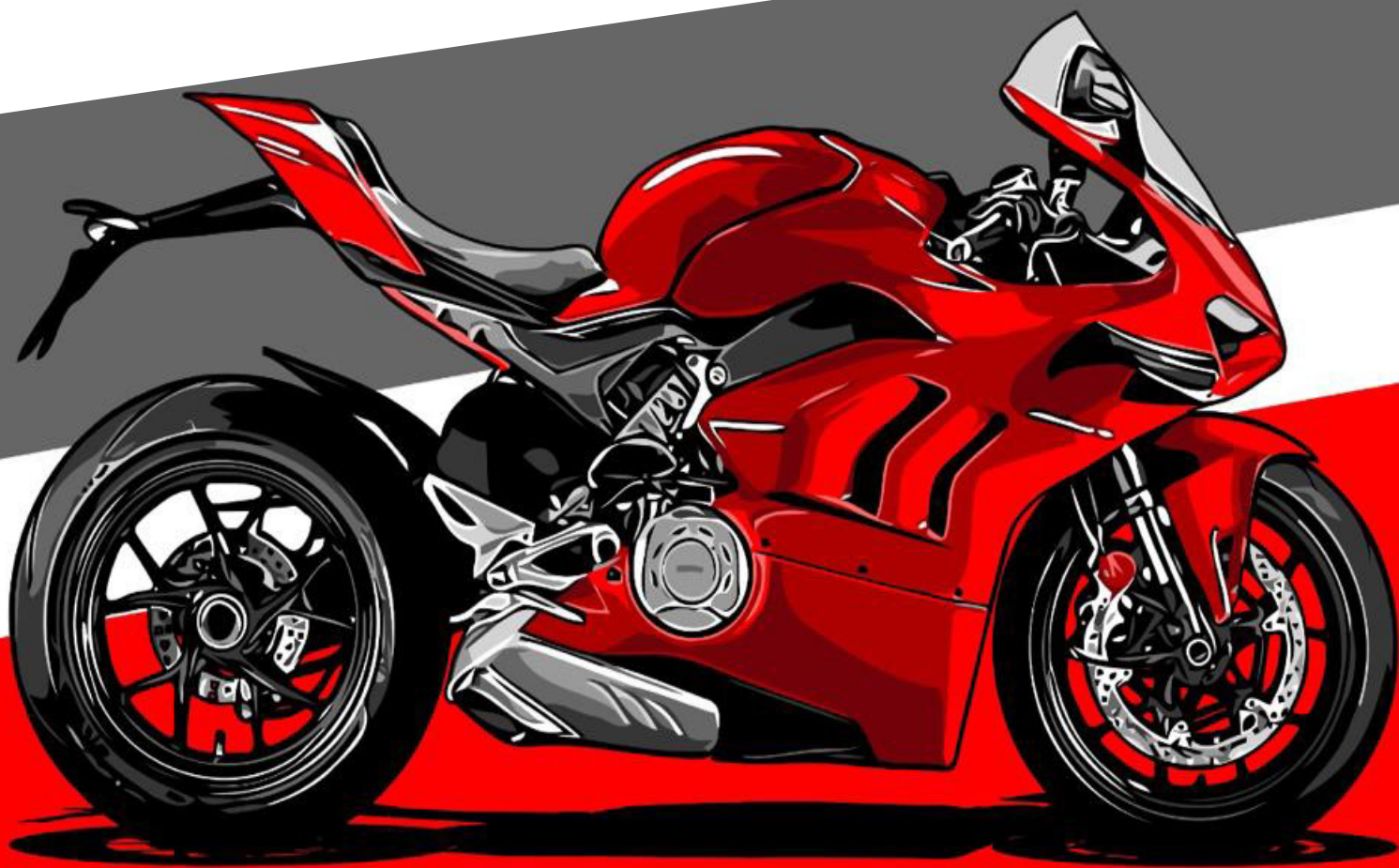


# ST RMAX



## **MOTORCYCLE & POWERSPORT BATTERIES**

FACTORY ACTIVATED, AGM MAINTENANCE FREE, ABS CASE

The world's leading battery brand



[www.starmaxbatteries.com](http://www.starmaxbatteries.com)

# Starmax Factory Activated, AGM Maintenance Free, ABS Case

Starmax Motorcycle and Powersport batteries are engineered to deliver Maximum performance, ultimate reliability, and longer life. They are tougher and more durable for demanding Powersport Applications.

## Designed and Engineered with Performance in Mind



# Factory Activated, AGM Maintenance Free, ABS Case

Starmax factory activated series uses ABS material, provides 12V batteries, with capacity ranges from 2.3Ah to 19Ah.



## Application

- ✔ Motorcycle
- ✔ ATV
- ✔ Snowmobile
- ✔ Lawn & Garden
- ✔ UTVs
- ✔ Scooters
- ✔ Jet Skis

## Special Features

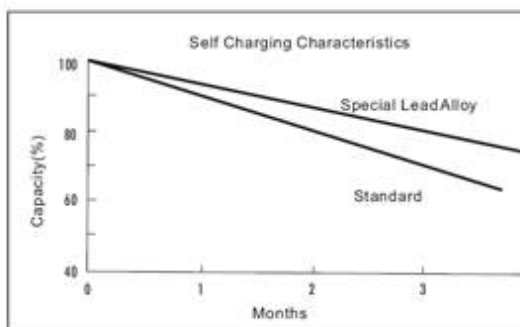
- ✔ 100% maintenance free, sealed battery, leak proof design
- ✔ Using AGM separator, absorbing acid effectively, and has excellent starting performance and vibration resistance
- ✔ Using lead-calcium alloy, with less water loss
- ✔ Using ABS material and glue sealing technology
- ✔ Using COS welding and TTP welding technology to reduce internal resistance and improve discharge performance
- ✔ With acid filled, easy to use

# SPECIFICATIONS

Model	Voltage (V)	Capacity (10hr) Ah	CCA (-18°C)	Approx. Dimensions						Weight	Terminal Type
				(±2mm)			(±1/16in)				
				L	W	H	L	W	H	kg	
ST4A-5	12	2.3	30	113	48	85	4 4/9	1 8/9	3 1/3	0.96	I
ST4B-5	12	2.3	30	113	38	85	4 4/9	1 1/2	3 1/3	0.91	J
ST2.5-3-2	12	2.5	20	80	70	105	3 1/7	2 3/4	4 1/7	1.04	/
ST3-3	12	3	30	98	56	110	3 6/7	2 1/5	4 1/3	1.20	B
ST4-3-2	12	3	50	113	70	85	4 4/9	2 3/4	3 1/3	1.36	A
ST4-3-2(J)	12	3	40	113	70	85	4 4/9	2 3/4	3 1/3	1.25	A
ST4A-3	12	4	55	120	70	92	4 5/7	2 3/4	3 5/8	1.59	A
ST5-3-2	12	4	70	113	70	105	4 4/9	2 3/4	4 1/7	1.78	A
ST5-3-2(J)	12	4	55	113	70	105	4 4/9	2 3/4	4 1/7	1.64	A
ST5A-3-1	12	5	75	120	60	130	4 5/7	2 1/3	5 1/8	1.90	B
ST5A-3-1(J)	12	5	55	120	60	130	4 5/7	2 1/3	5 1/8	1.76	B
ST6.5-3	12	6.5	85	139	66	102	5 1/2	2 3/5	4	2.30	B
ST6.5-3(J)	12	6.5	70	139	66	102	5 1/2	2 3/5	4	2.18	B
ST7-3-2	12	6	85	113	70	130	4 4/9	2 3/4	5 1/8	2.29	A
ST7-3-2(J)	12	6	70	113	70	130	4 4/9	2.76	5 1/8	2.10	A
ST7D-3	12	7	90	146	60	130	5 3/4	2 1/3	5 1/8	2.40	B
ST7D-3(J)	12	7	75	146	60	130	5 3/4	2 1/3	5 1/8	2.10	B
ST7D-4	12	7	90	146	60	130	5 3/4	2.36	5 1/8	2.40	B
ST7D-4(J)	12	7	75	146	60	130	5 3/4	2.36	5 1/8	2.27	B
ST7E-4	12	7	90	135	75	122	5 1/3	2.95	4 4/5	2.75	B
ST7E-3	12	7	90	135	75	122	5 1/3	3	4 4/5	2.75	B
ST9A-3	12	9	100	135	75	139	5 1/3	3	5 1/2	3.05	B
ST9A-4	12	9	100	135	75	139	5 1/3	3	5 1/2	3.05	B
ST9A-4(J)	12	8.5	70	135	75	139	5 1/3	3	5 1/2	2.85	B
ST9A-4-PW	12	9	100	135	75	154	5 1/3	3	6	3.10	B

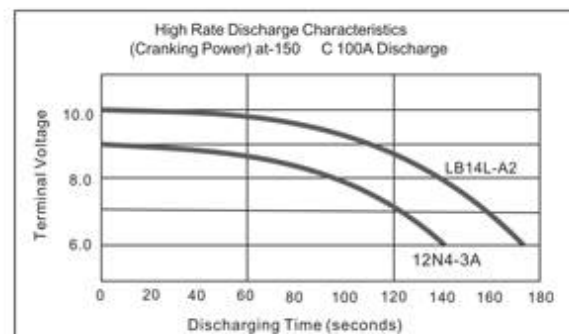
## LOW SELF-DISCHARGE

Self discharge occurs when batteries slowly lose charge when not in service. With the use of special lead alloy grids, self discharge is minimal and the batteries maintain their state-of-charge.



## GREATER TERMINAL VOLTAGE

At lower, batteries can supply greater terminal voltage over a longer period of time than conventional batteries as shown below.



# Why do Batteries Fail?

BATTERIES HAVE A FINITE LIFE, DETERMINED BY THE APPLICATION AND THE OPERATING CONDITIONS. BATTERY FAILURE CAN BE ATTRIBUTED TO VARIOUS FACTORS, HOWEVER THE CAUSES OF FAILURE FALL UNDER TWO DISTINCT CATEGORIES: MANUFACTURING AND NON-MANUFACTURING FAULTS.



## Manufacturing Faults

### » *Internal Short Circuit/Dead Cell*

This is when contact is made between the positive and negative plates causing a cell to discharge, resulting in a drop in voltage and battery failure.



## Non Manufacturing Faults

### » *Wear and Tear*

As a battery ages, grid metal corrodes and active material is lost from the plate. Over time this leads to a point where the battery will no longer be able to start a vehicle. High temperature will accelerate degradation rates.

### » *Physical Damage*

Incorrect fitment, handling and storage often leads to external damage and subsequent battery failure. Examples include over tightening the terminal leads or battery hold down bracket and dropping or knocking the battery casing.

### » *Incorrect Application*

Fitting a smaller, lower capacity battery or a battery designed for another application can lead to early failure.

### » *Lack of Maintenance*

Failing to regularly maintain the battery's state of charge, fluid levels or terminal connections will accelerate battery failure.

### » *Undercharging*

Lead acid batteries must be kept charged at all times. The leading cause of early battery failure comes from undercharging. Prolonged undercharging from short journeys and stop-start driving can cause plate sulphation and acid stratification which reduce battery life.

### » *Overcharging*

Excessive voltage and current is the primary cause of overcharging. This can happen due to a faulty charging system or if the charging output is not compatible with the battery. Temperature can also increase the chances of overcharging, especially when the battery is inadequately ventilated in a constant high temperature environment.

### » *Over Discharge*

A battery being discharged to 100% of its capacity regularly will cause permanent damage to the internals of the battery.

### » *Vibration*

Batteries installed in applications that are exposed to high levels of vibration from moving equipment, uneven road conditions, insecure fitment or engine harmonics can be detrimental to the life of the battery. It is important to install a battery that is designed to handle these conditions.

### » *Exposure to High Temperatures*

As the temperature increases, so does the chemical reaction inside the battery, leading to an increased rate of corrosion. High temperature increases gassing & water loss in the battery, leading to further self-discharge. Batteries in high temperature environments need to be well ventilated and have temperature compensation to reduce the output as the temperature rises, to avoid overcharging.

# Factors Affecting Battery Life

AS BATTERIES OPERATE AND AGE, THEY GRADUALLY LOSE THEIR CAPACITY. THE CONSTANT CHARGE AND DISCHARGE PROCESS EVENTUALLY LEADS TO FAILURE. COMPONENTS CORRODE OVER TIME, ELECTRICAL SHORTS OCCUR AND VIBRATION CAUSES DAMAGE; EVENTUALLY CAUSING FAILURE. OVERCHARGING AND UNDERCHARGING A BATTERY WILL ALSO HAVE A BEARING ON BATTERY LIFE.



## Early Warning Signs

Batteries often fail when least expected, this can be avoided with regular battery testing. Time plays a key indicator, too often motorists hold off replacing the battery and end up inconvenienced by a roadside breakdown. Typical warning signs include a slower than normal ability to crank the engine. Other less noticeable factors, such as changed driving patterns and colder/hotter weather will all have an affect on the life of a battery. Regular battery testing can identify suspect batteries before they fail and avoid the inconvenience of a roadside breakdown.



## Battery Inspection

Taking good care of a battery can significantly extend its service life and prevent early battery failure. (Refer to page 140 for battery care and maintenance advice).



## Discharged (flat) Batteries

A voltage below 12.5V for 12V batteries or 6.2V for 6V batteries or a low specific gravity reading of 1.240 or less in all cells indicates a discharged battery and it must be charged before further examination and testing can occur. The discharged condition may be due to the battery not being used for an extended period of time or a problem in the electrical system. Internal shorts may also be due to manufacturing defects, the ageing process or vibration damage.



## Useful Tips

- » Many alleged 'dead batteries' are merely flat batteries.
- » Ensure the battery is properly tested before replacing it.
- » Old batteries can give trouble in colder weather
- » It is difficult to know exactly when a battery might fail. A slow starting engine is sometimes an indication.

# Battery Care & Maintenance\*

REGULAR TESTING AND INSPECTION WILL HELP TO MAXIMISE BATTERY LIFE. A ROUTINE INSPECTION AT LEAST ONCE A MONTH IS RECOMMENDED TO MAINTAIN OPTIMUM PERFORMANCE.

## Use the following as a guide when examining the battery:



**1.** Make sure the battery is always fully charged. (Refer to page 146-147 for battery charging advice)

**2.** Ensure the battery top is clean, dry and free of dirt and grime. A dirty battery can discharge across the grime on top of the battery casing.



**3.** Inspect battery terminals, screws, clamps and cables for breakage, damage or loose connections. They should be tight, clean and free of corrosion.

**4.** Clean terminals, clamps and connectors as necessary using a grease cutting solution.

**5.** Inspect case for obvious signs of physical damage or warpage. This usually indicates the battery has overheated or been overcharged.



**6.** Check the vent tube is not kinked, pinched or otherwise obstructed.

**7.** If you have a maintainable battery, it is important to check if the battery has sufficient electrolyte covering the battery plates. If topping up is required, do not overfill as the fluid levels will rise when the battery is fully charged and may overflow. Top up using distilled or demineralised water and never fill with sulphuric acid.



**8.** For batteries used in seasonal applications and stored long term, fully recharge the battery prior to storing. Check the state of charge or voltage regularly. Should the voltage drop below 12.5V for 12V batteries or 6.2V for 6V batteries, recharge the battery. It is important to check the battery completely before reconnecting to electrical devices.

**9.** Test battery using either a hydrometer, voltmeter or digital tester and charge if necessary.

# Battery Health & Safety#

REGULAR TESTING AND INSPECTION WILL HELP TO MAXIMISE BATTERY LIFE. A ROUTINE INSPECTION AT LEAST ONCE A MONTH IS RECOMMENDED TO MAINTAIN OPTIMUM PERFORMANCE.



## **Battery Acid**

» Battery acid can cause burns. Suitable hand, eye and face protection and protective clothing must be worn.



## **If it is Necessary to Prepare Electrolyte**

» Always add concentrated acid to water – never water to acid. Store electrolyte in plastic containers with sealed cover. Do not store in the sun.



## **First Aid**

» For advice, contact the poisons information centre (phone 13 11 26 in Australia) or a doctor immediately. If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by poisons information centre or doctor, or for at least 15 minutes.



## **Exploding Battery**

» Batteries generate explosive gases during vehicle operation and when charged separately. Flames, sparks, burning cigarettes or other ignition sources must be kept away at all times. Exercise caution when working with metallic tools or conductors to prevent short circuits and sparks.



» If skin or hair contact occurs, remove contaminated clothing and flush skin or hair with running water.



## **Always Wear Eye Protection When Working Near Batteries**

» When charging batteries, work in a wellventilated area — never in a closed room.



## **Acid Spill Response**

» Bund and neutralise spills with soda ash or other suitable alkali. Dispose of residue as chemical waste or as per local requirements.

» Always turn battery charger or ignition off before disconnecting a battery.\*

## **If Electrolyte is Swallowed**

» Do NOT induce vomiting — give a glass of water. Seek immediate medical assistance.



**CORROSIVE**





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