

Megapulse

What will it do for me?

Prevent battery problems.

MEGAPULSE is an electronic battery maintenance device that operates in conjunction with charging systems to keep your battery in peak operating condition. It will;

- Keep batteries at optimum operating condition
- Prevent possible problems with vehicle electronics.
- Provide quicker starts
- Prevent premature battery death
- Extend battery life
- Keep batteries in "like new" condition
- Care for the environment, reducing the number of batteries going into landfill
- Reduce the number of batteries you will discard in a lifetime
- Restore 100% battery capacity
- Reduce recharge time
- Saves time, money and problems

Major motor vehicle and fleet owners across the world are finding the same results from their independent tests. Major car manufacturers are currently testing pulse technology for installation in new vehicles.

Military forces around the world use pulse technology.

New Features

Built-in battery load test

The Built -in computer controlled battery load test will test your battery once every 6 hours and display the results as; Green LED for battery Ok or Red LED for check battery. The load test regime consists of the following:



1. The microprocessor measures the battery voltage and records the result
2. The microprocessor tests the battery with a 40 amp load for 100 milliseconds
3. The microprocessor measures the voltage at the end of the 100 milliseconds and compares it to the initial voltage
4. If the voltage drop is less than 2 volt the Green LED will glow
5. If the voltage drop is more than 2 volt the Red LED will glow.

The microprocessor onboard FAB also independently monitors the internal resistance of the battery and adjusts the pulse output to minimize desulphation time and maximize battery performance and life. Unlike other pulse products Megapulse therefore does not just pulse the battery and hope for the best but it constantly interacts with the battery and reports the results to the user

Sealed case design

Megapulse MK III is now water resistant so it can withstand engine washing and short river crossings.

Electronic dual activation switching

Megapulse MK III can be easily and quickly switched from low activation to high activation, simply place the supplied magnet (or any magnet) on the spot marked "magnet", once the LED confirms the action, remove the magnet. Unlike other pulse products, Megapulse can be used on all applications whether it is engine starting or auxiliary applications without the need to purchase a separate unit.

Where can I use Megapulse?

With any lead acid battery in any application!

With any type of lead-acid battery in any application!

Megapulse can be used in all Wet-Cell, Dry-Cell and Gel-Cell Lead-Acid batteries.

Megapulse is available in 6 volt, 12 volt, 24 volt, 36 volt and 48 volt models.

Any voltage battery bank can be conditioned because multiple units can be installed in series

Any size Ampere hour battery bank can be conditioned because multiple units can be installed in parallel

Megapulse is essential equipment for deep-cycle applications such as industrial, electric wheelchairs, electric scooters, lighting, fridges, motorhomes and camping applications where batteries are drained each time.

Megapulse is essential equipment for batteries that sit unused for lengthy periods of time, such as pleasure boats, agricultural equipment and back-up systems. In these applications, frequent new batteries are required as result of sulphation when MEGAPULSE can eliminate this problem forever.

For fleet owners the savings are enormous, with reduced downtime, reduced replacement costs and improved performance.

How does Megapulse work?

Prevention is the only cure.

During normal operation of lead-acid batteries, lead sulphate forms on battery plates. This process is called sulphation. During the process the sulphates expand and crystallise, choking the plates, reducing battery efficiency to the point where the battery will not accept a charge.

Sulphation build-up on battery plates is a common cause of battery failure. The technology of the MEGAPULSE battery conditioner reverses the process, cleaning the battery plates of lead sulphate build-up and returning the battery to near-new condition, reducing internal resistance and improving charge times, capacity and life.

It is the sulphur molecules in the electrolyte of the battery that transfer the energy between the negative and positive plates. When a sulphur molecule is totally discharged it will bond with the plate. This sulphation build-up produces an insulating barrier around the battery plates, preventing the desired process from occurring.

Pulsing a carefully controlled DC current back into the plates has been found to energise the sulphur molecules again, returning them to the electrolyte and back into active service.



2 Years use without Megapulse



2 Years use with Megapulse

Who is using Megapulse?

The following organisations are already benefiting from using Megapulse in their fleets;

Crown Fork Trucks AU -

www.crown.com/asia

EVT electric scooters -

www.evtworld.com

Prime Power -

www.primepower.se

AJ Maskin AS -

www.ajmaskin.no

Norsk Scania AS

www.scania.no

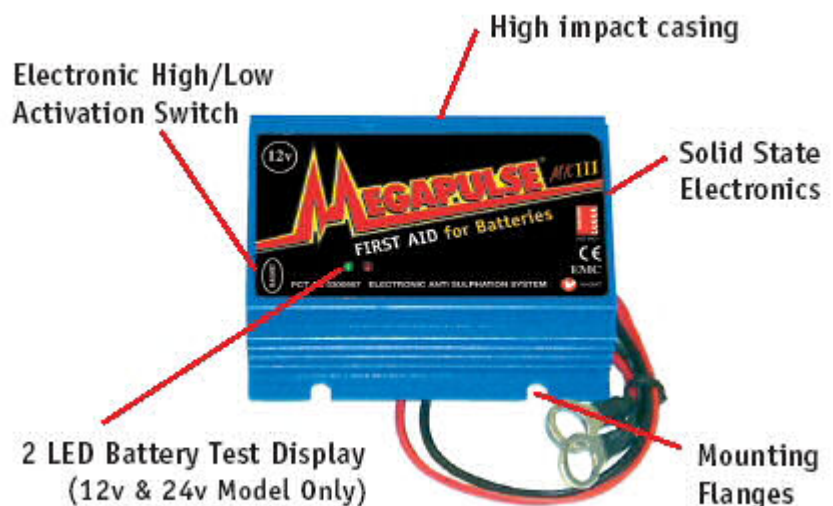
Ergopluss - www.ergopluss.no

Volvo Trucks - www.volvo.no

Bertel O Steen A/S - www.bos.no

JLG Sverige AB - www.jlg.se

Renault Trucks - www.renault-trucks.no



Technical Lead Acid Battery Information.

Batteries are the heart of any vehicle's electrical system. To understand why use of battery enhancement technology aids overall vehicle performance, it is important to understand the 3 functions of a battery

1. Supply power to the starter and ignition system so the engine can be started.
2. Supply extra power when the vehicle's load requirements exceed supply from the charging system.
3. Act as a voltage stabilizer in the electrical system, reducing temporary high voltages, which occur in the vehicle electrical system. These high voltages would damage solid-state components in the electrical system if it were not for the protection provided by the battery.

Battery plate sulfation occurs and increases every time your battery is used. It is part of the chemical reaction, which takes place in the battery. When a battery is sulphated, its voltage is depressed. The battery no longer meets the demands of the vehicle electrical system, and from an electrical perspective it "disappears". Electronic and electrical components then receive current directly from the alternator, and are subject to over-voltages. This results in premature failure of electronic components.

A lead acid battery is an electrochemical device, which stores chemical energy. This chemical energy is converted to electrical energy when the battery is connected to an external load such as a vehicle starter. The chemical energy is created by the chemical action between the materials which form the positive and negative plates of the battery, and the electrolyte:

Lead Dioxide (Pb O₂) Positive Plate
Sponge Lead (Pb) Negative Plate
Sulphuric Acid (H₂SO₄) Electrolyte.

A battery relies upon clean plates and strong electrolyte to receive charging current and offer discharge current. When the battery is connected to a load, the sulphate (SO₄) in the electrolyte combines with the active materials of the plates to form lead sulphate (PbSO₄) and release electrical energy. Electrons flow from the negative terminal to the load and back to the positive terminal of the battery.

The Battery specific gravity (ie. the unit of measurement of the sulphuric acid content of the electrolyte) of a fully charged 12-volt battery is 1.300 at 26.7 deg C. This means that the sulphuric acid of a fully charged battery is 1.3 times heavier than pure water. As a battery becomes discharged, the strength of the specific gravity decreases because sulphur is leaving the electrolyte as it forms lead sulphate which adheres to the battery plates

State of Charge Specific Gravity Voltage (12V battery)

State of Charge	Specific Gravity	Voltage (12V battery)
100%	1.300	12.84
75%	1.250	12.50
50%	1.200	12.20
25%	1.155	11.90
Discharged	1.120	11.00

Thus by the time the battery is discharged, the acid becomes dilute as the sulphur has adhered to the plates of the battery as lead sulphate crystals. When a discharged battery is recharged, the chemical processes within the battery operate in reverse. The majority of the sulphate leaves the plates of the battery and returns to the electrolyte. However, a residue of sulphate remains on the plates of the battery. The quantity of this residue increases with each charge/discharge cycle of the battery. Over time, the battery plates become coated with an insulating layer of sulphate and the electrolyte is

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weakened because of the loss of Lead Sulphur from the solution. Both these factors serve to inhibit the electron transfers and thus the energy producing function of the battery.

Over time the sulphate deposits on the plates become hard and crystalline. When in this condition, plates will not accept a charge under normal conditions, and the accumulation of lead sulphate may cause short circuits during recharging or other mechanical damage to the battery. Often, hairline cracks appear in the plates causing open circuit conditions.

When a lead acid battery discharges or remains inactive, lead Sulphate forms on the battery plates. Over a short period of time, sulphate gradually accumulates and crystallizes clogging the plates to the point where the battery will not accept or hold a charge. This process, known as sulphation happens to all lead acid batteries in all application. It is the leading cause of battery failure. Megapulse technology reverses sulphate accumulation in all lead batteries and it prevents sulphation from ever developing in new batteries. By pulsing a carefully controlled DC current into the battery, it re-energizes crystallized sulphates deposited on the plates and returns them to the electrolyte as active sulphur molecules. With the plates kept clean, batteries will provide more power, faster recharge and longer battery life.

Batteries commonly fail because of sulphation. Sulphation occurs when a battery is discharged. The deeper the discharge, the more serious the sulphation. A battery relies on clean plates and strong electrolyte to both receive charging current and offer discharge current. A Sulphated battery can do neither. Sulphation also occurs when batteries are in an undercharged state. Battery theory states that cell voltage should read 2.45 volts per cell (i.e. 14.7 volts in the case of a 12 volt battery) from time to time to allow the negative plate to "form". If this does not occur, the negative plate remains mushy and subject to erosion from motion, vibration, etc. In automotive systems, alternators seldom exceed 14.2 volts. Battery theory states that 12-volt batteries must receive a minimum of 14.1 volts to maintain a charged state.

What our customers are telling us



These are excerpts from letters we have received from customers telling us of their experiences using Megapulse. We keep all testimonials on file.

P. Gray , Australia

Murray Goulburn Milk Factory, Victoria - I received a Megapulse two years ago when I purchased an ERPS rust system. So, not necessarily really wanting a Megapulse, I skeptically thought I would test it out in the company workshop on a battery that had been lying out in the weather by the fence for about a year. After about a month the Company mechanics put a load test on the battery and they were surprised at the results. So we all skeptically thought we would disconnect the charger and give it a further load test the next day, and the result was very good. So we put the battery in the next diesel truck that needed a battery. And we did that about 10 months ago and it still starts the truck as good as any other truck, each day - and don't forget, it's really cold down here in the Gippsland in winter.

Trevor Hirn , Australia

Forklift – Gutless! We have an electric (battery operated) fork-lift which we use to load and unload carpets. Even though we charged the batteries every night, we would still run out of power during the day Our Auto Electrician recommended new batteries at a cost of about \$4,500. But I thought a Megapulse battery maximizer at a bit over \$100 may be a better investment. Two Years Later... The forklift still goes but now with PLENTY of GRUNT even on those old batteries. The batteries hold so much power now that we only put the charger on ONCE a WEEK, even though we are much busier than 2 years ago. The Megapulse could easily be the best investment I have made. You get the benefit of much more available power in your batteries almost immediately.

Peter Roper, Australia

I bought a Megapulse June 2003. I was going to replace a 5 year old car battery, which showed a specific gravity on all cells of around 11.75. Today, nearly 2 years later, this same battery is still soldiering on, the specific gravity is 12.00 on one cell and 12.5 on the others! In my view there is no doubt its life has been prolonged by using Megapulse.

Fred Shead , Australia

Batteries costing only \$10.00 but lasting 3 years!

Fred was skeptical of claims made about the Megapulse. Whilst he was at the Margate rubbish dump in Tasmania, he saw **several scrap batteries**. He asked the attendant **how much the batteries were**, and to his surprise they were only **\$2.00 each**. So Fred took **\$10 worth**, he selected 5 similar sized batteries which he took home. Fred installed 4 of the batteries in his motor home, AND guess what; **it took 3 years with the Megapulse** happily pulsing away **before 2 of the 4 batteries died**. Think about that - **3 years of battery life for \$10.00** plus 1 Megapulse. Fred sells the Megapulse now.

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Anna Fizzanotti, Spain

I am using Megapulse on a solar system where the batteries (two 4-year-old automotive batteries) were hardly responding to load. Megapulse has somewhat restored the batteries to a state close to new, in 3 to 4 months. It is really impressive. I knew about your product but I did not think it would restore old batteries.

Terence Hillard, Queensland..

Before fitting a Megapulse the most charge my batteries would accept was 29 Ah per day. 2 weeks after fitting megapulse, the same batteries were accepting 42 Ah per day. Removing the sulfation with Megapulse means I don't need to buy extra batteries, as I can get more out of the bank I now have, I now get 3 extra hours a day of Television.

Les Cosgrove, NSW

I have 3 Megapulse in use on my yacht and campervan and I assure you I am very happy with their performance.

Ian Spicer, QLD

I think Megapulse is super. It has brought back to life two batteries in my boat. I swear by it.

Ray Clegg, NSW

I thought megapulse was a gimmick, but within 2 weeks it has revived 2 batteries I was going to throw away.

Ron Hollywood, QLD

My outlay of \$99 saved me from spending \$540 on 3 new batteries for my motorhome.

Bruce Williams, QLD

My 2 year old and 5 year old batteries have never been so healthy. My diesel cranks like mad now.

Calvin Whitford, QLD

Two and a half years on and my battery was dying again. Imagine my surprise when after only 2 weeks with Megapulse my battery was cranking again.

Philip Barlow, VIC

I am thrilled with Megapulse. Within 3 months it has restored life to a 4 year old battery that was left in an over-discharged state and a 7 year old battery which was showing signs of dying.

L. McVarney, VIC

I am an auto electrician so I was keen to test Megapulse. I installed it on a battery which was severely over-discharged and would not accept charge. It took only 3 weeks to restore it to 100%.

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Graeme Skopal, QLD

I am an electrical engineer, I design remote area power systems. When a system I installed with used batteries began failing after only 9 months I gave Megapulse a try. It was an incredibly cheap fix as a new set of batteries would have cost \$12,000.

Graeme Reiffel, QLD

I am the biggest cynic in the world but I must say Megapulse really works. It rejuvenated my four 16 year old batteries in my motorhome. They now come up to full charge every day.

Geoff Gentil, Shipwright, Brisbane.

I aquired two large Vetus LM380D sealed lead acid batteries which had been condemned by my sparkies as not holding a charge. These batteries were only two years old, but because they had very little use they had sulfated up to the point they were unuseable.

I linked up the batteries in parallel and connected a megapulse unit.

My tests proved that the batteries are now back to full capacity and I will be reccomending your Megapulse units to my customers. Thankyou for your excellent product.