



# Modern Automotive Technology Chapter 3

## Basic Hand Tools



# Learning Objectives

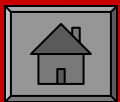
- Identify common automotive repair hand tools
- List safety rules for hand tools
- Select the right tool for the job
- Maintain and store tools properly
- Use hands tools correctly and safely



# Sockets

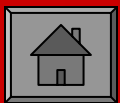


12 Point Deep Chrome and 6 Point Shallow Chrome  
Sockets



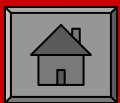
# Chapter 3

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.



# Chapter 3

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



# Chapter 3

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.



# Chapter 3

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

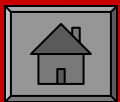
The edges of a socket are angled back a few degrees to allow the socket to slide easily over a fastener. The angle on a 6-point socket is less than its 12-point counterpart, again providing more contact area inside the socket.



# 6-Point Deep Chrome Socket



6-Point Deep Chrome Socket

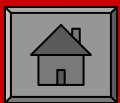


# Chapter 3

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).



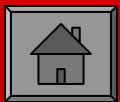
# 12 Volt Test Light



# Slip Joint Pliers



Slip Joint Pliers



# 12-Point Ratcheting Box Wrench

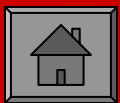


12 Point Ratcheting Box Wrench



# Chapter 3

Because most fasteners found in household appliances are not made of hardened steel and have heads smaller than 3/8", 6-point, 1/4" drive sockets are best to use when removing these fasteners. On fasteners between 3/8" and 3/4", 3/8" drive sockets are the most useful. Any fastener larger than 3/4" should be removed by 1/2" drive sockets.





# Ratchets



1/2" 3/8" and 1/4" Drive Ratchets



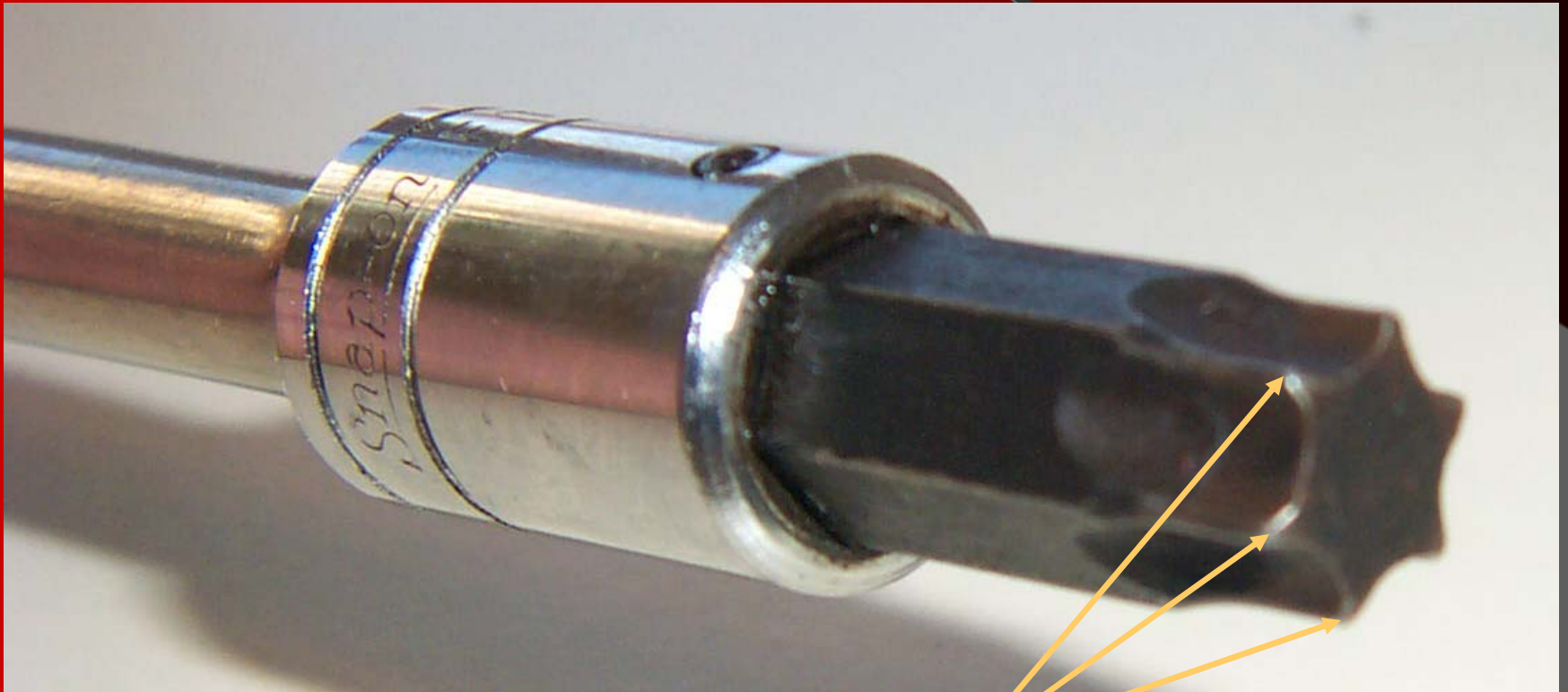
# Hex Sockets



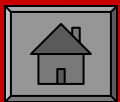
6-Point Hex Socket — DO NOT Confuse  
With a Torx!



# 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

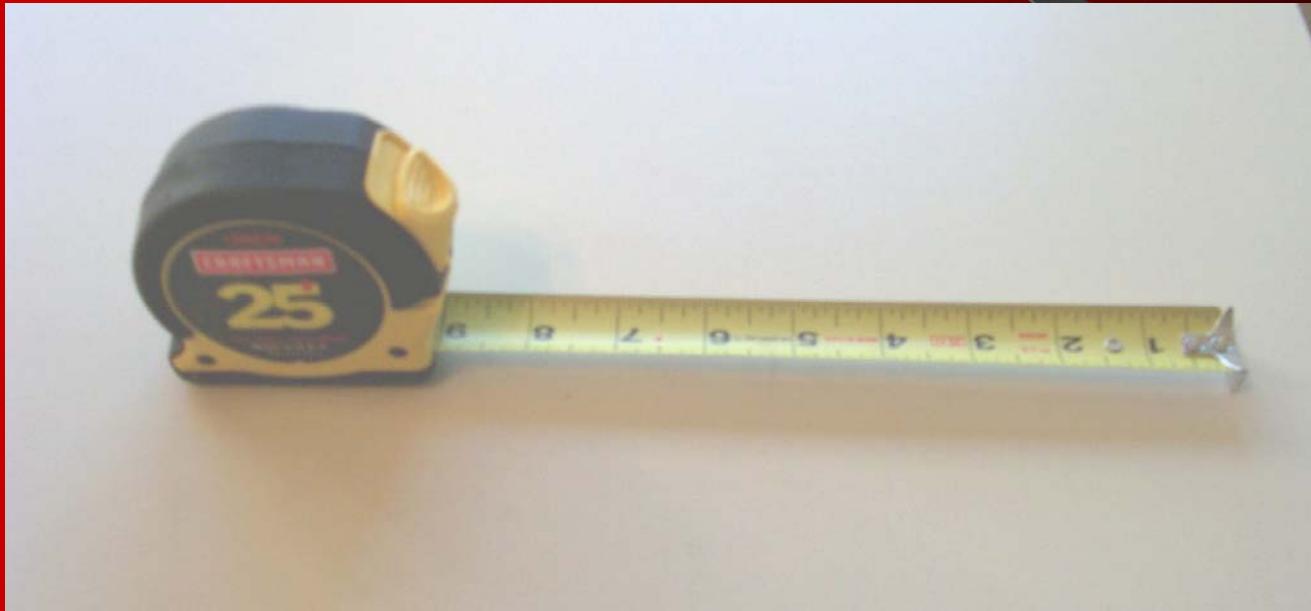


Off-Set Screw Driver





# Tape Measure



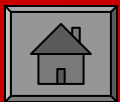
Tape Measure



# 3/8" Drive Ratchet



3/8" Drive Ratchet



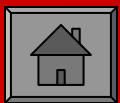


# Flare Nut Wrench



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

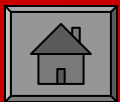
Combination Flare Nut (Tubing) Wrench



# Flare Nut Wrench



Double Flare Nut (Tubing) Wrench



# Chapter 3

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



# Screwdriver



Flat-head Screwdriver



# Snap Ring Pliers



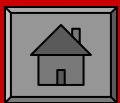
Snap Ring Pliers



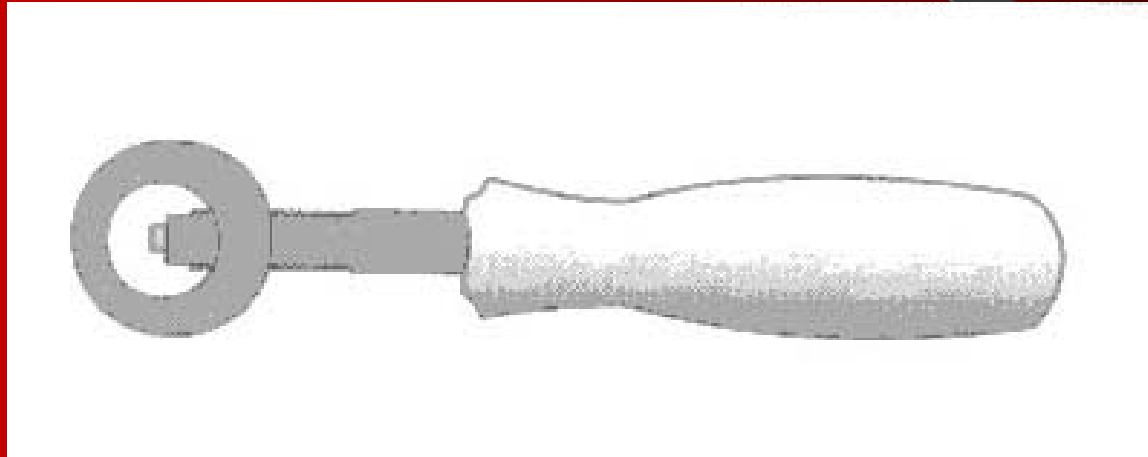
# Box Wrench



Box-End Wrench



# Punch /Chisel Holder



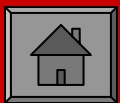
Punch /Chisel Holder



# Flex-Head Combination Wrench



Flex-Head Combination Wrench

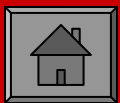




# Hammer



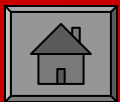
Ball Peen Hammer



# Combination Wrench



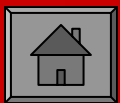
12-Point Combination Wrench. NEVER use the “open” end of a wrench to loosen tight nuts or bolts. The jaws are not strong enough to withstand the high torque needed to loosen frozen or rusted bolts.



# Metal Shears



Metal Shears (Tin Snips)



# Flex-Head Ratchet



Flex-Head Ratchet





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