

**551-88L-1085  
Identify Hand Tools  
Status: Approved**

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**Security Classification: U** - Unclassified

**Distribution Restriction:** Approved for public release; distribution is unlimited.

**Destruction Notice:** None

**Foreign Disclosure: FD1** - This training product has been reviewed by the training developers in coordination with the Transportation School Fort Lee, VA 23801 foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

**Conditions:** Assigned as a Marine Watercraft Engineer, Soldier must identify hand tools. Given a complete risk assessment, a vessel in port or at sea, all applicable publications, forms and records, tools, materials, personnel, and equipment in all weather conditions day or night and all MOPP levels in an operational environment scenario. Some iterations of this task should be performed in MOPP 4.

**Standards:** On orders, Soldier will identify hand tools IAW TM 9-243, and procedures and specifications utilizing the task Go / No-Go criteria. Comply with all warnings, cautions, and notes listed in all references. Soldier must perform this task with 100% compliant or without errors.

**Special Conditions:** None

**Safety Risk:** Low

**MOPP 4:** Sometimes

<b>Task Statements</b>
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**Cue:** On orders, Soldier will identify hand tools, and procedures and specifications utilizing the task Go / No-Go criteria.

<b>DANGER</b>
None

<b>WARNING</b>
None

## CAUTION

### MODIFICATION HAZARD

Unauthorized modifications, alterations or installations of or to this equipment are prohibited and are in violation of AR 750-10. Any such unauthorized modifications, alterations or installations could result in death, injury or damage to the equipment.

### HIGH PRESSURE HYDRAULIC SYSTEM HAZARDS

Hydraulic systems can cause serious injuries if high pressure lines or equipment fail. Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment, and who can give first aid. A second person should stand by controls to turn off hydraulic pumps in an emergency. When the technicians are aided by the operators, the operators must be warned about dangerous areas.

### MOVING MACHINERY HAZARDS

Be very careful when operating or working near moving machinery. Running engines, rotating shafts, and other moving machinery parts could cause personal injury or death.

### ELECTRICAL HAZARDS

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Do not be misled by the term "low voltage." Potentials as low as 50 volts may cause death under adverse conditions". Be careful not to contact 115-Vac input connections when installing or operating this equipment. Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

**Remarks:** None

**Notes:** None

## Performance Steps

### 1. Identify tool usages safety measures.

a. Shop safety practices: No ACU jackets will be worn while working in the shop around power tools. The looseness of the fit makes them extremely hazardous due to the fact that they can get caught in moving machinery.

b. All jewelry and metal will be removed from skin contact: watches, rings, identification tags, medals, etc. They can get caught in moving parts and take your body into those parts. Metal parts can also be electrical shock hazards.

### 2. Identify measurement standards

a. Rules and steel tapes: A rule or tape is used for measuring where accuracy is not an extremely critical factor. They can be rigid or flexible, and come in various lengths and can be made of wood, metal, cloth, or fiberglass.

b. Rules: The rule is the most common of measuring tools. The rule is usually 6 to 12 inches in length although others are available.

c. Folding rules: The folding rule is usually from two to six feet long. The folding rule cannot be relied on for highly accurate measurements because a certain amount of play develops at the joints after continued use.

d. Steel tapes. Steel tapes are made from 6 to about 300 feet in length. The most common steel tapes have a hook at one end to let one person take all readings.

### 3. Identify proper use of tools.

#### a. Adjustable Frame Hacksaw.

- (1) The hacksaw is designed to cut almost any size or shape of metal object.
- (2) The hacksaw uses two types of blades, hard and flexible.
- (3) The blade is held to the saw frame by pins that fit into small holes at each end of the blade.
- (4) Blade tension is adjusted by a screw and wing nut assembly at either the nose or the handle end of the frame.
- (5) The adjustable frame hacksaw should have only light pressure applied to the forward stroke and no pressure on the return stroke.
- (6) Two hands should be on the hacksaw to help guide it, not apply pressure.
- (7) To make an accurate cut, use a file to make a notch for guiding the first strokes of the saw.

#### b. Hacksaw Blade.

- (1) Three types of hacksaw blades are 18, 24, 32, teeth per inch.
- (2) The proper blade is determined by the thickness of the work.
- (3) The blade should have at least two to three teeth on the work at all times.
- (4) The thicker the work the coarser the blade (less teeth per inch).

#### c. Files.

- (1) Files are used for cutting, smoothing off, or removing small amounts of metal, wood, plastic, or other material.
- (2) Files are made in various lengths, shapes, and cuts.
- (3) Every file has five parts: the point, edge, face or cutting teeth, heel or shoulder, and tang.
- (4) The tang is used to attach the handle on American pattern files.

d. Grade of coarseness:

- (1) Bastard-cut for heavier work.
- (2) Second-cut and smooth-cut for finishing work.
- (3) Dead smooth-cut for extra fine finish.

e. Method of filing.

(1) Clamp the work securely in a vise so that the area to be filed is horizontal and parallel to and projecting slightly above the vise jaws. Do not over tighten.

(2) Hold the file handle in one hand, thumb on top, and hold the end of the file with the fingers of the other hand.

(3) When filing hard metals, apply pressure on the forward stroke only. Unless the file is lifted from the work on return stroke, it will become dull much sooner than it should.

(4) When filing soft metals, using pressure on the return stroke help keep the cuts in the file clean.

f. Draw filing.

(1) Draw filing is used to produce a very smooth and true surface. Hold the file at right angle to the direction of the stroke, keeping your hands close together to prevent bending and breaking the file.

(2) Pressure should not be great and can remain the same on the back stroke as on the draw stroke. The speed of filing is not important.

(3) For extra smooth surface, wrap a piece of emery cloth around the file and stroke in the same manner.

g. Punches.

(1) There are two basic types of punches: Hollow and Solid.

(2) Hollow punches are usually designed for punching holes in leather, gaskets, and other similar material.

(3) Solid punches are the most common type of punch.

(4) Center punching uses a solid punch and is used for starting drill holes.

h. There are two types of center punches: Hand-Held and the Automatic type

(1) The Hand-Held Type Center Punch has a narrow, cone-shaped point terminating in a sharp, conical tip. Size ranges from 1/8 to 5/8 inches in diameter and from 3 to 6 inches long. The hand-held punch must be struck with a hammer 1 or 2 times.

(2) The Automatic Type Center Punch has an adjustable regular for determining the impact of the punch and also has interchangeable points. The automatic punch also contains a tension spring for marking without the use of a hammer.

i. Taps and Dies.

(1) Used to cut threads in metal, plastic, or hard rubber.

(2) Taps are used for cutting internal threads.

(3) Dies are used for cutting external threads.

j. Taper (starting) hand type.

(1) Has a chamfer (non-threaded) length equal to eight to ten threads.

(2) The taper hand tap is used to start tapping operations. The taper hand tap has the longest standard chamfer and requires less tapping torque because of more working teeth.

k. Plug/Pipe Hand Tap.

- (1) Has a chamfer length equal to three to five threads.
- (2) Used after the taper tap is used.
- (3) Most common chamfer for use in through or blind holes.

l. Bottoming hand tap.

- (1) Has chamfer length equal to one and one half threads.
- (2) Used for threading the bottom of a blind hole only after the taper and plug taps have been used.
- (3) Also used when tapping hard materials.

m. Screw extractors.

- (1) Used to remove broken screws without damaging the threads or surrounding material.
- (2) There are Two types of screw extractors:
  - (a) Straight flute type.
  - (b) Spiral taper type.

n. Torque wrench.

- (1) Torque wrenches are designed to measure the specific degree of tightness of nuts and bolts.
- (2) Torque wrenches are considered precision instruments, and therefore must be calibrated at regular intervals.
- (3) There are two basic types of torque wrenches:
  - (a) Dial torque wrench: Has a head which contains the drive element. Has a dial for reading the exact amount of torque.
  - (b) Scale torque wrench: Has a rod which runs parallel to the handle on the drive element. This rod moves across the scale to the right or left as torque is applied.

o. Hammers.

- (1) There are many different types of hammers.
- (2) Hammers can either be hard or soft.

p. Machinist peen hammer.

- (1) All machinist peen hammers have a flat striking face on one end of the head for striking punches and chisels.
- (2) The other end of the head can be used for forming soft metal, making gaskets and striking metal in out of the way places.

q. Power Tools.

- (1) Small power machine tools are, generally speaking, not portable. All work that is to be done must be brought to the shop where the machine is set up.
- (2) There are two basic types of drill presses.

(a) There are two basic types of drill presses used in the Army: the bench-type and the upright-type.

(b) The drill press is an electrically operated power machine that was originally designed as a metal-working tool.

(Asterisks indicates a leader performance step.)

**Evaluation Guidance:** Score the Soldier a GO if all performance measures are correctly completed/pass (P). Score the Soldier a NO-GO if any of the performance measures are missed or incorrectly performed/fail (F).

**Evaluation Preparation:** Test this task in with applicable training material. Ensure Soldier understands why this task is important to support the overall training objective.

Setup: Test this task in in accordance with prescribed references or Technical Manual (TM).

Brief Soldier: Tell the Soldiers adhere to all Safety precautions when performing the task listed.

Note: Ensure that all required equipment to perform this task is available.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Identified tool usages and safety measures.			
2. Identified measurement standards.			
3. Identified proper use of tools.			

**Supporting Reference(s):**

Step Number	Reference ID	Reference Name	Required	Primary	Source Information
	TM 9-243	Use and Care of Hand Tools and Measuring Tools (M6290-AJ-MAN-010; TO 32-1-101; TM-10209-10/1) (Reprinted W/Basic Incl C1-2)	Yes	Yes	

**TADSS :** None

**Equipment Items (LIN):** None

**Material Items (NSN) :**

Step ID	NSN	LIN	Title	Qty
	5136-00-596-1227		Thread Cutter, Die Head, Hand	1
	3413-00-165-4136	G62899	Drilling Machine, Upright: Bench 1/3 HP 115V 60C 1 PH 1/2 IN Capacity	1
	5180-00-448-2362	W17051	Threading Set, Screw	1
	7530-00-281-5939		Folder, File, Tan, 9-1/2 X 11-3/4 Inch, 1/3 Cut 100S	1
	8415-01-408-2293		Glasses, Safety, Protective, Training	1
	5180-00-173-4890		Threading Set, Screw	1
	2815-01-108-6130		CYLINDER HEAD	1
	5120-00-900-1285		Wrench, Torque, Deflecting Frame End Drive Style, 3/4 Inch Drive, 0-300 Foot-Pound Capacity (DISCONTINUED WITHOUT REPLACEMENT)	1
	5180-00-629-9783	W39032	Tool Kit, General Mechanic's, Rail and Marine Diesel Engine	1
	5306-01-197-3089		BOLT,MACHINE	1
	3460-00-277-3504		Vise, Machine Table, Type 2, Size 3	1
	01T130001		carbon steel sheet	1
	5120-00-221-7983	Y85377	Wrench, Torque, Rigid Frame End Drive Style, 3/4 Inch Drive, 0-600 Foot-Pound Capacity	1
	5836-01-379-9564		Recorder, Video	1
	6730-01-363-4544	P18230	Projector, Multimedia: Model 800	1
	7010-01-504-2351	C27367	Computer System: Digital AN/TYQ-129(V)1	1
	01T130006		Aluminum Plate	1
	5130-00-293-2488	J84421	Grinder, Disk, Electric, Portable (DISCONTINUED WITHOUT REPLACEMENT)	1

**Environment:** Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to the current Environmental Considerations manual and the current GTA Environmental-related Risk Assessment card. It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. AR 200-1 delineates TRADOC responsibilities to integrate environmental requirements across Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) and ensure all training procedures; materials and doctrine include sound environmental practices and considerations.

The Army's environmental vision is to be a national leader in an environmental and natural resource stewardship for present and future generations as an integral part of all Army missions. This Training Support Package meets this standard.

Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to ATP-45.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

**Safety:** In a training environment, leaders must perform a risk assessment in accordance with current Risk Management Doctrine. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW current CBRN doctrine. In a training environment, leaders must perform risk management in accordance with ATP 5-19, Risk Management. Leaders will complete a DD Form 2977 DELIBERATE RISK ASSESSMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC), as well as any other variables.

All operations will be performed to protect and preserve Army personnel and property against accidental loss. Procedures will provide for public safety incidental to Army operations and activities and safe and healthful workplaces, procedures, and equipment. Observe all safety and/or environment precautions regarding electricity, cable, and lines. Provide ventilation for exhaust fumes during equipment operation and use hearing protection when required IAW AR 385-10, the Clean Air Act (CAA) and the CAA amendments, and the OSHA Hazard Communication standard.

Accidents are an unacceptable impediment to Army missions, readiness, morale, and resources. Decision makers at every level will employ risk management approaches to effectively preclude unacceptable risk to the safety of personnel and property affiliated with this task. (a) Take personal responsibility. (b) Practice safe operations. (c) Recognize unsafe acts and conditions. (d) Take action to prevent accidents. (e) Report unsafe acts and conditions.

No food or drink is allowed near or around electrical equipment (CPU, file servers, printers, projectors, etc.) due to possible electrical shock or damage to equipment. Exercise care in personal movement in and through such areas. Avoid all electrical cords and associated wiring. In event of electrical storm, you will be instructed to power down equipment.

Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW ATP 3-11.32, NBC Protection, ATP 3-11.32, CBRN Decontamination.



**Prerequisite Individual Tasks :** None

**Supporting Individual Tasks :** None

**Supported Individual Tasks :** None

**Supported Collective Tasks :** None

**Knowledges :**

<b>Knowledge ID</b>	<b>Knowledge Name</b>
K-551-T-0016	Knowledge of basic hand tools

**Skills :**

<b>Skill ID</b>	<b>Skill Name</b>
S-551-P-0283	Ability to use hand tools
S-551-T-0002	Ability to use power tools
S-551-T-0001	Ability to use measuring tools

**ICTL Data :** None