

Worksite: \_\_\_\_\_ Instructor: \_\_\_\_\_ Date/Time: \_\_\_\_\_

### Topic C142: Wrenches

**Introduction:** In nearly every assembly process, parts are glued, screwed, or bolted together. When hex-head (or Allen/Torx head) bolts and regular hexagon (six-sided) nuts are used for fasteners, wrenches are needed for loosening or tightening. You will find a good assortment of various types of wrenches in every skilled craftsman’s tool box.

**Hex-head nuts and bolts** are measured in SAE (Society of American Engineers) inch fractions or in metric (millimeters). Nut and bolt strength values are determined by the Rockwell Hardness scale of 1 through 9, with #9 being the hardest. These hardness scale values are marked on the top of the bolt.

**Wrenches come in** every style and type imaginable to tighten or loosen nuts and bolts in every possible application. Here are a few: Adjustable pipe wrenches; Allen/Torx (RV) wrenches; Open end wrenches; Box end wrenches; Breaker bars; Vise-Grips; Adjustable “Crescent” type wrenches; Combination open and box end wrenches; Ratchet (socket) wrenches; Deep and shallow well sockets; Combination open end swivel sockets; Chain wrenches (for pipe)Spanner wrenches; Torque wrenches; Air impact wrenches; Air ratchet wrenches; Groove-joint “Channelocks”, and; Speed wrenches.

Do not cock the wrench in a manner that puts a strain on the points of contact; this can lead to tool failure. Keep the wrench flush with the bolt head.

**Following are some good general safe practice techniques for using wrenches:**

- Inspect the wrench carefully before use and do not use if damaged.
- Always use the proper size wrench for the job. A slipping wrench can damage bolt heads and nuts and cause personal injury.
- Use a wrench that gives a straight, clean pull. If you must push the wrench, use the heel of your hand; do not wrap your fingers around the tool.
- Do not cock the wrench in a manner that puts a strain on the points of contact; this can lead to tool failure. Keep the wrench flush with the bolt head.
- Avoid using a pipe or other “cheater bars” to extend the length of a wrench. Under excessive force, the wrench or bolt can slip or break.
- Do not use a hammer with a wrench unless the wrench has been specifically designed for this purpose.
- Replace cracked, worn, or “tweaked” wrenches.
- Do not attempt to straighten a bent wrench. It will only weaken it further.
- Do not substitute slip-joint pliers for a wrench; the pliers can slip and damage the bolt heads and nuts and cause hand injuries.
- Sockets designed for use with hand wrenches should not be interchanged on air or impact wrenches; this can result in damage or injury.
- Use a torque wrench for tightening only. Never use torque wrenches to break nuts or bolts loose; they are designed to measure tightness.
- Be sure the jaws on you pipe wrenches are still sharp as unexpected slippage can cause injury.

**Conclusion:** The “nuts and bolts” of safe wrench use are not complicated. All that is needed is common sense and concentration on the job at hand. To avoid hand and finger injuries, use wrenches that are designed for the task and ensure the tools are in good condition.

**Employee Attendance:** (Names or signatures of personnel who are attending this meeting)

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*These guidelines do not supersede local, state, or federal regulations and must not be construed as a substitute for, or legal interpretation of, any OSHA regulations.*