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.
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.