

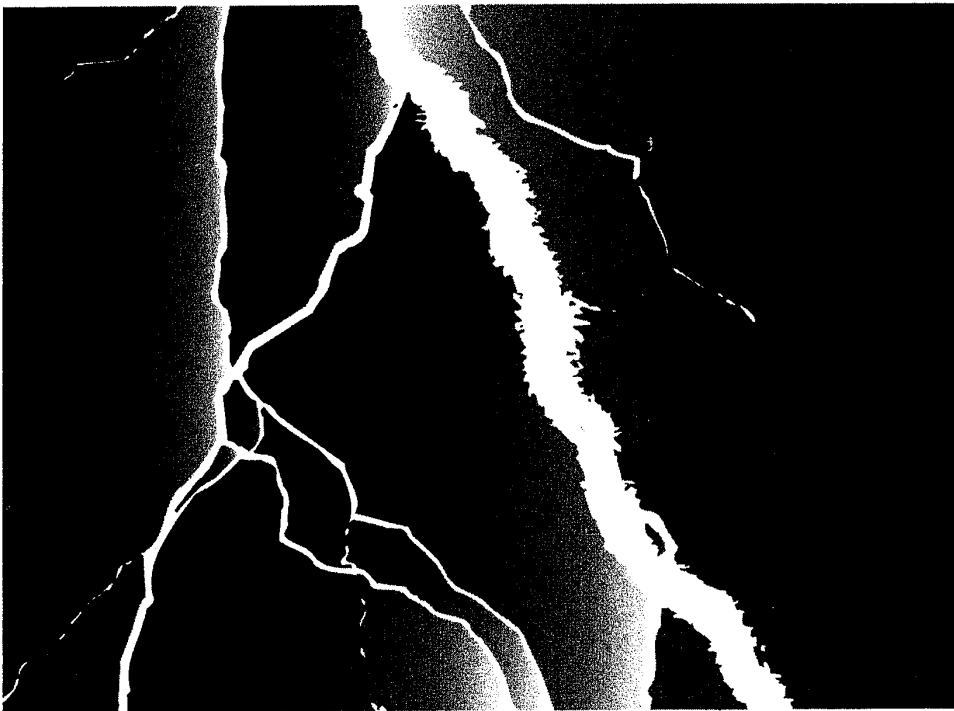
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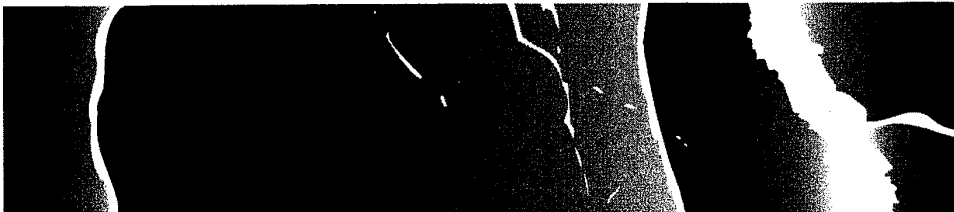


ELECTRICITY



LEO A. MEYER

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BASICS OF ELECTRICITY

by

LEO A. MEYER

H. LYNN WRAY, P.E., Technical Advisor

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FOREWORD

You are probably working as a technician in one of the indoor environment fields. This means that you have at least some understanding of airflow in ducts. However, don't fall into the trap of thinking. "I know all this stuff."

Read each chapter. Then do the Review. In my experience, every time I studied material I "knew all about," I learned new ideas and corrected misunderstandings.

If you study each chapter carefully, you will gain new ideas. More important, you will give yourself a solid understanding of basic principles that you will be able to apply in the field. You will also be able to apply your knowledge to more advanced technical principles covered in later books in this series.

Indoor Environment Technician's Library

This book is part of the *Indoor Environment Technician's Library*. These are practical books that you can use as training or as reference. These books apply to all areas of the indoor environment industry:

- Heating, ventilating, and air conditioning
- Energy management
- Indoor air quality
- Service work
- Testing, adjusting, and balancing

If You Are Training Other

If you are a supervisor training others, you will find that the *Indoor Environment Technician's Library* can make it easier. A *Supervisor's Guide* is available for some books. It includes teaching suggestions and key questions you can ask to make sure the student understands the material.

Leo A. Meyer

LAMA Books
Leo A. Meyer Associates Inc.
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888-452-6244
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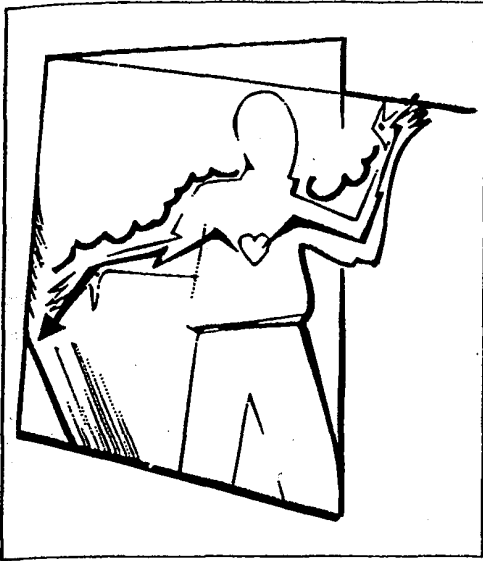


Fig. 4: If electricity flows through your heart, it may stop

Electricity always takes the path of least resistance. It flows through the best conductor. Unfortunately, the human body is a good conductor, since it is mostly water. If a human body is in contact with the ground, electricity can easily flow through the body to the ground. If it flows through your heart on its path to the ground, your heart may stop (Fig. 4). When you work with electricity, your basic safety practice is to keep from being a conductor to ground.

On DC circuits, you must touch both wires to be shocked.

However, automotive DC circuits are grounded by being connected to the auto frame and engine. Touching the hot wire and the car frame is the same as touching both wires.

STORED ELECTRICITY

Electricity isn't always moving through wires. It can also be stored in various ways. A battery is a familiar way of storing electricity in a DC circuit. In AC motors and other electrical equipment, a capacitor is a small component that stores electricity. Even when the equipment is completely disconnected from any power source, a capacitor may hold enough electricity to give you a shock if you touch it. You have to know how to discharge the stored electricity in the capacitor by letting it escape to ground. This process is described in Chapter 7.

COMMON VOLTAGES

In general, the higher the voltage in a given circuit, the higher the current, and therefore the more dangerous

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