

TRANSPORTATION



 **Trojan**[®]
BATTERY COMPANY
Clean energy for life™



EXPERTISE YOU CAN TRUST

WHEN IT COMES TO HEAVY DUTY TRUCKING AND COMMERCIAL VEHICLE APPLICATIONS DOES CHOOSING THE RIGHT BATTERY REALLY MAKE A DIFFERENCE? AFTER ALL, AREN'T ALL HEAVY DUTY TRUCK BATTERIES THE SAME?

TECHNOLOGICAL ADVANCES IN OEM MANUFACTURED PRODUCTS, INCREASED ANTI-IDLING REGULATIONS AND THE NEED FOR TIGHTER COST MANAGEMENT MEANS GETTING THE MOST OUT OF YOUR BATTERY IS EVEN MORE IMPORTANT THAN EVER. AT TROJAN BATTERY COMPANY WE BELIEVE THAT SELECTING THE RIGHT BATTERY DOES MAKE A DIFFERENCE TO THE PERFORMANCE OF YOUR APPLICATION AND TO YOUR BOTTOM LINE. WE UNDERSTAND THE IMPORTANCE OF GETTING THE MOST OUT OF YOUR BATTERY WHICH IS WHY WE HAVE DEDICATED OVER 85 YEARS TO NOT ONLY MANUFACTURING THE HIGHEST QUALITY, LEAD ACID BATTERIES BUT ALSO TO ENGINEERING THE RIGHT BATTERY FOR THE RIGHT APPLICATION.



The Right Battery the Right Application

APU and HVAC Systems

State and local emissions legislation has stimulated the need for idle elimination technologies that allow drivers to meet their heating and air conditioning (HVAC) needs without truck idling. Battery-based auxiliary power unit (APU) systems are quickly becoming the preferred technology. The energy requirements and extended time to power these systems during key off periods require a battery with the deep cycling capabilities not found in conventional starting or dual-purpose type batteries. The Trojan OverDrive™ AGM 31 is the only deep cycle battery exclusively engineered for these APU technologies.



Liftgate Systems

Operating under extreme conditions with continuous deep discharge and recharge of the batteries, heavy duty and severe-duty liftgate applications require rugged, deep-cycle batteries that can withstand the rigors of continuous use. For straight truck and tractor/trailer liftgate applications that operate under these conditions, the Technology and Maintenance Council's RP754 recommends Group 31 AGM batteries. The Trojan OverDrive™ AGM 31 delivers the rugged durability and deep cycling capabilities for liftgate applications.



Heavy Duty Truck, Commercial Vehicle and Refrigeration Units

Consider for a moment the extreme environments and rugged applications heavy duty starting batteries must endure to provide consistent, reliable performance. In rigid cold or sweltering heat drivers must rely on a starting battery that can deliver the cranking power needed in these extreme environments. The Trojan TransPower™ ST1000 is designed to deliver exceptional cranking power and optimum performance.



OVERDRIVE™ AGM 31

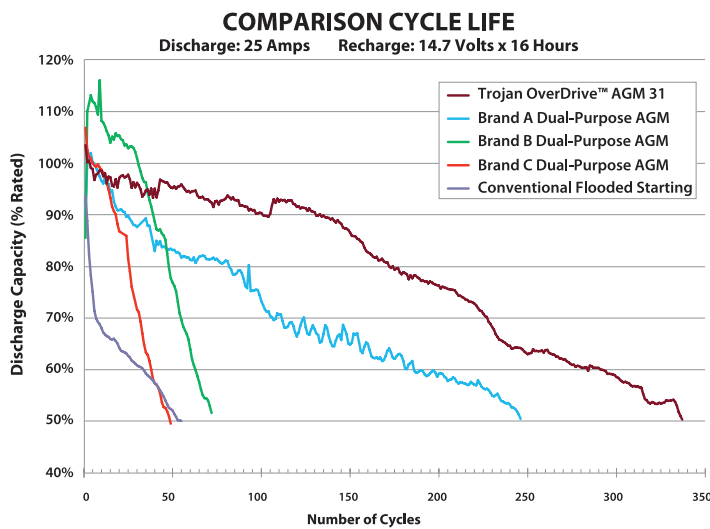
for APU and Liftgate Deep Cycling Applications



Heavy Duty Cycling Deep Cycle Endurance

The Trojan OverDrive™ AGM 31 battery is a true deep cycling battery. Engineered exclusively to withstand the rigors and abuse of deep discharge applications, the OverDrive incorporates a series of design features essential to deliver the long duration energy storage required for heavy duty APU and liftgate applications.

Selecting the wrong type of battery will cause disappointing performance, shortened lifetime and wasted money. Flooded starting, dual-purpose and multi-purpose batteries are best suited for intermittent use and not deep cycle applications. The Trojan OverDrive™ AGM 31 delivers high power cycling for extended periods of time.



* As tested in Trojan's state-of-the-art R&D centers and in accordance with BCI test procedures

For more information on selecting the right battery visit: www.trojanbattery.com/chooserrightrb



1 Robust Plate Construction

Trojan's OverDrive™ AGM 31 is designed with a thick plate construction. The plate used in the OverDrive is more robust and more resistant to the stresses encountered during deep discharge cycling. During repeated discharge and recharge active materials can expand and contract causing erosion of the active material. The robust plate structure prevents the active material from being eroded away resulting in longer cycle life.

2 Heavy Duty Corrosion Resistant Grid

The OverDrive™ AGM 31 features a thick grid framework formulated for use with the OverDrive's high density paste. The conductive framework of the grid is designed with large cross sectional areas to securely support the active material and to reduce the overall corrosion that can occur in batteries. The overall grid configuration is optimized to enhance current flow through the grid providing exceptional battery performance.

3 High Density Paste

The OverDrive™ AGM 31 is constructed with a high density paste formulation precisely engineered to deliver outstanding performance. The active material structure features larger crystals with smaller pores. Long, needle-shaped alpha lead dioxide crystals incorporated into the paste structure act like rebar in concrete, interlocking and strengthening the active material structure. This high density paste formulation optimizes porosity development utilizing the active material more effectively resulting in longer life.

4 Rugged Polypropylene Case

In heavy-duty truck applications increased battery protection is key. Trojan's OverDrive™ AGM 31 battery is packaged in a thick-walled, durable polypropylene case. Rigid enough to keep the internal components of the battery compressed, the rugged polypropylene case effectively protects the plates from damage caused by shock and vibration. Resistant to oil, gasoline and other road chemicals, Trojan's polypropylene case is durable enough to withstand the rigorous abuse over-the-road truck applications can cause.

BCI GROUP SIZE	TYPE	VOLTAGE	CAPACITY ^A Minutes	CRANKING Performance		CAPACITY ^B Amp-Hours (AH)		TERMINAL Type	DIMENSIONS ^C Inches (mm)			WEIGHT lbs. (kg)	WARRANTY ^G
			@25 Amps	C.C.A. ^D @0°F	C.A. ^E @32°F	5-Hr Rate	20-Hr Rate		Length	Width	Height ^F		
31	OverDrive™ AGM 31	12 VOLT	180	600	720	84	102	3/8 Stud	13-7/16 (341)	6-13/16 (174)	9-1/4 (234)	69 (31)	24 Months

A. The number of minutes a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.

B. The amount of amp-hours (AH) a battery can deliver when discharged at a constant rate at 80°F (27°C) for the 20-Hour and 86°F (30°C) for the 5-Hour rate and maintain a voltage above 1.75 V/cell. Capacities are based on nominal performance.

C. Dimensions are based on nominal size. Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with .5 inches (12.7mm) spacing minimum.

D. C.C.A. (Cold Cranking Amps) - the discharge load in amperes which a new, fully charged battery can maintain for 30 seconds at 0°F at a voltage above 1.2 V/cell.

E. C.A. (Cranking Amps) - the discharge load in amperes which a new, fully charged battery can maintain for 30 seconds at 32°F at a voltage above 1.2 V/cell. This is sometimes referred to as marine cranking amps @ 32°F or M.C.A. @ 32°F.

F. Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.

G. Visit www.trojanbattery.com for full details on limited warranty.

TRANSPOWER™ ST1000 AGM 31

for Heavy Duty Truck, Commercial Vehicle and Refrigeration Units Starting Applications



Trojan's TransPower™ ST1000... Powerful, Dependable, Rugged

At Trojan Battery we understand that compromising on a starting battery means compromising on your business which is why we are committed to manufacturing the highest quality, heavy duty starting battery the industry has to offer...the Trojan TransPower ST1000. Backed by a 48 month warranty, the TransPower ST1000 is a rugged, maintenance free AGM 31 starting battery that delivers superior performance and long battery life. Achieving optimum performance in the TransPower ST1000 is driven by its advanced battery design. Beneath the rugged exterior of Trojan's TransPower ST1000 are the design components that create a truly outstanding starting battery.



1 Heavy Duty Plate Design

Standard starting batteries are constructed using relatively thin plates with thin grids. While a thin plate design can deliver the few seconds of amps needed to start an engine, this thin plate design also results in shorter battery life. The Trojan TransPower™ ST1000 is constructed using a heavy duty plate design that is thicker than the conventional starting battery plate. Engineered with a combination of high density paste and a thick wire grid design, the heavy duty plate construction can deliver nearly double the battery life of a standard flooded starting battery. Contained within the plate design is a grid network constructed with thick wires arranged in sunburst array architecture. The grid wires are thick wires that are highly resistant to corrosion, which is a typical failure mode in batteries. The sunburst array ensures peak starting performance by guiding all of the battery's power to its focal point of charge resulting in 1,000 cold cranking amps.



2 Proprietary Paste

Battery performance and longevity are influenced by the physical structure of the active material. To deliver the cranking power needed to deliver the few seconds of hundreds of amps needed to start an engine, the paste formula must be designed with maximum surface area and high porosity. To deliver longer battery life the active material requires higher density characteristics. Cranking power and battery life are interrelated where the higher the power delivering porosity the shorter the battery life. The key to building a quality battery is finding the optimal balance between porosity and density. Formulated with a higher density paste than competitive batteries, the Trojan TransPower™ ST1000 features a proprietary paste formulation engineered specifically to achieve just the right balance of power and longevity.



3 Rugged Polypropylene Case

In heavy duty truck applications increased protection is important to the life of the battery. Trojan's TransPower™ ST1000 is packaged in a thick-walled, durable polypropylene case. Rigid enough to keep the internal components of the battery compressed, the rugged polypropylene case effectively protects the plates from damage caused by shock and vibration. Resistant to oil, gasoline and other road chemicals, TransPower's polypropylene case is durable enough to withstand the rigorous abuse over-the-road truck applications can cause.



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31	TransPower™ ST1000 AGM 31	12 VOLT	200	1000	1200	88	102	3/8 Stud	13-7/16 (341)	6-13/16 (174)	9-1/4 (234)	75 (34)	48 Months

A. The number of minutes a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.

B. The amount of amp-hours (AH) a battery can deliver when discharged at a constant rate at 80°F (27°C) for the 20-Hour and 86°F (30°C) for the 5-Hour rate and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.

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Experience The Trojan Difference – Reputation Built on Quality, Leadership and Innovation

Leadership

Founded in 1925 by co-founders George Godber and Carl Speer, Trojan Battery Company is the world's leading manufacturer of deep cycle batteries. From our deep cycle flooded batteries to our deep cycle gel and AGM batteries, Trojan has shaped the world of deep cycle battery technology with over 85 years of battery manufacturing experience. With the invention of the golf car battery for the Autoette vehicle in 1952, Trojan pioneered the development of deep cycle battery technology for the golf industry; successfully introducing mobilization to the game of golf. For Trojan, this began a legacy of leadership and innovation that prevails today in the global, deep cycle markets spanning applications for transportation, renewable energy, golf, floor machines, aerial work platforms, marine and recreational vehicles. Today, Trojan batteries are available worldwide through our global network of master distributors.

Headquartered in Santa Fe Springs, CA, Trojan's operations include ISO 9001:2008 certified manufacturing plants in California and Georgia, two advanced research and development centers dedicated exclusively to deep cycle battery technologies and international offices located in Europe, UAE and Asia. Trojan is a proud member of the Battery Council International (BCI) and a technical research partner with the Bulgarian Academy of Sciences.

Research and Development

Quality and innovation are the cornerstones of our product development. Engineering teams, backed by over 200 years of deep-cycle development expertise, work together to innovate and bring to market advanced battery technologies that exceed our customers' expectations for outstanding battery performance.

To ensure the quality and superior performance of our batteries, Trojan applies the most rigorous testing procedures in the industry to test for cycle life, capacity, charger algorithms and both physical and mechanical integrity. Trojan's battery testing procedures adhere to both BCI and IEC test standards. Trojan's state-of-the-art R&D facilities include charger characterization and analytical labs, battery prototype and evaluation labs and battery autopsy centers all dedicated to providing you with a superior battery that you can rely on.



Prototype development and evaluation

Environmental Stewardship

At Trojan Battery, when we say, "Clean energy for life™," we mean every word. As proactive supporters of environmental sustainability, our environmental stewardship focuses on clean energy initiatives and recycling programs.

- Trojan batteries are 97% recyclable. The container plastic, battery lead and electrolyte from old deep cycle batteries can be recycled to produce new deep cycle batteries.
- Through its partnership with Southern California Edison (SCE) Trojan saves over 8 million kilowatt hours and cuts CO2 emissions by over 12 million pounds significantly reducing our annual energy consumption and carbon foot print.



Trojan batteries are available worldwide through Trojan's Master Distributor Network. We offer outstanding technical support, provided by full-time application engineers.

**For a Trojan Master Distributor near you,
call 800.423.6569 or + 1.562.236.3000 or visit www.trojanbattery.com**

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