



SmartPedal FAQ

Operation and Performance

How does it work?

SmartPedal utilizes a proprietary technology—*pedal signal correction*—to improve the mileage and range of vehicles with electronic (drive-by-wire) accelerator pedals.

To power these corrections, SmartPedal incorporates computing power similar to an iPhone and built-in sensors to monitor movement of the vehicle. A second set of sensors tracks driver and pedal interaction by electronically monitoring the position of the accelerator pedal.

Utilizing probability theory, SmartPedal analyzes this sensor data dozens of times a second to measure the up-and-down movement caused by the roadway and to determine the influence of this motion on the driver's use of the pedal.

SmartPedal then electronically corrects the pedal signal to eliminate unwanted changes in speed. The entire process is designed to be invisible to the driver and to improve mileage without compromising handling or safety.

What is the difference between SmartPedal Prime and SmartPedal Advanced?

SmartPedal Prime and SmartPedal Advanced both contain our patented pedal signal correction and dynamic acceleration. The frequency and extent of adjustments are controlled by coefficients (variables) within the unit. In SmartPedal Prime, we set the coefficients to a fixed set of values that we found perform very well for most driver/vehicle/roadway combinations.

However, it is possible to get better results by tailoring the coefficients to the specifics of the vehicle and driver, so in SmartPedal Advanced we enable users to select from different sets of coefficients to control this process.

SmartPedal Advanced also contains a third technology—pedal remapping—unavailable on SmartPedal Prime. This technology enables users to create a more balanced and controlled rate of acceleration for vehicles that otherwise feel like they "lurch" forward with the slightest pressure on the pedal.

Like our pedal signal correction and dynamic acceleration technologies, the pedal remapping is also safe and easy to configure. Drivers can usually find the optimum setting for their vehicle in just a few minutes.

What are the target markets for SmartPedal Prime and SmartPedal Advanced?

SmartPedal Prime is designed for vehicle owners seeking a simple plug-and-play solution that increases mileage and pays back the original investment in 12-24 months.

SmartPedal Advanced is designed for vehicle owners that want to maximize mileage and their driving experience.

Both solutions target commercial fleet operators and consumers.

What is the mileage increase?

For combustion vehicles, the increase is typically equivalent to another 20-30 miles of driving per tank. Electric vehicles also benefit, typically seeing a 3-9% increase in range—and sometimes higher.

The results vary between vehicles, roadways, and drivers, but the numbers above are not exaggerations and are, in fact, based on pre-release testing by the public.

Is it a force-feedback or a driver-assistance system that provides visual feedback to cue different driving behavior?

No. One of the unique benefits of SmartPedal is that it operates transparently to the driver—the vehicle operates just the same as it did before.

This means no investment in driver training and no reliance on the driver to change their behavior or driving technique.

Does it work for electric vehicles too, or only gas/diesel?

SmartPedal can improve the mileage of *any* vehicle regardless of power type, including gas, diesel, electric, and hybrids.

The only requirement is that the vehicle incorporate an electronic accelerator pedal.

Do some vehicles perform better?

Yes. Electric, hybrid, and high-torque combustion vehicles tend to generate the largest gains. Extremely low-torque vehicles tend to generate smaller gains.

How much does SmartPedal cost?

Our goal is for customers to earn their investment back in fuel savings in about a year, so we price reasonably: SmartPedal Prime is \$149 and SmartPedal Advanced is \$219.

Both products include a one-year limited warranty and U.S.-based support. At the time of purchase, the limited warranty can be extended to three years for \$20.

Is SmartPedal comparable to a lag filter?

No. In fact, we like to say that we're nearly the opposite in terms of electronics, software, and safety. Here's what we mean:

SmartPedal identifies and corrects for unwanted acceleration by the driver with the goal of producing better mileage. We do this through the use of probabilistic analysis, which determines the driver's probable intent using the past and current pedal movement as well as accelerometer data that tracks vehicle motion.

In contrast, a lag filter simply reduces the rate of acceleration, which has two negative effects. First, it makes the vehicle feel slower. Most drivers (especially employees) consciously or unconsciously respond by pressing the pedal harder and longer—which is usually not good for mileage.

Second, studies show that slowing acceleration overall usually reduces mileage. This is because slower acceleration increases the time for the vehicle to reach its fuel economy sweet spot—the optimized area of the BSFC mapping. The best practice is to accelerate "briskly" to the target speed and then cruise

How does it differ from and interact with cruise control?

With cruise control engaged, the vehicle targets a specific speed set by the driver. SmartPedal doesn't affect mileage in this scenario unless the driver's foot remains on the accelerator pedal—which is the recommended practice.

With cruise control dis-engaged and the driver in direct control of speed, SmartPedal significantly improves mileage, with the additional benefit of allowing the driver to find the best rate of speed based on the current driving conditions. In fact, we sometimes describe SmartPedal as providing "cruise control" mileage without using cruise control.

What is the effect on CO2 emissions?

While SmartPedal does not affect the vehicle's engine, we do improve mileage and range, which in turn reduces fossil-fuel emissions for every mile driven.

Using data from the EPA, we calculated that for each year of use SmartPedal reduces CO2 emissions equivalent to what 20 trees would remove from the air if planted as saplings and grown for ten years. The equivalent savings for a vehicle operated for five years would be a small grove of nearly 100 ten-year-old trees.

Installation

How is SmartPedal installed?

The installer unclips the OEM wiring harness from the top of the accelerator pedal assembly, attaches the harness to SmartPedal, and then snap fits SmartPedal to the open connector on the pedal assembly. The entire process is usually accomplished in 10 minutes.

What is the investment in time?

Less than 5-20 minutes for most installations. Some vehicles are more challenging due to the area above the accelerator pedal assembly having limited access, but the worst-case scenario is usually less than 30 minutes.

Is installation (and removal) tool free and non-destructive?

Yes. SmartPedal features plug-and-play installation that is completely non-destructive. SmartPedal snap fits directly to the wiring-harness connector at the top of the accelerator pedal. If the top of the pedal cannot be reached without removing the pedal assembly, then in the worst-case scenario a 10 MM or 3/8" socket or open-end wrench may be needed to remove and re-install the assembly.

How is SmartPedal powered?

SmartPedal incorporates an ultra-low power circuit design that draws and load balances a miniscule amount of power from the two circuits supplying the pedal. This design detail contributes to its plug-and-play nature.

Safety

What happens if SmartPedal stops working?

SmartPedal has a built-in pass-through that can engage when the system detects an uncorrectable error. In those circumstances, the vehicle is still fully operable, but mileage returns to normal.

How is safety integrated into SmartPedal?

SmartPedal was originally designed to handle mission-critical defense and transit applications. The commercial and consumer versions incorporate the same hardware and software, which means that SmartPedal:

- Preserves all OEM safety measures. Nothing is disabled or circumvented.
- Meets current and even *proposed* federal standards for automotive safety.
- Incorporates a dozen additional hardware and software safety measures internally.

As a company, SmartPedal Labs also possesses an R&D ethos focused on safety. Formed in 2011, the company engaged in five years of R&D—including closed-course and open-road testing with OEMs—before initially offering its technology for sale in late 2016. Since that date, SmartPedal has been operated over two million miles of roadway by end customers and carried tens of thousands of passengers—with no safety issues ever.

We like that track record for personal and professional reasons. And while it costs more to manufacture a high-quality product, it ensures a safe and reliable product built to last for as long as the vehicle on which it is installed.

How long was SmartPedal in development?

Five years. The company formed in 2011 and SmartPedal was first made available for sale to transit authorities in late 2016. SmartPedal will be available for commercial operators and the general public in 2017.

Have you tested with OEMs?

Yes. Over the five-year R&D cycle, SmartPedal underwent both closed-course and open-field testing with OEMs.

Warranty

How long a warranty does SmartPedal include?

One-year limited warranty generally. Extended warranties are available on certain versions.

What does the SmartPedal warranty include?

Repair or replacement shipped free of charge. Details and limitations can be found on our website.

Does SmartPedal void the consumer vehicle warranty?

No. As a matter of federal law, the consumer warranty from the vehicle manufacturer remains in full effect.

Company

Is SmartPedal patented?

Yes. Two patents have already been granted and additional patent applications are pending.

Who invented SmartPedal?

SmartPedal was invented by Marc Lurie and Attila Vass. Seasoned entrepreneurs, they possess a combined 40+ years of experience in computing and are named inventors on more than 30 patents in the United States, Japan, and Europe.

What was the inspiration for SmartPedal?

SmartPedal took root in 2010 when Lurie noticed a significant difference in mileage between cruise control and manual operation during his regular highway commute.

After an initial investigation, Lurie contacted Vass for additional expertise and together the two began to look deeper into the technical problem and discovered a potential opportunity, which became the inspiration for SmartPedal.

When was the company founded?

SmartPedal Labs was founded in 2011 and released its first product—SmartPedal Transit—in late 2016.

Is SmartPedal manufactured in the USA?

Yes. To promote quality, minimize environmental impact, and create American jobs, all engineering, manufacturing, and assembly of our products is performed in the USA. All support is also provided from the USA.