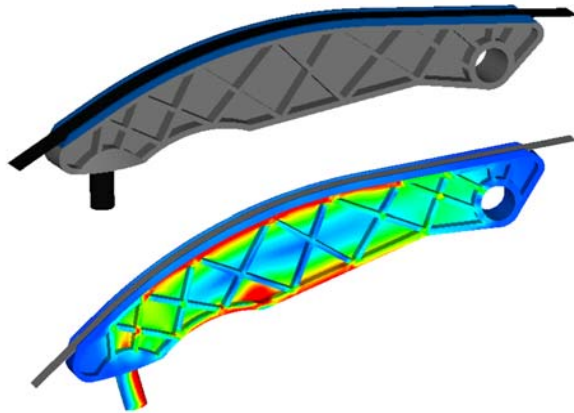
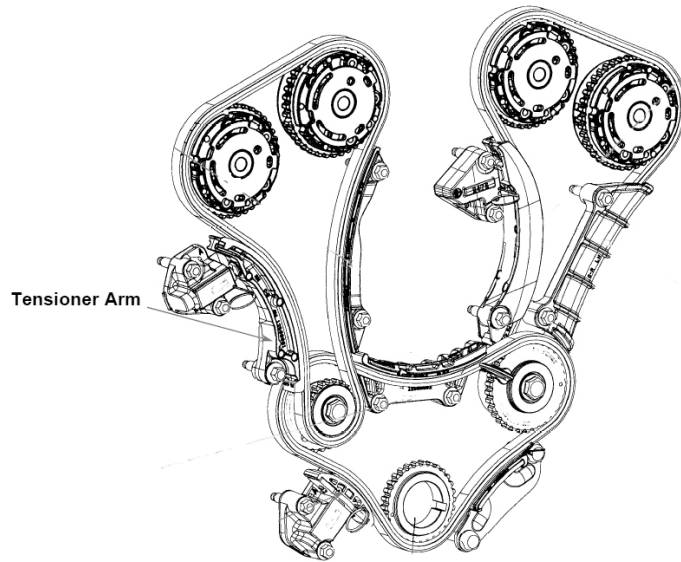


Automotive Case Study (Howarth Development Associates – Engine Timing Cam Chain Tensioner Arm)



Howarth Development Associates (HDA) is a design and development firm specializing in cost saving designs using plastic and reinforced composite materials as an alternative to heavier and more expensive metal counterparts (www.metalreplacement.com).

HDA developed and analyzed a plastic design of a cam chain tensioner arm for automotive engine timing systems using Femap with NEi Nastran. The function of the component is to provide a uniform tension on the cam chains and accommodate timing chain growth due to the stretching of the chain under normal wear. It also serves to dampen some of the extreme harmonics which can occur in engine firing anomalies. The part is inside the engine under the timing cover and is traditionally made of diecast aluminum or steel.

The new design is high temperature structural thermoplastic two shot molding. The arm itself is a highly glass reinforced nylon 4/6 which is then overmolded with a thin skin layer of the same nylon 4/6 without glass reinforcement. The reinforced arm provides structure while the overmolding provides wear resistance and lower friction.

Benefits of this approach include: mass and inertia reduction which translates to improved fuel economy and performance, increased wear performance, and lower manufacturing costs compared to metal alternatives. Strain gage testing showed excellent correlation with NEi Nastran Finite Element Analysis simulation results.

NEi Software, Inc. is aggressively focused on commitment to the customer. Detailed documentation, customized on-site training, and comprehensive technical support ensures that you will see immediate return on your investment.

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