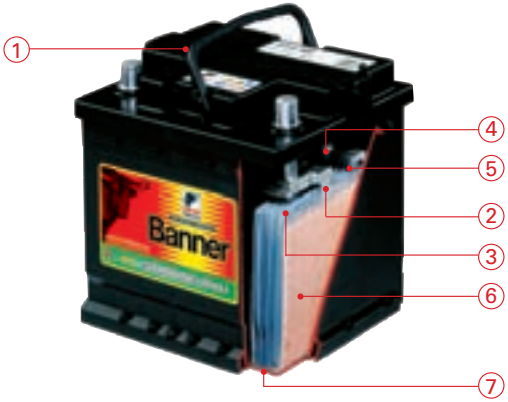
3. Microporous bag separator, which guarantees optimum protection against short circuits.

4. Cell connector with greatly reduced electrical resistance.

5. Computer optimised electrical design.

6. Positive electrode with optimised active mass.

7. Plate set bonded to the base.



Warnings and safety instructions for lead-acid batteries

Information printed on the batteries, in the instructions and the vehicle operating manual.

Wear eye protection!

Keep children away from acid and batteries.

Danger of explosions

- A highly explosive, hydrogen-oxygen mixture is created during battery charging.

Open flames, sparks, open lights and smoking are prohibited:

- Avoid sparks when handling cables and electrical devices! Avoid short circuits!

Danger of chemical burns.

- Battery acid can cause severe burns.
- Wear protective gloves and eye protection.
- Do not tip the battery, as acid can escape from the degassing valves.

First Aid:

- In the case of acid splashes in the eyes, immediately rinse out with clean water for several minutes! Then consult a doctor without delay!
- Treat acid splashes on the skin or clothing with an acid neutraliser or soap and rinse with large amounts of water.
- Should acid be swallowed, consult a doctor immediately!

Warning:

- Do not subject batteries to direct daylight.
- Discharged batteries can freeze, therefore use frost-free storage.

Disposal:

- Used batteries should be handed in at a collection point. The information provided under Item 1 should be taken into account during transport. Never dispose of batteries with household waste!

Return to the manufacturer!

- Used batteries bearing this symbol represent a reusable product and must be returned for recycling. Used batteries that are not to be recycled must be disposed of as hazardous waste in accordance with all regulations.

Installing the battery in a vehicle

WARNING! Stored electronic data in car radios and computers, etc. can be erased due to a power loss. In general, follow the instructions contained in the vehicle operating manual!

- Switch off the ignition and other power consumers.
- First remove the terminal caps during installation in the vehicle, in order to prevent short circuits.
- When taking the battery out, always disconnect the negative terminal first. During installation always begin by connecting the positive terminal.
- Should there be a degassing pipe, reconnect it.
- Please place the protective cap on the positive terminal of the old battery for safe transport to recycling.

Maintenance-free batteries, battery maintenance, memory effect

Definition of maintenance-free:

Banner batteries are designated as maintenance-free in accordance with EN/DIN, which means that no topping up with water is required at normal operating temperatures and correct alternator voltage.

Water is used where deviations from normal conditions occur. Following the opening of the screw caps, top up with distilled water (up to the mark or 1 cm above the plates).

The following generally applies to all batteries:

- Keep the battery and the terminals clean and dry.

- Never leave the battery in a discharged condition. The electrodes are subject to sulphation and permanent damage! Each discharge should be followed by charging as quickly as possible.

Effect on the memory:
As opposed to NiCd batteries, lead-acid batteries have no effective memory. Therefore, they may not be subjected to extra deep discharge prior to charging. Each deep discharge damages the battery.

Taking a battery out of operation (winter, summer)

General information:
Due to self-discharge, filled batteries may only be stored for a certain period. Therefore, recharging is essential prior to any longer, non-operative period. Tip for safe effective long term storage use a Banner Accugard charger & Conditioner.

- **Deactivating a battery**

- If possible, remove the battery from the vehicle.
- If the battery remains outside the vehicle, clamp at least one of the connecting cables (negative).
- Charge the battery and store in a cool, dry place (0 – 10 °C). This reduces self-discharge.
- If the battery is deactivated for a longer period, charge every 2 months, or use a charge retention device.
- Charged batteries first freeze at below -25 °C.

- **Reactivating a battery**

- Charge the battery before use.
- Clean the terminals and the connection prior to installation. This prevents creeping current and guarantees an optimum electrical contact.

Motor-cycle batteries

Banner offers two differing battery technologies.

1. Lead-acid batteries
These batteries are of the standard lead-acid type, i.e. they can be opened for maintenance and then closed. This functional principle is the same as that used in car batteries.

2. MF - batteries ➔ (MF = Maintenance Free)
Maintenance-free batteries are sealed lead-acid batteries, i.e. the battery is closed following filling and may not be reopened. Opening destroys the battery!

For winter storage see page 12

Charging technology

Ideally, an electronic charging device should be used (Banner Acctiva and Selectiva or Banner Accugard). These devices complete charging automatically. Follow the device operating instructions!

In general, the following applies:

- Remove the battery from the vehicle or disconnect the battery cables (disconnect the negative terminal first!).
  WARNING! Without power, data in the vehicle computer, radio, etc. can be erased!
- Connect the positive terminal of the battery with the positive output of the charging device. Then repeat for the negative terminal.
- Only switch on the charging device following battery connection and only switch off after charging.
- Charged power: max. 1/10 in amperes of battery capacity.
- Interrupt charging at acid temperatures of over 55°C.
- Following charging, check the electrolyte level, and if necessary, top up with distilled water (to the mark or 1 cm above the plates).
- Ensure good ambient ventilation! An explosive hydrogen-oxygen gas mixture is created during charging. Smoking, open flames and sparks (e.g. due to a short circuit) are strictly forbidden!

WARNING! Only use approved starting cables. The electrolyte level is frequently very low due to the misuse of the battery. This must be corrected before charging (to the mark or 1 cm above the plates).

Charging condition

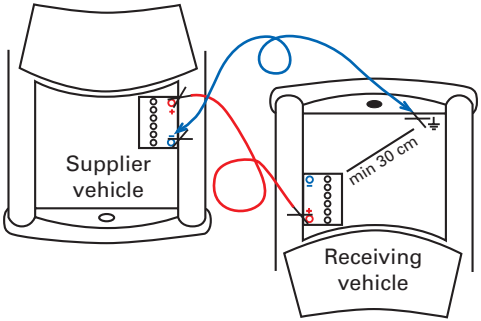
Acid density at 27°C	Charging condition	Off-load voltage(*) in a normal filled battery	Dry - Bull (reko) Gel, web (acid density cannot be measured)	Remarks
1,28 – 1,26	100 %	over 12,60 V per cell 2,10 V	> 12,92 V	ok
1,25 – 1,24	75 %	12,40 – 12,54 V per cell 2,07 – 2,09 V	12,86 – 12,74 V	ok
1,24 – 1,21	50 %	12,24 – 12,40 V per cell 2,04 – 2,06 V	12,66 – 12,54 V	from 50 % recharge immediately
1,18 – 1,13	25 %	11,88 – 12,18 V per cell 1,98 – 2,03 V	12,46 – 12,34 V	do not install in a vehicle
below 1,12	0 %	under 11,88 V per cell under 1,98 V	< 12,34 V	

(*) Off-load voltage = the battery voltage approx. 5 hours after the last charging or discharge procedure.

Assisted starting

WARNING! Only use standardised starting caples! Follow the instuctions contained in the vehicle operating manual!

- Only use batteries of the same rated voltage.
- Switch off the ignitions of both vehicles!
- First connect the positive terminals. Then attach a clamp to the negative terminal of the supplier vehicle. Afterwards, connect to the mass (empty space on the engine) of the receiving vehicle (at least 30 cm away from the battery).
- Do not start the engine of the supplier vehicle, as peak voltages can destroy the in-board electronics (follow the instructions contained in the vehicle operating manual).
- Start the engine of the receiving vehicle for a maximum of 15 sec.
- Detach the cables in the reverse order.



Possible causes of battery problems

Battery problems are frequently the result of defect, incorrectly set, or retrofitted electrical devices in the vehicle.

Untercharging
Due to a defective alternator, extremely short journeys, or too many power consumers. The battery is not fully charged and parts of the active mass are rendered inactive (sulphating). The consequences are a loss of capacity and reduced starting power.

Overcharging
Caused by a defective alternator regulator, platforms, or as a motive power battery. One indication of this problem can be the frequent burn out of headlight bulbs. This leads to very high water consumption and extreme electrode corrosion. The result is severe battery damage.

Strong cyclisation
Due to numerous deep discharge and charging cycles. Such loads do not generally occur under normal circumstances, unless the starter battery is used for other purposes, e.g. in taxis, for the operation of truck loading platforms, or as a drive battery (there are special batteries for these applications).

Unterdimensioning (of the battery)
Due to insufficient battery capacity. This results in increased cyclisation and battery damage. Can also be caused by excessive power consumption created by retrofitted devices (e.g. sound systems, mobile telephones, stationary heating)

Recombination batteries (sealed batteries with pre-determined electrolyte levels – "reco-batteries")

General information:
Recombination batteries represent a further development of the classic lead-acid battery. They employ a special technology to bind the electrolyte, thereby making it non-liquid.

Design of a recombination battery
The main characteristics are:
- A predetermined amount of electrolyte (gel or microporous glass nonwoven).
- Special electrode alloying (lead/calcium).
- Overpressure valves.

Recombination battery function
The oxygen and hydrogen gases created during charging can not escape via the safety valves. Instead they are recombined to form water inside the battery. The gases only leave the battery via the safety valves if the battery is highly overcharged.

Advantages of the "reco-battery"
- Absolutely maintenance-free.
- Secure against tipping and leakage.
- Excellent cyclicity resistance.
- Excellent deep discharge resistance

Charging technology for recombination batteries

„Reco“ technology requires specific charging techniques. Special, limited voltage charging devices must be employed.

The following applies for Banner Dry Bull batteries:

Cyclical operation:	**charging voltages between 14.1 and 14.4 V**
Constant charging:	**13.5 V (20°C) charging voltage**
Max. charging voltage:	**0.4 ampere (A) per Ah (battery capacity).**

WARNING! Recombination batteries must never be opened as this would destroy the battery!

Battery checks

The majority of defects can be recognised by measuring the voltage, the acid density or optical checks. Please note the following:

1. **Contaminated acid** (pump several times with the acid tester): Sludging of the active mass through strong cyclisation, overcharging, or severe vibration.
2. **Major acid density deviation in 1 or 2 cells:** Short circuits, leakage between two cells, or an interruption in the cell connection.
3. **Uniform low acid density following charging:** Parts of the active mass have sulphatised due to a long period of deactivation without charging.
4. **Peeling labels and high water consumption:** Battery was severely overcharged, or subjected to high temperatures.
5. **Smell of vinegar or petrol:** Battery was filled with alcohol or petrol.
6. **Melted terminal:** The battery has short circuited at the terminals (e.g. during connection in the vehicle, or with the charging device, using tools ...).

TIP: The acid tester is the battery „thermometer". When measuring the acid density, care must be taken that the acid tester float moves freely.

Terms of guarantee

Banner provides a warranty against material or production defects, which occur during the guarantee period. Expressly excluded from this warranty are normal wear, damage due to improper use and the opening of the battery. **The guarantee can only be met upon presentation of the battery subject to complaint and the purchase receipt.**

Warranty report explanation

1. **Determine the use of the battery.**
2. **Complete an optical check** for leaks and damage.
3. **Make a brief test of the battery with an electronic measuring device.**
   Decide whether a full examination should be carried out. Discharged batteries do not justify complaint!
4. **In the case of „check guarantee" display, have the battery examined by Banner staff, in order to assess whether a production defect, inappropriate use, or normal wear can be determined.** Measure the acid density, note the acid density and voltage, recharge empty batteries.
5. **Load test, subject to the voltage curve criterion.**
   - Should the voltage quickly fall below 9V = production defect.
   - Should the voltage fall steadily, but nonetheless too quickly to below 9 V = the battery is sulphated, undercharged or sludged. These are not justifiable causes for claims.

Zertificated quality
- ISO 9001
- QS 9000
- VDA 6.1

Battery-reclamationreport
Protokol o reklamaci
Akkumulátor-átvételi elismervény
Protokół reklamacyjny

THE POWER COMPANY

Nr.

Datum T T M M J J

Customer - Place / Zákazník - Místo / Vevő - hely / Klient - miejscowość:

Person in charge / Vyřizuje / Ügyintéző / Przyjmujący

B:

Customer N° / Číslo zákazníka
Vevő sz. / Numer klienta

Warranty time
Záruční doba
Garanciaidő
Okres gwarancji

Product code / Výrobní kód
Gyártási sz. / Kód produktu

Day of install / Datum montáže
Beszerelés dátuma / Data montażu T T M M J J

Article N° / Typ baterie / Cikk sz. / Artykuł nr.

Commodity / Příslušenství / Kereskedelmi áru / Akcesoria

1. Used as:
Použití:
Beszerelés:
Zamontowany w:

Correct using / Správné použití / Megfelelő beszerelés / Prawidłowe użycie

2. Optical check / Optická kontrola / Szemrevételezés / Kontrola optyczna

Leaky / Netěsní
Szivárog / Nieszczelny

Tight / Těsní
Zárt / Szczelny

Battery damaged / Poškození
Károsodás / Uszkodzenie

3. Test Midtronics

V

A

Unable to test
Test znemožněn
Elő. okkertelen
Pomiar niemożliwy

Charge + retest.
Nabíjí + testovat
Feltölt.és - el.
Naładować + ponowny test

Check warranty
Proverte záruku
Vizsgálja/el!
Sprawdź gwarancję

Good battery
Baterie dobrá
Akkumulátor ok
Akumulator dobry

Good + recharge
Dobrá + dobít
Akku jó, Feltölteni
Dobry + naładować

4. Voltage - acid density / Napětí - hustota elektrolytu / Feszültség - savsűrűség / Napięcie – gęstość elektrolitu

Reklamace uznávána
Reklamacja uwzględniona

Reklamace neuznávána
Reklamacja nieuwzględniona

Justified customer claim / Reklamace
Jogos reklamácia / Reklamácia

V

- 1 or 2 cells lower
- Hustota nižší v 1 nebo 2 článcích
- Savsúrüség 1, 2 cellában mélyebb
- Gęstość w 1 lub 2 celach niższa

1,10
1,24

1,25
1,28

- Highly varied measurement!
- Silné kolísajúci hustota kyseliny
- Erős savsúrüség ingadozás
- Silne wahania gęstości elektrolitu

Voltage + acid density after charging / Napětí a hustota kyseliny ponabití
Feszültség és savsúrüség töltés után / Napięcie + gęstość elektrolitu po naładowaniu

V

5. Test / Test / Terheléses vizsgálat / Test

A = ½ x K_5
A = 3 x K_{20}

A
A

30 min
60 sec

45 min
150 sec

60 min
180 sec

12 V
11 V
10 V
9 V
t

min
sec
-9V

- Guarantee
- Záruka
- Garancia
- Gwarancja

- Interruption
- Přerušení
- Szakadt
- Przerwa

- Short circuit
- 1_2 články plynují
- 1_2 cella pezseg
- Zwarcie

- Cells outgassed
- Bat._e sulfatizovány
- Akku vízuális
- Akumulator zasiarczony

- Battery de - only discharged
- Bat._e dobrá - byla jen vybitá
- Akku rendben - csak lemerült
- Akumulator dobry - był rozładowany

- Battery back to customer
- Baterii vrátit zákazníkovi
- Akku visszaa o vevőhöz
- Zwrot akumulatora do klienta

Remark. / Poznámka. / Megjegyzés / Uwagi

UF.Nr. / doklad č.

Stampe / Razítko / Pecsét / Pieczątka

Date / datum / dátum / data:

Tester / Zkoušku provedl
Vizsgálatot végző / Sprawdził

Date / datum / dátum / data:

Signature customer / Podpis zákazníka
Vevő aláírása / Podpis klienta

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