



# CONNECT

APRIL 2019

## Future Focused on Hybrid and Electric Vehicle Technologies

BorgWarner is focused on the future of the commercial vehicle (CV) market—and your success. With a range of technologies for combustion engine, hybrid and electric vehicle applications on the market or in development, we're providing a broad product portfolio that brings new, clean and energy-efficient solutions to the global trucking industry.



Combustion



Hybrid



Electric

### Solutions for Top Three Challenges

BorgWarner is developing solutions for nearly every propulsion equation an Original Equipment Manufacturer (OEM) is trying to solve. Specifically, we are focused on three primary challenges:

- Current and future OEM requirements for every form of powertrain
- Evolving consumer desires and governmental regulations
- Cost implications of more advanced systems

The goal, says Dane Carter, Senior Account Manager, is to provide flexible, cost-effective options for propelling hybrid and electric vehicles with individual components or fully-integrated propulsion system solutions. The technologies to do that are in various stages of development.

"Obviously, there's a mature market for starters, alternators and other internal combustion components," he says. "But the space for electrification and hybrids is still developing. It's more intricate with software, new components and new system applications."

Carter says several hybrid and electric technologies are being used in special engineering products, and others are in low-volume pilots to test various applications. They will be integrated into existing architectures as well as new platforms.

### Ahead in Hybrid and Electric Portfolio

BorgWarner has made strides in electrification solutions for the CV market in some significant ways. The HVH Series Electric Motor is a key example. Our HVH250 and HVH410 motors are now being used in transit bus applications. Additionally, they are being piloted in multiple CV applications, including both medium duty and heavy duty vehicles.



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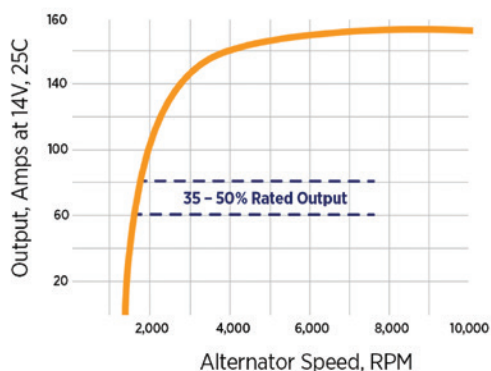
## Tech Tip: Benefits of Oversizing an Alternator

When managing a fleet, the goal is always to get the most out of your equipment. We've got an innovative way for you to do just that: oversizing the alternator.

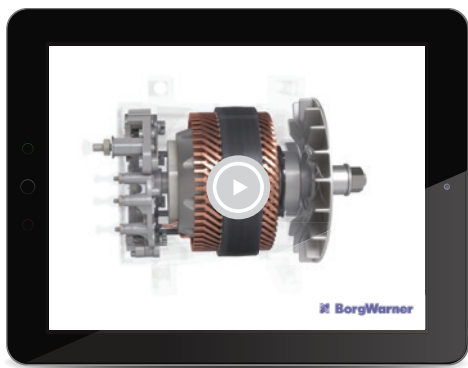
Oversizing an alternator is a proven strategy that benefits you in three ways:

- **FUEL SAVINGS:** If you choose an alternator that has approximately double the rated output of what your system requires, then you are essentially oversizing your alternator. For example, most on-highway vehicles have about 65 to 85 amps of electrical loads turned on when operating. While an alternator may be rated for a specific output, it runs most efficiently when it's operating at roughly 35 to 50 percent of that rated output. A more efficient alternator always decreases your fuel consumption.

Alternator Efficiency



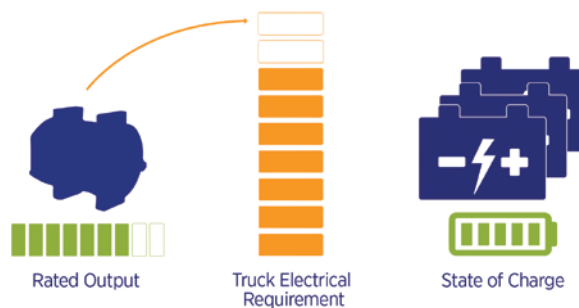
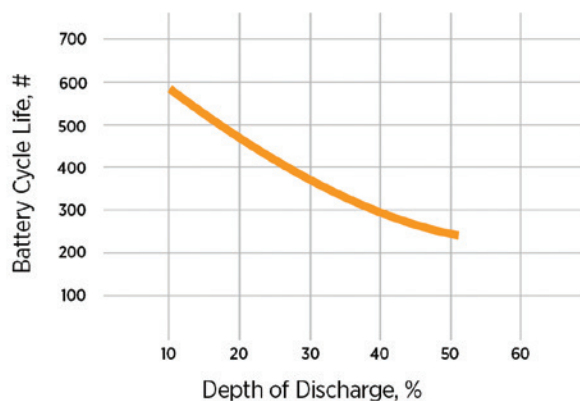
- **LONGER ALTERNATOR LIFE:** With an oversized alternator only using 35 to 50 percent of the alternator's rated output, you are reducing the amount of strain on the alternator. This means the alternator is running much cooler and isn't being tasked as much either. And this all results in increased bearing grease, rectifier diode, and stator insulation life.



To learn more about the benefits of oversizing an alternator, watch this short video on the BorgWarner YouTube channel at [tinyurl.com/DelcoRemyPlaylist](https://tinyurl.com/DelcoRemyPlaylist)

- **BETTER BATTERY LIFE:** Another added benefit of oversizing the alternator is the positive impact it can have on your batteries. You're able to reduce the depth of a battery's discharge—also known as cycling. That's because an oversized alternator produces more output at lower speeds, including idle. That increased output prevents the battery from having to help supply the load—and this keeps it at a more ideal state of charge. The battery cycles less, which translates into better battery life. With three to four batteries per vehicle, you can see how extending battery life can be a big benefit.

Depth of Charge



When making the smart decision to oversize your alternator, keep in mind that the original alternator cables may need to be upgraded to realize the full value. To determine if the cables need to be upgraded or if you have any other questions, contact Technical Support at **800.372.0222** or [DRTS@borgwarner.com](mailto:DRTS@borgwarner.com).

## Now Available: OSGR Reman Starter

We're excited to now offer the Offset Gear Reduction (OSGR) Reman Starter. This top-quality reman starter—with 100% replacement of critical components—can be used on a number of applications, giving you both ease and flexibility with your inventory.



One of the most attractive features of the OSGR is that it mounts where straight drive and planetary gear starters will not fit the application. Plus, it is designed to the same level as our OE starters. Consider these key points:

- 100% replacement of critical components: bearings, bushings, solenoids, seals, brushes
- Units upgraded during remanufacturing to the most recent revision level
- All replacement parts meet or exceed OE specifications
- Remanufactured to OE requirements
- 100% performance testing to OE standards

The result is a high quality reman product at a value level price point—backed by a 1-year/unlimited warranty—with no core charge.

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## Hybrid and Electric Vehicle Technologies (continued from page 1)

The HVH Series is attractive to the CV market for several reasons, Carter says. “These are high-efficiency motors that are rugged when operating at high voltage and power,” he explains. “As fully validated designs, the HVH motors are tested to high industry standards and have demonstrated performance and reliability.”

**We are making it more convenient for our customers to work with us on system integration.**

- Dane Carter, Sr. Account Manager

Another example of electrification for the CV market is our power electronics portfolio.

“We are developing complete system capability, making it more convenient for our customers to work with us on system integration,” says Carter. “Now, they have one company to represent a larger part of the system.”

BorgWarner is working with several major OEs on how to best apply these technologies to the CV market. Various system architectures are being evaluated as well as different products in all areas—the goal is to develop a broad range of applications tailored to CV.



48 Volt Motor/Generator



Power Electronics

### Great Strides, Future Innovations to Come

As BorgWarner's hybrid and electric portfolio continues to expand in the CV market, fleet owners will have greater access to high-performing solutions that are technologically advanced to better fit their evolving needs.

## Looking to the Future

BorgWarner estimates that by 2023 it will have content on **about half of the hybrids** and **over 30% of the electric vehicles (EV)** produced globally.

## Now Available: OSGR Reman Starter (continued from page 3)

For a cross reference and application guide about the OSGR, visit [delcoremy.com](http://delcoremy.com). The guide can be found by clicking "Download Literature" under the "Support" Tab.



### KEY NAMEPLATE APPLICATIONS

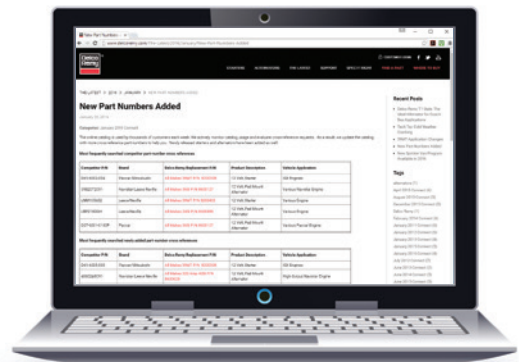
- Case
- Chevrolet
- Freightliner
- GMC
- Hino
- Isuzu
- Kenworth
- Terex

## New Part Numbers



Go to The Latest  
at [delcoremy.com](http://delcoremy.com)  
to find the following:

- Newly released heavy duty starters
- New part number cross references
- Most frequently searched competitor part number cross references



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