Modern Automotive Technology
Chapter 3
Basic Hand Tools
Learning Objectives

- Identify common automotive repair hand tools
- List safety rules for hand tools
- Select the right tool for the job
- Maintain and store tools properly
- Use hands tools correctly and safely
Sockets

12 Point Deep Chrome and 6 Point Shallow Chrome Sockets
Almost all high-quality sockets are chrome plated to keep the socket from rusting and to easily wipe grease away. However, after years of normal wear and tear, the chrome finish can begin to flake away. DO NOT use a socket if the chrome begins to peel off. The chrome will be sharp and can act like a razor blade, easily cutting into your fingers. Any reputable tool company will replace a tool that has peeling chrome.
A 12-point socket contacts a fastener on its corners. Even though a socket is made from hardened steel, on very tight, rusted or corroded hex-head bolts, where great torque is needed to loosen a fastener, the walls of a 12-point socket can flex, slipping off the fastener and rounding over the edges of a nut or bolt.
12-Point Sockets

12 Point Deep Chrome Socket
A 12-point socket is fine for most household repairs, and some minor motorcycle and automobile stuff. The main difference between 6 and 12-point sockets is strength. The walls of a 12-point socket are thinner because there’s simply less metal inside the socket.
By design, the walls of a 6-point socket are thicker due to having more metal. This allows you to increase the pressure needed to free a stuck fastener, while reducing the likelihood of slipping off the fastener and rounding over the edges.
6-Point Impact Socket

6-Point Shallow Impact Socket
Chapter 3

The edges of a socket are angled back a few degrees to allow the socket to slide easily over a fastener. The angle on a 6-point socket is less than its 12-point counterpart, again providing more contact area inside the socket.
6-Point Deep Chrome Socket
Where as a 6-point socket is designed to contact the head of a fastener away from the corners (actually about a 1/16” back from the corner of the fastener — so contact is made on the thickest part of the socket and the flat part of the fastener, not on the weak corner edges of both the socket and fastener).
12 Volt Test Light

Probe

Ground Connection
Slip Joint Pliers
12-Point Ratcheting Box Wrench

12 Point Ratcheting Box Wrench
Because most fasteners found in household appliances are not made of hardened steel and have heads smaller than 3/8”, 6-point, ¼” drive sockets are best to use when removing these fasteners. On fasteners between 3/8” and ¾”, 3/8” drive sockets are the most useful. Any fastener larger than ¾” should be removed by ½” drive sockets.
Ratchets

½” 3/8” and ¼” Drive Ratchets
Hex Sockets

6-Point Hex Socket — DO NOT Confuse With a Torx!
Torx Sockets

Torx Hex Socket (Has a “Star” Shape) — DO NOT Confuse With a Hex Socket!
Flex Socket

6-Point Shallow Chrome Universal (Flex) Socket
Nut Driver

6-Point Nut Driver
Off-Set Screwdriver

Off-Set Screw Driver
Tape Measure

Tape Measure
3/8” Drive Ratchet
Flare Nut Wrench

Note the special shape of the “box” end of this wrench

Combination Flare Nut (Tubing) Wrench
Flare Nut Wrench

Double Flare Nut (Tubing) Wrench
Chapter 3

- A screwdriver is not a pry bar, chisel or scraper
- Only use a screwdriver for turning screws
Screwdriver

Flat-head Screwdriver
Snap Ring Pliers
Box Wrench

Box-End Wrench
Punch /Chisel Holder
Flex-Head Combination Wrench
Hammer

Ball Peen Hammer
Combination Wrench

12-Point Combination Wrench. NEVER use the “open” end of a wrench to loosen tight nuts or bolts. The jaws are not strong enough to withstand the high torque needed to loosen frozen or rusted bolts.
Metal Shears

Metal Shears (Tin Snips)
Flex-Head Ratchet
Feeler Gauge — Each Blade is a Different Thickness
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