

# SIMPLIFIED PROCEDURE FOR PRESSURE TESTING AND BLEEDING AIR OUT OF THE COOLING SYSTEM

by Stephen Wynne

photos by Kjell Myhre

## Tools Required:

10mm Box Wrench  
11mm Box Wrench  
4 Ft. length 1/2" I.D. Vacuum Tubing  
1 1/2 Gallons Coolant  
Ample supply of water  
Large open container (trough)

## Indicators for a need to check the system:

1. Driving in traffic and temperature gauge rises and falls erratically.
2. A tendency of the car to overheat in traffic.
3. Visual signs of coolant loss: i.e., puddle under the car.

The subject vehicle of this article has not been driven for about a year. Initially, pressurize the cooling system at the header bottle with the pressure tester. It will be necessary for the system to maintain 15 pounds per square inch for a period of 15 minutes. (Photo 1) If 15 pounds per square inch is maintained for 15 minutes, you may proceed to start bleeding air from the system. Should the system not be able to hold the pressure for the indicated period of time, it will be necessary to determine the source of the pressure loss and to *repair the area of the leak*.

During pressurization, we will pump the pressure gauge to 15 pounds per square inch. (It is not necessary to exceed this pressure.) As pressure is applied, you may note that it is being lost immediately or you may notice small puddles are forming under the vehicle. Most leaks are the result of damaged water hoses or defective hose clamps. The original hose clamps tend to back off and simply may be retightened in most cases. Other possible pressure loss areas are the *radiator, water pump, coolant system, and the header bottle itself*.

Ideally the vehicle should be raised on a hoist and examined from the bottom. From beneath the vehicle, we are looking for fluid leaks identified by a green or yellow color. On the subject vehicle, we observe significant leaks which appear to be coming from the area of the water pump in the rear and the radiator in the front. (Photos 2,3,4,5) Upon closer inspection, we find that the leak is from the two water hoses which are behind the water pump and are

virtually impossible to see without removing the intake manifold.

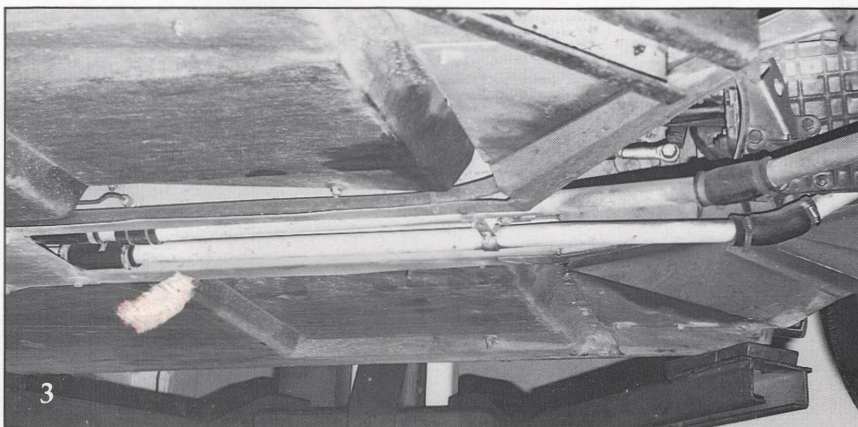
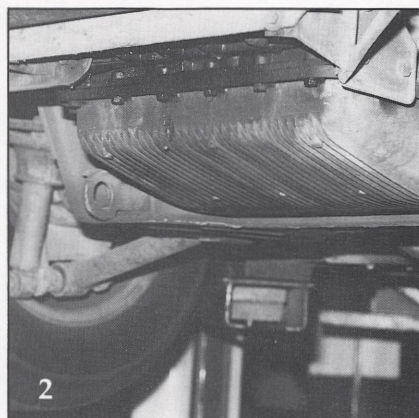
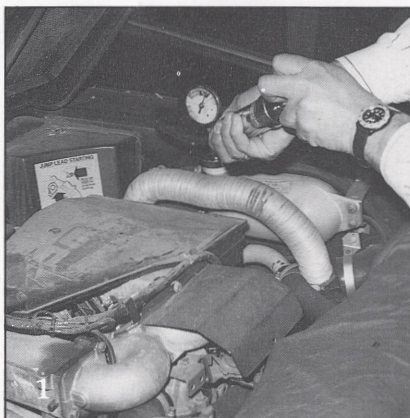
The only real way to determine if the water pump is leaking is to inspect the vent hole beneath the pulley of the pump. (Photo 5) If the water pump is defective, this will be the location of the leak.

Examine the hoses and coolant lines beneath the automobile. New hoses and clamps are simple to replace if necessary. See Photo 3 for a perspective of common areas that may potentially leak.

This article will not deal with the more complex leaks or the procedure for replacing hoses beneath the intake manifold, behind the water pump. We advise this be left to professional service technicians.

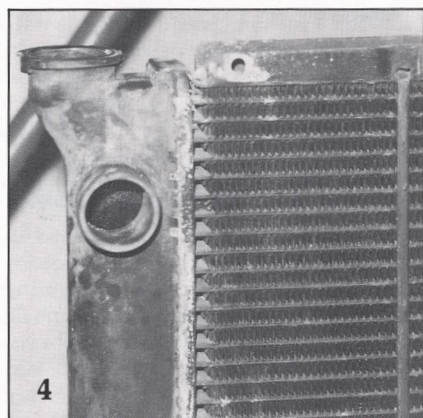
As previously mentioned, we observe the radiator in the subject vehicle is leaking. We find it is not prudent to repair the original aluminum radiators because of the construction which utilized plastic side tanks. When these plastic side tanks leak, we have found it is not economically feasible to repair them in a permanent manner. (Photo 4)

**CAUTION:** When replacing hoses that go to an original radiator with plastic side tanks, one must be extremely careful because the hose fittings on the side tanks are generally very brittle and will break when twisted. When replacing these hoses, it is best to use a sharp blade to cut the old hose horizontally before removing. DO NOT use excessive force to remove or replace! DO NOT remove the small radiator



cap. It is unnecessary and is no longer used on the new metal replacement units. It is further advised that metal radiators be used whenever replacing a defective unit because they can be serviced by any radiator shop in the future, should the need arise.

After performing preliminary pressure tests and repairing apparent leaks in hoses, clamps, radiators or water pumps, you can now bleed air from the cooling system. *With the engine*



*cold and not running*, remove the de-ice shield, if fitted, with the 11mm wrench. (Photo 6) When the shield is removed, reinstall the bolt into the manifold to prevent a vacuum leak.

Place a large open container beneath the vehicle. (Photo 7) Place a 4 Ft. length of 3/16" I.D. vacuum tubing onto the air bleed screw in the thermostat housing. (Photo 8) Route the hose between the muffler and the heat shield into the large container, *not over the top of the rear fascia*; make sure the hose does not contact any belts or pulleys!

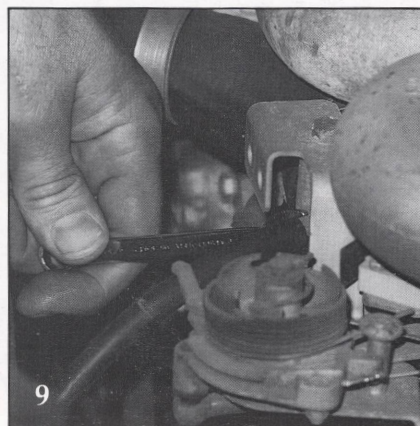
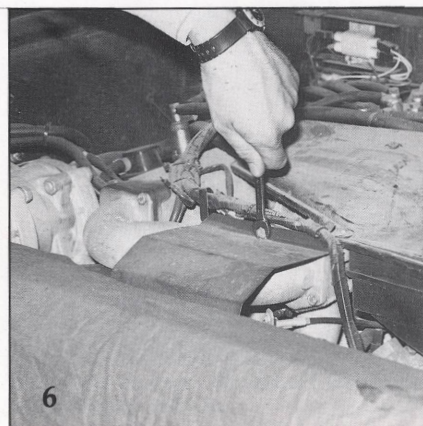
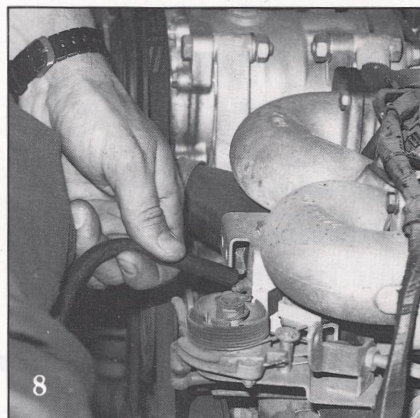
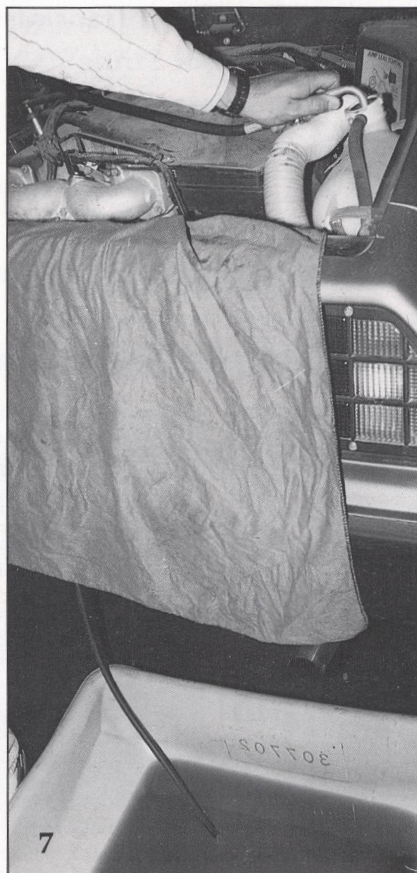
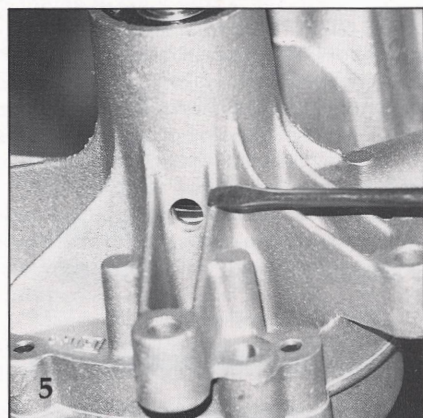
Using a 10mm wrench, loosen the air bleed fitting screw counterclockwise. (Photo 9) Coolant and water will eventually come out of the hose into the large container. Any air bubbles that are present in the cooling system will be apparent in the flow from the end of the hose. While the coolant is coming out of the hose, keep filling the reservoir of the header tank with cold water until a constant stream of water comes out of the hose with no air bubbles.

After you are sure there are no more air bubbles coming out of the hose, pour an additional half-gallon of water through the system, tighten the air bleed screw, and fill the header tank to the top.

**Note:** We find that when air gets into the system, it collects in the water pump, the highest point of the engine. Frequently, excessive air in the water pump will result in an "air lock" and subsequent loss of water circulation through cavitation. At this point in the procedure, it may take as long as thirty minutes to remove all the air bubbles from the system and obtain a continuous bubble-free water flow.

*Make sure there is nothing that can come into contact with the belts or any moving parts in the engine compartment.* Start the engine, turn the heater temperature control knob to full heat, and allow the engine to idle. Allow the engine to warm up. When the temperature reaches the first line on the gauge (160°F) (Fig. a), carefully open the air bleed screw and bleed additional air from the system until all air bubbles disappear. After no additional bubbles are seen, pour an extra half-gallon of water through the system, and close the air bleed fitting. Fill the header tank to the top and install the pressure cap. Allow the engine to idle until the needle on the indicator gauge reaches 1 to 2 needle-widths above the 160°F line. (Fig. b) The radiator cool fans should switch on auto-

**CONTINUED ON PAGE 38**



## PRESSURE TEST (FROM PAGE 25)

matically. They will remain on until the coolant temperature has dropped to one needle-width below the first line on the gauge. (Fig. c) If this happens through two cycles of the cooling fans, the system has been bled free of air. If, during the bleeding procedure with the engine running, the temperature gauge reaches the 220°F mark, it will boil over easily and you will then incur difficulty in restoring an air free circulation within the system. The preferred method is to turn the engine off and permit it to cool down. Repeat the procedure from the beginning.

**Note:** If air bubbles do not stop during the

bleeding procedure with the engine idling, it is possible that the vehicle could have a weakened head gasket. Should you suspect or experience this condition, seek professional advice from a qualified mechanic. Sometimes, under difficult circumstances, it may take in excess of an hour to bleed the air from the system during the idling cycle.

Basic *preventive maintenance* procedures suggest that the cooling system be pressure tested and excess air be bled off every 90-120 days.

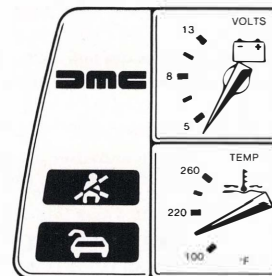


**FIGURE A**  
Approximately  
160°F

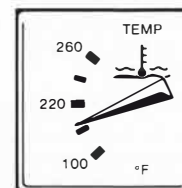


**FIGURE B**  
Cooling fans should start automatically with air-conditioning switch off — the gauge should read slightly above 160°F

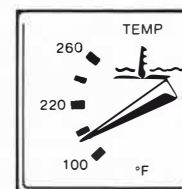


**FIGURE C**  
Cooling fans should automatically stop with airconditioning switch off — the gauge should read slightly below 160°F

## TECHNICAL QUESTIONS AND ANSWERS

We are going to try a new feature in the magazine starting with the next issue. A technical question and answer column will be used to answer questions and print comments from members concerning the DeLorean automobile. Responses will be derived from the knowledge and experiences of people familiar with the particular subjects. Send all correspondence to:

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