

# Less Friction + Less Weight = Less Fuel Consumption & Fewer Emissions

This simple formula is the dominant theme in the development of automotive components, with one of the key focuses being to reduce friction and weight of the traditional power unit - the internal combustion engine. The internal combustion engine has seen a significant reduction in cylinder capacity in recent times, but has still developed an increase in efficiency and power through the use of innovative valve train, fuelling and induction technologies – driven by the increasing demands of legislation to reduce vehicle emissions.

A key engine component is the timing belt drive system. The function of a timing belt is to provide precise synchronization for the rotary motion of the crankshaft, camshaft, balancer shafts and any other accessory drives of the internal combustion engine. In turn, this controls the opening and closing of the intake and exhaust valves and the precise fuelling of the engine, which is essential for accurate timing, efficiency and durability.

All automotive timing belt systems have traditionally been fitted externally to the engine, operating in a dry and enclosed environment. This, however, changed in 2008 when Ford switched from a chain immersed in oil to a belt that ran in oil, which was fitted to the 1.8 diesel engine, driving the fuel injection pump. This was designed to make this engine more efficient by reducing friction, which - in turn - would also reduce emission levels.

To make this possible, the timing belt had to be manufactured using specific rubber compounds and materials in order to make it more robust, durable and resistant to oil. This type of belt is made from ACN-HNBR high-temperature elastomer inbuilt with a glass fibre tension cord for strength. It also includes a polyamide fabric backing and Durolan-coated aramid fabric tooth tissue for thermal and chemical resistance.

Since 2008, Ford has used this belt technology for the complete timing belt drive fitted to their Ecoboost and EcoBlue engines, whilst the PSA group has used it in their award-winning 1.2 Puretech engine. The Volkswagen group has also used a belt in oil for driving the oil pump fitted to the 1.6 and 2.0 TDi engines. Nonetheless, the majority of these engines still require this 'wet' timing belt to be replaced as part of routine maintenance, which is why febi has incorporated these style belts into its range of timing belt kits in order to accommodate customer demand.

As wet belts are now driving oil pumps and engine timing systems in the newer Ford, PSA, and Volkswagen group engines, other vehicle manufacturers are following suit, designing new engines with this high-tech wet drive belt system made from rubber and plastic.

The main benefit of this type of belt is that they are narrower. As a result, this requires less operating space for compact engine bay designs. This efficient and quieter drive alternative to dry belts results in the reduction of friction losses, fuel consumption and exhaust emissions. The oil dampens any vibrations that occur and the engine runs evenly and more smoothly, making driving a pleasant experience, whilst using more environmentally friendly technology.

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