CHAPTER ONE

GENERAL INFORMATION

This service and repair manual covers all Harley-Davidson 1340 cc Softail models from 1984-1999.

Procedures unique to 1995-1999 models are covered in the supplement at the end of the manual.

Troubleshooting, tune-up, maintenance and repair are not difficult, if you know what tools and equipment to use and what to do. Step-by-step instructions guide you through jobs ranging from simple maintenance to complete engine and suspension overhaul.

This manual can be used by anyone, from first time do-it-yourselfer to a profes... drawings and clear photograph... information you need to do the wo...

Some of the procedures in this m... require the use of special tools. The resourceful mechanic can. in many cases, think of acceptable substitutes for special tools there is always another way. This can be as simple as using a few pieces of threaded rod. washers and nuts to remove or install a bearing or fabricating a tool from scrap material. However, using a substitute for a special tool is not recommended as it can be dangerous and may damage the part.

If you find that a tool can be designed and safely made, but will require some type of machine work, you may want to search out a local community college or high school that has a machine shop curriculum. Shop teachers sometimes welcome outside work that can be used as practical shop applications for advanced students.

Table 1 lists model coverage.

General specifications arc listed in **Table 2** while gross vehicle weight ratings are listed in **Table 3**. Fuel lank capacity is listed in **Table 4**.

U.S. to metric conversion is given in **Table 5**.

Critical torque specifications are found in table form at the end of each chapter (as required). The general torque specifications listed in **Table 6** can be used when a torque specification is not listed for a specific component or assembly.

...e found in **Table 7**.

...in **Table 8** that can be used ... when riding your Harley in cold weather.

MANUAL ORGANIZATION

This chapter provides general information useful to Harley vehicle owners and mechanics. In addition, information in this chapter discusses the tools and techniques for preventive maintenance, trouble-shooting and repair.

Chapter Two provides methods and suggestions for quick and accurate diagnosis and repair of problems. Troubleshooting procedures discuss typical symptoms and logical methods to pinpoint the trouble.

Chapter Three explains all periodic lubrication and routine maintenance necessary to keep your

Harley operating well. Chapter Three also includes recommended tune-up procedures, eliminating the need to consult other chapters constantly on the various assemblies.

Subsequent chapters describe specific systems, providing disassembly, repair, assembly and adjustment procedures in simple step-by-step form. If a repair is impractical for a home mechanic, it is so indicated. It is usually faster and less expensive to take such repairs to a dealer or competent repair shop. Specifications concerning a specific system are included at the end of the appropriate chapter.

NOTES, CAUTIONS AND WARNINGS

The terms NOTE, CAUTION and WARNING have specific meanings in this manual. A NOTE provides additional information to make a step or procedure easier or clearer. Disregarding a NOTE could cause inconvenience, but would not cause damage or personal injury.

A CAUTION emphasizes areas where equipment damage could occur. Disregarding a CAUTION could cause permanent mechanical damage; however, personal injury is unlikely.

A WARNING emphasizes areas where personal injury or even death could result from negligence. Mechanical damage may also occur. WARNINGS *are to be taken seriously*. In some cases, serious injury and death has resulted from disregarding similar warnings.

SAFETY FIRST

Professional mechanics can work for years and never sustain a serious injury. If you observe a few rules of common sense and safety, you can enjoy many safe hours servicing your own machine. If you ignore these rules you can hurt yourself or damage the equipment.

1. Never use gasoline as a cleaning solvent.

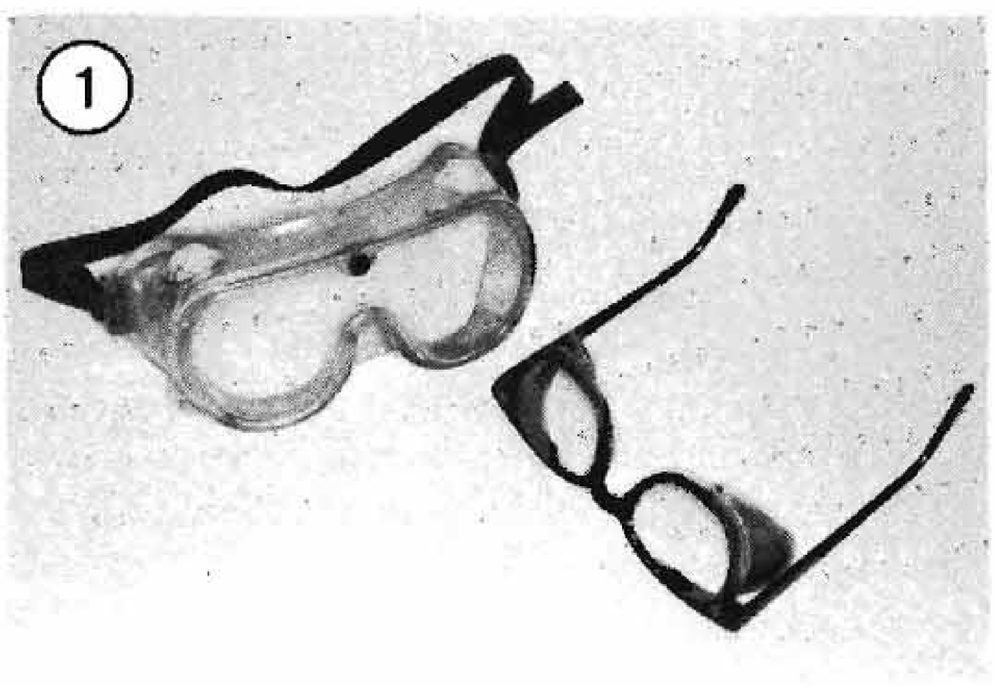
WARNING

Gasoline should only be stored in an approved safety gasoline storage container, properly labeled. Spilled gasoline should be wiped up immediately.

2. Never smoke or use a torch in the vicinity of flammable liquids, such as cleaning solvent, in open containers.
3. If welding or brazing is required on the machine, remove the fuel tanks to a safe distance, at least 50 feet away.
4. Use the proper sized wrenches to avoid damage to fasteners and injury to yourself.
5. When loosening a tight or stuck nut, be guided by what would happen if the wrench should slip. Be careful; protect yourself accordingly.
6. When replacing a fastener, make sure to use one with the same measurements and strength as the old one. Incorrect or mismatched fasteners can result in damage to your Harley and possible personal injury. Beware of fastener kits that are filled with cheap and poorly made nuts, bolts, washers and cotter pins. Refer to *Fasteners* in this chapter for additional information.
7. Keep all hand and power tools in good condition. Wipe greasy and oily tools after using them. They are difficult to hold and can cause injury. Replace or repair worn or damaged tools.
8. Keep your work area clean and uncluttered.
9. Wear safety goggles during all operations involving drilling, grinding, the use of a cold chisel or *any* time you feel unsure about the safety of your eyes. Safety goggles (**Figure 1**) should also be worn when solvent and compressed air is used to clean parts.

WARNING

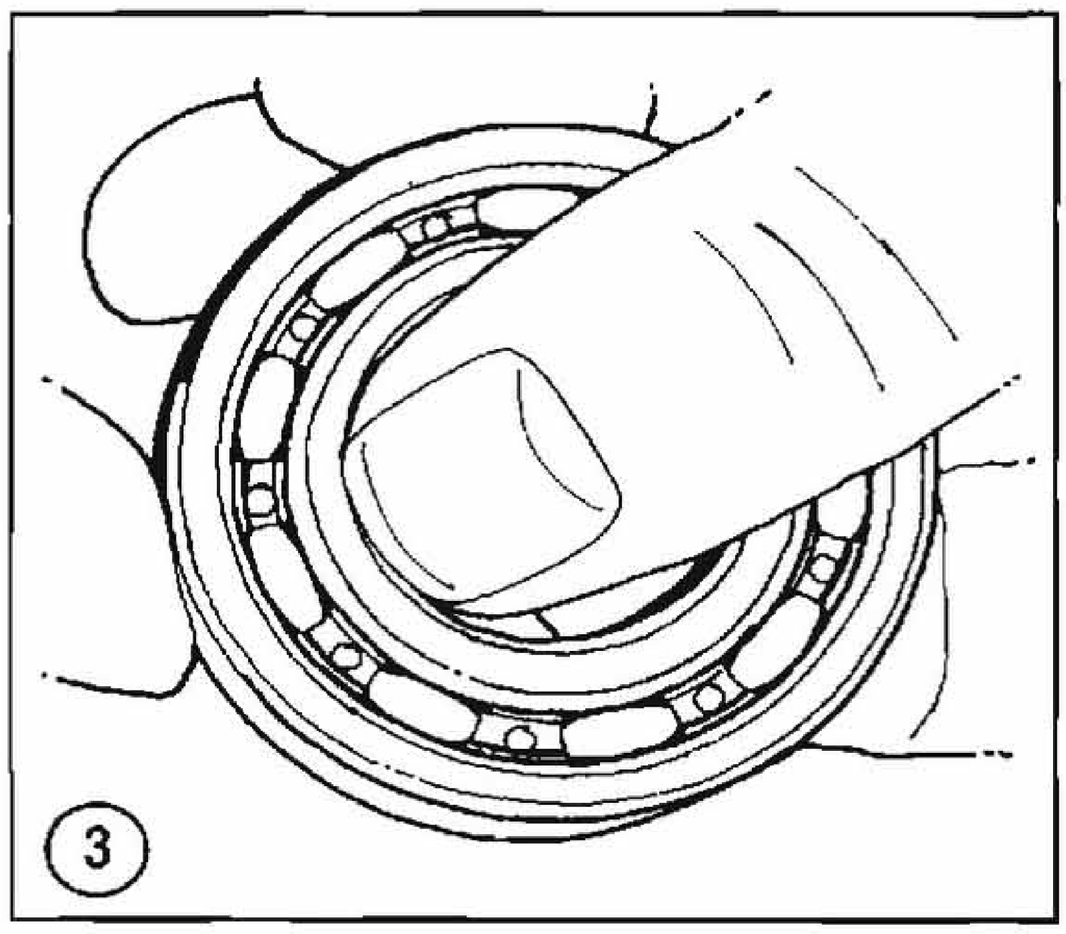
*The improper use of compressed air is very dangerous. Using compressed air to dust off your clothes, bike or workbench can cause flying particles to be blown into your eyes or skin. **Never** direct or blow compressed air into your skin or through any body opening (in-*



cluding cuts) as this can cause severe injury or death. Compressed air should be used carefully; never allow children to use or play with compressed air.

10. Keep an approved fire extinguisher nearby (**Figure 2**). Be sure it is rated for gasoline (Class B) and electrical (Class C) fires.

11. When drying bearings or other rotating parts with compressed air, never allow the air jet to rotate the bearing or part. The air jet is capable of rotating them at speeds far in excess of those for which they were designed. The bearing or rotating part is very likely to disintegrate and cause serious injury and damage. To prevent bearing damage when using compressed air, hold the inner bearing race (**Figure 3**) by hand.



12. Never work on the upper part of the bike while someone is working underneath it.

13. Never carry sharp tools in your pockets.

14. There is always a right way and wrong way to use tools. Learn to use them the right way.

SERVICE HINTS

Most of the service procedures covered are straightforward and can be performed by anyone reasonably handy with tools. It is suggested, however, that you consider your own capabilities carefully before attempting any operation involving major disassembly.

1. "Front," as used in this manual, refers to the front of the motorcycle; the front of any component is the end closest to the front of the motorcycle. The "left-" and "right-hand" side refer to the position of the parts as viewed by a rider sitting on the seat and facing forward. For example, the throttle control is on the right-hand side. These rules are simple, but confusion can cause a major inconvenience during service.

2. Whenever servicing the engine or transmission, or when removing a suspension component, the bike should be secured in a safe manner. If the bike is to be parked on its jiffy stand, check the stand to make sure it is secure and not damaged. Block the front and rear wheels if they remain on the ground. A small hydraulic jack and a block of wood can be used to raise the chassis or you can use a commercial type of stand. If the transmission is not going to be worked on and the drive chain or drive belt is connected to the rear wheel, shift the transmission into first gear.

3. Repairs go much faster and easier if the bike is clean before you begin work. There are special cleaners for washing the engine and related parts. Spray or brush on the cleaning solution, following the manufacturer's directions. Rinse parts with a garden hose. Clean all oily or greasy parts with cleaning solvent as you remove them.

WARNING

***Never** use gasoline as a cleaning agent. It presents an extreme fire hazard. Be sure to work in a well-ventilated area when using cleaning solvent. Keep a fire extinguisher, rated for gasoline fires, handy in any case.*

4. Much of the labor charged for by mechanics is to remove and disassemble other parts to reach the defective unit. It is usually possible to perform the preliminary operations yourself and then take the defective unit to the dealer for repair.

5. Once you have decided to tackle the job yourself, read the entire section *completely* while looking at the actual parts before starting the job. Make sure you have identified the proper procedure. Study the illustrations and text until you have a good idea of what is involved in completing the job satisfactorily. If special tools or replacement parts are required, make arrangements to get them before you start. It is frustrating and time-consuming to get partly into a job and then be unable to complete it.

NOTE

Some of the procedures or service specifications listed in this manual may not be applicable if your Harley has been modified or if it has been equipped with non-stock equipment. When modifying or installing non-stock equipment, file all printed instruction or technical information regarding the new equipment in a folder or notebook for future reference. If your Harley was purchased second hand, the previous owner may have installed non-stock parts. If necessary, consult with your dealer or the accessory manufacturer on components that may change tuning or repair procedures.

6. Simple wiring checks can be easily made at home, but knowledge of electronics is almost a necessity for performing tests with complicated test gear.

CAUTION

Improper testing can sometimes damage an electrical component.

7. Disconnect the negative battery cable (**Figure 4**) when working on or near the electrical, clutch or starter systems and before disconnecting any wires. On all models covered in this manual, the negative terminal will be marked with a minus (–) sign and the positive terminal with a plus (+) sign.

WARNING

Never disconnect the positive battery cable unless the negative cable has been disconnected. Disconnecting the positive cable while the negative cable is still connected may cause a spark. This could ignite the hydrogen gas given off by the battery, causing an explosion.

8. During disassembly, keep a few general cautions in mind. Force is rarely needed to get things apart. If parts are a tight fit, such as a bearing in a case, there is usually a tool designed to separate them. Never use a screwdriver to pry parts with machined surfaces such as crankcase halves. You will mar the surfaces and end up with leaks.

9. Make diagrams (or take a Polaroid picture) wherever similar-appearing parts are found. For instance, crankcase bolts are often not the same length. You may think you can remember where everything came from—but mistakes are costly. There is also the possibility that you may be sidetracked and not return to work for days or even weeks—in which the time carefully laid out parts may have become disturbed.

10. Tag all similar internal parts for location and mark all mating parts for position (A, **Figure 5**). Record number and thickness of any shims as they are removed; measure with a vernier caliper or micrometer. Small parts such as bolts can be identified by placing them in plastic sandwich bags (B, **Figure 5**). Seal and label them with masking tape.

11. Place parts from a specific area of the engine (e.g. cylinder head, cylinder, clutch, primary drive, etc.) into plastic boxes (C, **Figure 5**) to keep them separated.

12. When disassembling transmission shaft assemblies, use an egg flat (type that restaurants get their eggs in) (D, **Figure 5**) and set the parts from the shaft in one of the depressions in the same order in which they were removed.

13. Wiring should be tagged with masking tape and marked as each wire is removed. Again, do not rely on memory alone, especially if the wiring was changed by a previous owner.

14. Finished surfaces should be protected from physical damage or corrosion. Keep gasoline off painted surfaces.

15. Use penetrating oil on frozen or tight bolts, then strike the bolt head a few times with a hammer and punch (use a screwdriver on screws). Avoid the use of heat where possible, as it can warp, melt or affect the temper of parts. Heat also ruins finishes, especially paint and plastics.

16. No parts removed or installed (other than bushings and bearings) in the procedures given in this manual should require unusual force during disassembly or assembly. If a part is difficult to remove or install, find out why before proceeding.

17. Cover all openings after removing parts or components to prevent dirt, small tools, etc. from falling in.

18. Recommendations are occasionally made to refer service or maintenance to a Harley-Davidson dealer or independent Harley-Davidson repair shop. In these cases, the work will be done more quickly and economically than if you performed the job yourself.

19. In procedural steps, the term "replace" means to discard a defective part and replace it with a new or exchange unit. "Overhaul" means to remove, disassemble, inspect, measure, repair or replace defective parts, reassemble and install major systems or parts.

20. Some operations require the use of a hydraulic press. It would be wiser to have these operations performed by a shop equipped for such work, rather than to try to do the job yourself with makeshift equipment that may damage your machine.

21. When assembling parts, be sure all shims and washers are replaced exactly as they came out.

22. Whenever a rotating part butts against a stationary part, look for a shim or washer.

23. Use new gaskets if there is any doubt about the condition of the old ones.

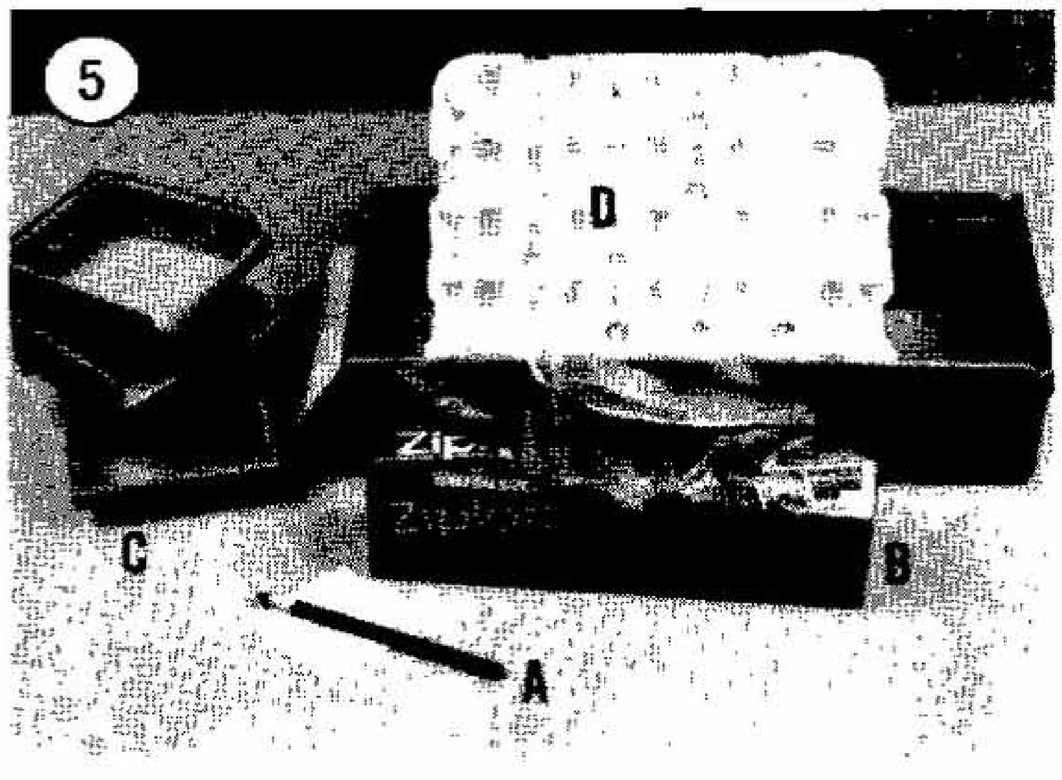
24. If it becomes necessary to purchase gasket material to make a gasket, measure the thickness of the old gasket (at an uncompressed point) and purchase gasket material with the same approximate thickness.

25. Heavy grease can be used to hold small parts in place if they tend to fall out during assembly. However, keep grease and oil away from electrical and brake components.

26. Never use wire to clean out jets and air passages. They are easily damaged. Use compressed air to blow out the carburetor only if the diaphragm has been removed first.

27. A baby bottle makes a good measuring device. Get one that is graduated in fluid ounces and cubic centimeters. After it has been used for this purpose, do *not* let a child drink out of it as there will always be an oil residue in it.

28. Take your time and do the job right. Do not forget that a newly rebuilt engine must be broken in just like a new one.



SERIAL NUMBERS

Harley-Davidson makes frequent changes during a model year, some minor, some relatively major. All Harley models in this manual can be identified by their individual 17 digit Vehicle Identification Number (VIN); for example, 1HD1BJL11LM110001. This number is stamped into the steering head (**Figure 6**) and recorded on a label placed on the right front frame downtube. The engine is identified with an abbreviated VIN number stamped onto the left-hand crankcase at the base of the rear cylinder block (**Figure 7**); for example, BJLM110001.

NOTE

When Harley-Davidson makes a running change during a production year, the bikes, depending on where they are produced during production, are identified as an early or late model for that year. For example, if a production