Coolants for All Motor Cars, with Special Relevance to Cars with Wet Cylinder Liners Especially Rolls-Royce Phantom III, Silver Cloud II, III, SY and SZ Models

COOLANTS - This is a WARNING to ALL OWNERS

By Stephe Boddice, September 2007 - July 2008

Conclusions within this article are made with the reservation that they are my opinions only, that many statements relate purely to my own experiences, and that any remedial action taken by owners is at their own risk. Certain information has been withheld from the article for legal reasons.

In July 2006 I serviced my Phantom III. The engine on this car had been totally rebuild, by me, in 2003 and, following a complete restoration of the rest of the vehicle, it won First Prize in the PIII class at the RREC National in 2005. The point being that the whole vehicle is in 90+ point condition. The coolant was two years old and therefore ready for replacement. My local auto spares store, part of a national (UK) chain, was out of stock of the standard own-brand antifreeze but was fully stocked with their own-brand 'Advanced Coolant'. The information on the label quoted the usual compliance numbers, offered extended coolant life, better anti-corrosion protection and stated that the product was suitable for older engines. On that basis, following a cooling system flush, I decided to use the new coolant.

After about 4 weeks I noticed damp patches on the floor beneath the engine. Further investigation revealed that coolant was leeching from almost every possible joint: both radiator top hoses, both radiator bottom hoses, the Calorstat joint in the header tank, drain tap joint in the bottom tank plus the weep holes in the block. Tightening joints and hose clips had no effect. My bodily fluids started to threaten sympathetic reaction with the coolant.

The new coolant was drained off, all hoses were replaced with new items and leaking gaskets replaced; obviously, the liner 'O' rings were left in situ pending further investigations. The engine was thoroughly flushed three times and the coolant replaced with a known standard anti-freeze from a different supplier. The result was that all of the coolant leaks stopped immediately. Unfortunately, after driving the car, there was evidence that minute amounts of oil had started to seep from at least three of the weep holes. Bearing in mind that this a concours' standard car, the result was not entirely satisfactory.

Cutting a very long story short, I spent 5 months attempting to get the retailers to provide technical information of any changes made to the formulation of the 'Advanced' coolant compared with their previous offering. This process went through the usual steps of stonewalling, denial, acknowledgement of changes, admission of known problems and culminated with them blaming me for using their product without the manufacturer's recommendation. At this point I escalated the problem and am now in discussions at Board level within the company, which is, in turn, making the manufacturer (one of GB's main producers) provide evidence of the product's suitability or otherwise.

It turns out that the 'Advanced' coolant is manufactured using an Organic Acid Technology (OAT) corrosion inhibitor pack. The previous anti-freeze used an Inorganic Additive Technology (IAT). Evidence supplied to the retailer by the manufacturer admits that the OAT inhibited coolant is known to cause leak problems even in engines that do not use wet liners. The major fault with the inhibitor being that it attacks, amongst other things, silicone compounds. The most commonly used base compound for gasket sealants is silicone.

The immediate problem to the buying public is that the manufacturers and retailers are failing to disclose which inhibitor technology is being incorporated in their coolants/anti-freezes . Anybody replacing their coolant MUST investigate with the manufacturer which system is employed. It appears that OAT, and even HOAT (Hybrid OAT), inhibited coolant can be supplied under the same national compliance standard codes as the earlier IAT technology.

To date, the industry has overlooked the volume/number of old car users who may inadvertently buy their products and the potential risks that this consumption represents. In 2006 there was a survey conducted relating to the 'old car' movement and its contribution to the EU economy. In the UK this was co-ordinated by the Federation of British Historic Vehicle Clubs (FBHVC), which is an umbrella body, funded by all of the recognised auto clubs, to fight poorly drafted EU automotive regulations that may accidentally drive old cars off the road. The findings, for the UK alone, were that this business sector contributed £2 billion (say $3.8 billion) to the UK economy alone. If the coolant manufacturers and retailers carelessly move to OAT inhibitors without considering the ramifications on the old car sector they may find that class actions through the courts will damage their Balance Sheets as much as these products do our old engines.

UPDATE *(ORIGINALLY DRAFTED 13TH SEPTEMBER 2007)*

Well, folks, this has been a long time coming but the situation has eventually been resolved. For those who had the patience to follow this saga from its inception I can now give the definitive answer, which is: -

DO NOT USE OAT INHIBITED COOLANT IN YOUR ENGINE!

I eventually had a meeting with the National Technical Manager of the OAT coolant manufacturer. He was categoric in his statement that this 'technology' is inappropriate for use in any Rolls-Royce or Bentley engine other than the latest Bentley GT and Goodwood Phantom. NO 'IFS' and NO 'BUTS'!

Glossary of inhibitor terminology: -
IAT = Inorganic Additive Technology
OAT = Organic Acid Technology
HOAT = Hybrid Organic Acid Technology

The officially recommended coolant for V8 engines is a 50/50 solution of water and ICI 007/400F antifreeze. The latter is still available from any Official Bentley Main Dealer - see http://www.bentleymotors.com for contact details.

Changeover history: -

Car manufacturers.
The major car manufacturers were looking for improved coolant performance with, amongst other needs, extended product life. Engine designs were changed, including new seals, sealants and gaskets being introduced on a model by model basis. The manufacturers started selectively to introduce OAT coolants from about 1995 and virtually all engines manufactured since 2005 are now compliant with this technology.

Coolant manufacturers.
The primary impetus for the coolant manufacturers is to satisfy the needs of their main customers who are the car manufacturers. The secondary action is to then provide the after-market retailers with the same products so the market can continue to function. 'Old cars', in the eyes of both are deemed to be vehicles up to about 12 years old, this being the national average vehicle life in both the USA and Europe.

No consideration is given to vehicles of a greater age. The decline in the retail sales of IAT coolants is taken as an indication of falling demand despite the fact that the retailers are encouraged to promote H/OAT coolant. General ignorance of the product differences has not been considered, whether this related to the DIY mechanic or non-franchise auto shop operatives. Unless specific demands are made, by owners of really old cars, IAT coolants will soon be removed from the marketplace.

Summary: -
The old car movement in Europe has, fortunately, organised a strong lobbying group as a defence against EU bureaucratic stupidity. The EU legislation drafting machine is constantly putting forward proposals that would inadvertently remove old cars from the road. Representation has stopped this by providing accurate data on the contribution that this group of people make to the various national economies.

When the coolant manufacturer's representative was presented with a copy of the 2005 report he was astounded, not least by the apparent lost opportunity.

Result: -
1) The coolant manufacturer has undertaken to change its own and its retailers' labelling to emphasise the unsuitability of OAT in 'old cars'. At the same time it will clarify or reword its definition of 'old car'.
2) My issue was resolved without recourse the courts, thus depriving the legal profession of a small income.
3) My car has regained its continence.
4) The coolant manufacturer may actually start to market IAT directly at the owners of those cars that need it.

YOU HAVE BEEN WARNED!!!