

## Testing, PMs vital to summer cooling system maintenance

Summertime heat can take its toll on cooling systems already taxed with engine operating temperatures at 225°F to 250°F. Today's engines have a much tighter cooling margin than previous models. As a result, proper coolant and cooling system maintenance becomes increasingly important to maximizing system life and maintaining its efficiency.

Field testing performed at every PM is vital to maintaining an efficient cooling system and coolant formulation that protect and prolong system life. It ensures that system components are functioning properly, glycol levels are maintained at 50 – 60% for boil point control, inhibitor levels are maintained for proper metal protection and the pH level is within OEM and the coolant manufacturer's specifications for adequate corrosion control.

Just how important is coolant formulation and system efficiency? A 50/50 coolant mix – 50% concentrate to 50% water – brings the coolant's boil point to 225°F at sea level. That's the low end for an engine today that operates at 225°F to 250°F. But every added pound of pressure raises that boil point another 2.7°F. So a 14 lb. pressure cap raises the boil point of a 50/50 formulation to about 263°F. If a pressure cap or relief valve is defective or glycol levels are inadequate, boil point is right back down to engine operating temperature.

About a 40° buffer provides adequate protection against boiling. When conventional coolants are allowed to boil, glycol decomposition can cause several problems. The chemical reaction results in oxalic acid. This "burnt" coolant has a very distinctive dark brown-gold color and an even more distinctive odor. It creates a "varnish" that covers internal system components, prevents the system from operating properly and is extremely difficult to correct. This varnish must be flushed, the system thoroughly cleaned and any hot spots corrected before new coolant can be introduced. Monitoring system condition and strip testing the coolant at every PM can keep operations running smoothly and without unexpected interruption.

Further laboratory testing on a quarterly schedule can identify many issues caused by excessive heat before catastrophic failure occurs and assist maintenance management in determining appropriate preventive maintenance testing regimes.