

# News Release



## **Chain, Chain, Chain: How BorgWarner's Automotive Chain Technology is Propelling Hybrid and Electric Vehicles**

- *Decades of experience with chain drives makes BorgWarner the trusted choice for vehicle manufacturers*
- *Chain-drive technology can be applied to P2, P3 or P4 hybrid propulsion systems*
- *Proven technology is cost effective, highly efficient and delivers reduced noise, vibration and harshness when compared with gear drives*
- *BorgWarner produces millions of chains each year for customers around the world*

Auburn Hills, Michigan, April 30, 2019 – As the automotive industry evolves to hybrid and electric propulsion, chain drive technology is a strategic enabler. With more than a half-century's worth of experience and success in developing and manufacturing HY-VO® (High Velocity Chain on Involute Profile Sprockets) chain drive systems, BorgWarner is leading the way in hybrid drive system solutions.

Commonly applied in transfer cases and transmissions, the BorgWarner HY-VO chain – a patented, inverted-tooth, silent chain technology that utilizes a high-efficiency rocker joint – is being applied to P2 off-axis (the electric motor is located between the engine and transmission), P3 (the electric motor is located after the transmission output) and P4 (the electric motor is located at the rear axle) hybrid systems.

“BorgWarner invented the patented HY-VO chain drive technology that has revolutionized chain drives, delivering millions of HY-VO chain drives to the automotive market each year,” said Joel Wiegert, President and General Manager Morse Systems and Vice President, BorgWarner Inc. “We are excited that our HY-VO chains can be a key enabler for hybrid and electric vehicles. We look at it as a great example of how our long-standing expertise can be a vital part of where the future of the auto industry is going.”

Generally chain drives are easily integrated into transmission designs in P2 off-axis, P3 and P4 hybrid applications and offer greater layout flexibility. Beyond easy packaging and

reduced mechanical complexity, chain drive systems are able to achieve a large range of drive ratios and provide opportunities for reduced manufacturing and assembly costs.

Through BorgWarner's random pattern technology, the HY-VO chains also have the ability to minimize noise, vibration and harshness levels, resulting in a better driving experience for the customer.

Chain drives are already common in many systems in today's vehicles including:

- Overhead cam and cam-in-block timing systems
- Engine and transmission oil pump drive systems
- Drivetrain Chains
  - Transfer Case Drives
  - Transmission Final Drive

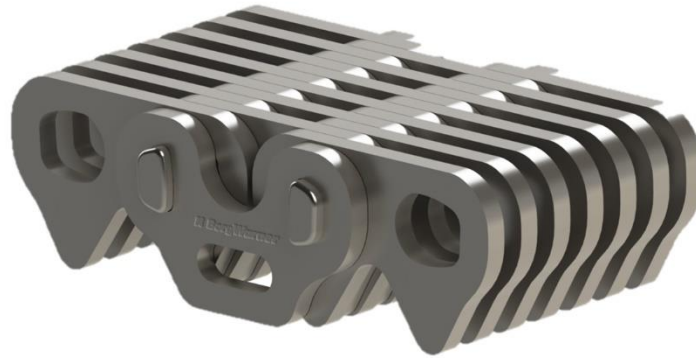
As original equipment manufacturers (OEMs) strive to increase efficiency, reduce weight and create more compact systems, BorgWarner continues to deliver the benefits of using chain technology to meet these needs. The company's patented HY-VO chain offers the benefits of the silent chain design and technology, and improves the capability of the chain by adding a rocker joint instead of the traditional round pin. The rocker joint, by design, delivers improved efficiency, reduces noise, vibration and harshness, generates less heat and delivers improved wear performance compared with round pin joints, while enabling the chain to perform at high linear speeds. In addition, HY-VO chains in transmissions and transfer cases have proven to be more efficient than two-mesh gear systems.

BorgWarner has extensive experience in providing durable, high-quality HY-VO chains in the chain drive market. Beyond HY-VO chains, BorgWarner also manufactures bush chains and roller chains to meet a range of customer needs.

## **About BorgWarner**

BorgWarner Inc. (NYSE: BWA) is a global product leader in clean and efficient technology solutions for combustion, hybrid and electric vehicles. With manufacturing and technical facilities in 68 locations in 19 countries, the company employs approximately 30,000 worldwide. For more information, please visit [borgwarner.com](http://borgwarner.com).

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The HY-VO chain – a patented, inverted-tooth, silent chain configuration that utilizes a high-efficiency rocker joint – is being applied for P2 and P3 hybrid systems.

Statements in this press release may contain forward-looking statements as contemplated by the 1995 Private Securities Litigation Reform Act that are based on management's current outlook, expectations, estimates and projections. Words such as "anticipates," "believes," "continues," "could," "designed," "effect," "estimates," "evaluates," "expects," "forecasts," "goal," "initiative," "intends," "outlook," "plans," "potential," "project," "pursue," "seek," "should," "target," "when," "would," variations of such words and similar expressions are intended to identify such forward-looking statements. Forward-looking statements are subject to risks and uncertainties, many of which are difficult to predict and generally beyond our control, that could cause actual results to differ materially from those expressed, projected or implied in or by the forward-looking statements. These risks and uncertainties, among others, include: our dependence on automotive and truck production, both of which are highly cyclical; our reliance on major OEM customers; commodities availability and pricing; supply disruptions; fluctuations in interest rates and foreign currency exchange rates; availability of credit; our dependence on key management; our dependence on information systems; the uncertainty of the global economic environment; the outcome of existing or any future legal proceedings, including litigation with respect to various claims; and future changes in laws and regulations, including by way of example, tariffs, in the countries in which we operate, as well as other risks noted in reports that we file with the Securities and Exchange Commission, including the Risk Factors identified in our most recently filed Annual Report on Form 10-K/A. We do not undertake any obligation to update or announce publicly any updates to or revision to any of the forward-looking statements.

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