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# **Bike Repair & Maintenance**

FOR  
**DUMMIES®**

## **Learn to:**

- Handle repairs by yourself — whether at home or on the road
- Insure top performance, from tires to handlebars
- Keep your bike in top working order
- Fix common problems with step-by-step photos and illustrations

**Dennis Bailey**

*Bike tour guide and repair manager*

**Keith Gates**

*Owner, A-1 Cycling*





***Bike Repair &  
Maintenance***  
FOR  
**DUMMIES®**

**by Dennis Bailey and Keith Gates**



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**Keith Gates:** Keith Gates started as a bicycle mechanic in 1977 when he was in high school. In 1982, after going to college, he got married and went back into the bicycle business as the Service Manager for A-1 Cycling in Manassas, Virginia. He became a partner in the business in 1984 and, in 1992, took advantage of an opportunity to buy out his partners. He has been the sole owner of A-1 Cycling since then, providing personalized service and expertise to local bike enthusiasts of all ages. You can contact him at [keith@a1cycling.com](mailto:keith@a1cycling.com).



# *Dedication*

**Dennis Bailey:** This book is dedicated to Randy Cronk, who showed me that the world is best explored on two wheels.

**Keith Gates:** This book is dedicated to Fred Landau, who originally opened A-1 Cycling and gave me the opportunity to turn my passion into a career, and to the many people throughout the years who have helped A-1 Cycling support the Northern Virginia cycling community.

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**Bike Repair & Maintenance For Dummies**

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# Introduction

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**W**elcome to *Bike Repair & Maintenance For Dummies*, where the often confusing and complex world of caring for your bike just got a whole lot easier. We've written this book to tell you not only what your bike needs to stay in great condition but also how to take care of the repair and maintenance yourself. It doesn't matter if you're planning to work on your kid's single-speed bike or overhaul an expensive road bike, the same repair and maintenance principles found in this book apply.

Maybe you picked up this book because you're planning on making biking a larger part of your life. With the price of gasoline these days and the health benefits from exercise, riding your bike makes a lot of sense. Or maybe after biking for a number of years, you've decided that your trusty two-wheeled companion could use a little better care. Good idea. You don't want a wheel or something coming off the next time you round a tight curve. Whatever the case, if you're interested in attending to the health of your bike and you want a simple and easy-to-understand guide to do it, you've found the right book.

Yes, working on bikes can be challenging — but it doesn't have to be. A lot of books written on the topic are thick, technical manuals written by hard-core bikers for hard-core bikers. Peel away the jargon and the arcane discussions and you're left with some basic procedures that anyone with a little hand-eye coordination, the ability to follow simple directions, and a willingness to get a little grease under the nails can do.

## About This Book

We know that many books on bike repair and maintenance are competing for your attention. But we offer the following compelling reasons why this book stands apart from the rest. If you're still not convinced, we're not above bribes and begging — but we're confident we won't have to go that far.

✔ **It's in plain English.** This book is not another one of those dense tomes full of technical language that require a degree from a bike-mechanic school to understand. Those are better left for when your only other source of entertainment is watching paint dry. In *Bike Repair & Maintenance For Dummies*, our goal is simple: If someone with zero bike knowledge can understand the concept, we've succeeded.

Dennis approaches bike maintenance and repair through the lens of a bike rider, having toured thousands of miles on three continents. Keith is a bike-shop owner who, over the years, has worked with thousands of customers, most of whom are *not* bike experts. Together we combine our biking knowledge with a penchant for communicating in everyday English to help you care for your bike.

- ✔ **It's a reference.** You can read this book cover to cover if you want. But we know that you're busy and that your goal is not to become a bike mechanic — at least not anytime soon. So you can also use this book as a reference guide — and we've written it with that goal in mind. You can pick it up whenever you're having a specific issue with your bike and turn right to the section that explains how to handle it.
- ✔ **It's comprehensive.** Just because this book is written in easy-to-understand language without a lot of biking jargon doesn't mean it's not comprehensive. We cover every part of the bike and all the maintenance and repair procedures that you'll likely ever need.
- ✔ **It's objective.** We're not trying to promote or sell bikes or a line of parts. Our goal is to make you as knowledgeable as possible so that you can repair the parts on your bike and, if needed, know how to replace them.

## *Conventions Used in This Book*

Every book has its own conventions, and this one is no different. To make the most of the information we provide, keep your eye out of for these conventions:

- ✔ Terms we're using for the first time are in *italics*. Plain-English explanations or definitions of these terms are nearby, often in parentheses.
- ✔ When we give you steps to follow in a particular order, we number the steps and put the action part of each step in **bold**.
- ✔ Web addresses are in `monofont`. **Note:** When this book was printed, some Web addresses may have needed to break across two lines of text. If that happened, rest assured that we haven't put in any extra characters (such as hyphens) to indicate the break. So, when using one of these Web addresses, just type in exactly what you see in this book, as though the line break doesn't exist.

One last thing: We're writing this book as a team, but when one of us has something to say, we use our first names (see the preceding section for an example of this convention in action).

## What You're Not to Read

You're not on the hook to read the whole book. You can jump around to find the information you need, and leave it at that. You can also safely skip *sidebars* (text in gray boxes) — sidebars are interesting, but they're not essential to your understanding of the topic at hand. Finally, you can skip anything marked by a Technical Stuff icon (for more on icons, see "Icons Used in This Book," later in this Introduction).

## Foolish Assumptions

So that we could tailor this book to your needs, we made a few assumptions about you:

- ✓ You like to bike or are thinking about making biking a part of your life.
- ✓ You or a member of your family owns a bike and you're interested in caring for and maintaining it.
- ✓ You'd like to find out how to do some of your own bike maintenance and repair so you won't have to take your bike to the shop every time you have an issue or call someone for a ride if you break down on the side of the road.
- ✓ You have little or no experience in using tools on your bike.
- ✓ You may be a seasoned bike rider who wants some additional tips and tricks to keep your bike in top condition.

## How This Book Is Organized

As soon as you look at the table of contents you'll notice that the book is divided into five parts. Here's what you can find in each of them.

### *Part I: Getting Started*

Part I is your Bike Repair and Maintenance 101 class. Before you jump into chapters on working on your bike, you may want to take the time to get to know the names of the different bike parts and how they work together — you find all that information in this part. Here we also describe some basics

for setting up a bike shop at home. Then just to whet your appetite for repair and maintenance, we discuss how to handle breakdowns on the road and tell you which repairs are better handled by a professional.

## ***Part II: Basic Bike Repairs***

If bike repair is a new endeavor for you, the repairs in this part will probably be the ones you attempt first. Here we cover the more basic bike repairs that anyone with a little concentration and elbow grease (be prepared to get dirty!) can do. We fill you in on tires and tubes, including probably the most frequent bike repair, the flat tire; wheels and hubs and the mysterious art of wheel truing; freewheels and cassettes (we tell you how you can tell the difference between the two); saddles and seat posts, including how to get the most comfortable fit for your bike; everything you need to know about brakes to keep them in working order and guarantee a sure stop every time; and the chain and why this hard-working part of your bike deserves more respect and attention than it normally receives.

## ***Part III: Shifting into a Higher Gear: Advanced Bike Repairs***

This is the part of the book where you earn your advanced degree in bike repair. These procedures are a little more advanced and some require specialized tools, but they're still very doable. Here, we cover the frame and suspension, the pedal, the crankset, the bottom bracket, the steering system, and the shifting system.

## ***Part IV: Keeping Your Bike on the Road***

If your bike has treated you well, this is the part of the book where you learn how to return the favor. If you want to greatly extend the life of your bike, increase your riding comfort, and improve safety, performing maintenance on your bike is the way to go. In this part, we discuss preventive maintenance, including how to perform a pre-ride inspection, how to care for your bike while you're riding, and how to store your bike when you're done for the season. We also tell you the regular maintenance you should perform on your bike, and we recommend setting up a schedule for monthly and annual maintenance.

## Part V: The Part of Tens

This is the part that all *For Dummies* books are known for — the cool lists of things in the back of the book. We've included a list of ten steps to take before you ride, ten ways to improve the fit of your bike, and ten things you can do to enhance comfort and increase performance when you ride.

## Icons Used in This Book

Throughout the book, you'll find icons in the margins that alert you to specific kinds of information. Here's what each of the icons means:



Whenever we have a particularly useful suggestion that'll save you time or money or just make your repair and maintenance a little easier, we flag it with this icon. (We wanted to flag this whole book with a big Tip icon, but our editor said no.)



This book is a reference, which means you don't have to memorize it — there won't be a pop quiz Monday morning. But occasionally we do tell you something that's important enough that you'll want to commit it to memory. When we do, we mark it with this icon.



When you see this icon, listen up. Bikes are precisely engineered machines, and sometimes you need to perform a certain procedure in a particular way or with a specific tool — or risk danger to you or your bike. Heed these warnings where they appear to keep yourself — and your bike — out of trouble.



We love bikes, and sometimes we can't help but share some information that's especially technical but that you don't really need to know. When we do, we mark it with this icon. If you're the kind of person who likes knowing all the details, read these paragraphs. But if you're more of a just-the-facts kind of a person, you can skip these paragraphs — no harm, no foul.

## Where to Go from Here

This book is a reference, which means you can dive in wherever you want. If you're brand-new to bikes and you don't know your derailleur from your down tube, turn to Chapter 2. If you're itching to set up your own workshop in your house or garage, head to Chapter 3. If your bike is riding fine and you

# 6

## Bike Repair & Maintenance For Dummies

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want to keep it that way, go to Chapter 16 and do a bike inspection so some part of your bike doesn't fall off on your next ride. Use the table of contents and index to find the information you need.

Finally, send us an e-mail with some feedback or a photo showing us your greasy bike hands as proof that you're caring for your bike. You can e-mail Dennis at [mail@dennisbailey.com](mailto:mail@dennisbailey.com) and Keith at [keith@a1cycling.com](mailto:keith@a1cycling.com).

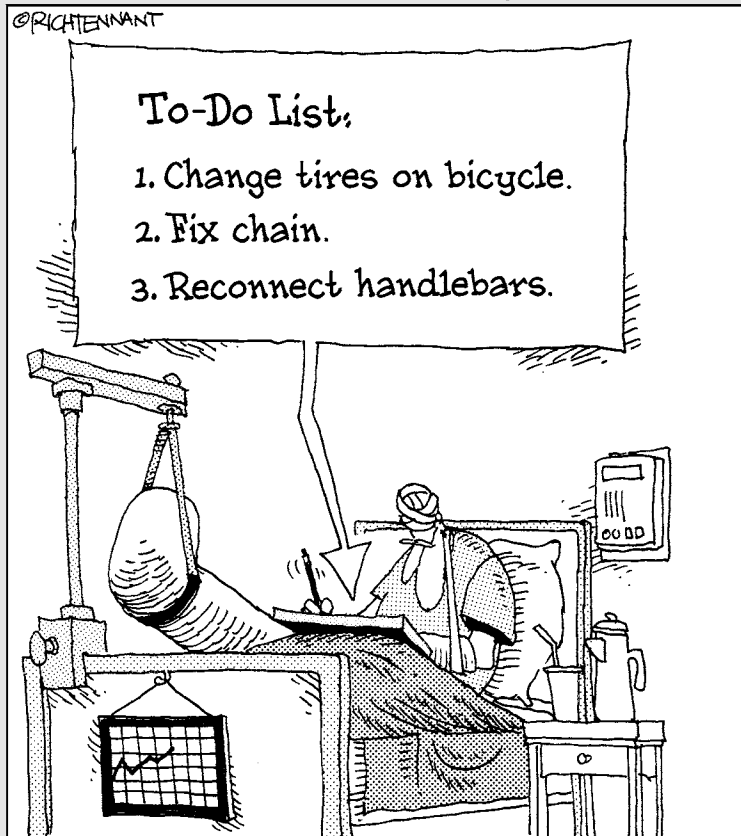


# Part I

# Getting Started

## The 5<sup>th</sup> Wave

By Rich Tennant



## *W* *In this part . . .*

Within the pages of this book, you find just about everything you need to help you care for your bike. But if you're completely new to bike repair and you don't know your derailleur from your drivetrain, this is the place to start. In this part, we identify each part of the bike for you and tell you how they work together. We show you how to set up space in your home to work on your bike, let you know which repairs are better left to the experts, and give you some basic steps to take if you break down on your next bike ride.

## Chapter 1

# Channeling Your Inner Grease Monkey

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### *In This Chapter*

- ▶ Entering the world of bike repair and maintenance
  - ▶ Caring for your bike before, during, and after you ride
  - ▶ Making emergency, basic, and advanced repairs
  - ▶ Performing monthly and annual maintenance
- 

**J**ust as you'd bring along a map if you were heading off for a trip on your bike into an unfamiliar area, you should have a roadmap for your venture into the world of bike repair and maintenance. The journey you're about to take or have already started can be fulfilling and bring lifelong rewards as long as you have a guide to help you get where you're going. We've written this book to be your guide — to take the mystery out of bike repair and maintenance.

In this chapter, we open up the roadmap and examine all the different routes that are possible when it comes to caring for your bike.

## *Starting down the Road of Bike Repair and Maintenance*

When it comes to bike repair and maintenance, the starting point is knowing the various parts of a bike, their function, and how they work together (see Chapter 2). When you know the various parts of the bike, you know

- ✔ How bearings reduce friction when you ride
- ✔ How to tighten threads an appropriate amount
- ✔ Why cables for brakes are different than shifters

- ✓ What combination of gears is best for your bike
- ✓ How springs drive derailleurs
- ✓ How to make sure a quick release wheel doesn't become dangerous

When you've figured out all the parts of your bike and how they work together, you're ready to get started on your journey. But wait! First you need a shop where you can work (see Chapter 3). Working on a bike doesn't require a lot of space, but it helps to have a location where you can operate comfortably. You'll want enough space for tools, a drop cloth to protect the floor, good ventilation, and lighting.



If you're serious about bike repair and maintenance think about two major additions to your shop:

- ✓ A workbench with a flat surface where you can work
- ✓ A bike stand that will hold your bike off the ground

Good news! You don't have to run out to the store to start your tool set. Many of the tools you need are probably in your house. If you have a variety of wrenches, Allen wrenches (hex keys), screwdrivers, pliers, and a hammer, you'll be able to perform a number of basic procedures on your bike. As you move into more advanced procedures, you'll need some specialized tools.



You may want to wait to buy a specialized tool until you have to actually perform the procedure it's used for. For example, you may need a crank extractor to remove a crank arm. Instead of running out to the store and buying a crank extractor right now, wait until you do your annual maintenance on your bike and actually need that tool.

When you do decide to purchase tools — such as a chain tool, chain whip, freewheel tool, or spoke wrench — you need to decide whether to buy them on the cheap or invest in a more expensive brand that will likely last longer than your bike. In Chapter 3, we give you some options.

Finally, to keep the moving parts of your bike in good working order, purchase an all-purpose lubricating oil. Focus on lubricating your chain and the pivot points in places like the brakes and derailleurs. Having a cleaner around when you're working on your bike is just as important. Look for an environmentally friendly product, such as a citrus degreaser.

## *Before, During, and After Your Ride*

Bike repair and maintenance involves more than caring for your bike while you have it stowed away at home. It's an ongoing process that'll involve action before, during, and after your ride.

## *Before you ride*

The before-you-ride part of the trilogy deals mostly with the preventive maintenance steps you should take, which not only help your bike but increase the safety of each ride.

One of the best things you can do to improve your safety is to do a pre-ride inspection and maintenance check:

- ✔ Using a gauge, check that your tire pressure is equal to the recommended level on the tire's sidewall. (See Chapter 6 for more information on tires.)
- ✔ Inspect the brake to make sure the pads are not worn and they tightly grip the wheel when you squeeze the brake levers. (See Chapter 8 for more on brakes.)
- ✔ Look and listen for looseness in the handlebars, headset, wheels, and other part. (See Chapter 16 for more information on inspecting your bike.)

Whether you have a brand-new bike or a 20-year-old clunker, things go wrong when you ride. Your best bet is to be prepared and bring a toolkit along with you to help you if you get into a jam. Here are some steps you should take to prepare your toolkit (see Chapter 4 for more information):

- ✔ Have a small tire pump mounted to your frame.
- ✔ Include everything you need to repair a flat, including a patch, glue, tire levers, and spare inner tube (in case you blow a tube).
- ✔ Include some hand tools, such as Allen wrenches, screwdrivers, a spoke wrench, and pliers. These will allow you to make adjustments as you ride.
- ✔ Pack away a rag to wipe the grease off your hands when you're finished.

If you're planning an extended trip, you'll want to add some tools to your kit. These include a spare foldable tire, a chain tool, chain links and rivets, extra spokes, spare cables, lube, and the all-purpose MacGyver tool, duct tape. (See Chapter 4 for more information.)

While you're preparing for a possible roadside emergency, don't forget the following:

- ✔ Cellphone
- ✔ Identification
- ✔ Money
- ✔ Energy bars
- ✔ Rain jacket
- ✔ Sunglasses

## *While you ride*

Although you may not think about riding as a time for bike maintenance, there are things you can do while you ride to care for and maintain your bike. If you get into the habit of doing these things, you'll extend the life of your bike and stay safer:

- ✓ Keep your tires properly inflated while you ride to improve rolling resistance and absorb shock.
- ✓ Pay attention to the road in front of you.
- ✓ Walk your bike over curbs and other objects.
- ✓ Raise yourself out of your seat and use your arms and legs like a horse jockey to absorb an impending blow.
- ✓ Shift into lower gears before you reach the steeper sections of inclines to put less strain on the chain and derailleurs.
- ✓ Look out for any creaks or loose parts on the bike before they're in need of repair.

For more information on safe riding practices, turn to Chapter 16.

## *After you ride*

The trilogy of maintenance activities is completed with the after-you-ride phase. Dirt acts as a major abrasive against your bike and, as it works its way into the internal parts, it starts wearing out bearings and other components. After you ride is a great time to combat this enemy by washing your bike. Wet it down — but make sure you don't spray water directly at the hubs or bottom bracket. Use a brush and soap to scrub down your bike. Use degreaser to break up any difficult-to-remove grease.

Remember to always lubricate your bike after drying it — particularly the chain, derailleurs, brakes, and cogs. When you're finished, wipe off any excess grease so that it doesn't attract additional dirt.

For more information on washing and lubricating your bike, turn to Chapter 16.

## *Making Repairs*

If you're lucky, you'll never have to repair your bike anywhere but in the comfort of your own shop at home. But nobody's that lucky. The fact is, if you ride long enough, sooner or later you're going to break down on the side of the road and have to make a repair, like one of the following: