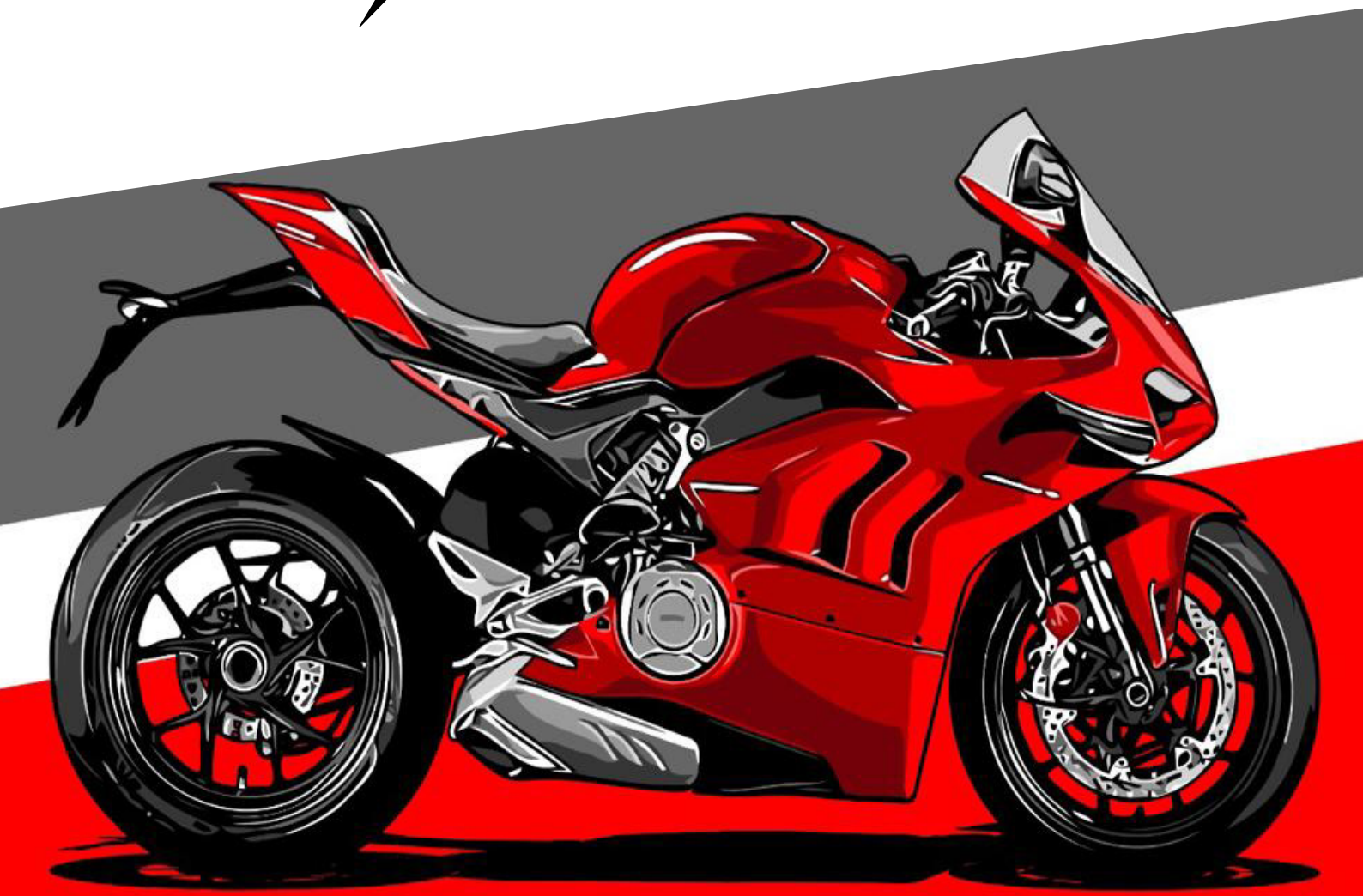
STARMAX



MOTORCYCLE & POWERSPORT BATTERIES

AGM MAINTENANCE FREE - 12VOLT

The world's leading battery brand

www.starmaxbatteries.com

Starmax AGM Maintenance Free - 12volt

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

Starmax AGM Maintenance Free Battery

Starmax PP/Dry Series(MF), Dry Charged AGM VRLA Maintenance Free type --PP case, Battery terminal setting into battery cover.

Application

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

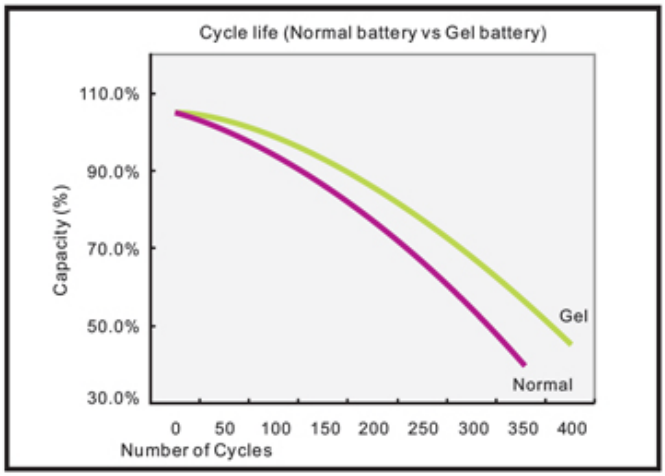
Special Features

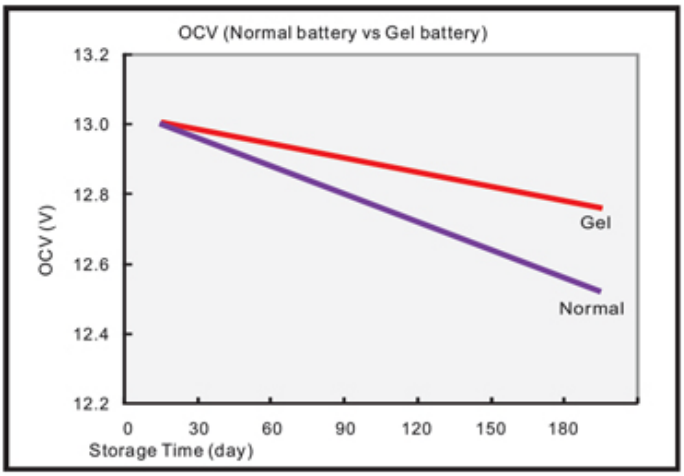
- Injection molding structure of battery terminal and battery cover.
- Sealing structure of PP materials.
- High capacity ,Long life.
- High CCA and good starting performance.
- Good charging acceptance and vibration resistant performance.
- Application of AGM technology.
- Application of COS and TTP.
- Advanced sulfate-resistant technology.
- Advanced calcium lead alloy technology, maintenance-free design.
- Dependable design of leakage resistant and valve regulated sealing.
- Dry charged design, long storage time and can be used at any time you want.
- Full ranges models, good appearance and high standard design.

SPECIFICATIONS

Model	Nominal Voltage (V)	Rated Capacity C10 (AH)	CCA (-18°C)	Approx. Dimensions						Appox. Weight	Terminal Type
				(±2mm)			(±1/16in)				
				L	W	H	L	W	H	kg	
STX4A-BS	12	2.3	30	113	48	85	4 4/9	1 8/9	3 1/3	0.99	A
STX4B-BS	12	2.3	30	113	38	85	4 4/9	1 1/2	3 1/3	0.92	A
STX4L-BS	12	3	50	113	70	85	4 4/9	2 3/4	3 1/3	1.39	A
STX4L-BS(J)	12	3	40	113	70	85	4 4/9	2 3/4	3 1/3	1.31	A
STX5L-BS	12	3.5	50	113	70	85	4 4/9	2 3/4	3 1/3	1.39	A
STX4.5L-BS	12	4	55	113	70	85	4 4/9	2 3/4	3 1/3	1.51	A
STX5L-BS	12	4	70	113	70	105	4 4/9	2 3/4	4 1/7	1.83	A
STX5L-BS(J)	12	4	5	113	70	105	4 4/9	2 3/4	4 1/7	1.67	A
STX7L-BS	12	6	90	113	70	105	4 4/9	2 3/4	4 1/7	2.14	A
STX7L-BS	12	6	85	13	70	130	4 4/9	2 3/4	5 1/8	2.36	A
STX7L-BS(J)	12	6	70	113	70	130	4 4/9	2 3/4	5 1/8	2.17	A
STX7A-BS-I	12	6	100	150	87	93	6	3 3/7	3 1/3	2.29	A
STX7B-BS	12	6.5	90	150	66	93	6	2 3/5	3 1/3	2.29	A
STX7B-BS(J)	12	6.5	70	150	66	93	6	2 3/5	3 1/3	2.15	A
STX9-BS	12	8	120	150	87	105	6	3.43	4 1/7	3.04	A
STX9-BS(J)	12	8	100	150	87	105	6	3 3/7	4 1/7	2.85	A
STX9A-BS	12	9	100	135	75	139	5 1/3	3	5 1/2	3.10	A
STX9A-BS(J)	12	8.5	70	135	75	139	5 1/3	2.95	1/2	2.87	A
STX9A-BS-1	12	9	100	135	75	139	5 1/3	2.95	5 1/2	3.08	B
STX9B-BS	12	8	115	150	70	105	6	2.76	4 1/7	2.78	A
STX9B-BS(J)	12	8	95	150	70	105	6	2 3/4	4 1/7	2.60	A
STX10-BS	12	8.6	150	150	88	93	6	3 1/2	3 1/3	3.11	A
STX12-BS	12	11	210	150		10	6	3 1/2	1/3	3.78	A
STX2-BS(J)	12	11	170	150	88	110	6	3 1/2	4 1/3	3.59	A
STX14-BS	12	12	220	150	88	110	6	3 1/2	4 1/3	3.80	A
STX12-BS	12	10	180	150	87	130	6	3 3/7	5 1/8	3.86	A
STX12-BS(J)	12	10	130	150	87	130	6	3 3/7	5 1/8	3.58	A
STX12A-BS	12	10	145	150	88	105	6	3 1/2	4117	3.29	A
STX12B-BS	12	10	165	150	70	130	6	2 3/4	5 1/8	3.55	A
STX12B-BS(J)	12	10	120	150	70	130	6	2 3/4	5 1/8	3.36	A
STX14L-BS	12	12	200	150	87	145	6	3 3/7	5 5/7	4.37	A
STX4L-BS(J)	12	12	160	150	87	145	6	3 3/7	5 5/7	4.06	A
STX14-BS	12	12	200	150	87	145	6	3 3/7	5 5/7	4.37	A
STX14-BS(J)	12	12	160	150	87	145	6	3 3/7	5 5/7	4.06	A
STX4B-BS	12	12	175	150	70	145	6	2 3/4	5 5/7	4.11	A
STX4B-BS(J)	12	12	150	150	70	145	6	2 3/4	5 5/7	3.09	A
STX14AHL-BS	12	12	210	133	90	164	5 1/4	3 1/2	6 1/2	4.42	A

STX14AHL-BS(J)	12	12	170	133	90	164	5 1/4	3 1/2	6 1/2	4.24	A
STX14AH-BS	12	12	210	133	90	164	5 1/4	3 1/2	6 1/2	4.42	A
STX14AH-BS(J)	12	12	170	133	90	164	5 1/4	3 1/2	6 1/2	4.24	A
STX14AH-BS-PW	12	12	210	133	90	174	5 1/4	3 1/2	6 6/7	4.47	A
STX16-BS	12	14	230	150	87	161	6	3 3/7	6 1/3	4.99	A
STX20L-BS	12	18	270	175	87	155		3 3/7	6 1/9	5.94	A
STX20L-BS(J)	12	18	240	175	87	155	6 8/9	3 3/7	6 1/9	5.62	A
STX20-BS	12	18	270	175	87	155	6 8/9	3 3/7	6 1/9	5.94	A
STX20-BS(J)	12	18	240	175	87	155	6 8/9	3 3/7	6 1/9	5.62	A
STX20HL-BS	12	18	310	175	87	155	6 8/9	3 3/7	6 1/9	5.94	A
STX20H-BS	12	18	310	175	87	155	6 8/9	3 3/7	6 1/9	5.96	A
STX20CH-BS	12	18	230	150	87	161	6	3 3/7	6 1/3	5.53	A
STX30L-BS	12	30	385	166	126	173	6 1/2	5	6 4/5	9.48	A





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 under-charging 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 maintainance 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.

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.

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

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.

If Electrolyte is Swallowed

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

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.

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.

Always Wear Eye Protection When Working Near Batteries

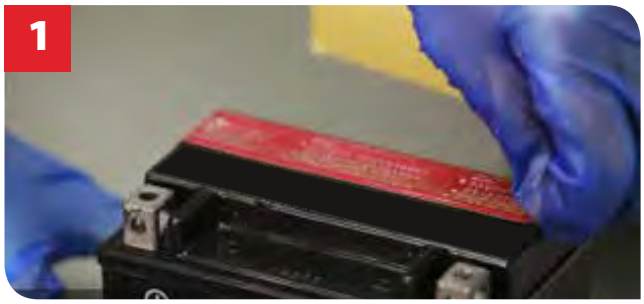
» When charging batteries, work in a wellventilated area — never in a closed room.

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

Battery **Activation**

The following steps outline the procedures for activating Starmax Maintenance Free AGM batteries:

1



1. Remove foil strip which runs across the top of the battery filling reservoir.

2

2. Remove electrolyte from safety bag and remove strip of caps. **IMPORTANT:** Do not discard this strip as it acts as the battery sealing plug and is required later. Do not attempt to separate the individual electrolyte cells.

3

3. Place electrolyte container, sealed top of the cells down, into the filler ports of the battery and push down to break the seals. Ensure the electrolyte container is kept in an upright position during this process.

4

4. Ensure container completely empties. If no air bubbles are coming from the filler ports or if container cells haven't emptied, tap the container a few times. Do not remove the container until it is empty.

5

5. Remove container and allow battery to stand for a minimum of 1 hour to allow the electrolyte to permeate into the plates.

6

6. Loosely replace the cap strip (as referred to in step 2) over the filling holes. Do not press down firmly or lock this into position at this stage.

7

7. Charge your battery according to the instructions printed on the battery and outlined on pages 146-147.

8

8. After charging is complete, press the cap strip firmly into the cap seats. It will click when correctly in place. Do not pound or hammer into place. I**MPORTANT:** Never remove the cap strip or add water or electrolyte to the battery during its service life.

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