LESSON I – TEST AUTOMOTIVE BATTERY

INTRODUCTION

In this lesson, we'll explore how to test a battery properly using different methods and tools. Testing ensures that we can diagnose electrical problems accurately, avoid unnecessary replacement, and verify the battery's ability to hold and deliver power.

© LEARNING OBJECTIVES

By the end of this lesson, students should be able to:

- I. Explain the purpose of battery testing and why it is important for preventive maintenance.
- 2. Identify the tools and procedures used to test a 12V automotive battery.
- 3. Interpret battery test results to determine battery condition (good, weak, or replace).

SECTION 1: PURPOSE OF BATTERY TESTING

- To determine if a no-start condition is due to a dead or weak battery
- To check battery health during routine service
- 1 To identify failing batteries before they cause problems
- <u>e</u> To confirm charging and electrical systems are working properly

SECTION 2: TYPES OF BATTERY TESTS - VISUAL INSPECTION

- I. Check for:
- Corroded terminals
- Swollen case
- Leaks or cracks
- Loose clamps or wires

SECTION 2: TYPES OF BATTERY TESTS - VISUAL INSPECTION

- 2. Open Circuit Voltage Test (OCV):
- Measures voltage with engine off
- Use a digital multimeter

Results:

- ✓ 12.6–12.8 V (good)
- 12.4—12.5 V (marginal)
- X 12.0 V or less (discharged)

SECTION 2: TYPES OF BATTERY TESTS - VISUAL INSPECTION

3. Load Test:

- Simulates engine start with a load
- Use a carbon pile tester or analyzer
- Voltage should stay above 9.6V during test (at 70°F/21°C)
- 4. Battery Conductance or Digital Test:
- Use handheld tester
- Displays: Voltage, CCA, Internal resistance, State of health

SECTION 3: BATTERY RATINGS AND WHAT THEY MEAN

- CCA (Cold Cranking Amps):
 - Current at 0°F for 30 seconds
 - → Higher CCA = more starting power
- AH (Amp-Hour):
 - Energy storage capacity (deep cycle use)
- RC (Reserve Capacity):
 - Time battery runs essentials if alternator fails
- ✓ Always match vehicle CCA spec when replacing/testing

SECTION 4:TOOLS REQUIRED FOR BATTERY TESTING

Tool	Purpose
Digital Multimeter	Measures battery voltage
Battery Load Tester	Applies load to test under strain
Conductance Analyzer	Quick and safe battery analysis
Hydrometer (for old wet-cell batteries)	Checks electrolyte specific gravity

SECTION 5: HOW TO TEST A BATTERY (STEP-BY-STEP)

Open Circuit Voltage Test:

- Turn off all loads
- Connect multimeter: red to +, black to -
- Read and record voltage

```
If < 12.4V \rightarrow charge/test further
If \ge 12.6V \rightarrow proceed to load/conductance test
```

Load Test:

- Connect tester
- Apply 1/2 CCA load
- Read voltage drop for 15 sec
- If stays above $9.6V \rightarrow pass$

! SAFETY REMINDERS

- Wear safety goggles and gloves
- Work in ventilated areas (hydrogen gas)
- Do not smoke or create sparks near battery
- Always connect positive (+) first, disconnect negative (-)
 first

RECOMMENDED VIDEO TUTORIAL

Video: How to Test a Car Battery with a Multimeter
 YouTube Channel: ChrisFix

https://www.youtube.com/watch?v=COJr7OB23Hw

Covers:

- Visual inspection
- Proper multimeter usage
- Common mistakes during testing



LESSON SUMMARY

- Battery testing is a quick and essential skill for diagnosing electrical problems.
- Use tools like multimeters and load testers to check voltage and capacity.
- Match test results against manufacturer specs (especially CCA).
- Proper testing ensures safety, savings, and reliability in service work.

REFERENCES

- I. Auto Electrical System Module Competency-Based Learning Material (TESDA) https://www.scribd.com/document/601714455/Auto-Electrical-System-Module-PDF
- TESDA Training Regulations Automotive Servicing NC II https://www.tesda.gov.ph
- 3. YouTube ChrisFix
 How to Test a Car Battery with a Multimeter
 https://www.youtube.com/watch?v=COJr7OB23Hw