

## Chapter Eight

**Table 8-2.**  
**How Temperature Affects Specific Gravity**

°F	Specific Gravity
107	1.260–1.280
77	1.280–1.290
47	1.290–1.300

To test the SPGR of the electrolyte, it will be necessary to use the fairly inexpensive and readily obtainable hydrometer shown in Figure 8-4. As the battery produces current, the acid transfers from the electrolyte to the active material in the plates, therefore less acid remains in the electrolyte. A chemist will tell you that the specific gravity of acid is considerably greater than the SPGR of water, so the loss of acid causes a drop in the specific gravity of the electrolyte.

To discover the SPGR of the electrolyte, you will first need to take off the battery box cover as shown in Figure 8-5. With the battery exposed, take a moment to check its general condition, as in Figure 8-6. Then take the cap off of a battery cell and draw electrolyte up into the hydrometer as illustrated in Figure 8-7. The small numbered stem will float inside the instrument and the SPGR reading is taken at the fluid level. It is important to note that the stem must be floating for the reading to be accurate, therefore it must have liquid below and around it. A fully charged cell should read between 1.275 and 1.300, depending on the manufacturer, and it is a good idea to check all the cells of the battery. Readings from 1.200 to 1.240 indicate a low state of charge, and engine starting may be difficult if not impossible.

If the temperature of the electrolyte is between 70 and 90 degrees F, the reading should be accurate. For temperatures above or below that range, a correction factor must be applied, as set forth in Table 8-3. For instance, if the electrolyte temperature is 100 degrees and the specific gravity reading is 1.267, the chart tells us that there is a +.008 correction factor.  $1.267 + .008 = 1.275$  SPGR.

Lombardo's First Law of Reciprocal Reliability states, "The reliability of any person or thing is directly proportional to the time available to accomplish the task." Practically speaking, that means batteries tend to fail most often when you are in a hurry. Therefore, the temptation is great to put the battery on a fast charge. Be careful; there is a very strong possibility of overheating the battery and buckling the plates. Unless you are an experienced mechanic, you should limit the charging rate to 4 amps per hour. It is also worth noting that battery charging produces the highly explosive hydrogen gas. Be very careful when connecting and disconnecting the charger to prevent possible sparking, and, of course, smoking should never be permitted in the area! One word of caution. When connecting a battery to a charger, be very careful about polarity. Reversing polarity will destroy a battery. Note that in Figure 8-8 a cautious mechanic went so far as to label the cables with "positive" and "negative."