COOLING TRENDS

If you were to learn that one system was responsible for nearly half of your heavy duty engine repair costs, you'd probably take a very close look at that system.

Here's your chance.

According to a study by Fleetguard, 40% of those repair costs can be traced to cooling system problems. And with the new exhaust-gas-recirculation engines putting out more heat, taking care of your cooling system is more important than ever.

Yet cooling systems are the Rodney Dangerfield of engine maintenance: They don't get no respect.

"Antifreeze/coolant has never really taken on the aura of a performance product like motor oil has," says Craig Gullett, brand manager with coolant maker Old World Industries. As a result, cooling systems suffer, and so does your bottom line.

NEW ENGINES, MORE HEAT

The 2002 emissions engines reject roughly 30% more heat than previous engines, says Gary Falendysz, senior principal engineer of the Truck Division at radiator manufacturer Modine. That meant changes in cooling systems.

"In some cases, the size of the cooling module increased accordingly," he says. "In other cases, there just wasn't enough room under the hood for such an increase." One way that has been used to overcome increased heat rejection requirements without a proportionate increase in cooling module size, he says, was to increase air flow through the cooling package by increasing fan speed or by using a more efficient fan or fan shroud. Another way was to use a more efficient cooling module.

According to Preston Feight, assistant chief engineer for Kenworth, the additional heat "meant treating the engine, the cooling module and the under-hood airflow as a single system."

Changes at various manufacturers include increasing the boiling point of the coolant by raising the pressure limit on the radiator cap; using higher-performance fans and fan clutches; increased coolant flow; and bigger and better radiators.

On the Mack Vision, the radiator is placed in front of the charge air cooler. International is using a side-by-side configuration of the radiator and the charge air cooler on its 8000 and 9000i Series. Peterbilt is testing a vertical modular design with a more efficient cross-flow system.

In general, OEMs say these changes have not affected any maintenance procedures. Darrell Hicks, OEM liaison with Penray, notes that before the 2002 model year engines were unveiled, there was some concern in the industry that new coolants might be required. That doesn't appear to be the case.

WHY COOLING SYSTEMS CAUSE PROBLEMS

Coolant not only provides freeze protection in cold weather, it also helps to prevent boil-over in hot weather. More important, says Modine's Falendysz, engine coolant contains corrosion inhibitors that protect cooing system components from internal corrosion. But those inhibitors lose their effectiveness over time, and if you're not paying attention to it, you could have big problems.

There are four major problems related to cooling systems: corrosion, cavitation erosion, scale deposits and inhibitor drop-out.

All metals exposed to coolant eventually will corrode, says Frank Cook, director of technology at Old World Industries, which makes Fleet Charge coolant/antifreeze. But maintaining proper coolant chemistry will slow the corrosion by forming a protective layer on metal surfaces.

A very common type of corrosion is liner cavitation erosion, or pitting. Cook says this can lead to one of the most common and costly results of improper cooling system maintenance: perforated wet-sleeve cylinder liners. Cavitation erosion is caused by tiny bubbles formed when coolant boils during the combustion process. These bubbles collapse against the liner wall surface at tremendous pressures, blasting small pits in the steel liner.

Nitrite in the coolant forms a thin protective film on the coolant side of the liner wall to protect against both corrosion and pitting. In addition, anti-foam agents chemically change the fluid so it's hard for bubbles to form.

Hard water scale can block a cooling system's ability to transfer heat, resulting in overheating. Only 1/16 inch of scale will reduce cooling system heat transfer efficiency by 40%. Scale tends to form in specific areas of the hot side of the engine, causing localized hot spots, which, in turn, can cause distortion and damage the engine. Properly charged coolant contains additives to minimize these deposits.

Inhibitor drop-out occurs when phosphate and/or silicate are present in too high a concentration, usually because someone's using too high a proportion of antifreeze to water. These inhibitors have limited solubility in engine coolant, so if there's too much, some of it "drops out." The result is seen in failed water pumps, thermostats, radiators and heater cores.

This problem, which used to be known as "green goo," is not as big a problem in today's engines, says Penray's Hicks. "The drop-out issue was primarily limited to a specific cooling system design that is no longer in use," he says.

WHICH COOLANT?

There have been many changes in coolant/antifreeze technology over the years, especially in the last decade or so.

In the 1950s, fleets had no choice but to flush and replace the antifreeze when the additives wore out at 10,000 to 15,000 miles. In the '60s, Nalco Chemical (now Ondeo Nalco) introduced Nalcool, the first comprehensive supplemental coolant additive for heavy trucks.

For the next several decades, diesel engine coolant technology consisted of mixing antifreeze with water, then adding the appropriate amount of supplemental coolant additives, or SCAs, to protect against corrosion, foam and cavitation. SCAs can be added as a liquid, as a tablet, or with special filters that release the chemicals into the system.

The next big advance came in the early '90s, when "fully formulated" products came onto the market. These products came "pre-charged" with the chemicals that heavy-duty engines needed. However, like traditional coolant/antifreeze, these coolants require close monitoring of SCA levels, with additional SCAs added on a regular basis - essentially at every oil drain interval or "wet" service.

This close monitoring, which can be a headache, led to two other new technologies designed to minimize coolant maintenance: a delayed-release SCA product and an organic acid technology product, also known as "extended life coolant," or ELC. The delayed-released SCA product

extends coolant maintenance intervals by releasing chemicals into the coolant over time. Maintenance intervals for the coolant are extended to 150,000 miles. Organic acid technology products appeared in the mid-1990s. Pioneered by Texaco, they can go 600,000 miles with only one addition of chemicals, or inhibitors, at 300,000 miles. They use a combination of carboxylate inhibitors in place of the traditional SCA package. These inhibitors deplete much more slowly.

"[Extended]-life coolant is becoming very popular as the initial fill from the OEMs," says Zack Ellison, director of customer technical support for Cummins. "Fleets and owners like not having to spend as much time with cooling system maintenance." Ron Moser, global coolants manager for ChevronTexaco, says ELCs have reduced costs for fleets and truck owners. While they may be more expensive at initial fill, he says, "if you look at the cost of the product over 600,000 miles versus what you would spend on regular coolant and SCAs," the savings are very real. ChevronTexaco also claims improved performance and longer component life by eliminating abrasive dissolved solids and improving heat transfer.

ELCS IN THE REAL WORLD There's a downside to extended life coolants. Extra care is required to make sure they aren't contaminated, or diluted, by non-ELC coolant used as top-up fill. In the real world, that takes a level of control many fleets find impossible. The typical road tractor, after its first year, uses about eight gallons a year in top-off coolant fluid - a drop a mile. When drivers pull into a truckstop for an oil change, the technician who checks the fluid levels often mistakenly puts conventional coolant in the system. Or the driver himself puts in the wrong stuff. Penray's Hicks says he has found it difficult to find extended-life coolant for sale at truckstops for top-offs. In fact, he says, most of the coolants he sees in truckstops are automotive-type coolants that don't have the necessary chemistry for a heavy-duty engine. The obvious solution would be for drivers to carry the proper 50/50 coolant solution in the truck with them. But Old World Industries' Gullett says in the real world, that just doesn't work for most fleets, especially for those with high turnover. "Does the industry really expect the truck driver is going to buy the right color?" asks Darry Stuart, who has worked with fleets for 35 years to solve maintenance problems. "The color isn't shown on the outside of the truck, so he sticks in the most attractively priced stuff, and it creates an ugly brown mixture of antifreeze that we have to drain and change." Makers of extended-life coolants provide stickers that go on the reservoir or the radiator identifying what product is in there, and warning technicians or drivers to top off only with the same product or with water. "In the long run, these extended life coolants are great products," Gullett says. "But with any new technology, acceptance is always slow." Understanding seems to be even slower. For instance, there has been some confusion about just how much dilution extended life coolants can take. A common misconception is that if any regular coolant gets into ELC, you must then treat the system as if it has been filled with traditional coolant. A TMC Recommended Practice says if the system has been topped off with more than 10% traditional coolant, there are three options: flush and fill the system, treat it as a traditional coolant system, or analyze the coolant and act accordingly. ChevronTexaco's Moser says his company's product will take up to 25% dilution and keep its extended-life properties. You do, however, lose some of the benefits of having a silicate-free, phosphate-free coolant, he says. There's also some disagreement about whether you should switch a truck that's been filled with conventional coolant to the extended life product. International's Ron Welch says customers do not gain the long-life benefit by doing this, because conventional coolants put a coating on cooling system components that the extended life coolants can't penetrate. ChevronTexaco's Ron Moser disagrees. While you lose some of the benefits of the long-life coolant by switching rather than factory fill, he says, it's still worthwhile to switch over. The best way to do this is to drain the system, flush it with water, and refill with the ELC, he says. He admits that in the real world, most fleets don't flush the system, but he says the benefits are still there. Penray's Hicks says he has seen fleets switch over from conventional to extended life coolants without any problems. He says he's seen even more switch from ELCs back to conventional coolants because they can't control contamination of the coolant. "People want something for nothing. They don't want to touch the system," Hicks says. "But the driver's going to touch it whether they like it or not." Old World Industries recently introduced a different formulation that it says addresses some of the concerns about ELCs. The product, Final Charge Global Extended Life Coolant, has an additive package that is more tolerant of contamination. It can accept up to 25% contamination, or mixing with conventional coolants, without sacrificing corrosion protection. If contamination exceeds 25%, the user simply need drain some coolant off and top off with Final Charge, instead of draining, flushing and refilling. In addition, Old World Industries offers a Final Charge Converter that lets a fleet convert from regular antifreeze to the Final Charge ELC without the expense of draining, flushing and refilling the system.

CARE AND FEEDING OF COOLANT While fully formulated antifreeze, SCA-charged filters and long-life coolants have all been marketed with the goal of less maintenance, a good maintenance program will still keep a close eye on coolant. Additives dissipate with usage; hard water can adversely affect the chemistry of coolant as well as its cleanliness; and top-offs on the road with plain water or the wrong kind of coolant dilute

the coolant's chemicals. Wayne Mellgren, field service manager at Donaldson, says cooling systems are misunderstood. "A high percentage of fleets don't have a good handle on the condition of the coolant in their engines," he says. "The filter and additive package can only do so much with the coolant as it is supplied." For instance, Mellgren says, if the coolant has a pH factor that's out of line and it becomes acidic, that can do as much damage to the engine as too much or too little additives. So here are the basics: Coolant in the truck should consist of a 50/50 mix of antifreeze and water. Use a refractometer regularly to check for freeze protection down to minus 34 degrees. These devices are available on any tool truck, says Hicks. SCA levels should be determined and adjusted through testing. Test kits feature plastic test strips that resemble litmus paper from your high school chemistry days. When dipped in coolant, the strips change color. You compare the strips against a color chart to determine the condition of the chemicals in the coolant. Some fleets simply spin on a new filter that includes SCAs at every oil change, but you can save some money on filters by only replacing when the test strips indicate SCA levels need replenishing. Mellgren says one of his customers is going three oil change intervals between filter changes by taking this approach. Another option is to use a filter with extended chemical release capabilities, which can go up to 150,000 miles. It's important to have the right filter for the engine. SCA-charged filters contain different amounts of chemicals depending on the size of the cooling system. Put on the wrong filter, and you can be adding too little or too much treatment. And don't make the mistake of thinking extended-life coolants get you off the hook. Larry Ericson, recently retired Peterbilt Midwest region customer service manager, says the longevity of ELCs does not mean you shouldn't still check to be sure you know what your cooling system is doing. "You can't just put it in and forget it. But that is what is happening in the industry," he says. "That's the way customers are interpreting what they're being told about ELCs." Ericson recommends testing ELCs about every 50,000 miles for freeze point, pH level and inhibitor levels.

DO YOU NEED FILTERS? Unlike oil or fuel filters, coolant filters are basically dispensers of chemistry. So are they even necessary? Because coolant filters containing conventional SCAs should not be used on engines filled with ELCs, today some manufacturers do not install a filter at all on engines filled with this kind of coolant. Darry Stuart says for years, he has taken the option of not having filters on the engine, opting to use liquid SCAs for the fleets he works with. However, there's little argument that the easiest way for most fleets to add SCAs is through a spin-on filter. In addition, Penray's Hicks says, filters can serve an important psychological purpose in the shop. "When that filter is sitting there in that row of filters, it is a visual reminder to check the cooling system," he says. "They say, 'Look, here I am - change me.'" Donaldson's Mellgren says coolant filters do perform a filter function. As a bypass filter, it only takes a small percentage of the total fluid that's circulating through the system and puts it through the filter. "It's really just looking for large pieces, to keep them from circulating in the engine, wearing out the pump bearings, that type of thing." Filters can also serve as a warning of problems in the coolant system, Mellgren says. "We get a lot of customers who complain that the filter canister is rusting out," he says. "They need to recognize that the coolant and the additives are there to keep rust from happening. If there's rust happening inside the filter, chances are something's happening in the engine." Perform the following checks at each wet service: • Check freeze point using a refractometer (should be at minus 34 degrees for a 50/50 mix of antifreeze and water). For ELCs, this can be done about twice a year. • Check SCA levels using test strips. For ELCs, this can be done about twice a year, or every 50,000 miles. • Visually check coolant for contamination. • Check radiator cap and radiator neck. For example, if the oil cooler is failing, there will be a greasy, gummy black ring in there. • Check radiator and coolers for exterior debris and dirt, such as bugs. • Check hoses and hose clamps for leaks. • Examine belts to make sure they're in good condition. Periodic cleaning of the air side of the radiator, charge air cooler, condenser and other heat exchangers is important. Leaves, bugs and other road debris can reduce performance. However, be careful with pressure washers, which could damage the fins. Stuart recommends pressurizing the coolant system at every PM to a minimum of 18 pounds. "If it's going to leak or blow something apart," he says, "let it do it where you don't need a wrecker." If you don't pressurize the system to the proper pressure, he says, you will have slow leaks that aren't visible because the liquid evaporates on the side of the engine block before it has a chance to leave puddles. A lot of fleets take it for granted that they're going to lose coolant, Stuart says, but they don't have to if they pressurize the radiator and check the cap integrity along with other proper cooling system maintenance. When a new hose is installed, it is a good idea to retighten the hose clamps after they have been at operating temperature to prevent cold weather leaks. Peterbilt's Ericson says he is seeing improper tightening of the new constant-torque hose clamps. "The tendency is to tighten those springs down tight. By doing that, you ruin the effectiveness of the constant torque. The constant torque is applied by the springs being able to contract and expand." Some new trucks come with shrink bands instead of hose clamps. Shrink bands are designed to prevent cold weather leaks, and do not require any adjustment after installation. International recommends that customers and dealers use higher initial tension values when installing a new belt. A new belt should be allowed to run for about five minutes to get seated in the groove, after which the belt should be re-tensioned to the recommended lower value range. This will minimize numerous belt adjustments and prevent new belts turning at low tension. Stuart says he has seen problems with short tensioner life

among the fleets he works with. Check the belt tensioners at each PM to make sure the bearing doesn't show signs of failure. Fan blades are increasingly being made of plastic and need to be checked periodically for cracks. Thermostats are another cooling system item that needs attention. "It's probably the most overlooked part of the vehicle," Stuart says. He says often the problem when an engine is running cool is actually a thermostat seal, not the thermostat itself. In addition, make sure you know the difference between a venting and a non-venting thermostat and use the right replacement part. "For years, cooling systems didn't need a lot of maintenance," Peterbilt's Ericson says. "People just changed the filter at normal service points and didn't pay a whole lot of attention to it. Now with the higher temperatures and added load being put on the engines because of the higher operational heat, it's very, very important that the cooling system be made an integral part of your maintenance." "Fleets are dealing with so many things right now," says Donaldson's Mellgren. "Revenue, new engine technology. Coolant is probably not something they're looking to review, but it's more important than ever."

TMC Proposes Color Guidelines The Technology and Maintenance Council of the American Trucking Assns. has proposed guidelines for standardizing the color of engine antifreeze/coolants. Coolants currently come in a rainbow of colors, including yellow, green, blue, pink and red. But TMC warns that you can't positively identify a traditional coolant from an ESI coolant by color alone. The TMC proposal also contains recommendations for a standard label format and location for identifying engine antifreeze/coolant used at factory fill and for aftermarket packaging. Under the proposal, conventional low-silicate antifreeze/coolant, designated TMC A, would be green. Fully formulated ethylene glycol antifreeze/coolant, or TMC B, would be purple/pink. Fully formulated propylene glycol antifreeze/coolant (TMC C) would be blue. Organic Acid Technology products (TMC D) would be red. Proposed labels would use these colors as well as the TMC letter designation, the description of the type of product, and the manufacturer. TMC also recommends that one-gallon containers, in addition to the labels, have color coded caps.

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COOLING TRENDS

If you were to learn that one system was responsible for nearly half of your heavy duty engine repair costs, you'd probably take a very close look at that system.

Here's your chance.

According to a study by Fleetguard, 40% of those repair costs can be traced to cooling system problems. And with the new exhaust-gas-recirculation engines putting out more heat, taking care of your cooling system is more important than ever.

Yet cooling systems are the Rodney Dangerfield of engine maintenance: They don't get no respect.

"Antifreeze/coolant has never really taken on the aura of a performance product like motor oil has," says Craig Gullett, brand manager with coolant maker Old World Industries. As a result, cooling systems suffer, and so does your bottom line.

NEW ENGINES, MORE HEAT

The 2002 emissions engines reject roughly 30% more heat than previous engines, says Gary Falendysz, senior principal engineer of the Truck

Division at radiator manufacturer Modine. That meant changes in cooling systems.

"In some cases, the size of the cooling module increased accordingly," he says. "In other cases, there just wasn't enough room under the hood for such an increase." One way that has been used to overcome increased heat rejection requirements without a proportionate increase in cooling module size, he says, was to increase air flow through the cooling package by increasing fan speed or by using a more efficient fan or fan shroud. Another way was to use a more efficient cooling module.

According to Preston Feight, assistant chief engineer for Kenworth, the additional heat "meant treating the engine, the cooling module and the under-hood airflow as a single system."

Changes at various manufacturers include increasing the boiling point of the coolant by raising the pressure limit on the radiator cap; using higher-performance fans and fan clutches; increased coolant flow; and bigger and better radiators.

On the Mack Vision, the radiator is placed in front of the charge air cooler. International is using a side-by-side configuration of the radiator and the charge air cooler on its 8000 and 9000i Series. Peterbilt is testing a vertical modular design with a more efficient cross-flow system.

In general, OEMs say these changes have not affected any maintenance procedures. Darrell Hicks, OEM liaison with Penray, notes that before the 2002 model year engines were unveiled, there was some concern in the industry that new coolants might be required. That doesn't appear to be the case.

WHY COOLING SYSTEMS CAUSE PROBLEMS

Coolant not only provides freeze protection in cold weather, it also helps to prevent boil-over in hot weather. More important, says Modine's Falendysz, engine coolant contains corrosion inhibitors that protect cooing system components from internal corrosion. But those inhibitors lose their effectiveness over time, and if you're not paying attention to it, you could have big problems.

There are four major problems related to cooling systems: corrosion, cavitation erosion, scale deposits and inhibitor drop-out.

All metals exposed to coolant eventually will corrode, says Frank Cook, director of technology at Old World Industries, which makes Fleet Charge coolant/antifreeze. But maintaining proper coolant chemistry will slow the corrosion by forming a protective layer on metal surfaces.

A very common type of corrosion is liner cavitation erosion, or pitting. Cook says this can lead to one of the most common and costly results of improper cooling system maintenance: perforated wet-sleeve cylinder liners. Cavitation erosion is caused by tiny bubbles formed when coolant boils during the combustion process. These bubbles collapse against the liner wall surface at tremendous pressures, blasting small pits in the steel liner.

Nitrite in the coolant forms a thin protective film on the coolant side of the liner wall to protect against both corrosion and pitting. In addition, anti-foam agents chemically change the fluid so it's hard for bubbles to form.

Hard water scale can block a cooling system's ability to transfer heat, resulting in overheating. Only 1/16 inch of scale will reduce cooling system heat transfer efficiency by 40%. Scale tends to form in specific areas of the hot side of the engine, causing localized hot spots, which, in turn, can cause distortion and damage the engine. Properly charged coolant contains additives to minimize these deposits.

Inhibitor drop-out occurs when phosphate and/or silicate are present in too high a concentration, usually because someone's using too high a proportion of antifreeze to water. These inhibitors have limited solubility in engine coolant, so if there's too much, some of it "drops out." The result is seen in failed water pumps, thermostats, radiators and heater cores.

This problem, which used to be known as "green goo," is not as big a problem in today's engines, says Penray's Hicks. "The drop-out issue was primarily limited to a specific cooling system design that is no longer in use," he says.

WHICH COOLANT?

There have been many changes in coolant/antifreeze technology over the years, especially in the last decade or so.

In the 1950s, fleets had no choice but to flush and replace the antifreeze when the additives wore out at 10,000 to 15,000 miles. In the '60s, Nalco Chemical (now Ondeo Nalco) introduced Nalcool, the first comprehensive supplemental coolant additive for heavy trucks.

For the next several decades, diesel engine coolant technology consisted of mixing antifreeze with water, then adding the appropriate amount of supplemental coolant additives, or SCAs, to protect against corrosion, foam and cavitation. SCAs can be added as a liquid, as a tablet, or with special filters that release the chemicals into the system.

The next big advance came in the early '90s, when "fully formulated" products came onto the market. These products came "pre-charged" with the chemicals that heavy-duty engines needed. However, like traditional coolant/antifreeze, these coolants require close monitoring of SCA levels, with additional SCAs added on a regular basis - essentially at every oil drain interval or "wet" service.

This close monitoring, which can be a headache, led to two other new technologies designed to minimize coolant maintenance: a delayed-release SCA product and an organic acid technology product, also known as "extended life coolant," or ELC. The delayed-released SCA product extends coolant maintenance intervals by releasing chemicals into the coolant over time. Maintenance intervals for the coolant are extended to 150,000 miles. Organic acid technology products appeared in the mid-1990s. Pioneered by Texaco, they can go 600,000 miles with only one addition of chemicals, or inhibitors, at 300,000 miles. They use a combination of carboxylate inhibitors in place of the traditional SCA package. These inhibitors deplete much more slowly.

"[Extended]-life coolant is becoming very popular as the initial fill from the OEMs," says Zack Ellison, director of customer technical support for Cummins. "Fleets and owners like not having to spend as much time with cooling system maintenance." Ron Moser, global coolants manager for ChevronTexaco, says ELCs have reduced costs for fleets and truck owners. While they may be more expensive at initial fill, he says, "if you look at the cost of the product over 600,000 miles versus what you would spend on regular coolant and SCAs," the savings are very real. ChevronTexaco also claims improved performance and longer component life by eliminating abrasive dissolved solids and improving heat transfer.

ELCS IN THE REAL WORLD There's a downside to extended life coolants. Extra care is required to make sure they aren't contaminated, or diluted, by non-ELC coolant used as top-up fill. In the real world, that takes a level of control many fleets find impossible. The typical road tractor, after its first year, uses about eight gallons a year in top-off coolant fluid - a drop a mile. When drivers pull into a truckstop for an oil change, the technician who checks the fluid levels often mistakenly puts conventional coolant in the system. Or the driver himself puts in the wrong stuff. Penray's Hicks says he has found it difficult to find extended-life coolant for sale at truckstops for top-offs. In fact, he says, most of the coolants he sees in truckstops are automotive-type coolants that don't have the necessary chemistry for a heavy-duty engine. The obvious solution would be for drivers to carry the proper 50/50 coolant solution in the truck with them. But Old World Industries' Gullett says in the real world, that just doesn't work for most fleets, especially for those with high turnover. "Does the industry really expect the truck driver is going to buy the right color?" asks Darry Stuart, who has worked with fleets for 35 years to solve maintenance problems. "The color isn't shown on the outside of the truck, so he sticks in the most attractively priced stuff, and it creates an ugly brown mixture of antifreeze that we have to drain and change." Makers of extended-life coolants provide stickers that go on the reservoir or the radiator identifying what product is in there, and warning technicians or drivers to top off only with the same product or with water. "In the long run, these extended life coolants are great products," Gullett says. "But with any new technology, acceptance is always slow." Understanding seems to be even slower. For instance, there has been some confusion about just how much dilution extended life coolants can take. A common misconception is that if any regular coolant gets into ELC, you must then treat the system as if it has been filled with traditional coolant. A TMC Recommended Practice says if the system has been

topped off with more than 10% traditional coolant, there are three options: flush and fill the system, treat it as a traditional coolant system, or analyze the coolant and act accordingly. ChevronTexaco's Moser says his company's product will take up to 25% dilution and keep its extended-life properties. You do, however, lose some of the benefits of having a silicate-free, phosphate-free coolant, he says. There's also some disagreement about whether you should switch a truck that's been filled with conventional coolant to the extended life product. International's Ron Welch says customers do not gain the long-life benefit by doing this, because conventional coolants put a coating on cooling system components that the extended life coolants can't penetrate. ChevronTexaco's Ron Moser disagrees. While you lose some of the benefits of the long-life coolant by switching rather than factory fill, he says, it's still worthwhile to switch over. The best way to do this is to drain the system, flush it with water, and refill with the ELC, he says. He admits that in the real world, most fleets don't flush the system, but he says the benefits are still there. Penray's Hicks says he has seen fleets switch over from conventional to extended life coolants without any problems. He says he's seen even more switch from ELCs back to conventional coolants because they can't control contamination of the coolant. "People want something for nothing. They don't want to touch the system," Hicks says. "But the driver's going to touch it whether they like it or not." Old World Industries recently introduced a different formulation that it says addresses some of the concerns about ELCs. The product, Final Charge Global Extended Life Coolant, has an additive package that is more tolerant of contamination. It can accept up to 25% contamination, or mixing with conventional coolants, without sacrificing corrosion protection. If contamination exceeds 25%, the user simply need drain some coolant off and top off with Final Charge, instead of draining, flushing and refilling. In addition, Old World Industries offers a Final Charge Converter that lets a fleet convert from regular antifreeze to the Final Charge ELC without the expense of draining, flushing and refilling the system.

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