Practical Exercise for Instruction Pack 1

By

Ed Abdo

About the Author

Edward Abdo has been actively involved in the motorcycle and ATV industry for over 25 years. He received factory training from Honda, Kawasaki, Suzuki, and Yamaha training schools. He has worked as a motorcycle technician, service manager, and Service/Parts department director.

After being a chief instructor for several years, Ed is now the Curriculum Development Manager for the Motorcycle Mechanics Institute in Phoenix, Arizona. He is also a contract instructor and administrator for American Honda's Motorcycle Service Education Department.

Contents

INTRODUCTION **1**

SUGGESTED ACTIVITIES **1**

Activity 1
Activity 2
Activity 3
Activity 4
Activity 5
Activity 6
Activity 7
Activity 8
Activity 9

CONCLUSION **17**

ANSWERS FOR TOOL IDENTIFICATION ASSIGNMENTS IN ACTIVITY 5 . . . . . **18**

Answers to Figure 3 Assignment
Answers to Figure 4 Assignment

EXAMINATION **21**

Practical Exercise for Instruction Pack 1

INTRODUCTION

This *Motorcycle and ATV Practical Exercise* is designed to help you apply your newly acquired knowledge of motorcycles and ATVs to several useful activities. These activities range from visiting a motorcycle dealership to designing and sketching out a floor plan for your own repair shop. They're intended to be fun, and at the same time they're intended to reinforce your understanding of the material presented in the first two study units.

Note: A practical exercise unit is included with each Instruction Pack.

The practical exercise starts with "Suggested Activities." This section lists some activities for you to try. None of these activities are required for your program completion. Although you won't be graded on them, we encourage you to devote some time to these activities. You'll benefit from the practical exposure that they can provide. We hope you enjoy this practical exercise!

After you've been through the suggested activities, we'll ask you some questions related to study unit 1 and study unit 2. There are 20 questions that will be graded as an examination. When you're ready, complete the practical exercise exam. Then submit only your answers to school headquarters for grading, using one of the answer options described in your first shipment of study materials.

Note: Before beginning the exercise, you may wish to review the text material that covers these topics. Refer to *Introduction to Motorcycle and ATV Repair* and *Motorcycle and ATV Engine Configurations*.

SUGGESTED ACTIVITIES

The following suggested activities are designed to enhance your learning. Remember, these activities aren't required to complete the program, and none of them will be graded. Because these activities are designed to help you to apply your motorcycle and ATV knowledge, we encourage you to spend some time on them. When you've completed these activities to your own satisfaction, proceed to the required and graded practical exercise exam that follows Activity Six.

Activity 1

Visit some local motorcycle dealerships. Walk around and observe the different types and brands of motorcycles and ATVs available. As you identify the many different types of motorcycles and ATVs, answer the following questions.

Question: What different makes of motorcycles did you encounter? Use the following checklist to record your findings.

Motorcycle Manufacturers

____BMW

____Moto Guzzi

____Honda

____Buell

____Kawasaki

____Suzuki

____Yamaha

____Harley-Davidson

____Triumph

____Ducati

____Other:_____.

Question: What different makes of ATVs did you to observe? Use the following checklist to record your findings.

ATV Manufacturers

____Honda

____Kawasaki

____Suzuki

____Yamaha

____Polaris

____Other:_____.

Question: What different engine configurations can you identify by looking at the various motorcycles and ATVs? Use the following checklist to record your findings.

____Single

____Inline four

____Opposed six

____Vertical twin

____Opposed twin

____Inline six

____V-twin

____V-four

____Triple

____Opposed four

Question: By looking at the various motorcycles and ATVs, can you tell which ones have two-stroke engines and which have four-stroke engines? Can you identify where the major components and systems on these vehicles are located?

Question: When observing the various motorcycles and ATVs, can you determine which ones have air-cooled engines and which have liquid-cooled engines?

Question: Can you identify the various types of motorcycle and ATV designs? Use Figure 1 as a checklist to record your findings.

FIGURE 1—Use this list to identify the different types of motorcycle and ATV designs you can find in stores.

Print

Motorcycles	ATVs
Standard street	Pleasure
Sport	Racing
Motor scooter	Utility
Custom cruiser	Three-wheel
Sport-touring	Four-wheel
Dual-purpose	
Hot-rod cruiser	
Touring	
Off-road	

Activity 2

One of the best ways to become familiar with the motorcycle repair business is to visit some dealerships and repair shops in your area. By visiting repair shops, you can get a first-hand look at operating businesses, get a feel for the services performed there, and find out what fees are being charged in your area. By visiting several shops, you'll be able to compare services and prices. You'll also learn whether certain motorcycle repair services aren't currently offered in your area. This information can be very useful if you plan to open your own shop. For example, there may not be a shop in your area that offers engine rebuilding. By doing a little research, you could thus corner the market for such a service in your area. If you prefer to work for someone else, find out where the job opportunities are in your area, which will help you when you complete your training.

Motorcycle repair shops and dealerships sometimes hire apprentice technicians. Even if this type of job is only part-time, it allows you to gain some hands-on experience. Another option is to work as an intern on a short-term basis. While you may not get paid for your services while you're working as an intern, you'll gain valuable experience that will add to the training you're already receiving.

When you call or visit a local repair shop, consider acting as though you're a customer looking for information. The shop owner or manager may not be as obliging with a motorcycle repair student as he or she would be with a potential paying customer. Therefore, it's usually better not to tell anyone you're only researching the shop for school.

When you visit a repair shop, always try to put yourself in the customer's place. As a customer, you would be interested in finding out what types of repair services are offered, how much the services cost, and what qualifications the technicians in the shop have.

Another good activity is to have the shop prepare an estimate for some work that may be needed on your own bike. For instance, you could get an estimate for the cost of a tune-up. In this way, you get an idea of what types of services are offered, and you get a look at a real repair estimate.

If the owner or manager of the shop seems helpful, you might explain that you're interested in a career in the field of motorcycle repair and would like to know what job opportunities are available at the shop.

Take note of what you liked and disliked about each repair shop you visit, and try to answer the following questions for each shop:

- Was the shop clean and neat?
- Were the location and business hours convenient?

- Did the shop have the proper equipment?
- Were the employees friendly and helpful?
- Was each service offered clearly explained to you?
- If you had a service performed on your vehicle, did the estimate clearly explain the work that was to be done?
- Did the cost estimate seem reasonable for the services offered?
- Were the fees charged for the various repairs clearly explained to you?

If you can answer "yes" to each of these questions for a particular shop, the shop probably has a high rate of customer satisfaction. Always keep these questions in mind, whether you're employed as a technician in a repair shop or whether you eventually have a shop of your own. Remember that customer satisfaction is important in every business, but particularly so in the repair business.

As you visit the various shops in your area, keep track of your observations. Make notes about the labor rates charged, the types of repairs performed, the things you liked or disliked about each shop, and so on. Remember, you're visiting these shops with the same viewpoint as a potential customer. The impressions you receive when you visit a business are very important. Good customer service may be the difference between a highly successful shop and a shop that lacks business. In fact, as you visit several shops in your area and compare the notes that you take, you'll probably be able to tell very quickly which shops are successful and which ones aren't.

Print

To help you keep track of your observations, fill in the chart provided in Figure 2. The first line has been filled in as an example.

Business Name	Labor Rate	Location	Hours	Comments on Service
Cindy's Cycle Service	$35 per hour	229 Pine Street	9 A.M.–5 P.M. weekdays	Courteous, helpful, professional

FIGURE 2—Use this chart to record the information you gather when you visit different motorcycle repair shops.

Activity 3

To perform Activity 2, you needed to locate various motorcycle repair shops in your area. Such shops are often listed in the Yellow Pages of your local telephone directory, and many shops also advertise in local newspapers.

Examine these listings, and take note of the various ways in which the shops are advertised. Successful advertising is an important part of a successful business. If you want to open your own shop, you need to advertise. By studying several repair shop ads, you can get a feel for what seems to work and what doesn't. Each advertisement you read will probably leave you with a certain impression of the shop, even though you may never have visited that particular business.

Read these advertisements as though you are a customer looking for some service. Decide which shop you would choose based on the ads, and think about why you would choose it. Try to determine which of the following factors influenced your choice:

- The size of the ad
- Information about the qualifications of the technicians
- The location of the shop
- The place where the ad appeared
- The professional image of the ad

Make a list of your findings so that you can refer to it at a later time. Such insight into advertising may prove useful in the future, either to increase the business where you work, or to promote a business of your own.

Activity 4

As a repair technician, you'll use many different tools every day. Therefore, it's very important to know the proper name of each tool, as well as the tasks that the tool can be used for. In addition, knowing about the different tools that are available for purchase—even if you don't often use these tools—is important. As you learn more about fixing motorcycles, you'll be surprised at how many specialized repair tools there are.

So, how does a technician learn about all the different types of tools? Well, tool manufacturers are often the best place to start. All of the major manufacturers publish catalogs to display their products. Try writing to some of these manufacturers to obtain their latest catalogs.

To find the addresses or phone numbers of tool manufacturers, visit your local library. Most libraries contain a set of books called the Thomas Register of American Manufacturers. These books contain information about almost every major company. The books are indexed so that you can easily search for manufacturers of different types of products.

Another way to locate manufacturers is to search the Internet. Most tool manufacturers have their own sites on the Internet—sites that often contain all the information you need. Some public libraries offer free access to the Internet. If you've never "surfed the net" before, ask a reference librarian for assistance.

As an activity, try to identify as many manufacturers and retailers of tools as you can. To help you get started, here's a short list of some major tool manufacturers. Each time you locate a new manufacturer or supplier, add the name to your list.

- Mac Tools
- Matco Tools
- Proto (Stanley)
- Sears/Craftsman
- Snap-On

Once you get some tool catalogs, study them carefully. Naturally, most repair technicians don't own every tool ever made. However, you should be aware of the different tools that exist, and you should know what each of these tools looks like. By using tool catalogs as references, you'll be able to identify and name almost any tool likely to be used in a motorcycle repair shop. At this point in your program, you may not understand exactly *how* the tools are used, but it's a good idea to start learning to identify them now. Then, when you start learning how to use each tool, the tool will already seem familiar to you.

While catalogs are a great way to learn about the variety of tools available, there's no substitute for examining the real thing. Therefore, you should visit some local tool shops and take a first-hand look at some of the tools available. Although a lot of tool companies sell their tools only through independent vendors, many hardware stores, department stores, and discount stores carry commonly used tools.

For example, most Sears stores carry a large selection of mechanics tools. In addition, most larger auto parts stores also carry tools used for repairing motorcycles. In fact, some auto parts stores and some general rental centers have specialty tools that customers can rent. Renting can come in very handy if you need a specialized tool for one

particular job. Since many specialized tools are used for only one task and sometimes on only one specific bike make and model, you can save a lot of money by renting these tools rather than buying them.

As you visit tool stores in your area, try to see how many tools you can identify. If you're unsure about the name or use of a particular tool, refer to your lesson materials and/or any tool catalogs you've obtained. In addition, take note of the quality of the tools you see. Note the many different tool brands of tools available, and note any differences in the quality and cost of these brands. Although many tools may serve the same functions, always remember that you "get what you pay for" (and sometimes you don't even get that!). Inexpensive, lower-quality tools may be all right for occasional home use. As a repair technician, though, you'll be using your tools over and over, hopefully for years to come. Therefore, it's usually better to pay a little more for high-quality tools whenever possible. Carefully compare any warranties offered with the tools. Quality tools often carry a lifetime warranty and may literally last forever. Over the long run, better tools are really less expensive, since you'll seldom have to buy replacements due to wear or breakage.

Activity 5

In your previous activity, you visited some automotive tool stores to gain a better understanding of the tools repair technicians use. Now, let's perform an additional activity to help you review what you've learned about repair tools.

For more practice in identifying tools, take a look at Figure 3A. This figure shows a layout of some tools commonly found in a repair shop. A numbered map of the tool layout is provided in Figure 3B.

Using the information from your lessons, from your visits to tool stores, and from any tool catalogs you've obtained, identify the tools in Figure 3 by writing the correct name of each tool according to how they're numbered on the map. (Note that some of these tools are *sets* of a particular type of tool.) To make the exercise a little more challenging, we've purposely included a few tools that weren't yet covered in your lessons. See how many of these you can identify. When you finish, check your answers against those provided in the Answer section at the end of this practical exercise.

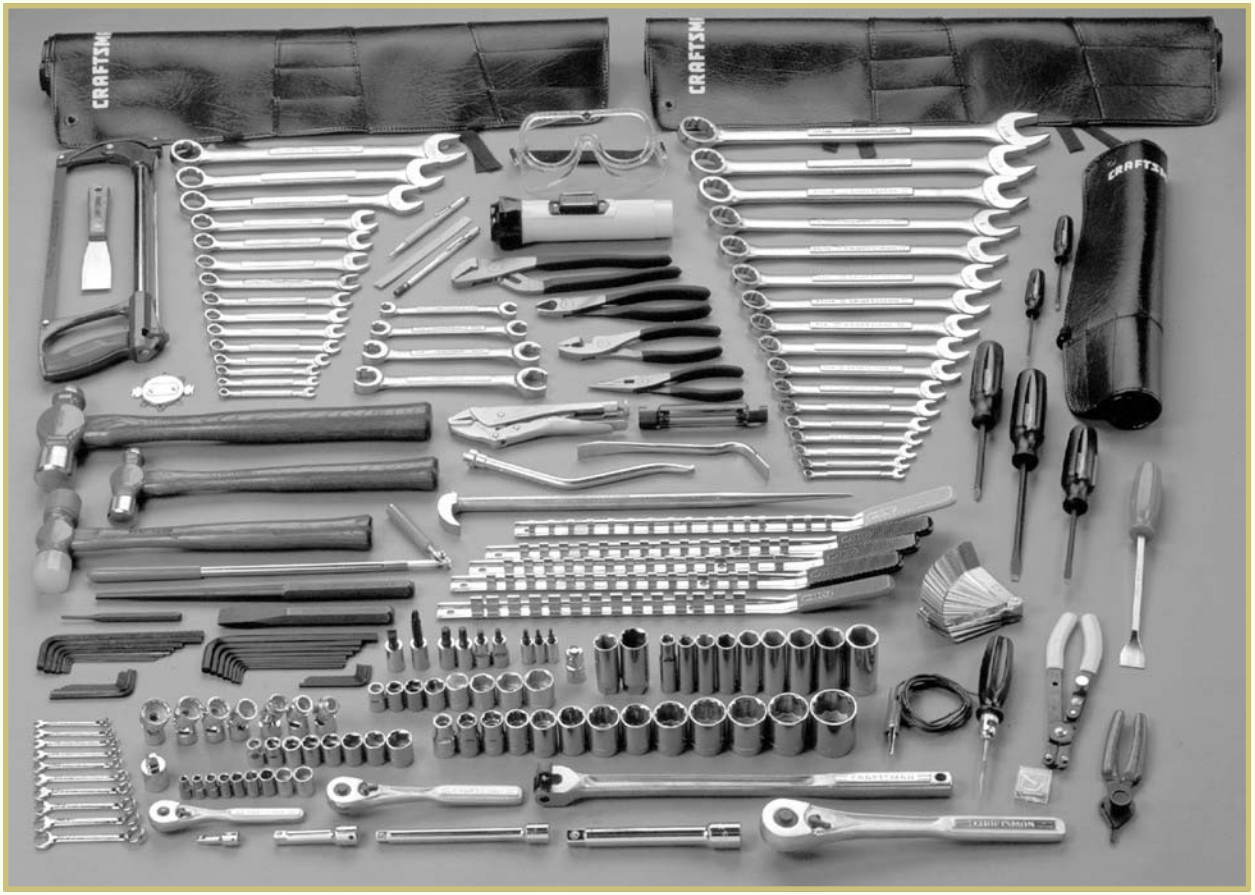


FIGURE 3A—Can you identify all the tools shown in this layout?

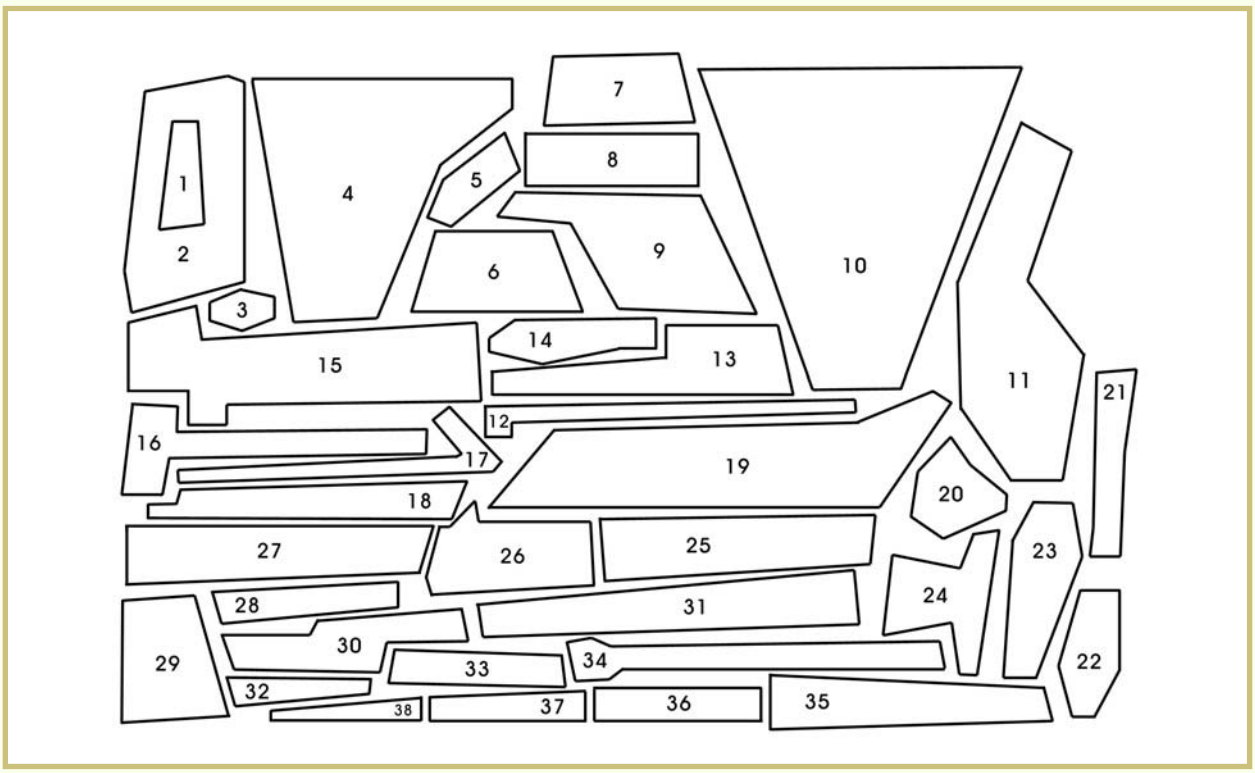


FIGURE 3B—This map numbers the tools laid out in Figure 3A. Number a sheet of paper 1 through 38, and write down the correct names for the tools indicated on this map.

Next, look at the tune-up kit shown in Figure 4A. Some of these tools have been covered in your lessons already, but some haven't. For additional practice in identifying tools, name the tools shown in this figure. Once again, a numbered map of the tool layout is also provided.

FIGURE 4A—Try to identify all the tools shown in this tune-up set.

According to how the tool layout is mapped out in Figure 4B, write down the correct names for each tool shown in Figure 4A. When you finish with both tool layouts, compare your answers with those provided at the end of this practical exercise.

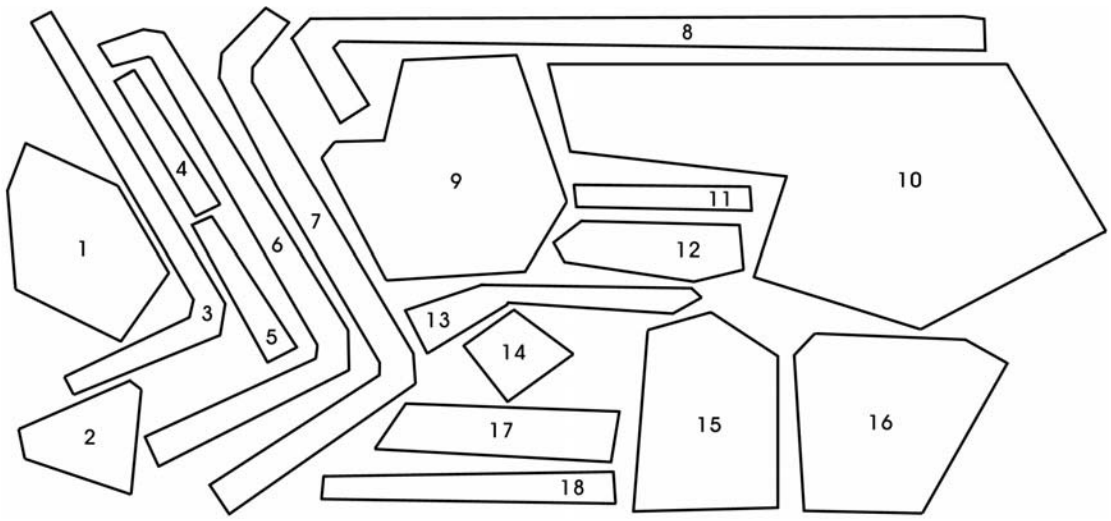


FIGURE 4B—This map numbers the tools laid out in Figure 4A. Number a sheet of paper from 1 through 18, and write down the correct names for the tools indicated on this map.

Activity 6

Start a collection of manufacturers' service repair manuals, owner's manuals, and sales brochures. Manufacturers' service repair manuals can usually be purchased at motorcycle dealerships. You can visit, call, or write to find out which manuals are available. Owner's manuals are the information booklets that customers receive when they purchase a motorcycle or ATV. The manuals provide illustrations of various parts and features of the vehicle, explain how to safely operate the equipment, and provide basic maintenance information. These manuals can help you learn how to use the features of many different motorcycle models and how to make basic, simple adjustments to the equipment.

Manufacturers' sales brochures are printed catalogs and folders that contain photographs, drawings, and descriptions of motorcycles and ATVs. These brochures are often given to potential customers who show an interest in purchasing a new motorcycle or ATV. The information found in these brochures can help you learn about the different models that are currently available, together with the latest features, innovations, and developments in the motorcycle and ATV industry.

Activity 7

In your lesson materials, you've learned the importance of *safety* on the job. Safety in the repair shop involves securing your personal safety as well as the safety of anyone else in your work area. One of your primary safety concerns in the repair shop is fire prevention. Working with engines and gasoline doesn't have to be dangerous if you follow the correct safety procedures. However, because gasoline is flammable, the potential for a fire is always present.

One of the best ways you can protect yourself is to know how to extinguish fires. Visit a local hardware store that sells fire safety equipment, such as smoke detectors and fire extinguishers. Note the safety warnings printed on the extinguishers. Extinguishers are rated according to the type of fire they're designed to extinguish. If you don't use the proper extinguisher on a fire, you may not be able to put out the fire. Therefore, always make sure you have the extinguisher or extinguishers that match the fire hazards present in your shop.

Knowing what *type* of fire extinguisher to use is only part of the training you need; you also need to know *how* to use the extinguisher. If you don't already own a fire extinguisher, purchase one. Examine its parts carefully and read the operating instructions. You may even want to purchase a small, inexpensive extinguisher that you can use for practice. Take the extinguisher to a safe outdoor area and practice operating it. You don't need to light an actual fire—doing so would be an unnecessary safety hazard. Simply practice discharging the extinguisher onto a clear area of the ground.

If you practice using an extinguisher in this way, you'll be able to operate one much more confidently should a fire ever occur. In addition, you may want to call your local fire department to find out if they sponsor any training courses on fire safety and the use of fire extinguishers.

Certain safety precautions should be taken when working in any garage area, whether you work for someone else or at home. In addition to always following these safety precautions, you should check that your work area is safe *before* you start working. Inspect your work area and complete the following safety checklist to be sure that you have everything in order. If your work area doesn't meet all of the safety conditions recommended, make the needed corrections before you begin any repair work. Your chances of ever having a serious safety problem will be drastically reduced if you take the time to perform this activity.

Safety Checklist

- ❑ Is your work area free of any paper, cardboard, and any other combustibles?
- ❑ Is the area free of any clutter or debris that could be a trip hazard?
- ❑ Are all flammable liquids removed from the area?
- ❑ Is the area well ventilated to the outside?
- ❑ Are fire extinguishers installed nearby in the work area?
- ❑ Is the capacity of the fire extinguishers large enough to cover the entire work area? (Fire extinguishers are designed to cover a certain number of square meters or square feet.)
- ❑ Are the fire extinguishers the proper type needed to extinguish an engine fire?
- ❑ Are the emergency exits clearly marked?
- ❑ If the engine repair area is on an upper floor of a building, is a fire escape route established?
- ❑ Are properly installed electrical outlets available to supply any needed power tools and equipment?
- ❑ Is the area free of any dampness or moisture—especially on the floor—that could promote electrical shock?
- ❑ Are the doors large enough to allow the easy transfer of vehicles in and out?
- ❑ Is the lighting in the area adequate for working on vehicles?
- ❑ Is a first-aid kit available in the room?
- ❑ Do the door latches open easily to allow for a quick exit in case of an emergency?
- ❑ Do you need to post a sign that warns others—especially children—not to enter when you're working?
- ❑ Do you need to prevent any pets from entering the work area?

Activity 8

Using the blank pages that follow, design your own motorcycle repair workshop. Don't worry about your artistic ability. Just sketch your plans with simple blocks and labels. Try to draw your plan to some kind of scale (such as ¼ inch equals 1 foot), so that you can allow room for working clearances, moving equipment in and out of the workshop, and seeing how all the pieces fit. Include the following:

- Workbench
- Tool storage area
- Parts-cleaning area
- Customer lounge
- Motorcycle and ATV storage area
- Lift
- Machine shop area
- Parts storage area
- Rest room

Remember to include lighting, electrical outlets, ventilation, and all the necessary fire protection equipment. Visit your local library for reference material on fire safety.

Your Workshop Design—Draw to Scale

Your Workshop Design—Draw to Scale

Activity 9

Calculate your own horsepower. To do this,

- Measure your weight on a bathroom scale.
- Measure the height of a set of stairs with a tape measure. (Measure vertically—not diagonally along the treads—from the floor to the top stair landing.)
- Time yourself with a watch or stopwatch as you climb the stairs.
- Record the information in the spaces provided.

  Your Weight:_____(lbs)

  Height of Stairs:_____(ft)

  Time:_____(sec)

- Use the following formulas to calculate your horsepower:

  Power = (Weight × Distance) ÷ Time

  Horsepower = Power ÷ 550

For illustrative purposes only, let's suppose that you weigh 150 pounds and you walk up a 10-foot-high flight of stairs in 15 seconds. Substitute these values into the formula:

Power = (150 pounds × 10 feet) ÷ 15 seconds

Power = 1500 ÷ 15

Power = 100

Your Horsepower = 100 ÷ 550

Your horsepower = 0.18, or 18 hundredths of one horsepower.

CONCLUSION

You've no doubt enjoyed participating in the activities that make up this practical exercise. If you feel you could benefit by repeating any activities at any time in the future, please do so. The more often you can reinforce your program's written material with a practical exercise, the better will be your understanding of the information presented to you.

When you're ready, continue with the examination portion of this practical exercise. Complete this examination in the same way you

would complete the other examinations in this program. Remember that you can refer back to any of your study materials if you feel you need to review some topic in your examination.

ANSWERS FOR TOOL IDENTIFICATION ASSIGNMENTS IN ACTIVITY 5

Answers to Figure 3 Assignment

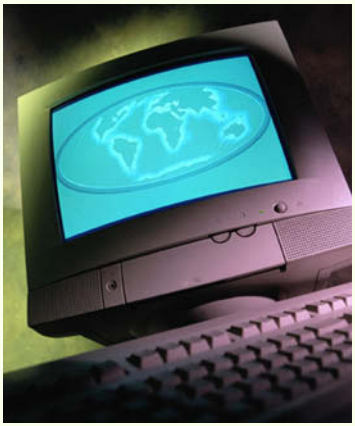
1. 2″ scraper
2. Hacksaw
3. Spark plug gap gage
4. Metric combination wrenches
5. Metal scribe, screw starter, 6″ scale
6. Line wrenches
7. Safety goggles
8. Flash light
9. Plier set
10. SAE combination wrenches
11. Screw driver set
12. Pry bar/rolling wedge bar
13. Brake adjusting and spring washer tools
14. Locking pliers
15. Ball peen hammers
16. Soft face hammer
17. Telescoping magnet
18. Punch and chjisel set
19. Socket holder rails
20. Feeler gage set
21. Gasket scraper
22. Snap-ring pliers

23. Interchangeable snap-ring pliers
24. Test light
25. Deep-well sockets
26. Allen sockets and 6-point sockets
27. Hex key set
28. Universal swivel sockets
29. Ignition wrench set
30. ¼″-drive socket set
31. ½″-drive socket set
32. ¼″-drive ratchet
33. ⅜″-drive ratchet
34. ½″ drive
35. ½″-drive ratchet
36. ½″ drive's 6″ extension
37. ⅜″ drive's 6″ extension
38. Short extensions for the ¼″ drive and ⅜″ drive

Answers to Figure 4 Assignment

1. Remote starter switch
2. Feeler gage set
3. Distributor wrench
4. Screw starter (Phillips)
5. Screw starter (slotted)
6. Distributor wrench
7. Distributor wrench
8. Telescoping magnet
9. Vacuum gage
10. Timing light

11. Tungsten ignition file
12. 5″ ignition pliers
13. Inspection mirror
14. Spark plug gage
15. Compression tester
16. Multimeter
17. Double-point scriber
18. Distributor adjusting tool



ONLINE EXAMINATION

For the online exam, you must use this

EXAMINATION NUMBER:

03382200

When you're confident that you've mastered the material in your studies, you can complete your examination online. Follow these instructions:

1. Write down the eight-digit examination number shown in the box above.
2. Click the **Back** button on your browser.
3. Click the **Take an Exam** button near the top of the screen.
4. Type in the eight-digit examination number.