THE OHIO STATE UNIVERSITY EXTENSION

FACT SHEET

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Buying the Right Battery for Your Buggy

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Introduction

This fact sheet will help you choose the right battery for the lights on a buggy or other vehicles to be used on highways. It will give some basic facts about batteries that are needed to understand their safe and effective use.

Amp-Hour Rating

One of the main ways batteries are rated is by their storage capacity in ampere-hours or amp-hours. This rating will help in choosing a battery to meet **two factors**. The first is that it has the **needed storage capacity** to operate the lights between recharging. The second is that it has enough **power** to operate the buggy lights correctly. We must have a battery that can do both.

Definition — An ampere tells us how much current is flowing in a circuit. Amps multiplied by the time operated in hours is the energy used in amp-hours.

Amp-hours = Amps X On-time in hours

For example, we know a No. 1156 12 V bulb draws 2.1 amperes. If it operates for 2 hours, it will use 2.1 amps x 2 hours = 4.2 amp-hours of energy.

Most battery makers recommend that the **current draw** on the battery, in amperes, not be more than 5 percent of the amp-hr rating of a battery. This means the highest recommended load for a 90 amp-hr battery would be 90 x 0.05 = 4.5 amps. Working the other way, we could calculate the smallest size of battery for a given load. Battery amp-hrs equals amps divided by 5 percent.

Battery amp-hrs = Amps ÷ 0.05

If a buggy has a lighting system like the one below, we can calculate the amperes needed by simply summing the loads. (Since turn signal lights are on for only a short time, they can be ignored in these calculations.)

2 tail lights (1156 12 V bulbs)	2 X 2.1	= 4.2 amps
2 front lights (1156 12 V bulbs)	2 X 2.1	= 4.2 amps
Total		= 8.4 amps

For our example buggy with the 8.4 amp load 8.4 amps ÷ 0.05 = 168 amp-hr or greater battery rating needed.

Amount of energy needed to operate a lighting system for the buggy in amp-hours can be determined from the number of lights, knowing their amps, and the operating time. For each hour on the road, the example buggy would use 8.4 amp-hrs.

To determine how long a battery could be used to operate these lights, we need to know that we can use only up to 80 percent of the energy storage in a deep-cycle battery and still have good brightness or lights. From the following type of calculation we can determine how many hours we can operate the lights from a fully charged battery.

(Amp-hr rating of battery X 80%) ÷ (Amp-hrs of energy per hr of use) = Hours of operation

Assuming a 200 amp-hr battery and 8.4 amp-hrs of energy use, we would get 200 amp-hr times 0.8 divided by 8.4 amp-hrs per hr equals 19 hrs.

200 amp-hr x 0.8 ÷ 8.4 amp-hrs per hr = 19 hrs

200 amp-hr
X 0.8
= 160

160 ÷ 8.4 amp-hrs per hr = 19 hrs

So if we start with a fully charged battery, we could expect to be able to make almost 10 two-hour trips before recharging the batteries in this example.

The battery selected must be able to both supply the continuous current and be able to store enough energy to have an acceptable number of trips between recharging. This means meeting both the current draw and amount of energy needed.

Battery Care

Regular maintenance and proper care will help ensure reliable operation. KEEP THEM CLEAN. Salts will build up on the top of batteries and can cause the battery to discharge itself. Therefore, two times a year or so, it's a good idea to take the battery out and scrub it with a baking soda solution. Rinse with fresh water and dry with a clean cloth. Do not apply grease to any part of the battery terminals, but an occasional light spray of silicone lubricant may be used.

Batteries should be "exercised" (slowly discharged and recharged) every so often to keep them in top condition. New batteries may need to be "exercised" before they reach their full rating.

For batteries that are not sealed, add water to batteries when needed. Battery fluid should cover the plates by 1/2 inch, allowing a small air space at the top. Do not fill the cells up to the filler cap, because this could cause the batteries to sputter fluid while being charged. Only distilled water should be added to your batteries; never use plain tap or well water. Tap and well water usually contains chemicals that can hurt the battery.

Ratings on Bulbs Commonly Used for Automotive Lighting Systems

Bulb Number	Voltage	Amperage	Life in Hours
1156	12.8	2.1	1,200
1157 (2 filaments)			
— tail	12.8	2.10	1,200
— signal	14.0	0.59	1,500

Amp-Hr Rating Battery Selection Worksheet

Determining the Load

Tail Lights		Front Lights		Other Lights		
(__) amps		(__) amps		(__) amps		
X 2 bulbs		X 2 bulbs		X 1 bulb		**Total Load**
= (__) Load	+	= (__) Load	+	= (__) Load	=	(___)

How Many Amp-Hrs Needed for Load Size?

Total Load (__) X 0.05 = (__) amp-hrs

Total Load (__)
X 0.05
= (__) amp-hrs

Amp-hrs between recharge

Amp-hr Rating of Battery (__) x 0.8 ÷ amp hrs (__) = (__) hours of use before recharging

An 1156 12V bulb draws 2.1 amperes.

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