ACDelco Professional Voyager Marine/RV Deep Cycle and ACDelco Advantage Voyager II Marine/RV Deep-Cycle Batteries:

New Battery Testing:

When checking the condition of a new battery prior to installation, ACDelco recommends only measuring open circuit voltage (OCV). ACDelco recommends a minimum installation OCV of 12.4volts.

1. Batteries that fall below 12.4 volts should be recharged, prior to installation.
2. The battery should be tested with a known, good Digital Volt Ohm Meter (DVOM).
3. When testing side terminal or top stud batteries, always use Lead (Pb) terminal adapters. Make sure the terminal adapter makes good contact with the Lead pad of the battery or inaccurate readings will result. Basic hand tools may be needed to ensure the terminal is tight.
4. Never use steal bolts/nuts/washers, etc., when testing a side terminal battery.
5. Never clamp the tester's leads directly to the threads when testing a top stud battery with a conductance tester.

Charging Instructions:

The ACDelco Professional Voyager Deep Cycle and ACDelco Advantage Voyager II Deep Cycle batteries are a deep cycling batteries that will give hours of electrical power in recreational vehicle and boating applications. The battery is an energy storage reservoir. When energy is removed from the battery it must be put back by recharging. The amount of energy required to be put back depends on how much was taken out. The time it will take to recharge will depend on the ampere output of the charger used.

The ACDelco Professional Voyage Deep Cycle and ACDelco Advantage Voyager II Deep Cycle Batteries (M24MF, M27MF, M29MF and ACDM24DC, ACDMF27DC) have a built-in state-of-charge indicator to show how much energy is left in the battery. A green colored ball or red colored ball may be visible in the indicator, or no ball may be visible causing the indicator to appear dark. The indicator is also used to determine how long the battery should be recharged as follows:

INDICATOR COLOR	CLEAR	RED	DARK	GREEN
STATE-OF-CHARGE	Low Electrolyte	Below 50%	50-70%	Above 70%

Charging Instructions

Before charging a battery, visually inspect the battery. If there is any sign of damage or the battery is broken, replace the battery. If the battery appears to be in good condition follow the charging instructions below.

- Check the Open Circuit Voltage (OCV).
  - Test the battery with a Conductance Tester
    - For a new and never installed battery preform a conductance test to check the safety of the battery for charging.
  - Three of the following results may occur: the battery is good, you may have to charge the battery and retest [you can follow the charging instructions below], or you may need to replace the battery. [This is on a battery that has been in service for a period of time.]

Fast charging at a high rate of current is not recommended; it may shorten battery life. Slow charging is preferred. General guidelines for charging ACDelco Batteries are given here:

1. Use terminal adapter tools when charging or testing stud or side-terminal batteries outside of the vehicle.
2. Connect charger leads to the terminal studs/nuts when charging or testing stud or side-terminal batteries in the vehicle.
3. Recharge battery after each use.
4. Use a taper type charger set at 15.0 volts: For best results, a 10-15 amp taper type charger is recommended to recharge ACDelco Voyager models. Taper chargers help avoid overcharge by reducing the charge rate as the battery nears full charge. Follow instructions provided with the charger.
5. Determine the charging time that will be required. Check the built-in indicator and charge the battery for at least the number of hours shown in the charging table (located in “Charging Instructions” section). If the green ball is not visible in the indicator after charging, tap lightly on top to dislodge trapped air bubbles that might keep the ball from floating into view. For the

most accurate results allow the battery to rest for 12 hours then measure battery voltage, 12.8 volts is fully charged.

a. NOTE: A more definite charging time can be set if an accurate voltmeter is available for reading open circuit voltage.

6. DO NOT leave a battery connected to a battery charger after the battery is fully charged. Leaving the battery on a 'float' charge can damage the battery. Inspect battery every 2 hours when charging.
   a. Once fully charged, charging must stop. ***Do not leave battery on a continuous trickle charger.***
7. Batteries charge more efficiently at 60° to 80°F. Turn off charger if battery is hot.
8. If the hydrometer or acid level indicator is clear do not charge the battery, remove from use and replace.
9. The time required for a proper charge will vary according to:
   - Battery size or capacity
   - Electrolyte temperature
   - State-of- charge
   - Battery age or condition
   - Charger capacity

Checking Open Circuit Voltage:

OCV may be used to estimate the Lawn and Garden battery state-of-charge. Observe the following guidelines:

- Use a voltmeter that has been verified as accurate. An inaccurate meter will give inaccurate results. The meter should read to the nearest 0.01 volts.
- When checking OCV, the vehicle engine and all current drains must be OFF. Any current flow into or out of the battery will cause an incorrect voltage reading.
- The battery must be stabilized before reading the OCV. If the battery has been charged or used in a vehicle in the past 12 hours, remove the surface charge (apply a 300amp load for 15 seconds). If the battery has just been discharged, allow at least 15 seconds for the voltage to stabilize, then read the OCV.
- Use the following table to estimate the state-of-charge based on the battery temperature:

Stabilized OCV (Volts)	% Charge* at 0°C (32°F)	% Charge* at 25°C (75°F)
12.75	100%	100%
12.70	100%	90%
12.60	90%	75%

12.45	75%	65%
12.20	65%	45%

*Estimates Only. Batteries vary ±10% by model.

- Keep batteries at 65% of full charge or higher. If the OCV falls below 12.4V, recharge the battery.
- IMPORTANT: When a battery needs charging, always charge it fully. If you don't:
  - Retests with electronic testers may be inaccurate.
  - Full shelf life will not be available if returned to storage.