Information Sheet

LARRY'S AutoWorks
When you want it right!

Why should you do a cooling system fluid exchange?

Whenever a fluid, especially hot water, is in contact with metal, electrochemical degradation takes place which results in a higher than normal level of acid present in any given fluid. This higher acid level, if left unchanged, can result in very costly repairs. As a result, it is recommended to exchange your cooling system fluids at any point that testing indicates a PH reading below 8 . This will help reduce the acid level and extend the life of your radiator, heater core, water pump, head gaskets, freeze plugs, radiator and heater hoses. High acid levels cause the hottest portion of the engine in contact with the coolant, usually the aluminum cylinders heads, to loose particles into the coolant which are carried to the coolest areas, usually the radiator and shaft areas of the pump, and deposited. Over time this action causes radiators to plug and lose their ability to cool and seals at pump areas to fail.

In addition to the proper PH it is important to have the proper mix of coolant to water in the system. You have probably heard that your coolant should be good to -35 degrees, and you wonder why since it never gets that cold in this area, it is because it is an indication of the proper mixture in the system. Water is the best conductor of heat because the molecules are spaced far apart and heat can be moved into the water very easily. The problem with water is that by itself it becomes corrosive (acidic) over time when in contact with metal and in cold weather it can freeze. Antifreeze (of the type appropriate for the system) is added to the water to protect the metal, keep the water from freezing, and lubricate the moving parts in the cooling system such as the water pump and thermostat. If you were to use 100% antifreeze, the engine would overheat in hot weather with or without your air conditioning on and antifreeze molecules are packed tightly together and are unable to remove the heat from the engine as efficiently as water. The condenser for your car's air conditioning operates much hotter than the radiator; that's why it is placed in front of the radiator. Since the radiator must dissipate the heat with air already heated from your air conditioning condenser this further decreases its ability to cool the system! So the right coolant mix and chemical makeup is critical.

Today's computer controlled engines coolant temperature is an important factor in gas mileage and performance. The coolant temperature sensor tells the computer, along with other sensors, how to adjust the fuel mixture and ignition timing. This affects engine performance and efficiency. For the best heat removal combined with metal protection 50% water and 50% antifreeze is desired. The proper mix is determined by checking the coolants antifreeze characterizes; -35 degrees equals 50/50. A 50/50 mix of water and antifreeze has a PH factor of 8.75. There are other important chemical characteristics of coolant but these two are excellent indicators of the health of the system.

To correct low Ph or a high freezing point, we do a complete coolant exchange on your cooling system by simultaneously forcing the old coolant out under pressure through the engine, radiator, and heater core and replacing it with a fresh coolant mixture. We also pressure test the system for leaks, clean the recovery bottle and test the radiator cap to see if it holds the proper pressure. This must be done with special equipment designed for this purpose.