

Cooling System: Technical Service Bulletins

Technical Service Bulletin # 04-06-01-029E

Date: 100429

Vehicle - Engine Crankcase and Subsystems Flushing Info. INFORMATION

Bulletin No.: 04-06-01-029E

Date: April 29, 2010

Subject: Unnecessary Flushing Services, Additive Recommendations and Proper Utilization of GM Simplified Maintenance Schedule to Enhance Customer Service Experience

Models:

2011 and Prior GM Passenger Cars and Trucks (including Saturn)

2010 and Prior HUMMER H2, H3

2005-2009 Saab 9-7X

Supersede:

This bulletin is being revised to update the model years and add information about the proper transmission flush procedure. Please discard Corporate Bulletin Number 04-06-01-029D (Section 06 - Engine/Propulsion System).

An Overview of Proper Vehicle Service

General Motors is aware that some companies are marketing tools and equipment to support a subsystem flushing procedures. These dedicated machines are in addition to many engine oil, cooling system, fuel system, A/C, transmission flush and steering system additives available to the consumer. GM Vehicles under normal usage do not require any additional procedures or additives beyond what is advised under the former Vehicle Maintenance Schedules or the current Simplified Maintenance Schedules. Do not confuse machines available from Kent-Moore/SPX that are designed to aid and accelerate the process of fluid changing with these flushing machines.

Engine Crankcase Flushing

General Motors Corporation does not endorse or recommend engine crankcase flushing for any of its gasoline engines. Analysis of some of the aftermarket materials used for crankcase flushing indicate incompatibility with GM engine components and the potential for damage to some engine seals and bearings. Damage to engine components resulting from crankcase flushing IS NOT COVERED under the terms of the New Vehicle Warranty.

GM Authorized Service Information: Detailed, Descriptive, and Complete

If a specific model vehicle or powertrain need is identified, GM will issue an Authorized Service Document containing a procedure and, if required, provide, make available, or require the specific use of a machine, tool or chemical to accomplish proper vehicle servicing. An example of this is fuel injector cleaning. Due to variation in fuel quality in different areas of the country, GM has recognized the need for fuel injector cleaning methods on some engines, though under normal circumstances, this service is not part of the maintenance requirements.

GM has published several gasoline fuel injector cleaning bulletins that fully outline the methods to be used in conjunction with GM Part Numbered solutions to accomplish proper and safe cleaning of the fuel injectors with preventative maintenance suggestions to maintain optimum performance. You may refer to Corporate Bulletin Numbers 03-06-04-030 and 04-06-04-051 for additional information on this subject.

Subsystem Flushing

Flushing of A/C lines, radiators, transmission coolers, and power steering systems are recognized practices to be performed after catastrophic failures or extreme corrosion when encountered in radiators. For acceptable A/C flushing concerns, refer to Corporate Bulletin Number 01-01-38-006. This practice is NOT required or recommended for normal service operations.

The use of external transmission fluid exchange or flush machines is **NOT** recommended for the automatic or manual transmission. Use of external machines to replace the fluid may affect the operation or durability of the transmission. Transmission fluid should only be replaced by draining and refilling following directions in SI. Refer to Automatic/Manual Transmission Fluid and Filter Replacement.

Approved Transmission Flushing Tool (Transmission Cooler Only)

The Automatic Transmission Oil Cooler Flush and Flow Test Tool is recommended for GM vehicles. Refer to Transmission Fluid Cooler Flushing and Flow Test in SI using the J 45096.

Service Is Important to You and Your Customer

General Motors takes great pride in offering our dealerships and customers high quality vehicles that require extremely low maintenance over the life of the vehicle. This low cost of ownership builds repeat sales and offers our customers measurable economy of operation against competing vehicles. Providing responsible services at the proper intervals will greatly aid your dealership with repeat business, and additional services when required. Most customers appreciate and gain trust in the dealership that informs and offers them just what they need for continued trouble-free operation. Examine your service department's practices and verify that all Service Consultants and Technicians focus on customer satisfaction, vehicle inspections, and other products at time of service. Use this opportunity to upgrade the services you provide to your customers. Here are a few suggestions:

- Take the time required to align your dealership service practices with the new GM Simplified Maintenance Schedule. Use the new vehicle Owner's Manual Maintenance I and II schedules to create a "mirror image" in your advertising and dealer service pricing that is easily understandable to your customer. Taking advantage of this new service strategy may greatly increase your dealership service sales and customer retention while decreasing the frequency of visits and inconvenience to your customer.
- Review your program to ensure that all vehicles coming in are evaluated for safety and wear items. Examine all vehicles for tire condition, signs of misalignment, brake wear, exterior lamp functionality, exhaust condition, A/C cooling performance, SRS or Air Bag MIL, along with Service Engine Soon or Check Engine indicators. **If the Service Engine Soon or Check Engine MIL is illuminated, it is vital that you inform the customer of the concerns with ignoring the indicator and what the required repair would cost. In addition to the possibility of increased emissions and driveability concerns, many customers are unaware that lower gas mileage may also result, with additional cost to the customer.**
- Be complete in your service recommendations. Some sales opportunities are not being fully pursued nationally. Focus on overlooked but required maintenance that has real benefits to the customer. Many vehicles are equipped with cabin air filters. If these filters are used beyond replacement time, they may impede airflow decreasing A/C and heating performance. Make sure these filters are part of your recommended service. Note that some of our vehicles may not have been factory equipped but will accept the filters as an accessory.
- Express the value in maintaining the finish quality of the customer's vehicle at the Maintenance I and II visits. More fully utilize the vehicle prep personnel you already have in place. In today's world, many people simply ignore the finish of their vehicle, at best infrequently using an automatic car wash for exterior cleaning. Offer vehicle detailing services in stages from just a wash and wax to a complete interior cleaning. When paired with the Simplified Maintenance visit, this will increase customer satisfaction. On return, the customer gets a visibly improved vehicle that will be a source of pride of ownership along with a vehicle that is now fully maintained. Also, reinforce the improved resale value of a completely maintained vehicle.
- For customers who clean and maintain the appearance of their vehicles themselves encourage the use of GM Vehicle Care products. Many customers may have never used GM Car Wash/Wax Concentrate, GM Cleaner Wax or a longtime product, GM Glass Cleaner, which is a favorite of many customers who try it just once. If your dealership give samples of these products with new car purchases, customers may already be sold on the product but not willing to make a special trip to the dealership. Capitalize on sales at this time. Stock shelves right at the Service counter with these products and consider instituting compensation programs for Service Consultants who suggest these products. Many consumers faced with an intimidating wall full of car care products sold at local auto parts stores may find it comforting to purchase a fully tested product sold by GM that they know will not harm the finish of their vehicle. We suggest these competitively priced basic vehicle care products to emphasize:

In USA:

- #12378401 GM Vehicle Care Wash/Wax Concentrate 16 fl. oz. (0.473L)
- #89021822 GM Vehicle Care Glass Cleaner Aerosol 18 oz. (510 g)
- #12377966 GM Vehicle Care Cleaner Wax 16 fl. oz. (0.473L)
- #1052929 GM Vehicle Care Chrome and Wire Wheel Cleaner 16 fl. oz. (0.473L)
- #88861431 GM Vehicle Care Odor Eliminator 24 fl. oz. (0.710L)

In Canada:

- #10953203 GM Vehicle Care Wash & Wax Concentrate 473 mL
- #992727 GM Glass Cleaner Aerosol 500 g
- #10952905 GM Vehicle Care Liquid Cleaner/Wax 473 mL
- #10953013 GM Vehicle Care Chrome Cleaner and Polish 454 mL
- #10953202 GM Vehicle Care Wheel Brite 473 mL
- #88901678 GM Vehicle Care Odor Eliminator 473 mL

- Display signboards with the installed price for popular GM Accessories such as running boards and Tonneau Covers. Customers may not think to ask about these desirable items at the time of a service visit.
- Finally, take advantage of the GM Goodwrench initiatives (Tire Program, Goodwrench Credit Card, etc. / Dealer Marketing Association (DMA) Promotions in Canada) to provide the customer with more reasons to identify your dealership as the best place to go for parts and service.

Remember to utilize ALL of the service aspects you possess in your dealership to satisfy and provide value to your customer. Many businesses exist profitably as an oil change location, a vehicle repair facility, or a detailing shop alone. You already have the capabilities of all three and provide these services with the inherent trust of your customer, under the GM Mark of Excellence.

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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Technical Service Bulletin # **99-06-02-018**

Date: **991101**

Cooling - Thermostat Design Change

File In Section:06 Engine/propulsion System

Bulletin No.: 99-06-02-018

Date: November, 1999

INFORMATION

Subject:

Thermostat Design Change

Models:

1994-2000 Buick LeSabre, Park Avenue, Regal

1995-1999 Buick Riviera

1995-2000 Chevrolet Camaro

1998-2000 Chevrolet Lumina, Monte Carlo

2000 Chevrolet Impala

1994-1996 Oldsmobile Ninety - Eight

1994-1998 Oldsmobile Eighty - Eight

1998-1999 Oldsmobile Intrigue

1994-2000 Pontiac Bonneville

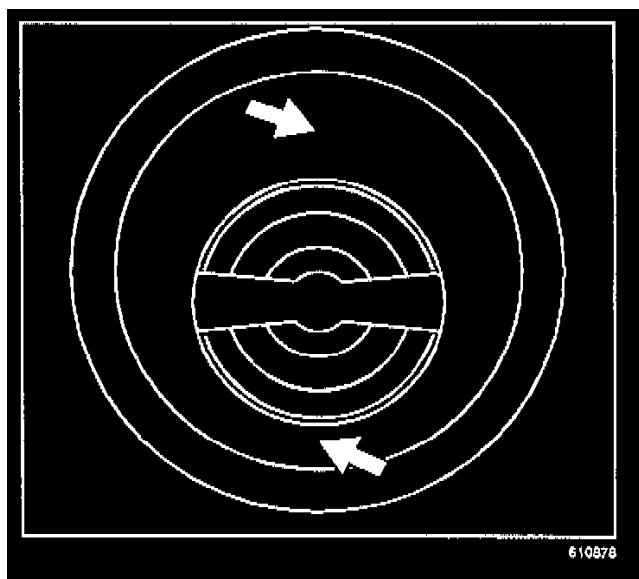
1995-2000 Pontiac Firebird

1997-2000 Pontiac Grand - Prix

with 3.8L Engine (VINs 1, K, L - RPOs L67, L36, L27)

There may be some confusion as to the correct thermostat application for the above mentioned vehicles when ordering a replacement part due to a design change for the 1999 and 2000 MY vehicles. The design change will affect service replacements of previous 90 degree V6 engines.

The new design will not fit previous 90 degree V6 engines due to a change in the position of the pintle and a different shape of the upper thermostat assembly. Refer to the following figure for identification of the current thermostat.



Important:

Noticeable offset of the pintle position.Parts Information

Year	Engine RPO	Part #	Housing Style	Housing Gasket Type	Housing Gskt P/N	Seal P/N
1994	L27	24506986	2 - Bolt	Flange	25535214	25535126
	L67	24506986	2 - Bolt	Flange	25535214	25535126
1995	L27	24506986	2 - Bolt	Flange	25535214	25535126
	L36	24506986	2 - Bolt	Flange	24502433	25535126
	L67	24506986	2 - Bolt	Flange	25535214	25535126
1996	L36	24506986	2 - Bolt	Flange	24502433	25535126
	L67	24506986	2 - Bolt	Flange	24502433	25535126
1997	L36	24506986	2 - Bolt	Flange	24502433	25535126
	L67	24506986	2 - Bolt	Flange	24502433	25535126
1998	L36	24505924	2 - Bolt	Flange	24502433	25535126
	L67	24505924	2 - Bolt	Flange	24502433	25535126
1999	L36	24505924	2 - Bolt	Flange	On T-stat	25535126
	L67	24505924	2 - Bolt	Flange	On T-stat	25535126
2000	L36	24505924	2 - Bolt	Flange	On T-stat	25535126
	L67	24505924	2 - Bolt	Flange	On T-stat	25535126

Parts are currently available from GMSPO. The following table contains: part numbers for the thermostats, the type of housing, whether it uses a gasket or O-ring, and their respective part numbers. The information is listed by year, then engine RPO code. Use the table to order the correct replacement thermostats.

Technical Service Bulletin # **99-06-02-017**

Date: **991001**

Cooling - Radiator Repair/Replacement Guidelines

File In Section: 06 - Engine/Propulsion System

Bulletin No.: 99-06-02-017

Date: October, 1999

INFORMATION

Subject:
Radiator Repair/Replacement Guidelines

Models:
2000 and Prior Passenger Cars and Trucks

If repair of an aluminum/plastic radiator is required, it is recommended that the following guidelines be followed:

For Vehicles Under Warranty

For aluminum/plastic radiators that have damage to the face of the core including bent fins, punctures, cuts, leaking tubes or header tubes, the aluminum radiator core section should be replaced with a new one. In these cases, if both of the plastic tanks are not damaged, they can be reused with the new core. If one or both of the plastic tanks are damaged along with the core, it is recommended that a complete new radiator assembly be installed.

Warranty repairs for leaks at the tank to header (gasket leaks), broken/cracked plastic tanks, cross threaded or leaking oil coolers should be repaired without replacing the complete radiator. This type of repair should be handled by the radiator repair facility in your area.

Many of these radiator repair facilities are members of the National Automotive Radiator Service Association (NARSA) who follow industry and General Motors guidelines when repairing radiators. These facilities have the special tools, tanks and pressurizing equipment needed to properly test the repaired radiator prior to returning it to the dealership. Many of these facilities receive the repair components directly from General Motors.

The sublet expense for a new radiator or the repair of the radiator under warranty should be handled following normal procedures.

For Vehicles No Longer Under Warranty

The GM released epoxy repair kit referenced in previous publications is no longer available. Repairs to the radiator, rather than replacement, is strictly at the owner's discretion. Technical Service Bulletin # **00-06-02-006D**

Date: **060815**

Cooling System - Coolant Recycling Information

Bulletin No.: 00-06-02-006D

Date: August 15, 2006

INFORMATION

Subject:
Engine Coolant Recycling and Warranty Information

Models:
2007 and Prior GM Passenger Cars and Trucks (Including Saturn)
2007 and Prior HUMMER Vehicles
2005-2007 Saab 9-7X

Attention:

Please address this bulletin to the Warranty Claims Administrator and the Service Manager.

Supersedes:

This bulletin is being revised to adjust the title and Include Warranty Information. Please discard Corporate Bulletin Number 00-06-02-006C (Section 06 - Engine/Propulsion System).

Coolant Reimbursement Policy

General Motors supports the use of recycled engine coolant for warranty repairs/service, providing a GM approved engine coolant recycling system is used. Recycled coolant will be reimbursed at the GMSPO dealer price for new coolant plus the appropriate mark-up. When coolant replacement is required during a warranty repair, it is crucial that only the relative amount of engine coolant concentrate be charged, not the total diluted volume. In other words: if you are using two gallons of pre-diluted (50:50) recycled engine coolant to service a vehicle, you may request reimbursement for one gallon of GM Goodwrench engine coolant concentrate at the dealer price plus the appropriate warranty parts handling allowance.

Licensed Approved DEX-COOL(R) Providers

Important:

USE OF NON-APPROVED VIRGIN OR RECYCLED DEX-COOL(R) OR DEVIATIONS IN THE FORM OF ALTERNATE CHEMICALS OR ALTERATION OF EQUIPMENT, WILL VOID THE GM ENDORSEMENT, MAY DEGRADE COOLANT SYSTEM INTEGRITY AND PLACE THE COOLING SYSTEM WARRANTY UNDER JEOPARDY.

Table 1 — Approved and Licensed Providers of DEX-COOL Products Meeting General Motors GM6277M Specifications

License #	Provider
DC 001	Chevron
DC 002	Prestone
DC 003	Shell
DC 004	Valvoline
DC 005	Recycled Fluid Technologies (Bulk Service)
DC 011	GM Vehicle Care
DC 011	AC Delco

Shown in Table 1 are the only current licensed and approved providers of DEX-COOL(R). Products that are advertised as "COMPATIBLE" or "RECOMMENDED" for use with DEX-COOL(R) have not been tested or approved by General Motors. Non-approved coolants may degrade the coolant system integrity and will no longer be considered a 5 yr/150,000 mile (240,000 km) coolant.

Coolant Removal Services/Recycling

The tables include all coolant recycling processes currently approved by GM. Also included is a primary phone number and demographic information. Used DEX-COOL(R) can be combined with used conventional coolant (green) for recycling. Depending on the recycling service and/or equipment, it is then designated as a conventional 2 yr/30,000 mile (50,000 km) coolant or DEX-COOL(R) 5 yr/150,000 mile (240,000 km) coolant. Recycled coolants as designated in this bulletin may be used during the vehicle(s) warranty period.

DEX-COOL(R) Recycling

Table 2 — Approved Engine Coolant Recycling Services – DEX-COOL®

Recycler	Equipment/Service	Recycled Products	Demographics	Contact
Recycling Fluid Technologies	Service	DEX-COOL® Licensed Provider (50/50 pre-mix)	IN, IL, MI, OH	800-474-4947

The DEX-COOL(R) recycling service listed in Table 2 has been approved for recycling waste engine coolants (DEX-COOL) or conventional to DEX-COOL(R) with 5 yr/150,000 mile (240,000 km) usability. Recycling Fluid Technologies is the only licensed provider of Recycled DEX-COOL(R) meeting GM6277M specifications and utilizes GM approved inhibitor packages. This is currently a limited program being monitored by GM Service Operations which will be expanded as demand increases.

Conventional (Green) Recycling

Table 3 — Approved Engine Coolant Recycling Services and Equipment – Conventional Green

Recycler	Equipment/Service	Recycled Products	Demographics	Contact
Antifreeze Technologies Systems	Service	Conventional Green (50/50 pre-mix)	IL, IN, MA, MD, MI, NH, NJ, PA, TX, VA	800-474-4947
Asbury Environmental Services/Demenno Kerdoon - Trinity Brand	Service	Conventional Green (50/50 pre-mix)	AZ, CA, NV, OR, WA	800-974-4495
Automotive Environmental Service	Service	Conventional Green (50/50 pre-mix)	AZ, CA, NV, OR, WA	650-325-2666
Kleentek	AF-250	Conventional Green (50/50 pre-mix)	US, Canada, Mexico	800-435-5336
Wynn Oil Company	Du-All Bulk 07400	Conventional Green (50/50 pre-mix)	US, Canada, Mexico	800-GMTtools 800-989-8363
Clore Automotive	TechGuard	Conventional Green (50/50 pre-mix)	US, Canada, Mexico	800-328-2921

Processes shown in the Table 3 are capable of recycling waste engine coolants (DEX-COOL(R) or conventional) to a conventional (green) coolant.

Recycling conventional coolant can be accomplished at your facility by a technician using approved EQUIPMENT (listed by model number in Table 3), or by an approved coolant recycling SERVICE which may recycle the coolant at your facility or at an offsite operation. Refer to the table for GM approved coolant recyclers in either of these two categories. Should you decide to recycle the coolant yourself, strict adherence to the operating procedures is imperative. Use ONLY the inhibitor chemicals supplied by the respective (GM approved) recycling equipment manufacturer.

Sealing Tablets

Cooling System Sealing Tablets (Seal Tabs) should not be used as a regular maintenance item after servicing an engine cooling system. Discoloration of coolant can occur if too many seal tabs have been inserted into the cooling system. This can occur if seal tabs are repeatedly used over the service life of a vehicle. Where appropriate, seal tabs may be used if diagnostics fail to repair a small leak in the cooling system. When a condition appears in which seal tabs may be recommended, a specific bulletin will be released describing their proper usage.

Water Quality

The integrity of the coolant is dependent upon the quality of DEX-COOL(R) and water. DEX-COOL(R) is a product that has enhanced protection capability as well as an extended service interval. These enhanced properties may be jeopardized by combining DEX-COOL(R) with poor quality water. If you suspect the water in your area of being poor quality, it is recommended you use distilled or de-ionized water with DEX-COOL(R).

"Pink" DEX-COOL(R)

DEX-COOL(R) is orange in color to distinguish it from other coolants. Due to inconsistencies in the mixing of the dyes used with DEX-COOL(R), some batches may appear pink after time. The color shift from orange to pink does not affect the integrity of the coolant, and still maintains the 5 yr/150,000 mile (240,000 km) service interval.

Back Service

Only use DEX-COOL(R) if the vehicle was originally equipped with DEX-COOL(R).

Contamination

Mixing conventional green coolant with DEX-COOL(R) will degrade the service interval from 5 yrs./150,000 miles (240,000 km) to 2 yrs./30,000 miles (50,000 km) if left in the contaminated condition. If contamination occurs, the cooling system must be flushed twice immediately and re-filled with a 50/50 mixture of DEX-COOL(R) and clean water in order to preserve the enhanced properties and extended service interval of DEX-COOL(R).

After 5 years/150,000 miles (240,000 km)

After 5 yrs/150,000 miles (240,000 km), the coolant should be changed, preferably using a coolant exchanger. If the vehicle was originally equipped with DEX-COOL(R) and has not had problems with contamination from non-DEX-COOL(R) coolants, then the service interval remains the same, and the coolant does not need to be changed for another 5 yrs/150,000 miles (240,000 km)

Equipment (Coolant Exchangers)

The preferred method of performing coolant replacement is to use a coolant exchanger. A coolant exchanger can replace virtually all of the old coolant with new coolant. Coolant exchangers can be used to perform coolant replacement without spillage, and facilitate easy waste collection. They can also be used to lower the coolant level in a vehicle to allow for less messy servicing of cooling system components. It is recommended that you use a coolant exchanger with a vacuum feature facilitates removing trapped air from the cooling system. This is a substantial time savings over repeatedly thermocycling the vehicle and topping-off the radiator. The vacuum feature also allows venting of a hot system to relieve system pressure. Approved coolant exchangers are available through the GMDE (General Motors Dealer Equipment) program.

For refilling a cooling system that has been partially or fully drained for repairs other than coolant replacement, the Vac-N-Fill Coolant Refill Tool (GE-47716) is recommended to facilitate removal of trapped air from the cooling system during refill.

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Disclaimer Technical Service Bulletin # **05-06-02-002B**

Date: **080118**

Cooling System - DEX-COOL(R) Coolant Leak Detection Dye

Bulletin No.: 05-06-02-002B

Date: January 18, 2008

INFORMATION

Subject:
DEX-COOL(R) Coolant - New Leak Detection Dye J 46366 - Replaces J 29545-6

Models:
1996-2008 GM Passenger Cars and Light/Medium Duty Trucks* (including Saturn)
1997-2008 Isuzu T-Series Medium Duty Tilt Cab Models Built in Janesville and Flint
1999-2008 Isuzu N-Series Medium Duty Commercial Models with 5.7L or 6.0L Gas Engine

2003-2008 HUMMER H2
2006-2008 HUMMER H3
2005-2008 Saab 9-7X

*EXCLUDING 2006 and Prior Chevrolet Aveo, Epica, Optra, Vivant and Pontiac Matiz, Wave

Supercede:

This bulletin is being revised to include additional model years. Please discard Corporate Bulletin Number 05-06-02-002A (Section 06 - Engine/Propulsion System).

Leak detection dye P/N 12378563 (J 29545-6) (in Canada P/N 88900915) may cause DEX-COOL(R) coolant to appear green in a black vessel making it appear to be conventional (green) coolant. This may cause a technician to add conventional coolant to a low DEX-COOL(R) system thus contaminating it. The green DEX-COOL(R) appearance is caused by the color of the leak detection dye which alters the color of the DEX-COOL(R) coolant.

A new leak detection dye P/N 89022219 (J 46366) (in Canada P/N 89022220) has been released that does not alter the appearance of the DEX-COOL(R) coolant. When adding the new leak detection dye the color of the DEX-COOL(R) coolant will not change. For detecting leaks on any system that uses DEX-COOL(R) leak detection dye P/N 89022219 (in Canada P/N 89022220) should be used. The new leak detection dye can be used with both conventional and DEX-COOL(R) coolant.

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Technical Service Bulletin # **05-06-02-001A**

Date: **080716**

Cooling System, A/C - Aluminum Heater Cores/Radiators

INFORMATION

Bulletin No.: 05-06-02-001A

Date: July 16, 2008

Subject:
Information On Aluminum Heater Core and/or Radiator Replacement

Models:
2005 and Prior GM Passenger Cars and Light Duty Trucks (including Saturn)
2003-2005 HUMMER H2

Supercede:

This bulletin is being revised to update the Warranty Information. Please discard Corporate Bulletin Number 05-06-02-001 (Section 06 - Engine/Propulsion System).

Important:

2004-05 Chevrolet Aveo (Pontiac Wave, Canada Only) does not use DEX-COOL(R). Refer to the flushing procedure explained later in this bulletin.

The following information should be utilized when servicing aluminum heater core and/or radiators on repeat visits. A replacement may be necessary because erosion, corrosion, or insufficient inhibitor levels may cause damage to the heater core, radiator or water pump. A coolant check should be performed whenever a heater core, radiator, or water pump is replaced. The following procedures/ inspections should be done to verify proper coolant effectiveness.

Caution:

To avoid being burned, do not remove the radiator cap or surge tank cap while the engine is hot. The cooling system will release scalding fluid and steam under pressure if the radiator cap or surge tank cap is removed while the engine and radiator are still hot.

Important:

If the vehicle's coolant is low, drained out, or the customer has repeatedly added coolant or water to the system, then the system should be completely flushed using the procedure explained later in this bulletin.

Technician Diagnosis

^ Verify coolant concentration. A 50% coolant/water solution ensures proper freeze and corrosion protection. Inhibitor levels cannot be easily measured in the field, but can be indirectly done by the measurement of coolant concentration. This must be done by using a Refractometer J 23688 (Fahrenheit scale) or J 26568 (centigrade scale), or equivalent, coolant tester. The Refractometer uses a minimal amount of coolant that can be taken from the coolant recovery reservoir, radiator or the engine block. Inexpensive gravity float testers (floating balls) will not completely analyze the coolant concentration fully and should not be used. The concentration levels should be between 50% and 65% coolant concentrate. This mixture will have a freeze point protection of -34 degrees Fahrenheit (-37 degrees Celsius). If the concentration is below 50%, the cooling system must be flushed.

^ Inspect the coolant flow restrictor if the vehicle is equipped with one. Refer to Service Information (SI) and/or the appropriate Service Manual for component location and condition for operation.

^ Verify that no electrolysis is present in the cooling system. This electrolysis test can be performed before or after the system has been repaired. Use a digital voltmeter set to 12 volts. Attach one test lead to the negative battery post and insert the other test lead into the radiator coolant, making sure the lead does not touch the filler neck or core. Any voltage reading over 0.3 volts indicates that stray current is finding its way into the coolant. Electrolysis is often an intermittent condition that occurs when a device or accessory that is mounted to the radiator is energized. This type of current could be caused from a poorly grounded cooling fan or some other accessory and can be verified by watching the volt meter and turning on and off various accessories or engage the starter motor. Before using one of the following flush procedures, the coolant recovery reservoir must be removed, drained, cleaned and reinstalled before refilling the system.

Notice:

^ Using coolant other than DEX-COOL(R) may cause premature engine, heater core or radiator corrosion. In addition, the engine coolant may require changing sooner, at 30,000 miles (50,000 km) or 24 months, whichever occurs first. Any repairs would not be covered by your warranty. Always use DEX-COOL(R) (silicate free) coolant in your vehicle.

^ If you use an improper coolant mixture, your engine could overheat and be badly damaged. The repair cost would not be covered by your warranty. Too much water in the mixture can freeze and crack the engine, radiator, heater core and other parts.

Flushing Procedures using DEX-COOL(R)

Important:

The following procedure recommends refilling the system with DEX-COOL(R), P/N 12346290 (in Canada, use P/N 10953464), GM specification 6277M. This coolant is orange in color and has a service interval of 5 years or 240,000 km (150,000 mi). However, when used on vehicles built prior to the introduction of DEX-COOL(R), maintenance intervals will remain the same as specified in the Owner's Manual.

^ If available, use the approved cooling system flush and fill machine (available through the GM Dealer Equipment Program) following the manufacturer's operating instructions.

^ If approved cooling system flush and fill machine is not available, drain the coolant and dispose of properly following the draining procedures in the appropriate Service Manual. Refill the system using clear, drinkable water and run the vehicle until the thermostat opens. Repeat and run the vehicle three (3) times to totally remove the old coolant or until the drained coolant is almost clear. Once the system is completely flushed, refill the cooling system to a 50%-60% concentration with DEX-COOL(R), P/N 12346290 (in Canada, use P/N 10953464), GM specification 6277M, following the refill procedures in the appropriate Service Manual.

If a Service Manual is not available, fill half the capacity of the system with 100% DEX-COOL(R), P/N 12346290 (in Canada, use P/N 10953464), GM specification 6277M. Then slowly add clear, drinkable water (preferably distilled) to the system until the level of the coolant mixture has reached the base of the radiator neck. Wait two (2) minutes and reverify the coolant level. If necessary, add clean water to restore the coolant to the appropriate level.

Once the system is refilled, reverify the coolant concentration using a Refractometer J 23688 (Fahrenheit scale) or J 26568 (centigrade scale) coolant

tester, or equivalent. The concentration levels should be between 50% and 65%.

Flushing Procedures using Conventional Silicated (Green Colored) Coolant

Important:

2004-2005 Chevrolet Aveo (Pontiac Wave, Canada Only) does not use DEX-COOL(R). The Aveo and Wave are filled with conventional, silicated engine coolant that is blue in color. Silicated coolants are typically green in color and are required to be drained, flushed and refilled every 30,000 miles (48,000 km). The Aveo and Wave are to be serviced with conventional, silicated coolant. Use P/N 12378560 (1 gal) (in Canada, use P/N 88862159 (1 L). Refer to the Owner's Manual or Service Information (SI) for further information on OEM coolant.

Important:

Do not mix the OEM orange colored DEX-COOL(R) coolant with green colored coolant when adding coolant to the system or when servicing the vehicle's cooling system. Mixing the orange and green colored coolants will produce a brown coolant which may be a customer dissatisfier and will not extend the service interval to that of DEX-COOL(R). Conventional silicated coolants offered by GM Service and Parts Operations are green in color.

^ If available, use the approved cooling system flush and fill machine (available through the GM Dealer Equipment Program) following the manufacturer's operating instructions.

^ If approved cooling systems flush and fill machine is not available, drain coolant and dispose of properly following the draining procedures in appropriate Service Manual. Refill the system using clear, drinkable water and run vehicle until thermostat opens. Repeat and run vehicle three (3) times to totally remove old coolant or until drained coolant is almost clear. Once the system is completely flushed, refill the cooling system to a 50%-60% concentration with a good quality ethylene glycol base engine coolant, P/N 12378560, 1 gal (in Canada, use P/N 88862159 1 L), conforming to GM specification 1825M, or recycled coolant conforming to GM specification 1825M, following the refill procedures in the appropriate Service Manual.

If a Service Manual is not available, fill half the capacity of the system with 100% good quality ethylene glycol base (green colored) engine coolant, P/N 12378560 1 gal., (in Canada, use P/N 88862159 1 L) conforming to GM specification 1825M. Then slowly add clear, drinkable water (preferably distilled) to system until the level of the coolant mixture has reached the base of the radiator neck. Wait two (2) minutes and recheck coolant level. If necessary, add clean water to restore coolant to the appropriate level.

Once the system is refilled, recheck the coolant concentration using a Refractometer J 23688 (Fahrenheit scale) or J 26568 (centigrade scale) coolant tester, or equivalent. Concentration levels should be between 50% and 65%.

Part Number	Description
12346290 (in Canada, 10953464)	Coolant, Extended Life (DEX-COOL®)
12378560 (in Canada, 88862159)	Coolant, Conventional (Green Colored) 1 gal. (in Canada 1 L)


Parts Information

Warranty Information

Labor Operation	Description	Labor Time
J 3100	Radiator Assembly – Replace	Use Published Labor Operation Time
J 3250	Radiator Surge Tank – Replace	Use Published Labor Operation Time
J 3523	Cord, Engine Coolant Heater – Replace	Use Published Labor Operation Time
J 3524	Heater, Engine Coolant – Replace	Use Published Labor Operation Time
J 3540	Cooling System – Flush	Use Published Labor Operation Time

For vehicles repaired under warranty, use the table.

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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