

# SECTION A

## BATTERY AND CABLES

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## DIVISION I SPECIFICATIONS AND ADJUSTMENTS

### 120-1 BATTERY SPECIFICATIONS

|  | 250 Eng.       | 350 Eng.       | 400 Eng.       | 430 Eng.           |
|--|----------------|----------------|----------------|--------------------|
| Make . . . . .                                   | Delco          | Delco          | Delco          | Delco              |
| Model . . . . .                                  | 1980032        | 1980030        | 1980036        | 1980038            |
| Location Under Hood . . . . .                    | Right Front    | Right Front    | Right Front    | Right Exc. Riviera |
| Terminal Grounded . . . . .                      | Negative       | Negative       | Negative       | Negative           |
| Voltage . . . . .                                | 12             | 12             | 12             | 12                 |
| Capacity (Amp. Hrs. @<br>20 Hr. Rate) . . . . .  | 44             | 61             | 70             | 70                 |
| Catalogue Number . . . . .                       | Y55            | R59            | R69            | Y71                |
| Cranking Power (Watts<br>@ 0°F.) . . . . .       | 2300           | 2900           | 3150           | 3000               |
| Number of Cells & Plates/Cell                    | 6, 9           | 6, 11          | 6, 11          | 6, 11              |
| Specific Gravity, Full Charge<br>@ 80°F. . . . . | 1.260 to 1.280 | 1.260 to 1.280 | 1.260 to 1.280 | 1.260 to 1.280     |
| Bench Charging Rate, Start . .                   | 5 Amps.        | 5 Amps.        | 5 Amps.        | 5 Amps.            |
| Bench Charging Rate, Finish . .                  | 2 Amps.        | 2 Amps.        | 2 Amps.        | 2 Amps.            |
| Case . . . . .                                   | Hard Rubber    | Hard Rubber    | Hard Rubber    | Hard Rubber        |
| Dimensions (Overall)                             |                |                |                |                    |
| Length . . . . .                                 | 9-1/2"         | 10-1/4"        | 10-1/4"        | 12-1/32"           |
| Width . . . . .                                  | 6-13/16"       | 6-13/16"       | 6-13/16"       | 6-13/16"           |
| Height . . . . .                                 | 8-1/4"         | 8-3/4"         | 9-1/2"         | 8-3/4"             |



Figure 120-1—Battery - Special, Skylark & LeSabre

## DIVISION II

### DESCRIPTION AND OPERATION

#### 120-2 GENERAL BATTERY INFORMATION

Every 1967 Buick is equipped with an Energizer, which is a type of battery having a one-piece cover. The battery is mounted on the front fender skirt under the hood. The battery negative (-) post is grounded to the engine cylinder head by a copper cable. The positive (+) post is connected by an insulated copper cable to a post on the starting motor.

#### a. Registration of Battery

Delco-Remy Battery dealers and distributors are prepared to carry out terms of the manufacturer's warranty on Delco-Remy batteries. In order that Buick owners shall have the protection and benefit of this warranty, it is necessary for the dealer or car owner to register his battery with the local Delco-Remy Battery dealer or distributor on all new car deliveries, and on all deliveries of new replacement Delco-Remy batteries. The Battery Owner's Certificate is located in the Owner's Protection Plan Booklet.

#### b. Care of Wet Batteries in Storage

Batteries in stored new cars, as well as batteries in stock, must be given regular attention to prevent sulphation of plates that may result from inactivity and self-discharge. All automotive wet batteries will slowly discharge on standing idle, whether in stored vehicles or in stock, and will self-discharge much faster when warm than when cold. Batteries in stock should be rotated and the older ones used first.

To minimize the extent of self-discharge always store batteries fully charged and in cool place where the temperature does not go below freezing. Every 30 days check the level of electrolyte, add water as required and charge the batteries at a 5 ampere rate until fully charged.

Batteries used for display purposes or standing in cars in storage must be treated in the same manner as batteries in stock.

When a new car, or a new replacement battery is delivered, make certain that it is fully charged and the electrolyte is at proper level. This is extremely important because the delivery of a partially discharged battery may not only lead to its return for charging but may also result in shortened life of battery.



Figure 120-2—Battery - Wildcat, Electra & Riviera

#### c. Importance of Maintaining Electrolyte at Proper Level

Water is the only component of the battery which is lost as the result of charging and discharging, and it must be replaced before the electrolyte level falls to the tops of the separators. If the water is not replaced and the plates become exposed, they may become permanently sulphated, which would impair the performance of the plates. Also, the plates cannot take full part in the battery action unless they are completely covered by the electrolyte.

#### d. Importance of Keeping Battery Properly Charged

The battery has three major functions: (1) It provides a source of energy for cranking the engine. (2) It acts as a stabilizer to the voltage in the electrical system. (3) It can for a limited time furnish energy when the demands of the electrical units in operation exceed the output of the generator.

In order for the battery to continue to function, it is necessary that current withdrawal from the battery be balanced by current input from the generator so that the battery is maintained in a properly charged condition. If the outgo exceeds the input the battery will become discharged so that it cannot supply sufficient energy.

The state of charge of the battery as well as the temperature of the electrolyte has an important bearing on its capacity for supplying energy. Battery efficiency is greatly reduced by decreased electrolyte temperature as it has a decided numbing effect on its electrochemical action. Under high discharge such as cranking, battery voltage drops to lower values in cold temperatures than in warm temperatures.

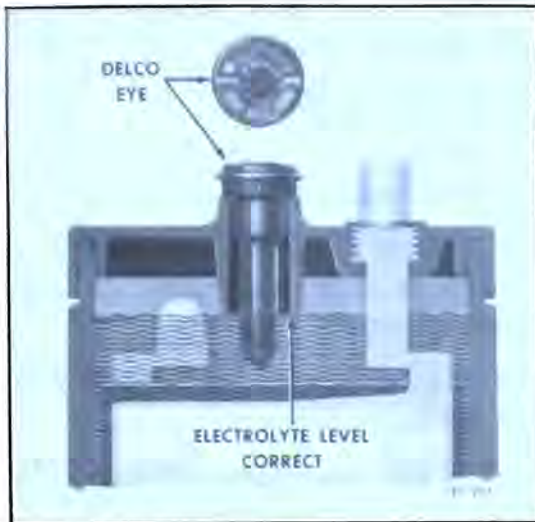


Figure 120-3—Correct Electrolyte Level

top will glow. The Delco Eye reveals at a glance if water is needed, without the necessity of removing the vent plugs. See Fig. 120-4.

The Delco Eye is used in only one cell because when the electrolyte level is low in one cell, it is normally low in all cells. Thus when the Delco Eye indicates water is needed, check the level in all six cells.

Add distilled water as required to maintain the electrolyte level at the split ring at bottom of filler well. See Figure 120-3.

**CAUTION:** Do not overfill, as electrolyte may be sprayed out by gassing or may overflow due to heat expansion during charging.

If distilled water is not available, it is better to add clean, mineral-free tap water than to allow the electrolyte level to remain below the top of the plates.

In freezing weather the water should be added just before using the car or otherwise charging the battery so that the water will be mixed with the acid before it is allowed to stand in freezing temperatures.

If it is found necessary to add water to the battery more frequently than about every 1,000

miles and the quantity of water added per cell is great, check setting of voltage regulator and adjust, if necessary. Abnormal water loss is an indication that the battery is being overcharged.

#### b. Inspect Battery, Mounting and Cables

Check outside of battery for damage or signs of serious abuse such as broken case or broken covers. Check inside of battery by removing the vent caps and inspecting for signs of abuse such as electrolyte level too low, or bad or unusual odors. If battery shows signs of serious damage or abuse, it should be replaced.

Check the battery hold down bolts to make certain that battery is securely held in place. Excessive tightening may distort or crack the battery case.

If the top of battery is dirty or the hold down strap is corroded, clean thoroughly with a brush dipped in ammonia or soda solution. Care must be used to prevent any solution from getting into battery cells. After the foaming of solution stops, flush off with clean water and dry thoroughly. If hold down strap is corroded it should be painted with acid-resisting paint after cleaning.

Check battery cables to make certain they are tight at battery

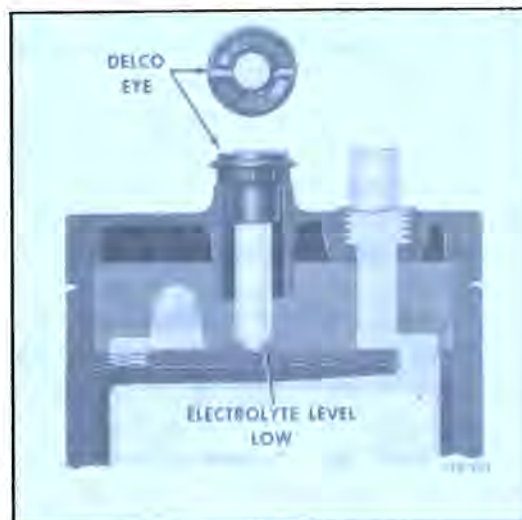


Figure 120-4—Low Electrolyte Level



Figure 120-5—421 Battery Tester - Charger

posts, engine mounting bracket and junction block. If a connection is found loose it should be cleaned before being tightened as arcing and corrosion may have taken place in the loose connection. Check condition of cables and replace if badly corroded or frayed. See paragraph 120-6 for instructions on cleaning and tightening cable terminals and replacement of cables.

#### 120-4 421 BATTERY TEST

New Energizers which have become completely discharged over a relatively long period of time during vehicle storage should not be tested by the "421" Test Procedure. Energizers discharged to this degree cannot accurately be tested by any procedure as they have no load capability, and must be recharged.

Energizers that become discharged in actual service may be accurately tested by the "421" Test Procedure as periods of inactivity are not involved.

Energizers that are merely discharged are not subject to warranty.

The following test procedure is recommended to determine whether the Energizer or 12-Volt Battery is good and usable, requires recharging, or should be replaced - any deviation from this complete procedure may produce erroneous results:

### a. 421 Test Procedure

1. Visual Inspection - The first step in testing the Energizer or 12-Volt Battery should be a visual inspection, which very often will save time, labor and expense in determining the condition.

(a) Check for broken or cracked case or cover.

(b) Check for loose terminal posts.

(c) Check for defective or mutilated sealing compound.

(d) Check for other visible signs of physical damage.

Obvious damage as a result of conditions described above indicates the need for Energizer or battery replacement.

2. The "421" Test is a programmed test procedure consisting of a series of timed discharge and charge events, requiring approximately 2 to 3 minutes, that will determine the condition of the Energizer or battery with a high degree of accuracy when used in conjunction with this entire test procedure. "421" Testers are produced by a number of different manufacturers and their directions for tester operation should be carefully followed. General comments on overall "421" Tester operation follow:

(a) Energizers or batteries should NOT be charged prior to making this test. Defects within the unit can be hidden by the charging and erroneous test results will be obtained.

(b) Erratic or extremely low initial meter readings may indicate poor connections at the tester terminals. Obtain clean and tight connections before performing the "421" Test.

(c) All meter readings should be made immediately after the meter indicator light comes "on" even if the meter needle is still moving.

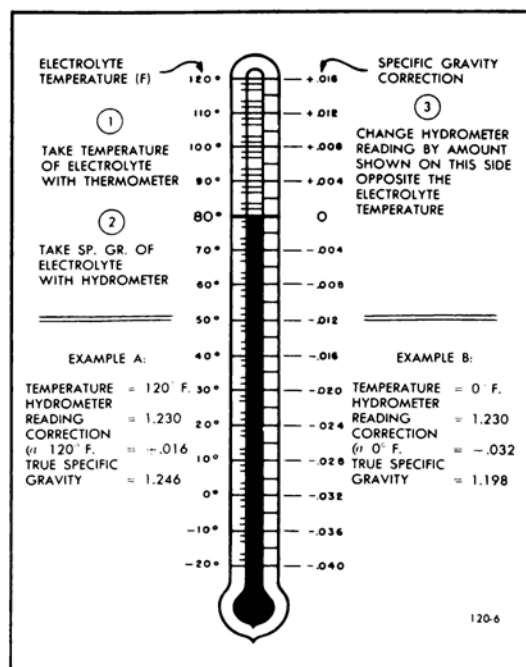


Figure 120-6—Specific Gravity Temperature Correction Scale

(d) If additional discharges are required after the initial discharge, set meter indicator following the last discharge cycle.

(e) Batteries designated as "bad" by the tester should be replaced.

(f) Batteries designated as "good" with no owner's complaint or indication of poor performance, should be left in service. Posts, cable clamps, and top should be cleaned, water should be added and recharging should be performed, if required. For dependable and reliable battery service, the battery should be in at least a 75% state-of-charge.

(g) Batteries designated as "good" that are suspected of being questionable because of owner complaint, or age of the battery, should be further tested by the Hydrometer Test.

### 120-5 HYDROMETER TEST OF BATTERY

The 421 Battery Test as described in the previous paragraph is the fastest and most accurate means of determining the serviceability of a one-piece cover battery. However, if a 421 Battery Tester is not available, a hydrometer test may be used on a

battery that has failed to give proper service.

#### a. Hydrometer Test

1. Fully charge battery as described under Slow Charging.

2. Measure specific gravity of each cell as described in subparagraph below.

Decide battery serviceability as follows:

(a) If all cells read between 1.230 and 1.310, the battery is okay. All it needed was a full charge.

(b) After fully charging battery, if any cell reads less than 1.230, the battery is defective and should be replaced.

#### b. Use of Hydrometer

The hydrometer measures the percentage of sulphuric acid in the battery electrolyte in terms of specific gravity. As a battery drops from a charged to a discharged condition, the acid leaves the solution and enters the plates, causing a decrease in specific gravity of electrolyte. With a hydrometer, an indication of the concentration of the electrolyte is obtained.

The specific gravity of the electrolyte varies not only with the percentage of acid in the liquid, it also varies with temperature. As temperature increases, the electrolyte expands so that the specific gravity is reduced. As temperature drops, the electrolyte contracts so that the specific gravity increases. Unless these variations in specific gravity are taken into account, the specific gravity obtained by the hydrometer may not give a true indication of the concentration of acid in the electrolyte.

Correction can be made for temperature by adding .004, usually referred to as 4 "points of gravity", to the hydrometer reading for every 10°F. that the electrolyte is above 80°F. or subtracting .004 for every 10°F. that

3. Internal Condition. The internal condition of the battery may be such that it cannot hold a charge satisfactorily. Check electrolyte level and test the battery using the 421 Battery Test (par. 120-4).

**e. Overcharge Failure of Battery**

A common cause of battery failure is overcharging, that is, con-

tinued input of excessive charging current after the battery has reached a fully charged condition.

One evidence that battery is being overcharged is the need for frequent addition of water to the battery in order to maintain the electrolyte level above the tops of the battery separators, since

overcharging causes rapid water loss. When this becomes evident the charging rate of generator should be immediately checked and adjusted (par. 68-9) to avoid internal damage to battery.