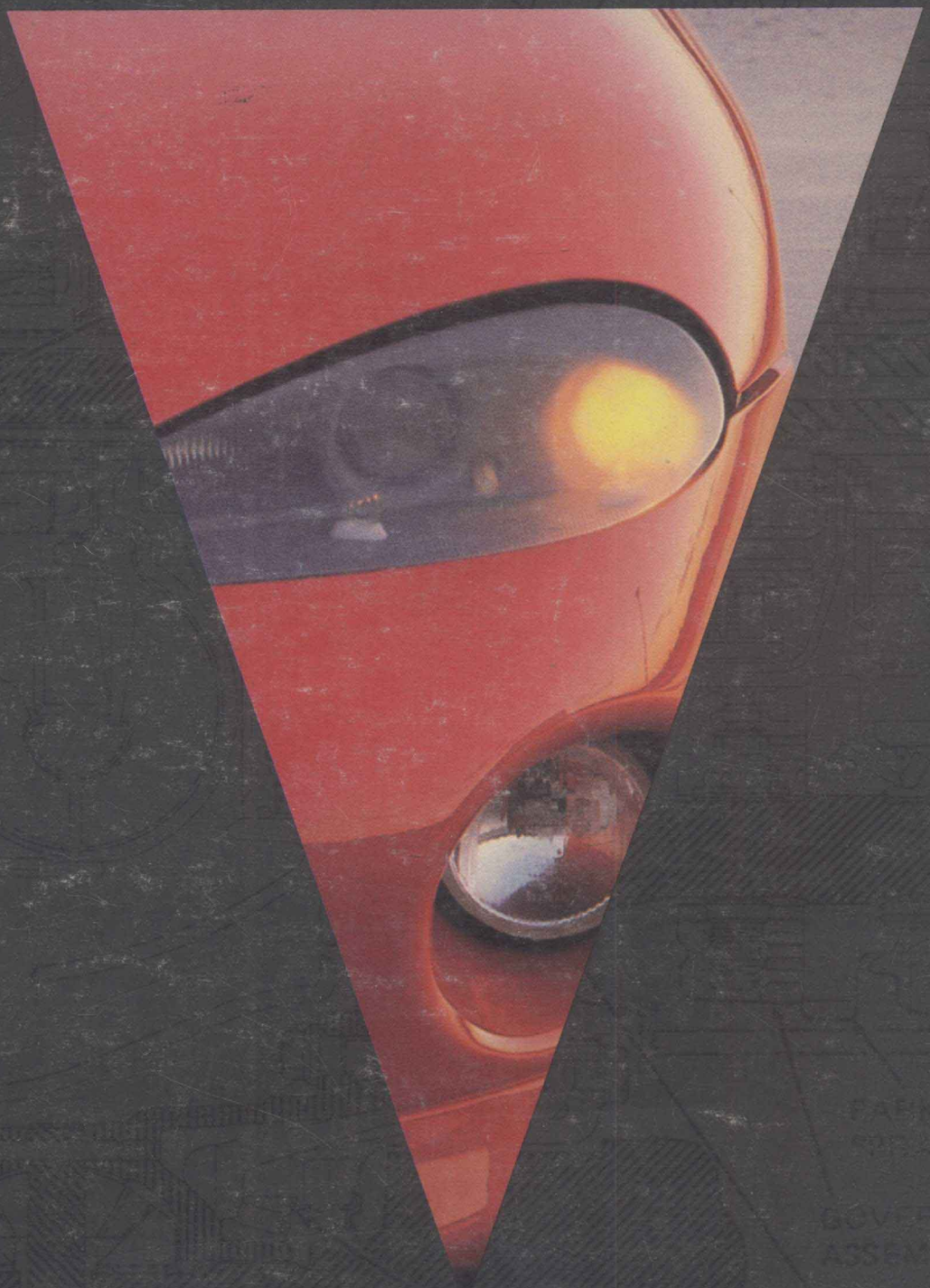
AUTOMOTIVE TRADES
READING



Thomas G. Sticht
Barbara A. McDonald

GOAL Series

Automotive Trades

INFORMATION PROCESSING SKILLS:

READING

Thomas G. Sticht
Barbara A. McDonald

GOALS
Glencoe Occupational Adult Learning Series

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Send all inquiries to:

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Preface

People used to think that when they got out of school, they could stop learning. Today, that is no longer true!

People who want careers in well-paying jobs have to use their knowledge and skills to learn every day. They have to keep up with rapid changes in technology. They must meet new demands for goods and services from customers. They have to compete for good jobs with workers from around the world.

The books in this program will help you learn how to learn. The *Automotive Trades Knowledge Base* will give you the background you need to learn about automotive technology. The *Reading and Mathematics Information Processing Skills* books will teach you how to use your skills to learn new information.

When you complete these three books, you will be ready for more training in auto technology careers. Then when you start your career, you will be able to learn new knowledge and skills. This way, you will always be able to keep up with changes in jobs.You will also be ready to move ahead to jobs of greater responsibility.

We wish you the very best of success in your chosen career field!

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PART 1

INTRODUCTION

The ability to read is one of the most important, most useful skills you can have. Reading is becoming more important every day. The reason is simple: No matter what kind of work you do, you *must* be able to read to do your job well.

❑ READING ON THE JOB

Today's automotive service world is an information world. You may work in an auto shop, a showroom, a factory, or an auto parts store. What you read on the job depends on the kind of work you do. You may read many letters and memos. Perhaps you will read charts and graphs. You may need to read reports and manuals. Chances are, you will need to read many different kinds of materials.

Whatever you do, you will need good reading skills.

SELF-CHECK 1-1

Directions: *If you now work, take a separate sheet of paper and list the kinds of materials that you read on your job.*

❑ THE IMPORTANCE OF GOOD READING SKILLS

Good reading skills will make your work easier. When you can apply good reading skills, you will be able to find answers to on-the-job questions. You will be able to solve on-the-job problems.

For example, when you learn to use parts of books such as the table of contents, you will be able to find information in books very quickly. You will save time, but more important, you will be sure to find the right answers.

SELF-CHECK 1-2

Directions: *In the space below, write three ways that good reading skills can help you in your job.*

1. _____
2. _____

3. _____

SELF-CHECK 1-3

Directions: *In addition to the table of contents, can you name other parts of a book that might help you find something? Write your answers in the space below.*

_____

_____

This book and the *Automotive Trades Knowledge Base* will help make your reading both easier and more effective by helping you to understand your reading goals. Let's see what this means.

❑ UNDERSTANDING YOUR GOALS

At times, you will read to *learn* something. Your goal will be to understand as many details of what you are reading as you can in order to master the information. At other times, you will read simply to *do* something—for example, to find an answer to a question. As you will see, reading to learn and reading to do are two very different goals, but both require reading skill.

READING TO LEARN

Assume that you must read a manual that describes how to use a new piece of auto equipment. The equipment can be dangerous if not used properly.

Of course, you want to learn as much about this equipment (especially its safety features) as you can. You want to *recall* the information you learn. That means that you want to be able to *use* the information in the future. You want to be able to apply what you read when you operate the equipment.

The information is important. Your purpose, your goal in reading, is to *master* the information. You want to keep the information in your permanent memory. Your goal is *reading to learn.*

READING TO DO

But you do not always read to master information. Sometimes, you will read simply to find an answer to a question or a problem. Once you find that answer, it really may not be important to *keep* the information in your memory at all.

For example, suppose you need to find the manufacturer's serial number for that same piece of equipment. You need to (1) find the number, (2) write it accurately on a form, and (3) give the filled-out form to your supervisor. Do you need to *memorize* the number? No. Do you need to *understand* it? No.

You simply need to *find* the number. It's somewhere in the 300-page manual that comes with the equipment. But you don't want to read every page of the manual just to find the number.

Of course, you *can* find the number quickly and easily. How? By using "finding tools" such as the table of contents in the manual. Your goal here is *reading to do.*

SELF-CHECK 1-4

Directions: *You have been asked to do the following tasks. In the space provided, put a check mark to indicate whether they are reading-to-learn or reading-to-do activities.*

Task	Reading to Learn	Reading to Do
1. Read a shipping chart to find the cost of mailing a three-pound package.	____	____
2. Read the instruction manual to learn how to operate the copying machine.	____	____
3. Read a chapter in a textbook for a homework assignment.	____	____
4. Read a parts manual to find the number and cost of a part.	____	____
5. Read a telephone book to find a friend's number.	____	____
6. Read a manual to learn how to use a VCR.	____	____
7. Read a book about the Vietnam War.	____	____
8. Read the newspaper to find the score of last night's basketball game.	____	____
9. Read the newspaper to find out about an earthquake in California.	____	____
10. Read your *Automotive Trades Knowledge Base.*	____	____

As you use this book together with your *Automotive Trades Knowledge Base,* you will learn more about reading-to-learn and reading-to-do skills. First let's look at the system your mind uses to process information. As you will see later, this will help you to use reading-to-learn and reading-to-do skills.

❑ INFORMATION PROCESSING

How do we learn? How does new information enter the memory? How does our brain remember? How does our mind store information and then find it again? In other words, how does the brain *process* information?

Understanding how we learn and how our brains process information will help you to improve your reading skills. To understand this process, let's begin by taking a look at the brain and its "inventory."

YOUR KNOWLEDGE BASE

Think of the information that is stored in your brain as your knowledge base. Your brain stores all kinds of information, including:

- ❑ Dates
- ❑ Statistics
- ❑ Pictures (of people's faces, of places, and of things, for example)
- ❑ Names
- ❑ Addresses
- ❑ Phone numbers

In other words, the total inventory in your brain, your total memory and knowledge, make up your knowledge base.

SELF-CHECK 1-5

Directions: *Write one example for each of the following items:*

1. *Dates* Write your date of birth. _____
2. *Statistics* Write your height and weight. _____
3. *Pictures* Draw the flag of any country, and write the country's name to the right of it.

_____

4. *Names* Write the names of two of your friends.

_____

_____

5. *Addresses* Write your address. _____

_____

_____

What, then, is "learning"? Learning is adding new information to your knowledge base—that is, adding to what you already know.

Stop for a moment to consider what is in *your* knowledge base. Take one topic—bicycles. Take about five minutes to try to jot down everything you know about bicycles. Use the list that follows as a starting point. This is not a test—just a way of helping you to see how much information your brain has stored away about bicycles.

- ❑ All the experiences you have had riding, borrowing, racing, or repairing bicycles.
- ❑ All you know about bicycle gears—how they work, the names of the various types of bicycles, what kind of terrain they cover.
- ❑ The names of different bicycle manufacturers, the popular types of bicycle clothing and so on.
- ❑ Statistics about bicycles—safety, costs, exercise value, use of helmets, and so on.
- ❑ The kinds of bicycles your family, friends, and coworkers own and ride.

SELF-CHECK 1-6

Directions: *Jot down on a separate sheet of paper what you know about three of the following everyday topics. Spend about two minutes on each topic.*

1. Movies
2. Business
3. Finance
4. Sports
5. School
6. Advertising

Now choose *one* of the topics, and write what you know about it. Write three or four sentences in the space provided.

_____

_____

_____

_____

Don't be concerned with how much information you have stored away on these topics. Instead, think about how this information entered your brain and became part of your knowledge base. We are concerned with the *process* of learning.

HOW YOUR BRAIN PROCESSES INFORMATION

Learning means adding new information to your knowledge base, adding to what you already know. The brain adds new information to your knowledge base in two different ways: by experience and by practice. Let's take a look at each.

EXPERIENCE. Whenever you see, taste, touch, hear, and talk, you remember some or all of that experience and store it in your knowledge base. For example, when you thought of bicycles earlier, you might have remembered:

1. Seeing a very fancy or unusual bicycle—or a picture of one.
2. Racing with friends on your bicycle.
3. The feel of the wind on your face when riding your bicycle on a cold day.
4. Hearing a new horn on your brand-new mountain bike.
5. Talking with a friend about a biking trip or your bicycle.

SELF-CHECK 1-7

Directions: *Write a specific example, stored in your knowledge base, for each of the five experiences described above.*

1. _____

2. _____

3. _____

4. _____

5. _____

Each of these experiences is stored in your knowledge base. Your brain will also store other experiences, such as:

1. Seeing the exact words on a page.
2. Tasting a certain food.
3. Touching a soft fabric.
4. Hearing a favorite song or hearing a joke.
5. Talking to a friend or coworker about a certain topic.

No matter how the information gets there, your brain, or knowledge base, stores some information for a short time and some information for a long time. And once it is in your memory, you can use the information to help you learn more. You add to what is already stored in your brain.

Think of what might happen if you tried to drive a motorcycle for the first time. Would your earlier experience on a bicycle be helpful? Most likely it would be. If you were about to use a word processor for the first time, would your past experience on a typewriter be helpful? Sure it would be. In both instances, the "old" experience stored in your knowledge base would help you learn something new.

When you read, you can also use past experiences to help you understand what you are reading. If you are reading about a computer keyboard, you can use your experience with a typewriter keyboard to help you understand basic ideas.

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PRACTICE. The more you use a piece of equipment that requires skill, the more you improve your skill. In other words, you learn through practice. For example, hammering nails becomes easier when you've repeated the process a few times. When you travel the same route day in, day out, for several months, the repetition helps you to learn that route.

As you will see, practice also helps you improve your reading skill. New, unknown words become familiar through practice, just as that travel route became familiar through practice.

SELF-CHECK 1-8

Directions: *Name five activities in which you improved your skill through practice.*

1. Activity: _____
2. Activity: _____
3. Activity: _____
4. Activity: _____
5. Activity: _____

PART 2

Reading to Do

LOCATING INFORMATION IN BOOKS

Books offer tools that help readers find information. The *Automotive Trades Knowledge Base* has many of these tools. Working with this book and the *Knowledge Base*, you will learn about the following "finding tools":

- ❑ Table of Contents
- ❑ List of Figures
- ❑ Glossary
- ❑ Index

Each of these tools is described below.

❑ THE TABLE OF CONTENTS

The table of contents lists the major topics covered in a book. A portion of the contents from your *Automotive Technology Knowledge Base* is shown in Figure 2-1.

CHAPTER 7 Auto Power Systems *69*

Types of Power Systems *70*

Parts of the Power System *70*

Clutch 70

Transmission 70

Manual Transmissions 71

Automatic Transmissions 71

Figure 2-1

The table of contents is always in the front of a book. It is usually in the first few pages. Find the *Automotive Trades Knowledge Base* Table of Contents. What kind of information does it provide?

As you can see, it offers very useful information. The first part tells you where in the *Automotive Trades Knowledge Base* you can find the *preface* and the *list of figures.*

Notice that the page numbers to the right of "Preface" and "List of Figures" are lowercase roman numerals. That is because they are in a part of the book called the *front matter*. The front matter is numbered separately from the main part of the book. The *Knowledge Base* Table of Contents is also part of the front matter. It is found on pages iii to vii.

On the left side, the contents page shows both the title and the number of each chapter in the *Knowledge Base*. For example:

Chapter 1 Working in the Automotive Trades

Below each chapter title, you'll see a list of the subjects discussed in that chapter. For example:

Chapter 3 Working on the Car

(Topic 1) Routine Maintenance

(Topic 2) Diagnosis and Troubleshooting

Just as the chapter titles tell you what's in the book, these subject listings tell you what's in each chapter.

Some subjects are divided into subtopics. Subtopics can also have their own subtopics. For example, look up Chapter 6 in the Table of Contents for the *Knowledge Base*. Chapter 6 is divided into five main topics:

(Topic 1) Fuel Basics

(Topic 2) Gasoline Quality

(Topic 3) Diesel-Fuel Quality

(Topic 4) The Fuel System

(Topic 5) Where the Emissions Go

Four of these main topics have subtopics. The "Gasoline Quality" section has two subsections:

(Topic 2) Gasoline Quality

(Subtopic 1) Volatility

(Subtopic 2) Octane Rating

Look at pages 58 and 59 of the *Knowledge Base*. Notice that the main topic, "Gasoline Quality" appears larger than the subtopic, "Volatility."

Look in the Table of Contents at the section "Where the Emissions Go." It has two subtopics:

(Subtopic 1) Exhaust Systems

(Subtopic 2) Emission Control Systems

Each of the two subtopics has its own subtopics. For example, "Emission Control Systems" has five subtopics.

(Subtopic 1) PCV System

(Subtopic 2) Fuel-Vapor Emission Control

(Subtopic 3) Heated-Air System

(Subtopic 4) EGR System

(Subtopic 5) Troubleshooting Emission Control Systems

Look at page 66 of the *Knowledge Base*. "Emission Control Systems" is underlined. The subtopics to "Emission Control Systems," on pages 67 and 68 which can be referred to as sub-subtopics, are not underlined. They also appear smaller than "Emission Control Systems."

The page numbers in the Table of Contents (shown to the right of each chapter title and each section) tell you the first page of that chapter or section so that you can find it quickly.

Chapter 5 Auto Electricity and Electronics *49*

Now spend a few minutes looking over the Table of Contents in your *Automotive Trades Knowledge Base*. Then do the following Self-Check.

SELF-CHECK 2-1

Directions: *Use the Table of Contents in the* Knowledge Base *to answer the following questions.*

1. How many chapters are there in the *Knowledge Base?*

_____

2. What is the title of Chapter 8?

_____

3. How many main topics are discussed in Chapter 8?

_____

4. Name *all* the topics, subtopics, and sub-subtopics in Chapter 8.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

5. On which page does Chapter 2 begin?

6. In which chapter will you find information on:

   Engine Operation? _____

   Fuel Systems? _____

7. In a sentence or two, write about how a table of contents can help you locate information.

❑ THE LIST OF FIGURES

If a book has many tables, charts, and drawings, it may include a list of figures (illustrations) in the front. Find the page number for the List of Figures in the Table of Contents of your *Automotive Trades Knowledge Base*. Turn to that page. Part of the List of Figures is shown in Figure 2-2 below.

Figure 2-5 *A computer printout showing some A&P accounts.* 17
Figure 2-6 *A diagnostic computer.* 18
Figure 3-1 *A technician using a dipstick to check the oil level.* 20

Figure 2-2

The List of Figures gives the titles and page numbers of all the figures in the *Knowledge Base*. Like a chapter, each figure has a number and title. If you wanted to see a picture of the four engine strokes, for example, you could use the List of Figures to find what page it is on—instead of searching the whole book.

Every figure listed has two numbers that identify it. The first number tells you what chapter the figure is in; the second number tells you its order in the chapter. Each figure also has a title that describes its content. For example, in the list of figures, you find this:

Figure 4-4 *The four engine strokes: intake, power, compression, and exhaust.*

That means that the picture of the four engine strokes is the fourth illustration in Chapter 4.

SELF-CHECK 2-2

Directions: *Use the List of Figures in the* Knowledge Base *to answer the following questions.*

1. How many figures are there in Chapter 6? _____
2. Give the number of the figure that shows a work order filled out by the receptionist at A&P Auto. _____
3. On what page will you find Figure 5-2? _____
4. Which chapter has the most figures? _____
5. Which chapter has an illustration of an inflated air bag? _____
6. On what page is the last figure in the *Knowledge Base?* _____
7. In a sentence or two, write about how a list of figures can help you save time while you read.

_____

_____

_____

As you have just learned, the *Knowledge Base* contains many figures. It is often easier to find information in a figure than it is to find information in a paragraph or more of text. Look at Figure 3-16 on page 39 of the *Knowledge Base.*

The title appears beneath the illustration and tells you its subject. This figure is a chart showing the conversion of measurement from U.S. Customary units to metric units. By looking at the figure and its title—also called a caption—you learn several things:

- ❑ You learn that U.S. Customary measurements have an equivalent in the metric system.
- ❑ You learn how many centimeters there are in an inch.
- ❑ You learn how to change from Fahrenheit to Celsius (also called "centigrade") temperatures.
- ❑ You learn how to convert other measurements as well.

SELF-CHECK 2-3

Directions: *Use the figures indicated to answer the following questions.*

1. Figure 3-17 on page 41 of the *Knowledge Base*
   a. At what mileage should the first service be performed?

      _____

   b. How many times do the spark plugs need replacement in 120,000 miles?

      _____

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