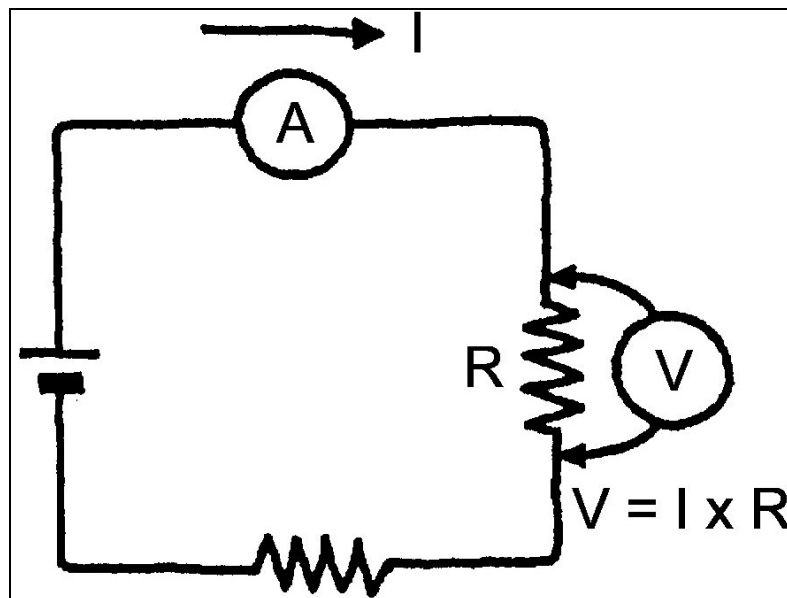




# Basic electrical



**SUZUKI**  
**TRAINING ACADEMY**

Electrical / Electronics

Course code: GE02

Student training manual  
Suzuki Online Training



## Foreword

For many years, electrical technology has been used in the motor vehicle to power up important on-vehicle functions like headlights, engine ignition system, the radio, etc. It is very important for the automotive technician to understand basic electricity. In this course, we will study the fundamentals of electricity and electrical systems in a motor vehicle.

### Smart manuals



Some sections of this training manual contain videos with detailed information on the topics you are studying. If you are studying this training manual on a PC, look out for the “green play video” symbol on any photo or picture in this manual, click on the green button to watch a video providing you with detailed information on that topic. **Note: Internet connection required.**

*This document is intended solely for training purposes only. All vehicle repairs and adjustments must be carried out according to the procedures stipulated in current service manuals and technical bulletins.*

## Suzuki Technician curriculum

This training manual is part of the [Non Suzuki Technician to Suzuki Technician curriculum](#). The curriculum consists of the following modules:

1. GE01 Suzuki Introduction
2. [GE02 Electrical / Electronics](#)
3. Diagnostics
4. EN02 Engine Mechanical part I
5. EN03 Engine Mechanical part II
6. EN04 Engine Mechanical part III
7. EN05 Engine Auxiliary systems
8. DS01 Driveshaft/Axle
9. DS02 Driveshaft/Axle transfer case
10. BR02 Brake control systems
11. Manual transmission / transaxle
12. CS02 Control system / body electrical
13. CS03 Communication / bus systems

You are currently studying EN05 Engine Auxiliary Systems. This module consists of the following courses:

- [Basic electrical](#)
- [Basic electronics](#)

Click on the other training modules to view training contents.

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# Fundamentals of electricity

## Objectives

At the end of this lesson, you will be able to:

- Explain the principles of electricity
- Describe voltage, resistance and current
- Define Ohm's law
- Describe direct current voltage and alternating current voltage
- Describe the qualities of good conductors, semiconductors and non conductors
- Explain what is meant by a series circuit, parallel circuit and mixed circuit.
- Describe the different effects of electrical current.
- Explain the operating principle of electromagnets
- Explain the operating principle of mutual induction
- Explain the operating principle of a DC motor
- Explain the operating principle of an AC motor

## Suzuki Basic Electrical System

Full download: <http://manualplace.com/download/suzuki-basic-electrical-system/>

All matter is made of atoms. The atom is the smallest part of any matter and it contains the following parts:

- Proton
- Neutron
- Electron

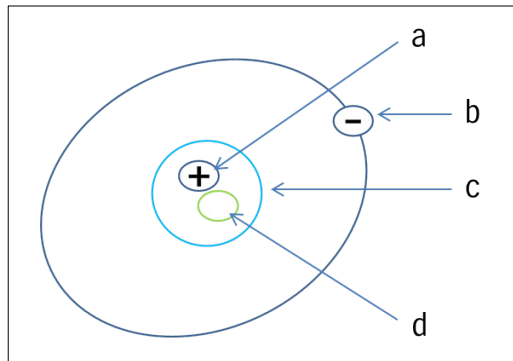


Figure 1 - Atom

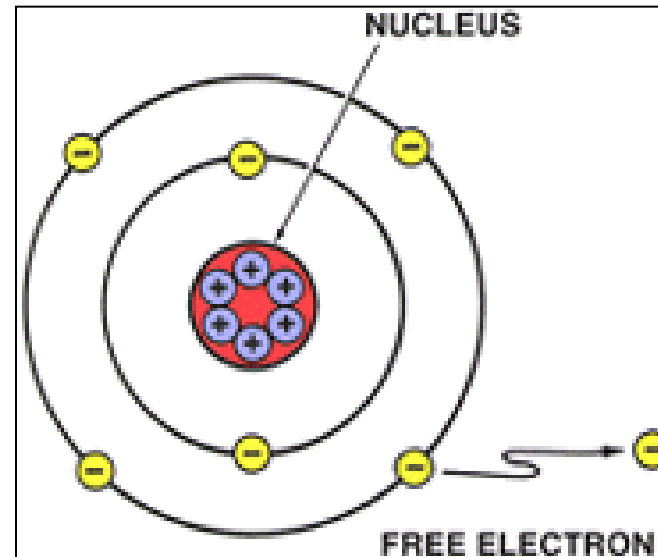
- [a] Proton
- [b] Electron
- [c] Nucleus
- [d] Neutron

A nucleus is at the centre of the atom and it contains the Proton (Positively charged) and a nucleus (No electrical charge). The electrons orbit the nucleus. The maximum number of electrons found in the valence (outer) ring is 8 and this number depends on the type of material.

An insulator for example, has 6 or more electrons in the valence ring, and a good conductor has 3 or less electrons in the valence ring.

## Electricity

Electricity is the movement of electrons from one atom to the next atom in a conductor such as a piece of wire. In electrolyte, the movement of ions also produces electricity.



Only the FREE ELECTRONS in the outermost shell (Valence Ring) are free to move from atom to atom. This movement is called ELECTRON FLOW.

These FREE ELECTRONS are loosely held and can easily be moved to another atom or ion.

Because of their distance from the nucleus, free electrons have a weak magnetic attraction. Since this attraction is not as strong to the nucleus as the bound electrons on the inner orbits, the electrons move easily from atom to atom.