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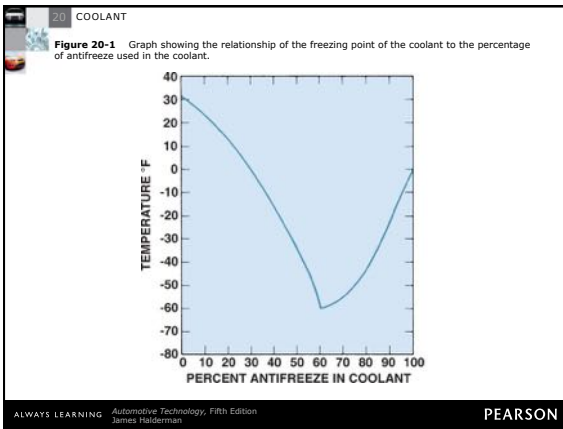
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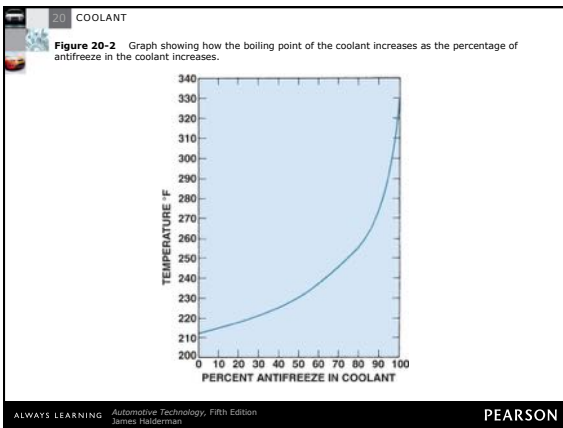
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20 COOLANT

**Figure 20-3** Havoline was the first company to make and market OAT coolant. General Motors uses the term DEX-COOL.



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20 COOLANT

**?** FREQUENTLY ASKED QUESTION

**What is a "G" Coolant?**

The "G" coolants come from the trade name *Glysantin* of BASF in Europe and Valvoline (Zerex) in the United States. The following is a summary of the types listed by G number.

- G05: different from DEX-COOL in certain amounts of additives
- G30 and G34: nonsilicate and phosphate free
- G11: blue VW used before 1997
- G12: pink/red VW 1997+ (purple VW 2003+)
  - HOAT formulation
  - Phosphate free
- G48: low silicate and phosphate free
  - Blue
  - Nitrates, amines, phosphate (NAP) free

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20 COOLANT

**Figure 20-4** Coolant used in Fords that use Mazda engines and in Mazda vehicles. It requires the use of a PHOAT coolant which is dark green.



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20 COOLANT

**?** FREQUENTLY ASKED QUESTION

**What Makes Some Water Bad for Coolant?**

City water is treated with chloride, which, if the levels are high enough, can cause corrosion problems when used in coolants. Well water may contain iron or other minerals that can affect the coolant and may increase the corrosion or cause electrolysis. Due to the fact that the water quality is often unknown and could affect the engine, many vehicle manufacturers are specifying the use of pre-mixed coolant. In pre-mix coolant, the water is usually demineralized and meets the standards for use in coolant.

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20 COOLANT

**?** FREQUENTLY ASKED QUESTION

**Why Is Most Coolant 50/50 with Water?**

According to the freezing point, it appears that the lowest freezing point of coolant is achieved when 70% antifreeze is used with 30% water. While the freezing temperature is lower, the high concentrate of antifreeze reduces the heat transferability of the coolant. Therefore, most vehicle manufacturers specify a 50/50 mixture of antifreeze and water to achieve the best balance between freeze protection and heat conductivity.

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20 COOLANT

**Figure 20-6** Checking the freezing temperature of the coolant using a hydrometer.



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20 COOLANT

**TECH TIP**

**Ignore the Wind Chill Factor**

The wind chill factor is a temperature that combines the actual temperature and the wind speed to determine the overall heat loss effect on open skin. Because it is the heat loss factor for open skin, the wind chill temperature is *not* to be considered when determining antifreeze protection levels.

Although moving air makes it feel colder, the actual temperature is not changed by the wind, and the engine coolant will not be affected by the wind chill. If you are not convinced, try placing a thermometer in a room and wait until a stable reading is obtained. Now turn on a fan and have the air blow across the thermometer. The temperature will not change.

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20 COOLANT

**Figure 20-7** Using a refractometer is an accurate method to check the freezing point of coolant.

1. PLACE A FEW DROPS OF THE SAMPLE FLUID ON THE MEASURING PRISM AND CLOSE THE COVER

2. HOLD UP TO A LIGHT AND READ THE SCALE

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20 COOLANT

**Figure 20-8** A meter that measures the actual pH of the coolant can be used for all coolants, unlike many test strips that cannot be used to test the pH of red or orange coolants.

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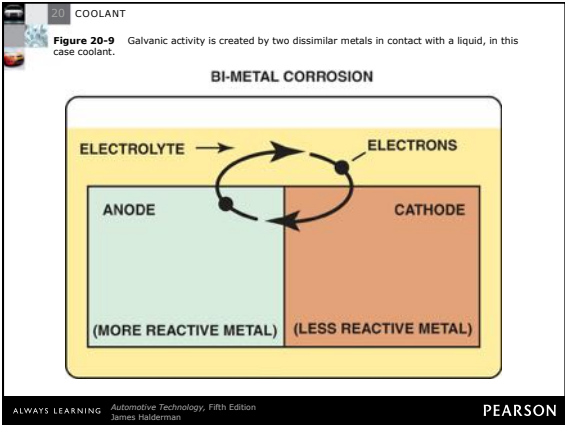
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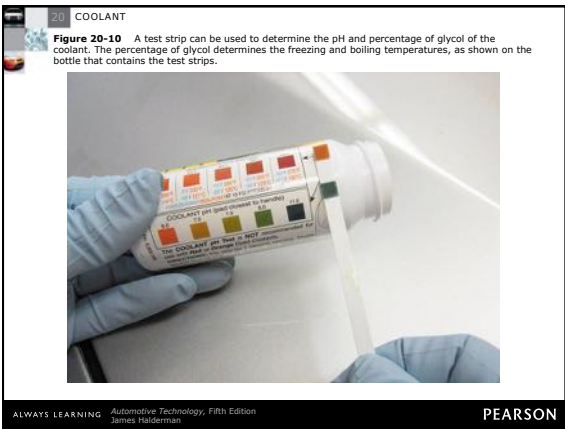
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