The New Lubrication Technology and China's Sustained Development

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ABSTRACT

The application of new lubrication technology has a close relationship with the industrial development of automobile, machinery and transportation. Energy saving and environment protection are main two factors to push lubricants upgrades. Lubricant quality and correct application directly influence the use-life of machine, consumption of energy and environment protection. All over the world, especially in Western developed countries people pay more attention to the research and application of new lubricant technology. The lubricant specifications were reviewed and upgraded continuously according to the requirements of machine, fuel economy and emission. China’s sustained development means the ability to satisfy current human’s requirement as well as not to destroy nature resources for next generation. That also means we must balance the fast development of economy, society, resources and environment, we must protect natural resources and environment such as water, ocean, lands and forest which we live on, which can keep our next generation developing. Research and application of new lubricant technology is basic issues to keep China’s economy continuously growing.

China’s petroleum consumption increased rapidly during the recent decades. There are two rapid period within 25 years after China’s application of opening and reform policy. The first is from 1978 to 1990, the whole petroleum consumption increased from 913million to 1.18billion tons respectively, increasing rate is 2.0% per year. The second was from 1991 to 2003, petroleum consumption increased from 1.18 to 2.74 billion tons, increasing rate was up to 6.7% per year. If we compare 2003 with 2001, the net petroleum consumption amount had increased 4.4million tons, increase rate is 8.7% per year. China now becomes one of biggest petroleum consumption country.

The efficiency of China’s petroleum consumption is low. According to world petroleum consumption level (ton per thousand U.S. Dollar, GDP), China consumes four times more petroleum than that of Japan, three times of that of European, two times of that of USA. The wide application of low-grade lubricating oil and the lack of new lubrication technology are the main cause of the low-efficient petroleum usage.

In the future decades petroleum shortages will be more and more strict in China, and it will have an important role in the delay of economic development and national safety. It is our lubricants workers duty to develop and apply the new lubrication technology to enhance the use efficiency of petroleum, to prevent our reliable environment and to push the China’s sustainable development. The world total consumption quantity of lubricating oil keeps about 37 to 39 million tons per year. It shares about 1% of total crude refining amount. The lube consumption amount in North America keeps stable about 9.5million tons which listed No.1 while European and previous Unit Soviet area decreased. Asia is the only increased area, mainly because of the fast economic growth in China and India. China has consumed 4.4million tons lubricating oil in 2003, take about 1.6% of total crude refining amount, shares about 11% of whole world consumption amount, values about 22 billion RMB[1]. The increased rate reaches the highest--10.56% compared to 2002. This was the first time China become the second lubricant consumer in the world, just after USA. In 2004, China’s lubricants consumption will reach over 5 million tons, reaches the top in history, the increased rate will reach 10% comparing with 2003.

China’s Automobile industry develops rapidly in the recent years, at the same time fuel efficiency keeps a low level. In 2002 China’s automobile has consumed 2.28 ton fuel per automobile which is 110-120 percent of USA, 200 percent of Japan.

There exists a wide market for the application of new lubrication technology. The application of those additives and lube oils such as environment-friend additives, friction modified agents, nano-lube additives, energy-conserving multi-grade lube oils can enhance lubrication efficiency of equipments, decrease fuel consumption and conserve the petroleum resources.

In this paper the applications of Cu nano-lube additive are introduced. and 0.1% Cu nano-lube is added into passenger car motor oil 5W30 SJ. The four-ball test equipment, cam-tappet test equipment and MS VI engine test are used to evaluate the performance, the test results shows the application of Cu nano-additive can obviously decrease the friction coefficient and fuel consumption.

China should establish its national lube oil evaluation system, this system can greatly push the warranty of the quality of lube oil. The standard and national principle for fuel-conserving should be acted to improve the application of multi-grade lube oil and energy-conserving lube oil and new technology.

Conference