

RESPONSE TO SPANNERMAN ARTICLE 'OVERCOOLING' APRIL 2015

I refer to the article, which appeared in the Spannerman section of the April 2015 issue of ARVM ONLINE (reprinted below), recommending the removal of antifreeze from a vehicle's radiator in order to "cure" problems of overheating.

OVERCOOLING

I own a brand-new American motorhome built on a Freightliner chassis and powered by a Cummins 330bhp diesel engine. The engine appears to be running too cool – 168 degrees Fahrenheit – even when working hard on the hills. I know this is not good for fuel economy or my engine. I'm getting only 7.5 miles per gallon. I have had the cooling system thermostat changed but that did not help. My Cummins engine manual states that the engine is supposed to run between 180 degrees and 195 degrees Fahrenheit and that continuous running outside these parameters will cause damage.

I recently took the coach to an experienced workshop to have the cooling system tested. The mechanics detected a problem but did not know how to fix it. The highest temperature the mechanic could get the engine to register at on his computer was 175.6 degrees Fahrenheit, with the radiator completely blocked with cardboard and the rpm set at 1,500 for 15 minutes. My Allison transmission fluid level check always tells me that the temperature is too cold to check (lower than 160 degrees. My Allison manual tells me to operate between 160 degrees and 230 degrees Fahrenheit.

When I check the radiator from the rear of the coach, I find there is warm air coming from the first 5 or 6 inches toward the right side. As I move my hands toward the left side, the air is cold – ice cold. Could the problem be related to the direct-drive fan? The transmission cooler is cooled by the same fan. I have a friend who is experiencing the same problem with his coach. I would appreciate any help you can give me.

The direct-drive fan has a thermostat that is separate from the engine thermostat. The direct-drive fan should not operate under 190 degrees; that may be the cause of your cooling problem. I suggest that you contact your nearest authorised Cummins service centre and have them check the system electronically and make any necessary adjustments.

From time to time there's a question in your column regarding overheating and what to do about it. All kinds of solutions are given, and most of them could very well be valid. However, there is one solution that is never mentioned: antifreeze. Most people don't realise that common ethylene glycol antifreeze is a

rather poor conductor of heat. In fact, its thermal conductivity characteristics are only about half that of water. This means that the more antifreeze you put into your radiator, the hotter your engine will run. This is true regardless of engine type – diesel or petrol.

The experts all tell us to use a 50-50 mix of antifreeze and water but please remember that those experts are the same ones that sell antifreeze. A 50-50 mix may be all right for cold weather driving but if you drive in hot weather that 50-50 mix is going to ruin your trip. You'll spend more time at the side of the road letting your engine cool down than on the road enjoying the beautiful scenery.

I know this may sound blasphemous, but if you have overheating problems, try the logical solution. Just drain out all that wonderful antifreeze and put in plain water. You'll be amazed at the difference.

The article stated:

"If you have overheating problems try the logical solution, just drain out all that wonderful antifreeze and put in plain water.."

My very strong advice to any RV owner is **PLEASE, PLEASE** do not apply this advice to your very expensive RV cooling system.

This is very bad advice. Not only is it not logical, it can and will if followed, result in extensive and irreparable damage to your engine.

Some of the "logical" reasons for overheating are as follows:

PROBLEMS WHICH CAN CAUSE OVERHEATING

1. RADIATOR CAP IS FAULTY

The radiator pressure cap is designed to increase the boiling point of the cooling solution in your radiator. For every 1lb of pressure the boiling point of the coolant is raised by 3°F. Pressure caps start to lose their efficiency after only twelve months. Change it for the correct type regularly to avoid problems.

When I bought my present rig from the authorised UK dealer, who had serviced the vehicle from new, it lost coolant when hot. I checked with Cummins and Spartan, who both informed me that I should have been using a 15lb pressure cap, namely, 275°F boiling point. My radiator had been fitted with a 7lb pressure cap, namely 233°F boiling point. When I fitted the new correct cap the coolant loss ceased and five years on all is still O.K. (cost – less than a fiver!)

2. CORROSION

The Formation of Rust and Corrosion in the Cooling System. The system should be flushed and refilled periodically to

prevent the formation of this debris, which will otherwise impair the performance of the system. Anti freeze starts to lose its corrosion inhibiting properties after two years, so needs to be changed regularly.

3. BUGS LEAVES ETC IN THE RADIATOR COOLING FINS

Carefully remove these with a soft brush or compressed air.

4. RUBBER RADIATOR HOSES

These can leak when hot yet appear OK when cold. Even a minute split will be enough to allow the coolant mixture to escape when hot.

Be aware that while the hose may appear fine on the outside, it can close up on the inside thereby restricting the flow of coolant in the system.

So check for "mushiness" by squeezing the hose, and replace if in doubt as to its internal condition.

5. THERMOSTATS STICKING

If the engine runs hot check the temperature of the upper radiator hose. If the hose is not hot the thermostat is probably stuck shut. This will result in the coolant in the engine block overheating to the point where the radiator is unable to achieve the correct coolant temperature, even if the faulty thermostat does eventually open. If faulty change it.

6. STICKING BRAKES

Brakes binding will cause the engine to work harder, with resultant higher temperature. Service your brakes regularly.

7. HARD DRIVING

Hard driving in hot or mountainous regions, particularly if towing causes heat build-up. This is very relevant if your automatic transmission cooler is in the main radiator, or, if separate is in contact with the main coolant radiator. My advice is slow down, drop down a gear and increase engine revs. Do not overload your vehicle.

8. DRIVE BELTS

Slipping drive belts stop the water pump from working correctly. Adjust or replace.

CONCLUSION

From day one, your vehicle was designed to run with antifreeze at the designated mixture ratio (refer to handbook).

Without it corrosion **WILL** quickly take hold in your very expensive RV engine. Antifreeze also increases the boiling point of your coolant. **NEVER NEVER NEVER RUN YOUR ENGINE WITHOUT IT!**

I hope the above information will be of help to you if you experience overheating in the future.