

What You Should Know About Antifreeze

by Von Patterson

Carolinas AHC

When does "permanent" not really mean *permanent*?...

When it's the adjective "permanent" as applied to antifreeze.

Contrary to what most car owners have come to believe, "permanent" antifreeze is not permanent. Permanent as applied to antifreeze simply means it will not boil away like the alcohol mixture of the good ol' days.

Modern antifreeze maintained at the proper mixture (50/50 water and antifreeze) will protect against freezing down to about -34°F. This same 50/50 mixture also raises the boiling point to about 295°F with a 7 lb. radiator cap to help in the proper cooling indefinitely.

But that's not the "permanent" you need be concerned about!

What you *do* need to be concerned about is the wearing out and disappearance of the other inhibitors added to antifreeze by the manufacturers. These inhibitors wear out and just go away during the normal coolant circulation. Along with acting as a water pump lubricant, these inhibitors keep the coolant at about Ph 7 and prevent rust and corrosion and actually give a sweet smell if everything is in order.

The 50/50 mix is critical! Too little water, and the system's ability to transport heat will be affected. If you have been adding straight antifreeze to top up, the concentration will get

too high, and the silicates that protect the aluminum can fall out and stop up water passages.

Most cooling system failures are due to neglect! It is important that the inhibitors and lubricants be kept in the system. The Ph balance rarely ever goes up; it goes down and the coolant becomes acidic... next come the holes in the radiator core or possibly gasket failure.

The easiest way to insure against failure of or problems in the cooling system is to **CHANGE ANTIFREEZE every two years.**

This is something you might want to do at spring tune-up... and also change the belt and hoses. It's easier at your convenience than beside the road in a ditch.

This tech tip applies to your daily driver as well. -Ed.

SILICONE BRAKE FLUID VS. TRADITIONAL BRAKE FLUID

Compiled by Reid Trummel
Editor

This is another installment in the continuing story of silicone brake fluid versus traditional brake fluid. It seems that both types have their advocates. This "conversation" took place via e-mail on the "Healeys Mail List" (see the *Austin-Healey Resource Book*). We take no position on this question and merely pass along these comments from others in hopes that they better inform you of the options. "We report, you decide," to borrow a phrase.

Dwight Patten (pattend@nortelnetworks.com) asked:

My fellow Healey community, I know this discussion and question are flammable, but I am about to fill a brand new brake system with brake fluid. I have been told by reputable sources to use only original Castrol Girling fluid. Now other sources (also reputable) tell me, in no uncertain terms, to go with silicone brake fluid. What am I to do? I want to do it right the first time and have heard that the silicone is hydroscopic, but the pipe will still have moisture entering via condensation, open air

when filling, bleeding etc. so it does not matter. If you had to do it all over again new, which would you now chose?

Ed Santoro (esantoro@drbc.statc.nj.us) responded:

Silicone! Water droplets will move into the reservoir and can be removed.

Ken Freese (Ken.Freese@Aerojet.com) responded:

My erratic clutch operation has gone away since switching back to Castrol from silicone. But be warned that switching back like I did requires changing all the seals except on the calipers.

Brian Mix (brianmix@home.com) responded:

Things to think about:

Is your paint new? Silicone brake fluid won't damage it. (This was a biggie for me). Pressure bleeders ALWAYS spill fluid on the car, and new pipes ALWAYS leak.

Some Closing Thoughts On Silicone Brake Fluid

by Bruce Gearns

Just my thoughts on this question of what fluid to use. As mentioned in the articles, the problem with non-silicone fluids, is their ability to absorb water. The resulting change in boiling point is tremendous. As an example, the Dry Boiling Point (0.1% or less moisture content, as in a new system) for Motul Racing Fluid is 572° F. The Wet Boiling Point (3.2% moisture content) is 298° F. Even worse, the fact that this moisture contamination causes pitting and corrosion, resulting in sized cylinders and calipers.

So, the answer is to prevent moisture build up in the fluid. You can do this by changing the fluid on a regular basis. I will never understand why the American auto makers do not tell people to do this. The European manufacturers tell you to do it every 24 months. And most racers do it after every session religiously.

Now, I don't know about you, but I have enough routine maintenance to do now, this is one thing I can avoid. There is no doubt in my mind the way to

go is run silicone. When you need brake work, rebuild everything and change the fluid to silicone.

By today's standards, our car's brake systems are marginal, especially the early all drum models. They sit for long periods of time (I can hear the rust forming on the wheel cylinders and pistons now). And over ninety percent of them (all pre 67 cars), don't have dual master cylinders, so if you lose hydraulic pressure, you lose braking at all four wheels.

If I use silicone, I don't have to worry about reduced boiling point or moisture build up. All fluids will weep past seals over time, and with silicone I don't have paint damage from the fluid. I gave myself a break by using silicone brake fluid. I want my car to go and I want my car to stop. I don't want to break, because I couldn't brake. Oh, by the way, \$20 per quart for silicone fluid you see in catalogs, is ridiculous. I bought a case several years ago from a hot rod shop on the east side, it was on sale for \$9.95 per quart.

If you're looking for some really good performance (racing) front disk pads for your 3000, you may want to consider using Carbon-Kevlar pads. They have a very low wear rate, are pre-burnished, have a super high friction level through all temperatures (which means you don't lose your brakes under heavy braking; e.g., racing), substantially reduce heat transfer to your calipers (meaning you don't start boiling your brake fluid and thus lose your brakes when everything gets real hot), and they don't change brake pedal effort.

Porterfield Enterprises (located in Costa Mesa, CA, 800-537-6842) carries these pads in stock. The part numbers are as follows:

- '59 - '63 3000 GD520 R4 (these are for the smaller calipers)
- '64 - '67 3000 GD525 R4 (the larger calipers)

Cost is approximately \$110 for the GD520 (cheaper for the GD525) which is considerably more than stock pads, but these Carbon-Kevlar pads are great!

They'll also reline your rear brake shoes using the same compound, but you need to send them your shoes. Takes about three weeks. They also carry Carbon Metallic linings for your tow vehicle. Try stopping quickly while going downhill with your Healey on the trailer behind, and you'll quickly realize how inadequate the stock brake pads full-size pick-ups are. Check it out!

Improve the Octane Rating of Your Gas

Most of the gas available at the pumps these days is pretty low octane (typically 89/91; sometimes 93 is available). If you're trying to set your Healey up to maximize performance (generally that means the timing is advanced substantially), you're probably coping with pre-ignition (which sounds like your kids dumped a bunch of marbles in the engine). To solve the problem, assuming everything else is in good condition (plugs, points, coil, valve adjustments, compression, etc.), it is necessary either to retard the ignition or to go to a higher grade of gas. Since retarding the ignition generally causes a decline in performance, you might want to go to higher octane gas. Automotive racing gas will do the trick (octane ratings are typically 100 or better but cost a lot—upwards of \$5 a gallon, and it may also be illegal to use on the street). Another alternative is to buy octane boost at an automotive store. However, be aware of claimed results. When used as directed, a 12-16 oz. can (at \$5 to \$6 a can) will raise octane two to three "points" (this means decimal points; e.g., 93 to 93.3). This is not much of an increase for the \$. You can make your own octane booster for a fraction of the cost.

The basic formula relies upon Toluene (available at paint stores in one and five gallon containers), mineral spirits (or kerosene or diesel fuel) as a cleaning agent, and transmission fluid (or light turbine oil) as a lubricating agent.

The ratios to make different amounts of boost:

<u>1 gallon</u>		<u>1 quart</u>	
<u>of boost</u>		<u>of boost</u>	
Toluene	100 oz	(0.8 gal / 3.1 qts)	25 oz.
Kerosene	25 oz.	(0.2 gal / 0.8 qts.)	6.5 oz.
Transmission fluid	3 oz.	(0.02 gal / 0.1 qts)	0.5 oz.

Using the above formula, the following mixes will raise the octane number as noted.

A 10% mix raises the octane level approximately 2.4%. A 20% mix raises the octane level approximately 4.8%.

	<u>Octane Boost</u>	<u>Raises Octane by</u>
For 10 gallons of gas:	2 gal	over 4 full points (e.g.: 93 to 97.5)
	1 gal	2 full points (e.g.: 93 to 95.2)
	0.5 gal	1 full point (e.g.: 93 to 94.1)

Some costs: Toluene runs about \$6 for a 5 gallon container (and about \$3 for one gallon).

If you're still running without hardened valve seats, you may want to add some lead additive (or equivalent) to help protect the seats.

Disclaimer #1: If your state has tough emission laws, and your Healey is subject to emissions testing, you're on your own!

Disclaimer #2: As with anything, don't overdo it. I use one gallon of boost for about seven gals. of gas when racing (this is approximately a 14% mix of boost to gas, and takes 93 octane and raises it to a little over 96, at a cost of about \$2). I also constantly check my plugs for deposits (especially black pits indicating pre-ignition, and color (which is tied into carburetor mixtures).