SMART BLEND SYNTHETICS

By Life Automotive Products Inc.

Subject: Technical Bulletin
Re: Piston Chatter Analysis
ANALYSIS PERFORMED BY PAUL HUGHETT, Ch.E.

The Patented chemical formulation of our Total Intake System Cleaner is very unique in both the chemical composition and the type of propellant used. Due to this, in a few rare cases you may experience slight piston chatter during application. Although not harmful to the vehicle, it may get your attention and needs to be addressed.

Historically, low molecular weight ethers have been used in the internal combustion engines for winter or cold weather starting. These molecules have a relatively low flash point and are already partially oxidized, thus they are easy to ignite and will give a quick release of energy. This quick release of energy, or rapid burn, has little effect on a high compression internal combustion engine at regular use levels. However, in lower compression, or some four-cylinder engines, the compression rings are not as tight, and the rapid burning ethers at low rpm's can cause slight piston chatter. In Diesel engines with a compression ignition system, you may experience a short term increase of the rpm's at idle. This situation is short term and will quickly readjust itself to a normal idle situation.

Raising the engine idle from 1500 rpm's up to 2000 rpm's can prevent this chatter. With our unique patented chemical formulation, contact time within the engine is not rpm driven, and cleaning expectations will not be affected by the faster rpm introduction of product. Our synergized Heterocyclic Amine ring compounds have a natural affinity attraction to carbonaceous deposits, and our chemical contact time has been developed at five minutes. At lower or higher engine rpm's; introduction does not change or alter this chemical contact time. Accordingly, all of our engines cleaning studies have shown little differences in cleaning relationships to a changing of the engine rpm's. Also, the chemical levels have been set for eight cylinder engines, and upper engine surface wetting of the synergistic chemicals are well increased in four cylinder engines.

Finally, increasing the rpm in some four-cylinder engines and some compression firing Diesel engines will not result in less cleaning or less chemical surface contact time.