



IMPROVE FUEL ECONOMY WITHOUT SACRIFICING PERFORMANCE.

NuVinci® DeltaSeries™ Supercharger Drives Offer:

- Significantly more boost at low engine speeds, providing more power for launch or hauling
- Supercharger speed control independent from engine speed
- Increased fuel economy and improved engine efficiency by enabling the use of smaller engines
- Diesel-like torque curves from gasoline engines
- Enables integration of superchargers with advanced engine technologies



—NuVinci DeltaSeries Supercharger Drive

Add Fuel Economy, Performance and Lower Costs.

Original Equipment Manufacturers (OEM) are seeking ways to improve the fuel economy of their product offerings, without sacrificing performance and possibly improving it. One way to solve this problem is to downsize the engine from 8 cylinders to 6 and then supercharge the smaller engine to achieve equivalent engine performance. Doing so results in an engine that is more efficient and allows vehicle designers to reduce the engine compartment as well as the cross sectional area of the vehicle.

A NuVinci DeltaSeries supercharger drive can also be used in conjunction with other engine technologies such as Displacement-on-demand systems to simulate a variable displacement supercharger.

High diesel prices (compared to gasoline) and emissions equipment costs for diesel engines are compelling fleet operators to look for less expensive solutions. NuVinci technology now makes possible a new opportunity for superchargers that provide diesel-like performance with gasoline engines – particularly in terms of launch and hauling. This reduces operating costs for heavy-duty fleets by enabling the use of equivalent and less-expensive gasoline engines.

NuVinci CVP Technology

At the heart of every NuVinci DeltaSeries accessory drive is Fallbrook's award-winning NuVinci continuously variable planetary (CVP) transmission technology. This affordable, advanced technology enables NuVinci accessory drives to increase fuel economy and vehicle performance by optimizing system operation. Because NuVinci accessory drives decouple accessories from engine RPM, the system delivers the ideal output all the time... optimizing accessory operation thereby enhancing engine performance, increasing system efficiency and improving fueleconomy.

As a power management system for supercharger accessory drives, it delivers significantly more boost at low RPM. It does this by enabling high supercharger speeds at low engine speeds, providing increased torque for launch and towing, while reducing supercharger speed on demand for light loads or for traction control purposes. The NuVinci CVP does this by offering an infinite number of speed ratios between its high and low ratio extremes, with programmable instantaneous, smooth and continuous ratio changes. Operation is completely seamless and transparent to the driver.

Optimization



Economy

Performance





A Real Solution for Fleets.

Figure 2 illustrates the performance gains possible with a NuVinci DeltaSeries supercharger drive. An SUV with a 3.6L V6 engine was simulated with a much smaller 2.0L I4 engine (which has been supercharged in production). Engine torque is depicted on the Y axis on the left, and engine speed is on the X axis. The blue dashed curve represents torque from the standard 3.6L V6 engine. Simply replacing that with the smaller, normally aspirated 2.0L I4 engine would result in the lower curve, producing about 175 Nm peak. By supercharging this engine (grey curve), over 330 Nm can be produced, approaching the 350Nm capacity of the larger engine. But this peak output only comes at the top end of the engine speed range – the vehicle remains significantly underpowered throughout most of the range.

The green area represents the increased low-end torque generated by a downsized gasoline engine, as compared with the same engine without the supercharger. The red line indicates that the smaller NuVinci supercharger-equipped engine performs on a par with a larger engine.

Regardless of the type of supercharger technology, the NuVinci DeltaSeries supercharger drive can add significant boost at low engine speeds, providing more power for launch or hauling.

The NuVinci DeltaSeries Supercharger Drive Offers:

- Engine downsizing capabilities resulting in lower fuel and operating costs
- Gasoline performance that is competitive with diesel:
 - Increased power density
 - Increased low-end torque
- Reduced operating costs of heavy-duty fleets
- Reduced cabin noise and vibration when compared to diesel



Figure 1. Variable Speed Supercharger

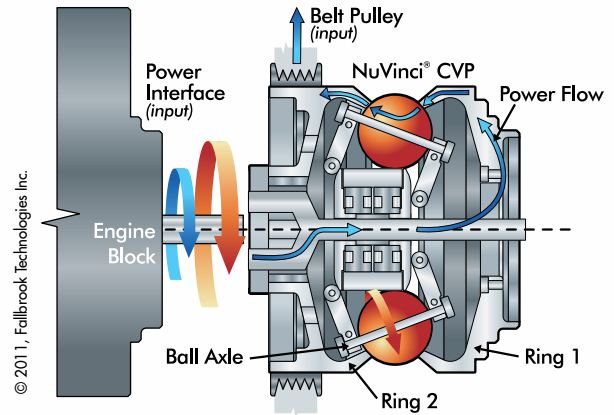


Figure 2. NuVinci Supercharger Performance Gains V6 Performance with Inline 4 Economy

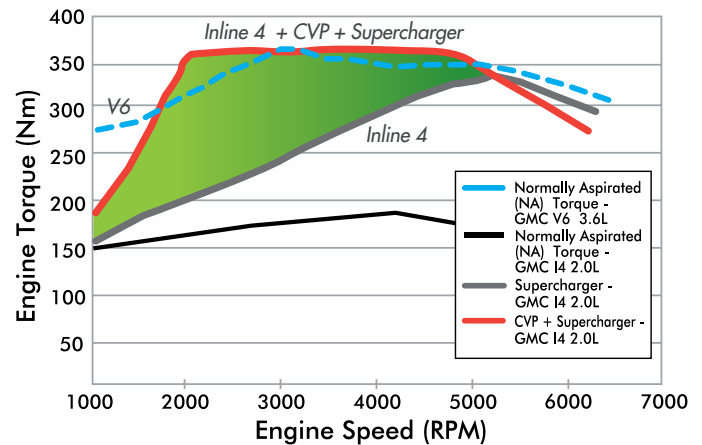
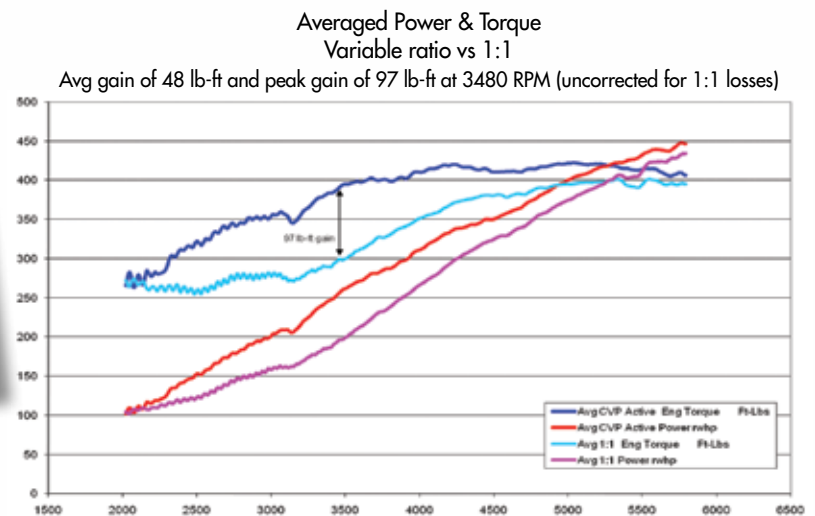


Figure 3. Supercharged Mustang Performance with and without NuVinci CVP



Become a NuVinci Development Partner

Fallbrook Technologies currently is selecting NuVinci CVP development partners in several key cleantech/heavy duty market areas. Becoming a development partner gives you first-strike capability in reaching your market with innovative new products, as well as access to the comprehensive and unmatched NuVinci technology portfolio of over 350 patents and patent applications worldwide.

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