Audi allroad 2.7t Coolant Flush

Greg Treantos
gtreanto@gmail.com

Introduction

Disclaimer: The purpose of this guide is to document the methods and results when flushing my 2.7t allroad coolant system. I am not recommending changing from factory fill G12. If you make a change to a different coolant and something happens I am not responsible.

It was time to flush the coolant in my 2001 allroad with 93K mile. Mindful, I have to replace the allroad's timing belt in the spring, I could have done both jobs then. Out of warranty I decided to change coolant type from the factory fill G12 to something more common. When changing coolant types it's possible for coolant to affect the water pump seals and impeller. With the potential water pump failure issues I decided the prudent approach was to use the old water pump and see what happens. If the water pump failed because of the new coolant this would move up the timing belt change a few months.

When researching what to use I learned more the I wanted to about coolant types. There is a lot of information and opinions on coolants. At the end of this document, I included a Motor Magazine article on coolants which gives general information about coolant types. If you want to learn more head over to bobistheoilguy.com and browse around the Coolant Fluids & Additives forum.

Research complete I narrowed down my choices to Zerex G05 HOAT and Prestone/Walmart SuperTech All Makes All Models OAT coolants. To break the tie I wrote to Zerex technical support and they recommended an OAT based coolant for the allroad. I added the correspondence to the end of this document. With this information I decided to go with Walmart SuperTech All Makes All Models at $6.88/gallon. At the writing of this document I have 2000 trouble free miles on the new coolant.

allroad 2.7t coolant flush

Tools

General:

- Car Ramps
- Snap-on B240B Pedal Jack
- Flashlight or portable shop light

For Belly Pan:

- Standard screw driver
- Stubby standard screw driver
- 8mm allen driver, 3/8" drive
- 3/8" drive ratchet
- 3/8" drive extension
- T30 Torx driver

For Coolant System:

- Standard screw driver
- Water pump pliers
- 5mm allen driver, 3/8” drive
- 6” 3/8” drive extension
- 3/8” drive ratchet
- drain pan
- Hydrometer

allroad 2.7t coolant flush

Supplies

General:

- Cloth shop towels
- Oil Dry (oil/water absorber for spills)

Coolant:

- 1 Gallon coolant concentrate
- 14 Gallons distilled water (Walmart $00.68)
- 1 Bottle Prestone Super Radiator Flush

allroad 2.7t coolant flush

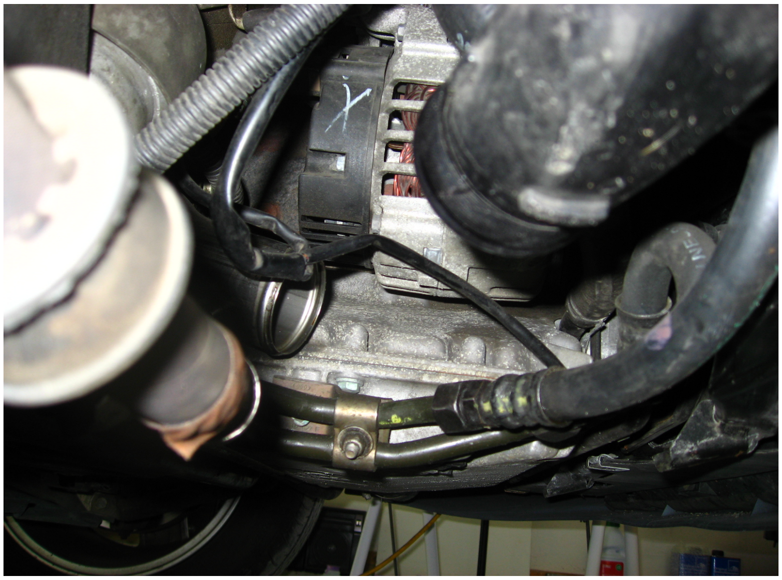
Procedure

Be aware properly changing coolant is time consuming, and messy. Consider having this done at a shop that has a coolant flush machine. This could be an Audi dealer if you are staying with G12 or upgrading to G12+. If you are changing coolant types consider an independent auto maintenance repair shop like Jiffy Lube, or independent auto mechanic.

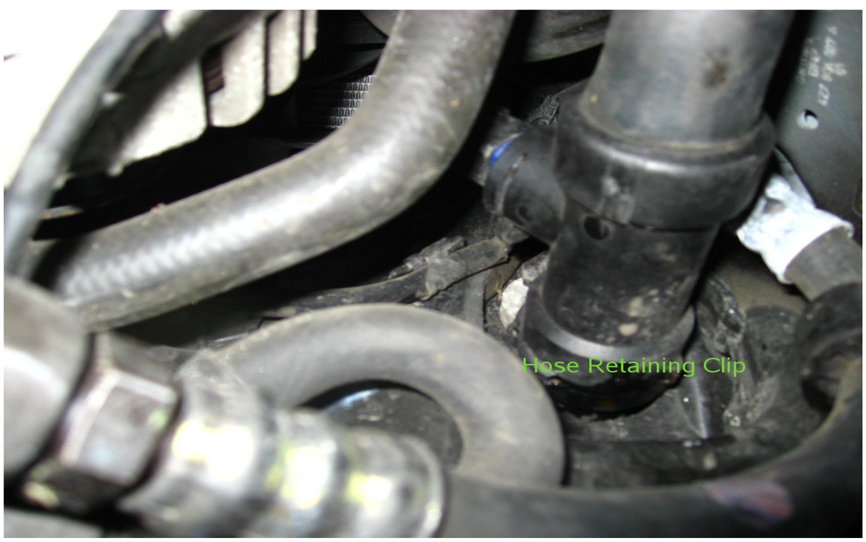
- Start Car and move suspension to level 4
- Turn steering wheel clockwise and remove 2 RH wheel well belly pan screws
- Turn steering wheel counter clockwise and remove 2 LH wheel well belly pan screws
- Move ramps in place (I used 2 sets, a taller set in rear and rhino ramps in front, faster more complete drain)

allroad 2.7t coolant flush

- Remove front belly pan
- Remove Audi 2.7t engine cover
- Remove expansion tank cap
- Remove right hand lower intercooler hose



- Move coolant drain pan within easy reach
- Pop lower radiator hose retaining clip



- Carefully remove lower radiator hose, try to direct fluid into drain pan

allroad 2.7t coolant flush

- Remove cowl cover
- Remove Upper heater core hose

- Wait for all the coolant to drain out
- Note: Bentley's shop manual states our cars hold 6 liters of coolant. Approximately 4 liters of coolant will drain when removing the lower radiator hose. The last 2 liters will be flushed out by refilling the system with distilled water and draining until coolant is fairly clear.
- Attach lower radiator hose, and intercooler hose (I left clamps off at this point)
- Attach upper heater core hose (no clamp at this point)

allroad 2.7t coolant flush

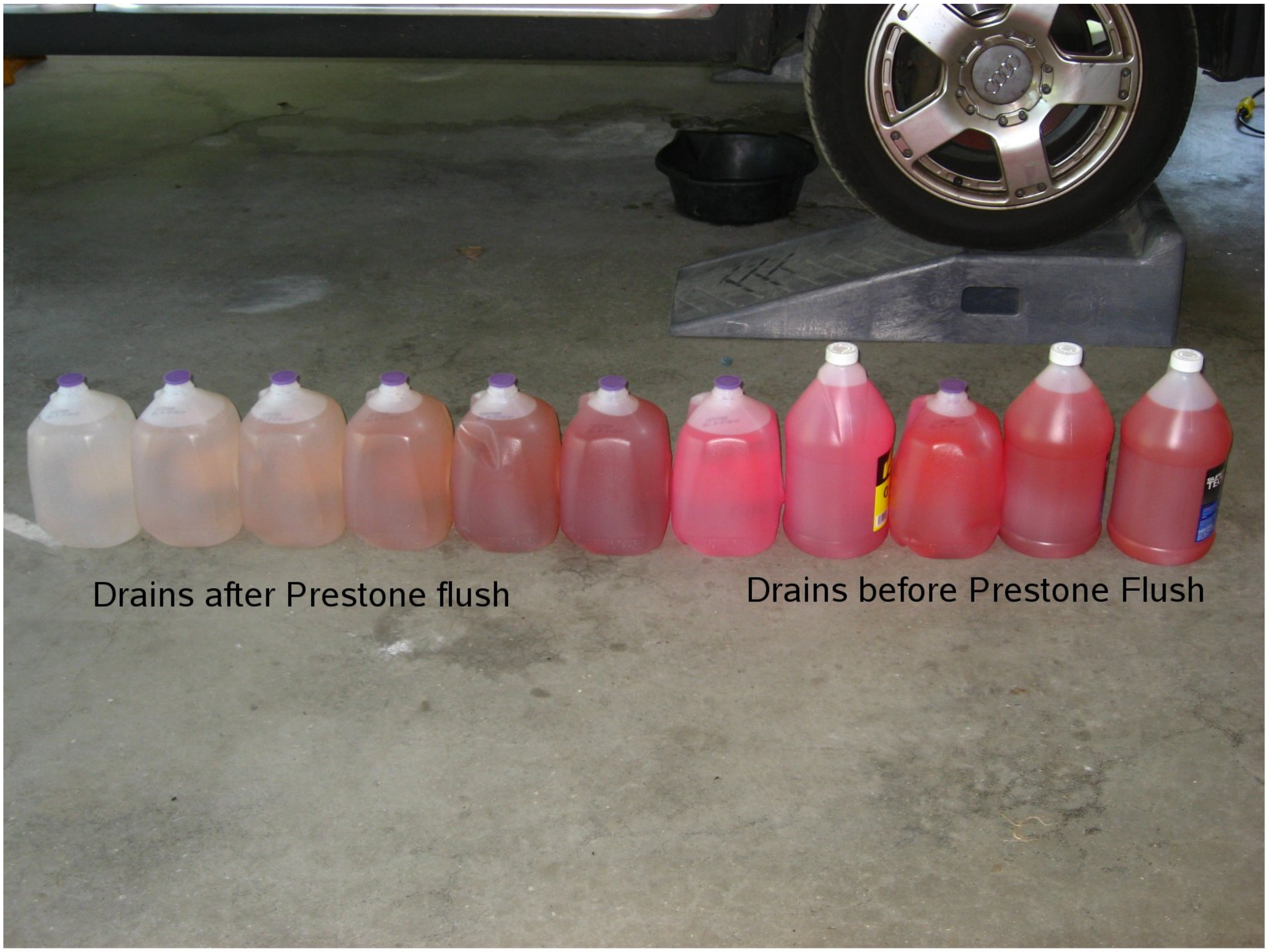
- Loosen front bleeder screw with 5mm socket allen wrench

- Fill system with distilled water, watching front bleeder for water.
- Once you see water coming from front bleeder tighten screw and continue to fill the system until water in the expansion tank is approximately to minimum mark.
- Turn car on, set temperatures to hi, put system in econ mode (2001)
- Start car and run engine to 2000 RPM's,
- When you feel heat the system is bled and you can shut the car off
- Let car cool
- Drain coolant
- Fill system with distilled water
- Run car
- Repeat this until coolant is fairly clear
- Note: I filled and drained with distilled water 4 times before I did the Prestone flush.

- Once coolant is fairly clear add Prestone Super Radiator Flush, then distilled water.
- Run car at 2000 RPM's for 15 minutes after the car reaches operating temperature. (the pedal jack comes in handy for this)

- Let the car cool and drain the system again
- Fill and drain system until clear water comes out
- Note I did 6 drains until I got clear water out of the system after the flush
- Fill system with 3 liters of coolant concentrate.
- There should be approximately 5 liters of coolant in the system. If all went according to plan you should have to top off with approximately 1 liter of distilled water. If you need more than 1 liter of distilled water use coolant concentrate to finish up.
- Run the car for 20 minutes and let cool
- Check system with hydrometer.
- Button up, pick up, clean up and drive
- Note: if you do this, plan on a full day's work. Waiting for system bleeds and cool downs is time consuming.

A picture of the drains



Conclusion

If you decided to change coolant types make sure to clean your system of the old coolant completely. If you don't the new coolant will not work properly and you could have problems. If you stay with G12 you don't have to be as cautious.

http://www.motor.com/MAGAZINE/Articles/082004_04.html

Coolant Confusion: It's Not Easy Being Green ... or Yellow or Orange or ...

by Paul Weissler

August 2004. *With so many different coolants out there, it's important--make that essential--to know what's safe to put in where, and when.*

Lift the hood of a new Ford vehicle and you're likely to see a yellow coolant in the overflow jug and an interesting label on it. In pictorial language it says "Do not use orange coolant; yellow coolant is okay."
Sounds pretty straightforward, right? It isn't. Lift the hood of another Ford product (in this case, a Taurus with the pushrod V6) and you'll see that same label, but the jug contains orange coolant. Wait a minute. Something clearly is very wrong. It cautions "don't use orange," but the factory-installed coolant is orange.

Lift the hood of a Chrysler product and you'll see orange coolant in the jug and a "special engine coolant only" warning on the cap. Isn't DexCool the special coolant, and isn't it orange? Yes to both questions, but Chrysler Group says don't use DexCool in its products. It's confusing, to say the least.

The basic answers to what coolant to use where, and when, are pretty simple, but when you go past that, you're getting into some pretty complex territory. And you have to know what coolant you're dealing with to be sure you're doing no harm.

Longtime Motor readers know that the color of the coolant dye really is meaningless. Dye should help you spot a leak, but that's about it. But with these seemingly contradictory warning labels, you really need a basic understanding of what's been happening with coolant formulations and colorings.

You may remember that about 93% of most coolant is ethylene glycol, another few percentage points are water and/or a solvent to keep rust/corrosion inhibitors in solution and the remainder are those inhibitors. The inhibitors make a huge difference, and they're what all the arguments are about.

Didn't we talk about all these coolants last year? You bet, and we'll probably be talking about them for years to come. Since last year, however, Honda and Toyota have moved strongly into extended-life organic acid technology (OAT) coolants. Yes, DexCools also are OATs, but these Japanese formulas are not DexCool, and the two car companies have indicated they absolutely, positively don't want DexCool-type coolants used in their vehicles.

Nevertheless, you have to pick something to install, and to top up with, and we've learned that the systems are not necessarily forgiving of some mixtures of different coolants. There are circumstances where an unfavorable mixture can cause an increase in corrosion.

Taking these issues a step further, this year we've seen more cases that contribute to coolant confusion. These days, it's all too easy to make a mistake.

You have to appreciate a bit of chemistry about the various formulas. You've got to know in basic terms what's different about the different coolants-both conventional and extended-life types-and what it means when you have to pick one. Yes, that includes a bit about the dye colors.

What's In DexCool?

You should know that the term "orange coolant" has come to mean a DexCool-approved brand but that doesn't mean it's really true. If you make this assumption, you'd be wrong. It's what Ford's warning labels could be interpreted to refer to, so that label doesn't serve to clarify things (certainly not when a Ford system contains a very different-non-DexCool, but orange-dyed-coolant). The discontinued Mercury Cougar was an exception; it did contain an orange coolant similar to DexCool.

The "DexCool" designation means the coolant passes General Motors performance testing. Although DexCool is not a specific formula, all three brands that have the label (Texaco Havoline, Prestone Extended Life and Zerex Extended Life) are somewhat similar. In particular, they're OAT coolants, but the similarities go beyond that basic description.

All DexCool-approved coolants to date use two organic acid rust/corrosion inhibitors, one called sebacate, the other called 2-EHA (which stands for 2-ethylhexanoic acid). These organic acids are very stable and last a long time, although they take thousands of miles to become fully effective in protecting coolant passages.

GM recommends a DexCool change every five years or 150,000 miles, whichever comes first. Because most people drive 15,000 to 20,000 miles a year, that translates to a five-year replacement interval. As noted, the thousands of miles required to protect metal is an important trade-off for that longer life. Although like conventional coolants, OATs also contain other inhibitors, for targeted protection.

The inhibitor 2-EHA works well in hard water and is more effective than sebacate at lower pH levels (when the coolant moves from the alkaline end toward the acid side), particularly for cast iron. Well, GM has a number of cast-iron engines. When there's a low coolant level in the coolant passages, the exposed cast iron rusts. Apparently, that rust is washed away later by flowing coolant, and is deposited in the heat exchangers. It eventually produces the rust powder problems that have been so widely observed (see Motor's August 2002 issue at www.motor.com). Why does the coolant level in these engines drop?
The original radiator cap design was blamed for some of the issue, but there probably are a number of causes, including owner neglect and normal seepage. However, the rust powder issue is not a problem that was observed with the previously used conventional American coolant.

The inhibitor 2-EHA poses another issue: It's a plasticizer (softens plastic), so it has been blamed for coolant passage gasket leakage. Softening (and the resulting distortion) was reported by Ford, which encountered gasket leakage problems when it tested a DexCool-type formula on its V8 engines. Ford also saw similar issues with other gasket materials. That killed the OAT coolant idea for Ford, which had used a DexCool-like coolant in the '99 Cougar V6.

Could that inhibitor be responsible for the intake manifold coolant gasket leakage on GM 60° V6 engines? Or is there some other service issue involved? (After all, GM isn't the only one with coolant gasket leakage problems.) The experts are still working on it.

What Preceded OATs
Until the extended-life OATs came on the scene, there had been primarily two major coolant inhibitors for aluminum protection-silicates and phosphates-and conventional American coolants have used formulas containing both of them. Silicates are related to sand, and there were questions as to their effect on water pump seals. Some old tests seemed to suggest they were harmful, but there has been no credible evidence to support that stance on late-model designs with reputable brands of coolant. In fact, today's carbide seals are about as durable as you can get, and silicates that remain in solution seem to produce no problem anywhere. In real-world evaluations, there's no evidence of any issue, as silicate inhibitors have been used successfully for many decades in all makes of cars. Where a seal-deterioration issue surfaces, it has been attributed to core sand, from failure to clean engine blocks properly.

Silicates protect very quickly, so if there's some mechanical breakdown in the silicate protection, it re-forms very rapidly. For example, a water pump may suffer cavitation erosion/corrosion (a high coolant/ambient temperatures issue, particularly with certain cooling system designs).
That means that as the coolant passes through the pump, bubbles are produced, which then collapse with explosive force, pockmarking the internal parts of the pump. That pockmarking is erosion, the marks being exposed, unprotected metal. If the inhibitors work quickly, the damage stops after minor corrosion. If they work slowly (as with organic acid inhibitors), the pockmarked areas corrode for a longer period.

American conventional green coolants use doses of both silicates and phosphates. Phosphates also protect aluminum quickly, but have raised concerns in hard water. OAT coolants contain no silicates and no phosphates.

European coolants also contain no phosphates, but do contain silicates (at a somewhat lower dose than conventional American coolant) plus other inhibitors. These have been used for a long time, and although they're conventional formulas, there are enhanced versions today, as covered in the section on "Other Extended-Life Coolants."

Japanese conventional coolants contain no silicates, but they do contain phosphates for fast-acting protection, plus other inhibitors. Extensive Japanese tests have shown phosphates to be a good corrosion inhibitor for aluminum, and particularly effective in protecting water pumps from corrosion after cavitation erosion/corrosion.

The questions about 2-EHA were raised not only by Ford (and reportedly DaimlerChrysler) but within Japanese coolant development circles, as well. When Honda introduced its long-life coolant, it specifically excluded 2-EHA, and we can tell you there is unhappiness at Honda regarding DexCool in the new Saturn VUE with the Honda-supplied 3.5L V6. The system is being filled with DexCool because that's what's in the plant for everything else. It would not be simple to set up a separate coolant fill system for the Honda engine.

We can't tell you how this dispute is going to play out, but you do have to make a choice when it's time to change. The engine already has been protected with DexCool (unless there's an assembly line change in the works) and it's reasonable to install that when you service that engine. However, to extend gasket life and protect the water pump impeller and chamber, it wouldn't be a terrible idea to flush the system and switch to a coolant with phosphates and/or silicates (conventional American or G-05) at this point.

Other Extended-Life Coolants

Ford and Chrysler Group use G-05, a low-silicate, no-phosphate formula long specified by Mercedes, even for its passenger car diesels. Once a similar formula even was made by Texaco for Saturn, with green dye and carrying a 3/36 service interval. Today, the Ford and aftermarket versions have yellow dye-or at least they're supposed to. And the Chrysler Group formula has been dyed orange. Now that we've seen Ford products with orange, it's possible that some of the stuff meant for Chrysler also is being shipped to Ford. Or perhaps it's the DexCool-like coolant used in the old Cougar, although that's doubtful. It's confusing, particularly when you see a "don't use orange" label on the coolant jug and there's orange coolant in the jug.

What is G-05? It's called a HOAT (for hybrid organic acid technology) that today serves for extended intervals, typically 5 years/100,000 miles. Like conventional Euro coolants, it's a low-silicate, no-phosphate formula designed to pass European hard water tests. The reference to OAT in HOAT is for an organic acid inhibitor called benzoate, which actually has been used for many years in almost every American, Japanese and European conventional coolant except what we now call OAT.

Honda and Toyota use a new extended-life OAT coolant-made with sebacate as the only organic acid-no 2-EHA. Sebacate isn't quite as effective in combating corrosion at lower pH levels, but because that's more of a cast-iron issue, it apparently didn't concern the Japanese. Both Honda and Toyota do continue to avoid silicates, but add a dose of phosphates to provide fast-acting aluminum protection, particularly to recoat the water pump after cavitation erosion/corrosion.

What to Use

We used to say that maintaining the coolant level was more important than which type of coolant to use. But there's new evidence that we've been too cavalier in that respect. Sure, for small top-ups or in an emergency situation, it doesn't matter-use what you have. However, there are possible problems with extreme mixtures. An example cited by one coolant chemist: A somewhat diluted mix, perhaps 50% to 60% water, with the remainder (from top-ups) a 50-50 combination of an OAT and a conventional American coolant or a G-05. A remaining inhibitor (borate) could attack aluminum if the silicates are depleted. This becomes more of an issue when a part is being changed, and that new part has no protection against cavitation erosion/corrosion.

Top up with DexCool in GM and VW/Audi vehicles, and '98 Chrysler L/H cars or the '99 Mercury Cougar, if you get one with the original coolant or DexCool. Top up everything else with your second coolant-G-05 or conventional American.

Replacement Parts

Original equipment coolants are validated for factory replacement parts. One of the issues that may arise is the use of an aftermarket replacement radiator or heater core made of copper-brass with lead solder. We have in previous articles pointed out that today's coolant inhibitor packages contain a small amount of copper-brass protection, but may provide little protection if a radiator is made with high-lead solder. Results of industry standard tests of the new Toyota extended-life coolant now show a substantial weight loss (corrosion), both in a 50-50 mix and in a 33% coolant mixture (solder corrosion is much greater in this more diluted solution).

If you have to change a radiator or heater core, use aluminum. Or, if it's an older car and the owner wants the lowest-cost radiator, you might procure a soldered-together copper-brass unit. Conventional American coolant should provide better protection against solder corrosion, which can result in radiator tube restrictions and leaks. But no coolant provides perfect protection.

If you're replacing aluminum parts on an engine, such as a water pump or even a new cylinder head, remember that part's coolant passages have not been protected. In those cases you should perform a complete coolant exchange.

Complete Coolant Service Choices
Chances are you'll standardize on two coolants to cover most situations. One will be a DexCool formula; the other could be a G-05 extended-life or a conventional American (green or gold). A better approach would be to have all three coolants. When it comes to what to use and when, here are recommended or suggested strategies:
GM and VW/Audi vehicles. For these applications, use DexCool because that's in accordance with factory coolant formula recommendations. Sure, the vehicle probably will be out of warranty by the time you get it and have to make a decision. But the OE recommendation is the safe way to go, and because you can easily obtain a DexCool, it's a no-brainer.

Ford and Chrysler vehicles. Here again, it's a no-brainer. Both companies have identified problems with DexCool, so use something else. G-05 is available in the aftermarket, so that's your choice for extended life on vehicles from those makers. However, if your second coolant is conventional American, that's fine. The recommended service interval is shorter, but if the coolant level is maintained and the motorist is not a high-mileage driver, it can serve beyond two years. In fact, Ford long recommended four-year intervals with conventional American coolant.

Japanese vehicles. This is a problem area, because Japanese-spec coolants have never been sold in the U.S. aftermarket and history says conventional American coolants work well in these vehicles. Toyota research indicates the new extended-life coolant contains phosphates to protect the water pump, and DexCool contains no phosphate. Honda has said it will not use a coolant with 2-EHA. So both carmakers exclude DexCool. Best solution with aftermarket coolants: Do a complete coolant exchange, and replace the Japanese OE coolant-conventional or extended-life -with conventional American or G-05.

Coolant Exchange
Never before has the capability to do a complete coolant exchange been more important. Even if you're changing a DexCool system and putting in new DexCool, you want to get the system full, really full. A low coolant level is bad news, particularly with cast-iron engines. Even if the engine is aluminum, a low coolant level could mean engine-damaging temperatures and surely cause poor heater performance in winter. With today's smaller coolant capacities, the system doesn't have to be low by much for problems to surface.

If you're making a change in coolant type, such as any Japanese coolant to American green or G-05, you should get at least 90% of the old stuff out. The only way to do this and ensure a full system when you're done is with coolant exchange equipment.

A complete coolant exchange can be done manually, if you have a lot of time and infinite patience, plus a willingness to lose money on the job.
In addition to the coolant exchangers already on the market, we've been seeing new ones designed to handle two or more coolants. They're a recognition of the many different coolants currently in use.

Whatever the coolant, remember the other half of the mixture is water. In hard water areas, always use de-mineralized water. Some coolant formulas are more tolerant of hard water than others, but that doesn't mean it's good for them.

allroad 2.7t coolant flush

feedback@ashland.com <feedback@ashland.com> Tue, Aug 1, 2006 at 1:00 PM
To: <gtreanto@gmail.com>

Our testing show Zerex Dexcool provides the maximum protection for your application. Those charts we send out will indicate the best product we have.

To: VWEBMAIL@Ashland
cc:

Subject: Site feedback from Valvoline.com

The following person submitted a question or comment via the Contact us form of type Ask Zerex
First Name:
Last Name:
Address1:
Address2:
City:
State:
Zip Code:
Phone:

Email Address: gtreanto@gmail.com

Comments:

I have a 2001 Audi allroad and it's time to replace the antifreeze. I have been doing some research on the Internet and I have read a lot about the benefits of G05 HOAT over Dexicool OAT. Your recommendation chart indicates I should use Dexicool. I was wondering if there is a benefit of using G05 instead. I am out of warranty so that's not an issue for me. I was planning on a complete flush and fill. Thanks for your guidance.

Timely maintenance of your vehicle is the best way to avoid costly repairs down the road and to keep your car running longer. Valvoline has introduced 'Vehicle Manager' to help you maintain and track your car maintenance.

Vehicle Manager:
- - Provides car manufacturer (OEM) specifications and maintenance schedule
- - Helps you manage and track services for multiple vehicles
- - Keeps information readily available in a single, private environment
- - Provides email reminders for services due

Visit www.vehiclemanager.com and take a test drive or register for this FREE service.