



# INTRODUCING START-STOP

## A Realistic Solution for Reducing Fuel Use and Emissions

Start-stop technology is easy for automakers to apply to traditional internal combustion engines, and easy to use – no change in driving habits required. It's the most affordable, convenient way for today's drivers to cut fuel use and greenhouse gas emissions.

The popularity of start-stop technology is on the rise. Between 2016 and 2020, the global market will surge from 25 million to 65 million vehicles in North America, Europe and China.

### Easy to Use

*No need to change driving habits.*

- Gas engine shuts off during idle.
- A robust battery keeps lights, air conditioner, heater, entertainment systems and other accessories running.
- Engine restarts automatically when you take your foot off the brake or engage the clutch.

### Easy on the Wallet

*The sound of silence is the sound of savings.*

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**Up to 5% fuel savings every  
time you fill up your gas tank**

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- Included in typical fuel economy packages.
- Far less expensive than hybrid or plug-in electric technologies, which can add 20 percent to the vehicle's cost. *(Source: Edmunds)*

### Better for the Environment

*Reduced emissions from millions of vehicles add up.*

- Cuts greenhouse gas emissions up to 5 percent.
- Johnson Controls start-stop battery technology is now integrated into 35 million vehicles, saving an estimated 660 million gallons of fuel and cutting greenhouse gas emissions by 5.9 million metric tons per year – equivalent to the carbon captured by 4.8 million acres of forest in one year.

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**660 million gallons of fuel saved**

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# At the Heart of Start-Stop Systems: Johnson Controls Batteries



Johnson Controls batteries for start-stop vehicles are engineered for longer life and improved performance:



- Superior starting power even at low states of charge



- Reliability in harsh weather and extreme conditions



- Excellent durability in high-load applications

## The World's Leading Provider

*Powering popular start-stop vehicles around the globe*



Johnson Controls produces 7 out of every 10 absorbent glass mat (AGM) batteries sold worldwide. In the U.S., our batteries power vehicles such as the Ford F-150, Ford Fusion and Chevy Malibu, to name a few.

## Serving a Growing Global Market

*Expanding our capacity to meet increasing demand*

In 2020, most new cars produced will be equipped with start-stop technology.

As start-stop technology continues to gain market share, Johnson Controls is increasing global production capacity. Over the next five years, we're investing \$780 million to grow our capacity for producing batteries for start-stop vehicles.

## About Johnson Controls Power Solutions

Johnson Controls Power Solutions is the world's largest manufacturer of automotive batteries, supplying approximately **146 million** to automakers and aftermarket retailers. Our full range of lead-acid and lithium-ion battery technology powers nearly every type of vehicle for our customers – including conventional, start-stop, micro-hybrid, hybrid and electric. Johnson Controls' recycling system has helped make automotive batteries the most recycled consumer product in the world. Globally, **15,000 employees** develop, manufacture, distribute and recycle batteries at more than **50 locations**.