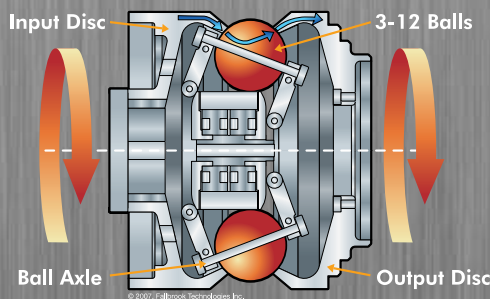




NuVinci CVP is a power management system for engine accessory drives that enables unprecedented ability to change accessory loads and outputs instantaneously for improved performance, improved fuel economy, and higher accessory output on an as-needed basis.



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.

Power Loss from Un-Optimized Accessories

The belt-driven accessories for a typical U.S. passenger car or truck usually include an alternator, power steering pump, water pump, AC compressor, and, in some cases, a hydraulic brake booster. Some may also include emissions control pumps, an oil pump, and a cooling fan.

But in the effort to improve fuel economy, engineers have seldom looked at accessory drives, simply because existing technology offered no practical alternatives for producing an accessory drive whose speed was continuously optimized for all conditions...until now!

www.nuvinci.com

Reduce energy consumption of belt-driven engine accessories with a NuVinci® crankshaft-mounted Continuously Variable Accessory Drive (CVAD).



A crankshaft-mounted CVAD decouples belt-driven accessories from engine speed, enabling them to run at the minimum speed required to meet accessory load. At higher engine RPM, decreasing accessory speeds decreases power use, thus saving energy. Additional energy savings can be realized by optimizing the accessories for a narrow speed range operation. Conversely, at low engine RPM, the accessory belt speed can be increased to provide additional battery-charging power or to increase the water pump speed.

NuVinci technology delivers:

- Improved vehicle fuel economy
- Quiet, smooth operation
- Compact, in-line packaging



FALLBROOK®
TECHNOLOGIES

Solution:

A crank-mounted CVAD using the NuVinci® CVP

NuVinci technology makes possible a practical CVAD that measurably improves fuel economy by separating accessory speed from engine speed. When installed on the crankshaft, a NuVinci-based CVAD can be used to optimize the operation of front-end accessories and improve fuel economy, or to increase alternator power and coolant flow at idle. The CVAD also allows for the downsizing of components to reduce packaging and improve constant speed performance.

Figure 1 illustrates the CVAD's "U" drive power path configuration. Power comes in from the crankshaft, transfers it to one traction ring, through the planet balls, and brings the power out of the other traction ring to the belt. Tilting the balls provides a smooth ratio transition from underdrive to overdrive.

The CVAD enables control of output speed (see red line in Figure 2), independent of engine speed (white line). At engine idle, output speeds may be increased, providing more accessory power. At higher engine speeds, (such as acceleration from a stop or cruising), accessory speeds may be substantially reduced, saving energy.

Results:

During a typical drive cycle, engine speeds operate between idle and highway cruise depending upon conditions as illustrated in Figure 3. For vehicles with belt-driven accessories, accessory speeds follow these transients, wasting power when the engine is accelerating or cruising. With the NuVinci-equipped CVAD mounted on the crankshaft, belt speeds may be varied independent of engine speed, reducing accessory speeds and power consumption.

Thus, a NuVinci-equipped CVAD offers:

- Increased fuel economy
- Smooth accommodation of engine speed transients
- Opportunities to add "smart" controls for accessory drives
- Ability to downsize accessory capacity

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 325 patents and patent applications worldwide.

For more information, visit www.nuvinci.com.
Contact: info@fallbrooktech.com

(888)-NUVINCI

Figure 1. Fuel Economy - Crank Mount

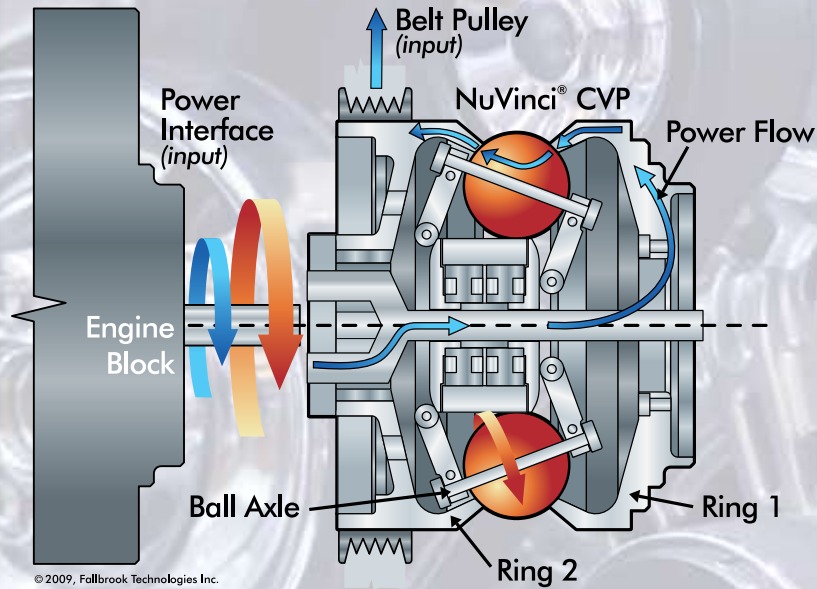


Figure 2. Speed Comparison

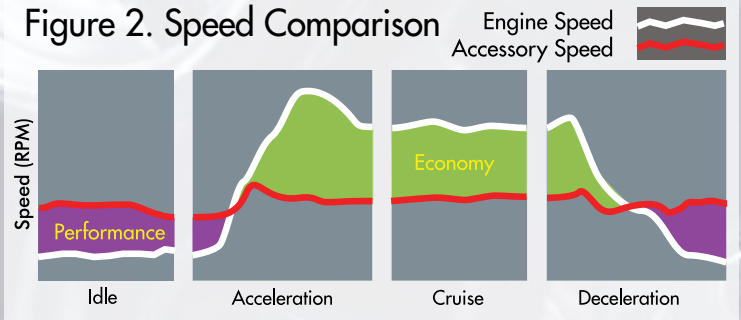
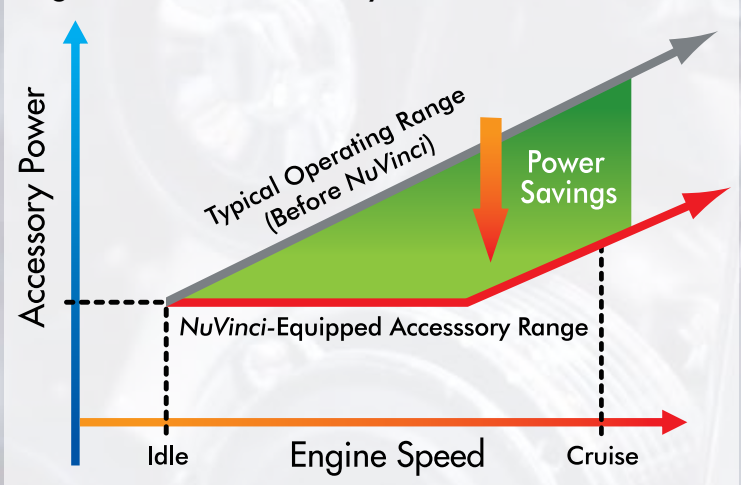


Figure 3. Total Accessory Power Consumed



Fallbrook Technologies Inc.

505 Cypress Creek Road, Suite C
Cedar Park, TX 78613
Tel: +1 (888) NuVinci (688-4624)
Tel: +1 (512) 279-6200
Fax: +1 (512) 267-0159
support@fallbrooktech.com



FALLBROOK
TECHNOLOGIES