# California Agricultural Mechanics Tool Identification Manual


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Common Tools

Axes

Hand Axe
Used for sharpening stakes, cutting small limbs or brush. Also used to drive in small stakes, grade stakes, and corner stakes. The hand axe is similar to the single bit axe but smaller. The handle is 16 to 18 inches long.

Single Bit Axe
Used for building fences, cutting small trees and construction work. This very versatile tool should not be used as a sledge hammer on wedges or iron stakes. Handles are usually of hickory, 36 inches long, oval in cross section and shaped for good balance.

Double Bit Axe
Used to cut small trees, trim logs and tops. Its two cutting edges should not be left in a vertical position because of the safety hazard. The 36 inch handle is oval and straight.

Fence Pliers
Grips between the handles hold the wire tightly while leverage is exerted against the fence post to stretch the wire fairly tight.

Pliers

Battery Pliers
Used for removing battery terminals. The end clearance prevents cell-cover damage.

Diagonal Cutting Pliers
It has curved handles, lap joined; and diagonal cutting jaws.

Locking Pliers
Locks with a toggle action that holds until the lever is opened. Commonly called Vise-Grip pliers.

Retaining Ring Pliers
User for remove and install internal and external retaining (snap) rings.
Common Tools

Slip Joint Combination Pliers
Used for general purpose work, for holding flat or round stock, and for cutting soft wires.

Drift Punch
The shank is tapered.

Pin Punch
This punch has a long, straight shank, the diameter of which designates the size. Used to remove bolts and pins.

Water Pump Pliers
The jaws are adjustable to 2 inches.

Punches

Center Punch
It is manufactured in various sizes and lengths.

Hole Punch
These punches are used to make holes in gaskets and other materials. Also called a belt punch.

Prick Punch
The punch should be sharp and ground to 30 degrees.

Leather Punch
The handles are similar to pliers. Used to punch holes in soft materials like leather and rubber.

Screwdrivers

Clutch Driver
This is a specialty drive that fits screws used in mobile homes, boats, recreational vehicles, and electric motors.
Common Tools

**Nut Drivers**
This is a very popular tool in the electrical and sheet metal industry.

**Screwdriver Bits**
Available in slotted, Phillips, square, and torx drives for power screwdrivers. Shank is hexagonal.

**Stubby Screwdriver**
It comes in slotted and Phillips, and has a blade length of 1 1/4 to 1 1/2 inches long.

**Offset Screwdriver**
Used where it is difficult to reach the screw head with a common or standard screwdriver.

**Slotted Screwdriver**
Used mostly in woodworking applications.

**Torx Head Screwdriver**
Also used on appliances, lawn and garden, and electronic equipment.

**Phillips Screwdriver**
Always select the correct size for the correct application.

**Square Recess Screwdriver**
Each screwdriver is color coded for easy size identification.

**Box End Wrench**
Wrench is available in 12 and 6 point ends.

**Wrenches**

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California Agricultural Mechanics Tool Identification
Common Tools

Combination End Wrench
The reason for the popularity of this wrench is that it has the advantage of having both open and box ends.

Open End Wrench
Both ends of the wrench are open but are of different sizes.

Tubing Wrench
The box at each end of the wrench is 6 point only. Also called a flare nut wrench.

Deep Socket
The deep socket is made in standard, thin, and extra thin walls, with 6 or 12 point openings and with 3/8, 1/2 or ¾ inch drive.

Six Point Socket
The socket has 6 points inside to fit over hexagonal nuts.

Eight Point Socket
Has 8 points and is used on square nuts found on farm machinery.

Twelve Point Socket
The socket has thin walls to fit in tight places.

Extension Bar
Used to connect, the socket wrench to the ratchet handle to give working clearance, and are 3 to 20 inches long.
Common Tools

Flex Handle
The end that fits into the socket is swivel hinged, and the other end has a hole with a sliding cross bar to permit use of the wrench at an angle.

Speed Handle
Used to rapidly remove a nut or bolt. Common drive sizes 1-4”-3/4”.

Adjustable Wrench
Size is designated by inches in length.

Ratchet Handle
The ratchet speeds up the work. Common drive sizes 1-4”-3/4”.

Socket Adaptor
Allows the use of larger drive sockets with smaller socket drives; i.e., 1/2 inch drive socket and 3/8 inch drive ratchet.

Chain Wrench
It is made in several sizes ranging from 13 ¾ to 87 inches long, and will handle pipe from 1/8 to 18 inches in diameter.

Slide Bar Handle
Used as a “T” or “L” handle and is normally used with the extension.

Universal Joint
It makes work possible in restricted places where the wrench cannot be aligned with the bolt.

Hex Key
This wrench is made of hexagon stock with one end bent to a 90 degree angle.
Common Tools

Strap Wrench
The adjustable strap is useful in rotating large diameter objects like filters.

Bars

Crow Bar
It is normally four or five feet long with one end tapered round and the other end with a chisel point.

Pry or Fitting Bar
It has a long round taper at one end and a curved pry hook at the other.

Parts Brush
Metal handle is usually sealed at both ends to enable brush to float in solvent to prevent losing brush in solvent tank.

Flat Pry Bar
Contoured flat bar, with beveled nail slots at each end. Also called a Wonder Bar (Stanley brand name).

Ripping Bar
Usually it is of octagon tempered steel. Used for demolition and pulling large nails. Also called a Wrecking Bar.

Push Broom
Handles are 7/8 inch in diameter 4 to 5 feet long and are threaded into broom body or bolted on.

Bench Brush
The overall length is 16 inches.

Wire Brush
Used for cleaning metal parts to be welding, cleaning machinery parts and removing slag and rust.

Vises
Drill Press Vise
Drilling is safe and more accurate when a vise is used, and fewer drill bits are broken.

Machinist's Vise
A bench mounted vise for metal with a swivel base and replaceable jaws. It should not be used for hammering or bending metal. Also called a Bench Vise.

Woodworker's Vise
The flat smooth jaws open up to 12 inches. Jaws may be lined with wood.

Pipe Clamp
A clamp made with a steel pipe.

"C" Clamp
The screw has a sliding bar or a thumb screw at one end and usually a ball and socket pad at the other. Sizes range from 2 to 12 inches.

"C" Clamp Locking Pliers
Used for clamping irregular shapes quickly and firmly when welding or fastening.

Bar Clamp
Bar type clamp has quick non-slip adjustment to approximate size; then screws tight to apply pressure.

Corner Clamp
Jaws are at 90 degree angles. Used to clamp items like cabinet frames.

Locking Welding Clamp
Works well when clamping two pieces adjacent to each other or at 90 degree angles.
Spring Clamp
Jaws are specially formed to hold flat or round objects.

Strap Clamp
Uses a fabric strap that tightens around large or irregular projects.

Irrigating Shovel
The same as the round point except the blade is almost straight with the handle.

Bow Rake
Has 15, 2 1/2 inch pointed teeth attached at 90 degrees to a 5 foot ferruled handle.

Round Point Shovel
A shovel used for digging. Typical handle length approximately 50 inches.

Scoop Shovel
The handle can be a short capped ferrule “0” type or 54 inch long handle.

Clay Picks
The handles for all picks are 32 inches long and are larger at the head or blade end.

Shovels, Rakes, Picks, and Posthole Diggers

Square Point Shovel
Used for scooping materials such as sand and gravel. Typically the handle about 50 inches long.

Cutter Mattocks
The blades ends are rotated 90 degrees and oval hole is in the center for the handle which is sold separate.
Common Tools

Pick Mattocks
Similar to the cutter mattocks except one end of the blade comes to a sharp point for breaking or digging in hardpan or very hard soil.

Face Shield
Eye protection that covers the entire face. Often used with safety glasses when full protection of the face is required.

Air Compressor
Used for supplying compressed air for spray painting and for operating air tools at low pressures (less than 100 psi).

Posthole Auger
It is operated by rotating the handle.

Safety Glasses
Eye protection that covers eyes only. Safety glasses have side shields. The California State Educational Code states that all students, teachers, and visitors in a school shop must wear eye protection.

Posthole Digger
It is operated by thrusting the points into the soil and spreading the handles to remove the soil. Also called a Clam Shell.

Anvil
Sizes range in weight from 20 to 200 pounds. Used to shape cold and hot metal.

Miscellaneous

Bolt Cutter
The toggle and lever joints develop great mechanical advantage. Commonly used to cut bolts, chain, and reinforcing bar.

Safety Goggles
Eye protection that covers eye glasses.
### Common Tools

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<td>Most chain saws are gasoline powered, but smaller pruning saws can be electric or hydraulically powered.</td>
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<td>Hog Ringer</td>
<td>It is somewhat like a pair of pliers except the jaws of the ringer has special slots for holding the ring.</td>
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<td>Staple Gun</td>
<td>Heavy duty and light utility models are available driving 3/16 to 1/2 inch staples.</td>
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<td>Contractors Wheelbarrow</td>
<td>Used widely in the construction industry. Typical capacity 1/5 cubic yard. Wheel is pneumatic.</td>
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<td>Rotary Hammer</td>
<td>Used for drilling holes in concrete and with chisel attachments. Special carbide tipped bits must be used with this unit.</td>
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<td>Cut Off Saw</td>
<td>Cutting wheels are disposable. Used for cutting steel bar and pipe.</td>
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<td>Hammer Tacker</td>
<td>A stapler that operates like a hammer. Used to install insulation, builder's paper, roofing felt, etc.</td>
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Measuring, Layout, and Surveying

Measuring And Marking Tools

Fiberglass Tape
Lengths of 50', 100', 200, and 300' common. Tape maybe graduated in feet and inches, feet and 1/100', or metric.

Measuring Wheel
Used to measure long distances such as field boundaries or road length where high accuracy is not required.

Steel Tape
It should be cleaned after using and kept free from rust.

Rafter Square
An aluminum square marked for cutting rafters and angles. Also can be used as a guide for cross cutting with a circular saw. Small size will fit in a nail pouch.

Combination Square
A level and a scribe are contained in the beam.

Micrometer
Sizes range from 0 to 1 inch up to 12 inches.

Try Square
It is marked in 8ths and 16ths of an inch.

Framing Square
Rafter framing squares are marked in 12ths of an inch on the back side. Also called a Carpenter’s or steel square. Many of these squares are inscribed with rafter tables.

Depth Gauge
Usually graduated in 32nds and 64ths.
Measuring, Layout, and Surveying

Sliding “T” Bevel
After it is set at the correct angle, it is much the same as a square.

Inside Calipers
The calipers are adjusted to the diameter of the object and then laid on a rule where the reading is taken.

Line Level
It consists of a bubble tube housed in a metal or plastic case which has hooks for attaching to the line.

Dial Caliper
Capacity is from 0 to 6 inches.

Outside Calipers
The calipers are adjusted to the outside diameter of the object and then laid on a rule where the reading is taken.

Dividers
Used for marking out circles or parts of circles, for transferring or duplicating short measurements, and for dividing distances into a number of equal parts.

Fractional Vernier Caliper
Direct reading of 16ths and 32nds of an inch on the handle, and vernier readings of 1/128 inch.

Carpenter’s Level
Used for marking level lines and for checking surfaces for level and plumb. Typical length 24-48 inches. Longer levels are often called masonary levels since they are commonly used to lay brick.

Feeler Gauge
Used for gauging the clearance or spacing of valve tappets and other jobs where accurate measurements of .001 to .032 may be desired.
Protractor
It is graduated from 0 to 180 degrees.

Chalk Line
A special container contains the chalk powder and line which is on a winding spool.

Marking Gauge
It is marked in 8ths and 16ths of an inch and is 8 inches long.

Plumb Bob
It can also be used to establish a plumb line in laying brick or concrete blocks. Also used to establish a survey instrument (like a transit) above a specific point.

Scratch Awls
Also used as a punch for making small holes in light gauge sheet metal for the insertion of sheet metal screws.

Scribe
The tip is brittle and will snap off if dropped on the point or used as center punch.

Soapstone
Unlike chalk, it is hard enough not to mark hands or clothing and can be used in holders that resemble pencils.

Surveying Tools
Builder's Level
A telescope instrument used to check level of forms or field grades. Builders' levels are designed to be used for short distances. Farm or dumpy levels are similar to builder's levels, but have more powerful telescopes. Farm levels are used for longer distances. Both instruments are leveled manually using adjusting screws. An “auto” level requires less manual leveling and has only three leveling screws.
Direct Elevation Rod
Rod reads elevations directly (without subtraction from the HI) by used a sliding tape. Some rods have a cut/fill scale for use in grading.

Laser Level
A level that used a rotating laser beam to establish a level plane. Leveling can be done with a single person.

Range pole
A simple pole used in lieu of a rod where elevation measurement is not needed.

Global Position System receivers
Commonly called GPS receivers, they used satellites to establish the user’s position (e.g., latitude and longitude). Recreational receivers have an accuracy of 13 m and survey grade receivers have an accuracy of 2 cm. Differential GPS receivers (accuracy 2 cm – 1 m) are commonly used in agriculture to map field boundaries, scout fields, and provide tractor guidance.

Laser Level Receiver
The receiver that detects the laser beam of the laser level. Can be fitted to a Philadelphia or Direct Elevation rod.

Rod Target
Used with the surveyor’s rod to allow readings at a greater distance.

Philadelphia Rod
Reads like a tape measure. An adjustable target is available to allow readings up to 700 feet in distance.

Surveying Tripod
Used to hold a level or other survey instrument. To protect threads, keep cap on when not in use.
Measuring, Layout, and Surveying

Surveyor’s Steel Tape
Quite often called a “chain.”
These may be stored on a reel or coiled.

Hand Level
The hand level is held in the hand thus providing little accuracy.

Surveyors Arrows
Sizes range from 10 to 14 inches in length. Used to mark distances when "chaining" or measuring distance.

Transit
Similar to a level, but a transit telescope can be tilted vertically to measure vertical angles. Surveyor’s have generally replaced these with “Total Stations”, but transits are still used to measure vertical angles in construction.
**Fasteners**

**Bolts**

**Cap Screws**
It resembles a short bolt with a hexagon head with either coarse, fine, or metric thread. Term describes machine bolts and machine screws.

**Grade 2 Bolt**
Soft bolt commonly used for landscape applications and other applications where strength is not important.

**Machine Screw**
The head is slotted for a screwdriver and may be either round of flat. Typical sizes 4-12.

**Carriage Bolts**
Never use a washer under the head. Use to bolt wood.

**Lag Bolt**
The bolt has a square or hex head with a tapered wood screw on the other end. Common sizes 1/4 to 1/2 in diameter, 2" to 12" long. Also called a Lag Screw.

**Machine Bolt**
The head and nut may be square or hexagon shaped.

**Eye Bolt**
It has an eye on one end and coarse or fine threads on the other.

**Plow Bolt**
No wrench is necessary to hold the bolt head.

**Toggle Bolt**
When the screw is tightened a firm anchorage is made.
**Fasteners**

**Grade 5 Bolt**
Mildly hardened bolt used commonly in machinery and equipment applications. Three markings on the head.

**Grade 8 Bolt**
Hardened bolt used where high tensile strength is required. 6 markings on the head.

**Nuts**

**Cap Nut**
A nut closed on one side to cover an exposed bolt.

**Hex Nut**
It may have NC, NF, or metric threads.

**Self-Locking Nuts**
When tightened on a bolt the scored threads bite into the threads of the bolt preventing it from backing off.

**Castellated Hex Nut**
Used with a cotter pin to prevent loosening or tightening. Top the nut is smaller in diameter than the base.

**Slotted Hex Nut**
It differs from the castellated nut in that there is no stepped-in castle-like top.

**Square Nut**
Used on farm implements with carriage bolts, machine bolts, stoves bolts and plow bolts.

**Wing Nuts**
 Used where hand tightening (no wrench) is desired such as inspection covers.

**Washers**
**Fasteners**

**Fender Washers**
The large holes are used for aligning or adjusting for proper fit.

**Lock Washer**
It should not be used on wood.

**Drywall Screws**
All Are Phillips Except the Hex Wafer Head. Used to fasten drywall. Bugle shaped flat head.

**Finishing Washer**
This is a chrome plated countersunk washer used with oval head wood or metal screws.

**Malleable Iron Washer**
Used where excess pressure or stress is exerted on wooden structures.

**Screw Eye**
It may be described as a screw with an eye or ring head.

**Flat Washers**
Used to prevent the nut from rubbing and becoming imbedded in the bolted material. Also called a Cut Washer.

**Deck Screws**
A straight shank wood screw with a bugle head. Commonly made with a Phillips or square drive 2 1/2" of longer. Coated to prevent rusting.

**Screw Hook**
Can be screw into wood walls or concrete or masonry when pre-drilled and a plastic or lead anchor is used.

**Screws**
Fasteners

Self Drilling Screws
No pre-drilling is necessary when using a self drilling screw.

Self Tapping Screws
Screw has a sharp point with coarse threads that make their own threads when screwed into a pre-drilled hole that is smaller than the diameter of the screw.

Set Screw
When screwed into a set collar the cup point makes an indentation in the shaft preventing the collar from vibrating loose.

Sheet Metal Screws
Head types are flat, round, pan, oval and binding.

Torx Head Screws
The head is similar to the Phillips but having a six point star shaped opening in the center of the head rather than a four point star.

Wood Screws
A tapered screw with a round, oval, or flat head. The threaded portion of the screw is tapered with a very coarse thread and cuts its own thread as it is turned into the wood. Shown L-R oval head, round head, flat head Phillips, and flat head slotted.

Nails

Box Nail
Roughly speaking, d equals 1/4 inch in length, but this is not constant. The shank is smaller in diameter than the common nail to prevent splitting of the wood. Common sizes 2d to 16d

Duplex-Head Nail
The point is sharp, and there are two heads, one above the other, to make removal easy. Common sizes 6d, 8d, 16d.
Common Nail
Roughly speaking, d equals 1/4 inch in length, but this is not constant. The shank is larger in diameter than the box nail making the nail less likely to bend. Common sizes 2d – 20d. Sizes larger than 20s are often called spikes.

Galvanized Nail
Common, box, and finish nails are available for exterior use with a galvanized coating. The coating may be hot dipped (thicker) or electro-plated (EG).

Finish Nail
The sizes range from 2d to 20d. The nail is designed to be counter sunk and the hole filled.

Galvanized Nail
Common, box, and finish nails are available for exterior use with a galvanized coating. The coating may be hot dipped (thicker) or electro-plated (EG).

Spiral Shank Nails
Designed for the construction and repair of wood pallets. These spiral shank nails are also good for re-nailing wagon beds, trailers.

Cement Coated Nails
Sizes range from 2d to 16d. Commonly found in a green coating in 8d and 16d ("sinkers").

Blue Plaster Board Nail
The range in size is 1 to 1 1/2 inches.

Aluminum Roofing Nails
Sizes range from 1 to 1 1/2 inches long.

Wire Brad
The size is expressed in wire gauge and ranges from 1/4 to 1 1/2 inches long.
Fasteners

Lead-Head Nails
Lead washer is to prevent oxidation between the head of the nail and the galvanized roofing and also prevents leakage.

Furring Nail
This allows the wire to become a reinforcing agent and the nails hold the plaster to the wall.

Galvanized Shingle Nail
The 3d is generally used for shingling.

Corrugated Fastener
The size is 1/4 to 1 inch in depth and 2 to 7 corrugations. Used to fasten wood.

Galvanized Roofing Nail
The head is about 1/2 inch in diameter, and the length ranges from ¾ to 2 inches.

Cotter Pin
This prevents the nut from working loose. Also called Cotter Key.

Pop Rivet
A pop rivet tool is required to set the rivet.

Miscellaneous Fasteners

Pop Rivet Tool
Tool is adjustable to use the various sizes (diameter) of rivets available.

Rivets
A rivet set is a small bar of steel with a hole drilled in the end to receive the rivet, and with a cup-like depression for forming a round head on the rivet.
Fasteners

Soft Iron Rivet
The size is based on length and diameter.
### Hardware

#### Hinges

<table>
<thead>
<tr>
<th><strong>“T” Hinge</strong></th>
<th><strong>Continous Hinge</strong></th>
<th><strong>Strap Hinge</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Size is measured from hinge pin to the end of the strap. Commonly use for gates (&quot;T&quot; fastens to post).</td>
<td>Same as the butt hinge except it comes in 8” to 8’ lengths and is cut to length with a hacksaw. Also called a Piano hinge.</td>
<td>The size is measured from the hinge pin to the end of one strap.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Barrel Bolt</strong></th>
<th><strong>Gate Latch</strong></th>
<th><strong>Hinge Hasp</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The other end, a separate piece is an eye which the bolt slides into when locking.</td>
<td>The hook is inserted into the eye screw to latch.</td>
<td>One end is like a strap hinge with a slot which folds over an eye or staple to accommodate a padlock.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Butt Hinge</strong></th>
<th><strong>Chain Link Fencing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>This hinge is available with fast pin or loose pin and is plain brass or steel or primed with paint.</td>
<td>Comes in 36 to 60 inch widths and 50 to 100 foot lengths. Also called Diamond Mesh.</td>
</tr>
</tbody>
</table>

#### Fencing And Supplies

<table>
<thead>
<tr>
<th><strong>Barbed Wire</strong></th>
<th><strong>Chain Link Fencing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A spool of wire is 80 rods long.</td>
<td></td>
</tr>
</tbody>
</table>
Come-A-Long
By working the ratchet handle the cable is tightened and moves the sheave block closer to the ratchet spool.

Poultry Wire Netting
The rolls are 50 to 150 feet long and from 1 1/4 to 4 feet wide.

Steel Fence Posts
Round steel post with an anchor plate 12 inches from the bottom and comes in 3 to 6 foot lengths.

Electric Fence Gate Handle
By pulling on the handle, tension can be released on the fence and it can be disconnected allowing entry.

Smooth Galvanized Wire
It is made of smooth galvanized steel and is available in a variety of gauges.

T Post
A steel post with an attached plate to help anchor the post. Commonly 5'-8' long.

Nail On Electric Fence Insulator
Commonly a plastic insulator that nails to a wood post. Insulators hold electric fence conductors about 1" from the post.

Staples
The length is stated in inches and fractions.

T-Post Insulator
The insulator is clipped to the steel post and the wire inserted into the plastic clip, thus preventing grounding of the electrical system.
**Turn Buckle**
Turning the body tightens or loosens both at the same time.

**Wire Stretcher**
It consists of two double sheave blocks specifically designed with hooks, holding lock, wire clamp and a rope.

**Welded Wire Fence**
Consists of 16 gauge galvanized wire spot welded rather than woven, and has 2 inch by 3 inch mesh.

**Woven Wire Fencing**
The roll contains 20 rods of wire ranging from 32 to 47 inches wide.

**Wire Grip**
Made of steel or malleable iron. Used to grip fencing wire when tightening

**Tension Spring**
This spring can be extended, but exerts force by extending to pull back to its original length.

**Torsion Spring**
When the spring is wound up it exerts a twisting force.

**Springs**

**Compression Spring**
A compression spring is one that exerts pressure when it is compressed.
Chains, Lashing Straps, and Accessories

Proof Coil Chain
A welded link chain. Chain size is designated by the diameter of the steel used in making the links (e.g., 3/16"-3/4"). Made from low carbon steel, proof coil is a general utility chain for such uses as tie-down, log chain and assembly tow and switch chain. Available in plain, hot galvanized, and bright zinc finishes.

Load or Chain Binder
This devise consists of a handle, two offset links and grab hooks which, when connected to a section of the load-binding chain and the handle pulled, tightens the chain.

Sash Chain
Sash Chain is sold by the foot. Used to hang light fixtures, etc.

Twist Link Chain
Used where the chain must travel easily over something (links don’t get caught).

Double Loop Chain
Used for tether chains, swings and hammocks and wherever a light inexpensive chain is needed.

Repair Link
Used to repair a broken chain and for attaching rings and hooks. Also called a Lap Link

Slip Hook
A round hook used on one end of a log chain to permit it to slip along the chain.

Grab Hook
Grab hooks are designed to hook over a chain link and will hold fast when the chain is tightened.
Rope and Chain

Swivel
It consists of two chain links connected by a riveted pin.

Lashing Straps
Used for securing loads. Not used for securing heavy equipment. Typical polyester or nylon strap strength is 10,000-20,000 pounds. Smaller straps are available with a built-in winch. Larger straps are designed to be used with winches mounted on the truck bed.

Manila Rope
This is a laid (twisted) and comes in three and four strands. A natural fiber, manila is stronger than cotton, but weaker than the synthetic ropes.

Clevis or Shackle
Used for fastening an implement to a draw bar for pulling, fastening a tow cable, and for purposes requiring the fastening or securing of machines or materials.

Nylon Rope
Maybe manufactured as a laid (twisted) rope or a braided rope. Stronger and more expensive then poly rope. Braided rope does not have individual strands therefore it is not suited for hand braiding.

Winch
A ratcheting device used to tighten a rope or lashing strap.

Rope
Cotton ropes are soft but the weakest of the natural fiber ropes.

Chain Hoist
Sizes are available from 1/2 to 5 ton capacity.

Rope Thimble
Used to protect the eye in a rope or cable.
Rope and Chain

Twisted Polypropylene Rope
Keep away from flames and hot metal, it will melt or solidify and break easily. Also called trucker's rope which is generally black with an orange stripe.

Wire Rope
To coil or uncoil, roll the rope like a steel hoop.

Wire Rope Clamps
There are two types, the “U” bolt with cleat and the bolt clamp.

Knots, Hitches, and Splices

Bowline
A knot for making a loop

Clove Hitch
A hitch used to secure a rope to a hook.

Square Knot
A common knot for joining two ropes

Trucker's Hitch
A hitch used for securing a load

Eye Splice
Used to make a permanent loop in a laid (twisted) rope.

Sheet Bend
A knot for joining ropes of different diameters
Metal Working

Metals

Aluminum
It is sold by the square foot, by the piece or by the pound.

Angle Iron
It is sold by the pound. Sized by the length of the legs and thickness. Ex. 2”x2”x1/4”.

Brass
It is sold by the piece or by the pound.

Cast Iron
Used to make castings for cylinder blocks, plow bottoms, housings for tractor differentials, transmission cases, sprockets wheels, pulleys, pipe fittings and gears.

Galvanized Steel
The coating varies from 0.0002 inch for the lightest coating to 0.002 inch for water pipe.

Channel Iron
The common sizes range from 1/2” X 1 inch to 4 X 12 inches.

Stainless Steel
An alloy steel that resists oxidation. Commonly a chrome or nickel alloy of iron.

Copper
It is sold by the piece, running foot or pound.

Cold Rolled Steel
It is commonly used for making bolts and shafting. Shaped cold the metal is bright and shiny.
Metal Working

Hot Rolled
Available in many shapes. Formed hot the finish is rough and dark.

Flat Bar
Size is 3/16 inch thick and greater and comes in a variety of widths.

Diamond Plate
Sizes range from 1/8 to 1/4 inch thick, 4 to 5 feet in width and 8 to 12 feet in length.

H Beam
A 4 inch H beam is 4 inches wide and 4 inches high.

Expanded Metal
Come in gauge thickness and usually 4 to 5 foot width and 8 to 12 foot lengths.

Rectangular Tubing
Unequal dimensions (ex. 2"x4") steel tubing. Wall thickness varies from very light (ex. .080") to thick in larger sizes (ex. 1/2"). Also see square tubing.

Square Bar
Ranges in size from 1/8 inch and greater.

I Beam
Used to support structures (placed horizontally). Typical lengths 20-40 feet.

Square Tubing
Wall thickness varies from very light (ex. .080") to thick in larger sizes (ex. 1/2"). Heavier wall tubing is excellent for cultivator tool bars because of its smooth exterior finish and ability to withstand heavy loads.
Strip Iron
It is 1/8 inch or less in thickness and comes in various widths.

Chuck Key
Used in keyed chuck to tighten or loosen the chuck.

Morse Taper Sleeve
Used as an adaptor to insert different number taper shank twist drills into the drill press.

Tool Steel
It can be tempered to various degrees of hardness.

Countersink
The shank is 1/4 inch in diameter and can be used in hand or power drills.

Reduced Shank Drills
The shank of the drill comes in three sizes, 1/4, 1/2, and 3/4 inch.

Boring Tools (Metal)

Chuck
Used to hold a drill in a drill press or drill motor. May portable drill motors are using keyless chucks that are tightened by hand.

Drill Drift
Used for removing morse taper sleeves and tapered shank twist drills from a drill press. Also called a Center Key.

Straight Shank Twist Drill
If used on hard steel and at high speeds, it should be made of high speed steel.
Taper Reamer
Used to ream holes for tapered pins used on farm machinery and equipment.

Cold Chisel
Size is determined by the width of the cutting edge.

Ball Pein Hammer
This hammer is constructed with a ball at one end and a round crowned hammering face at the other. Also called a Machinist’s Hammer.

Tapered Shank Twist Drill
It should never be used in a chuck.

Chisels

Diamond Chisel
Use for cutting keyways and groves. Useful for tight places where a cold chisel is too large. Sized by the width of the cutting edge.

Blacksmith’s Hammer
The hammering surface is crowned. Designed for use in forming hot metal.

Cape Chisel
Use for cutting keyways and groves. Useful for tight places where a cold chisel is too large. Sized by the width of the cutting edge.

Round Nose Chisel
The sides of the shank are flattened and the width at the cutting edge determines the size.

Hammers (Metal)

Dead Blow Hammer
It does not absorb liquids or produce sparks when striking steel objects. Some models are weighted with lead shot.
Engineer’s Hammer
Sized are form 2 1/2 to 4 pound with handle length of 16 inches.

Hand Drilling Hammer
The head is made in three different sizes, 2, 3, and 4 pound. It has a short handle and can be used in tight places to drive punches and chisels.

Sledge Hammer
Looks like engineers hammer but much larger. 6-12 pounds in weight.

Tinner’s Hammer
The hammer head is beveled on one end and has a square face on the other.

Files, Threading, and Cutting Tools

File Card
The card is a small fine wire brush.

Bottoming Tap
Widely used in machine operations to complete a thread in a bottom of a hole.

Plug Tap
Used to cut threads in machine operations.

Tap Wrench
“T” type tap wrenches have an adjustable chuck.
SAE Tap
Used to cut Society of Automotive Engineers or National Fine threads in bored holes and nuts.

Die Stock
Used as a handle for dies.

Taper Tap
Also used to start threads in a blind hole.

USS Tap
Used to cut United States Standard or National Coarse threads in drilled holes or nuts.

SAE Dies
Used to cut Society of Automotive Engineers of National Fine (NF) Threads on bolts.

USS Die
The die cuts the male thread of a bolt or rod. USS also called National Course (NC) thread.

Hack Saw
The handle normally has a pistol type grip.

Screw Extractor
A hole is drilled in the center of the broken stud, and the extractor screwed into the hole in a counter clockwise direction. Also called an easy out.

Whet Stone
Used for sharpening tools such as wood chisels and other tools to a fine edge.
Metal Working

Round File
It is available 4 to 16 inches long and 3/16 to ¾ inches in diameter.

Single Cut File
It has a single series of teeth and is made in bastard cut, second cut and smooth type teeth.

Sheet Metal Tools

Adjustable Trammel Points
The trammel points can be adjusted to any point on the bar.

Aviation Snips
Available in straight, left, or right. Compound action makes cutting easier and the jaws are usually serrated. Also called Compound snips.

Flat Leg Pattern Dividers
Used for Precision Transferring of Segments From Pattern To Pattern.

Sheet Metal Layout Rule
It also has circumference measurements on the back side.

Tin Snip
There are four types available; regular straight snip, curved (left and right) snip, and duckbill snip.

Wing Dividers
Divider tips are adjustable by loosening a set screw and spreading the tips apart.

Power and Stationary Tools
Angle Grinder
Available in sizes from 2 to 9 inch. May be used with a grinding, sanding, or wire brush wheel.

Brake
Used for bending sheet metal.

Grinder
Used for sharpening and removing material. Stones are classified by diameter, width, and coarseness (i.e. 1" x 6" 80 grit).

Hydraulic Shear
Powered by a hydraulic pump and cylinder these shears commonly can cut flat stock, angle iron, and punch holes.

Sheet Metal Shear
Foot operated shear
Woodworking

Wood

Cedar
Known for its resistance to decay. Used for fencing.

Douglass Fir
Used primarily for structural framing. Very strong.

Oriented Strand Board (OSB)
Primarily made from wood chips. Used for shear walls and roof sheathing.

Particle Board
Primarily made from sawdust. Used for subfloor where shear strength is not needed.

Pressure Treated Lumber
Generally fir species that is treated to resist decay. Green in color.

Plywood
Composed of layers of wood sheets with the grain of each sheet glued at right angles. Very strong. Used for flooring, roof sheeting, and shear walls. Comes in various grades denoted by letters. A=best, D=worst. For example AC would be A on one side and C on the other. Plywood can be designated as interior or exterior depending on the type of glue used in its manufacture.

Redwood
Known for its resistance to decay. Used for landscaping, decking, etc.

Oak
A hardwood used for cabinets and similar applications. The grain is very distinctive. May be used as a solid wood or as a veneer on plywood or particle board.
Birch
A hardwood used for cabinets, door veneer, and similar applications. May be used as a solid wood or as a veneer on plywood or particle board.

Hammers (Wood)

Curved Claw Hammer
Used for driving and pulling nails. Face is commonly rounded for finish work. Weight 13-16 oz.

Shingler’s Hatchet
It has a gauge that can be adjusted for the desired shingle exposure and has a nail pulling slot in the back and above the cutting edge.

Back Saw
This saw should be used in a horizontal position.

Coping Saw
The blade is installed to cut on the pull stroke.

Straight Claw Hammer
The hammer head is the same as a curved claw hammer, but the claw is nearly straight. Weight 16-28 oz. Head may be smooth or serrated. Also called a Ripping hammer.

Mallet
Heads are made of wood, plastic, rawhide and rubber. Also called a Soft Headed Hammer.

Tack Hammer
One side of the head is magnetic and used for starting short tacks.

Saws And Accessories

Back Saw
The standard length is 26 inches. Typically 8-12 teeth/inch.
Woodworking

**Hand Rip Saw**
The edges of the teeth are not beveled, but are shaped like chisels. Typically 4-7 teeth/inch.

**Keyhole or Compass Saw**
Used for sawing curves, especially where the cut must be started from a hole bored with an auger bit.

**Circular Saw**
Primarily used for cutting wood, however many blades types are available for cutting sheet metal, metal, stone, and various other products. Available as a direct drive or worm drive.

**Belt Sander**
Sands or cuts using a sanding belt. Used for course sanding of large surfaces.

**Circular Saw Blade**
The size is determined by the diameter of the blade.

**Electric Drill**
Many models are variable speed.

**Finishing Sander**
Sands by a vibrating action.

**Jig Saw**
Many variations of blades are available for cutting wood, plastics, and other soft materials. Also called a Saber Saw

**Miter Saw**
The saw pivots on the miter box for various angles.
Woodworking

Nail Gun
Nails are fed automatically from a loading chamber and are dispensed by pulling the trigger.

Router
Depth of cut is adjustable. Used to shape wood (ex. round the edge of a board).

Jack Plane
Planing should be done with the grain of the wood. Note tail behind the handle.

Planer
Used for planing wood surfaces. A portable power version of a hand plane.

Screwdriver
Comes in many shapes and sizes. These power tools are battery or AC powered, reversible, and variable speed. They are commonly used for dry wall or decking installation. Many models also have a high speed range for drilling.

Reciprocating Saw
Similar to the jig saw but much larger and used for heavy duty work.

Block Plane
Sizes range form 5 1/2 to 7 inches long and 1 3/8 to 1 5/8 inches wide. Used to plane the end of a board.

Disc Sander
A stationary power tool with a 6-12 inch sanding disc.

Smooth Plane
Sizes range from 5 1/2 to 10 inches long and 1 1/4 to 2 3/8 inches wide.

Boring Tools (Wood)
**Woodworking**

**Forstner Bit**
A power bit for drilling flat bottomed holes in wood. Commonly found in sizes 3/8-2 inch.

**Auger Bit**
The straight round shank adapted for power drills.

**Expansive Bit**
The shank is a square taper, adapted for the bit brace.

**Hole Saw**
Hole saws come in sizes from ¾ to 2 1/2 inches and one mandrel fits all.

**Spade Bit**
A wood boring bit with a hex shaft to be used in a power hand drill or drill press.

**Nail Puller**
A pair of jaws is driven into the wood below the nail head by impact action of the handle.

**Cat's Paw**
A tool used to pull nails

**Hand Screw Clamp**
The wooden handles are mounted on opposite sides of the jaws.

**Nail Set**
The point has a slight hollow at the end.
**Woodworking**

**Surform Tool**
A tool like a wood rasp with a replaceable cutter. Available in flat, round, and half round shapes.

**Drywall Saw**
A tapered hand saw for cutting drywall.

**Band Saw**
Used for making curved cuts in wood or metal.

**Wood Chisel**
It is sharpened only on one side to a 25 or 30 degree angle and may be used with or across the grain.

**Drywall Trowel**
A flexible trowel for applying drywall compound and tapping.

**Drill Press**
A stationary drill.

**Wood Rasp**
Other rasps are 4-in-hand and horse rasps.

**Utility Knife**
A sharp knife for cutting drywall, roofing felt, etc.

**Radial Arm Saw**
A saw designed to cross cut and rip with the ability or cut compound angles.

**Stationary Power Tools**

**Construction**
Woodworking

Table Saw

A stationary saw used primarily for ripping lumber and sheet materials.
Concrete Tools And Supplies

Bull Float
A large float with a long detachable handle. Made from wood or magnesium. Common sizes are 8 inches wide by 36 or 48 inches long.

Concrete Edger
The ends may be curved up slightly. Used to finish the edges of concrete.

Concrete Tampers
A tubular steel frame handle is attached to the top which allows a person to operate the tamper while walking in the concrete. Also called a Jitterbug.

Corner Trowel
Size is 2 1/2 by 2 1/2 wide and 6 inches long. Used to finish corner in curbs, steps, etc. The handle placement determines if the trowel is outside or inside. Outside corner trowel is also called a step trowel.

Groover
It is 2 7/8 inches wide and 6 inches long with the ridge being 1/2 inch deep and 1/2 inch wide. Use to place groves in concrete slabs.

Hand Float
It is 4 to 5 inches wide and 13 inches long. Floats are used for rough finishing.

Finishing Trowel
The finishing trowel is made of steel and is 4 inches wide by 14 inches long.

Fresno Trowel
This large finish trowel also has a long detachable handle.

Hawks
The size is 13 x 13 inches square. Use to carry mortar.
Concrete

Masonry Bit
Used to drill in brick, block, and concrete. The tip is treated with tungsten carbide to resist heat and wear.

Reinforcing Bar
Available in 20, 30, and 40 foot lengths. Common sizes (diameter) of 3/8" to 1" are use in small construction projects.

Brick Chisel
Blade is 3 1/2 inches wide, overall length is 7 inches.

Mortar Hoe
It also has a 5 1/2 foot handle and holes in the hoe to aid mixing.

Sponge Rubber Float
Must be dipped continuously in water when working plaster to keep the plaster from adhering to the rubber.

Mud Pan
Used mostly with small trowels or putty knifes.

Brick Jointer
The jointer is bent at each end at about 20 degrees to allow the mason to use one end as a handle and the other as a jointer. The tool is used to finish the joints between bricks.

Brick Layer’s Hammer
The wedge shaped end is for scoring and cutting brick, and the other end is for tapping bricks into place when leveling.

Star Drill
It is operated by striking with a hammer while rotating by hand.
Brick Trowel

It is pointed and measures 4 ¾ inches by 11 inches.
**Plumbing Tools And Supplies**

### Plumbing Tools

**Acid Brush**
Used for applying pipe joint compound on threaded pipe and tinner’s fluid (acid) or flux on copper pipe for soldering. The handle is tubular sheet metal 3/8 inch in diameter and 6 inches long.

**Flaring Tool**
Used to make flared ends for soft tempered tubing.

**Pipe Cutter**
Too much pressure on the handle may cause the cutting wheel to break.

**Pipe Die**
Pipe dies should not be used for bolt threading as they are tapered.

**Pipe Die Stock**
Operates as a ratchet in both directions. Hold the pipe die.

**Pipe or Burring Reamer**
This type of reamer is made with bit brace shank, round shank, or “T” handle.

**Pipe Tap**
Used to cut internal threads in pipe fittings.

**Pipe Vise**
Used for holding pipe while cutting and threading.

**Pipe Wrench**
Adjustable and is used to turn pipe or conduit or round stock. Sizes 6” – 18” in length are common, but can be much larger.
**Plumbing Tools And Supplies**

**Propane Torch**
A propane/air torch that develops temperatures suitable for soldering.

**Teflon Tape**
Used for sealing threads on metal and PVC pipe and on valves.

**PVC Primer**
User to clean and soften PVC pipe before applying cement. Generally recommended for pipe 1" and larger.

**PVC Pipe Cutter**
This cutter makes smooth clean cuts.

**Tubing Cutter**
Used to cut copper and aluminum tubing.

**Compression Coupling**
Can be used on steel or PVC pipe. Usually used for repair or temporary connections.

**Solder**
It is available in 1 or 5 pound spools. Lead free solder is used for plumbing of domestic copper pipe.

**Wire Brush**
Used to clean metal parts to be soldered or welded and for cleaning pipe threads.

**Female Adaptor**
Used to connect PVC pipe to threaded pipe, has female ends.

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**PVC Pipe And Fittings**

California Agricultural Mechanics Tool Identification
Plumbing Tools And Supplies

Male Adaptor
The PVC slip end is female and the threaded end is male thread.

S Cap
Used to stop the flow on PVC pipe.

SxS Reducer Bushing
Used to connect PVC pipes of different diameters.

PVC Glue
When gluing, apply glue to both the fitting and the pipe, slide the two pieces together and rotate 1/4 turn for good adhesion.

SxS Coupling
Used to connect two pieces of pipe together in a straight line.

SxS Street Ell
Used to connect two pieces of PVC pipe at an angle.

SxS Elbow
Comes in 45 and 90 degree angles.

SxSxS Tee
Used to connect three pieces of PVC pipe together.

PVC Pipe
For domestic purposes, sizes range from 1/2 to 2 inch and it comes in 20 foot lengths.
SxSxT Tee
Used to connect a straight length of PVC pipe to a threaded pipe at an intersection.

SxT Street Ell.
Used to connect PVC pipe to threaded pipe at an angle.

Copper Tubing
Flexible tubing used for water applications. Sizes commonly 1/4"-2" O.D. Connections are soldered, flared, or compression type.

SxT Elbow
Used to connect PVC pipe to threaded pipe at a 45 or 90 degree angle.

Threaded Cap
Used to stop the flow on threaded pipe.

SxT Reducer Bushing
Used to connect PVC pipe to a smaller diameter threaded pipe.

CxC Street Ell
A street elbow for use the copper fittings. Often used with a C x C Ell to make a odd angle.

Copper Pipe and Fittings

Copper Pipe
Rigid pipe used for water supply plumbing. Sizes commonly 1/2" - 2". Connections are soldered. Copper pipe is available in three basic types: Type M is thin-walled, Type L is medium-walled and Type K is thick-walled.

C Cap
Used to stop the flow of liquid or gas in a copper pipe.
### Plumbing Tools And Supplies

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CxC Coupling</strong></td>
<td>Used to connect two copper pipes together.</td>
</tr>
<tr>
<td><strong>CxC Union</strong></td>
<td>Used to connect two copper pipes together when neither can be moved.</td>
</tr>
<tr>
<td><strong>CxT Adaptor or Male Adapter</strong></td>
<td>Used to connect copper pipe to threaded pipe.</td>
</tr>
<tr>
<td><strong>CxC Elbow</strong></td>
<td>Comes in 45 and 90 degree angles.</td>
</tr>
<tr>
<td><strong>CxCxC Tee</strong></td>
<td>Used to connect three pieces of copper pipe together.</td>
</tr>
<tr>
<td><strong>CxT Female Adapter</strong></td>
<td>Used to adapt to female threads.</td>
</tr>
<tr>
<td><strong>CxC Reducing Coupling</strong></td>
<td>Used to connect copper pipes of different diameters.</td>
</tr>
<tr>
<td><strong>CxCxT Tee</strong></td>
<td>Used to connect two copper pipes to a threaded pipe.</td>
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### Steel Pipe and Fittings

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<tr>
<td><strong>45 Degree Elbow</strong></td>
<td>A elbow that changes direction by 45 degrees. Both ends are female threads.</td>
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</table>
Plumbing Tools And Supplies

90 Degree Elbow
A elbow that changes direction by 90 degrees. Both ends are female threads.

Bushing
One end is hex shaped to receive a wrench.

Coupling
It is used to connect two pieces of pipe in a straight line.

Bell Reducer
Similar to a coupling, but changes pipe sizes.

Cap
Used to screw over the threaded end of a pipe to stop the opening.

Cross
It is shaped like a cross and is threaded inside at the four ends.

Black Pipe
Pipe lines may be constructed with threaded fittings or may be welded.

Close Nipple
A nipple that is as short as possible (threads touch).

Floor Flange
It is a steel flange with female threads in the center and holes drilled on the edge of the flange for bolts or screws.
Plumbing Tools And Supplies

Galvanized Pipe
Steel pipe with a galvanized coating to prevent corrosion. It should not be used in hydraulic systems.

Pipe Clamp
For 1/2 to 2 inch pipe.

Tee
Used to connect lateral branches of a pipe.

Hose Clamp
It consists of a circular steel collar with a tightening screw to secure the hose in place.

Pipe Plug
The end is square to accommodate a wrench.

Union
A three piece fitting. The center piece is hex shaped to accommodate a wrench and tighten the two outer pieces. Used to join two pipes so they can be easily disconnected or join threaded pipe in the middle of a piping run.

Nipple
Short pieces of threaded pipe, nipples are classified as close, short and medium, or are measured in inches of length.

Street Ell
An elbow with male thread on one end and female threads on the other. Available in 90 and 45 degree angles.

ABS Pipe and Fittings
ABS Pipe
Acrylonitrile-Butadiene-Styrene (ABS) pipe used for sewer applications. Pipe is black plastic. ABS fittings are glued like other plastic pipe systems. Male and female ends are designated as "spigot" and "hub" respectively. Elbows are not designated by degrees, but rather by the part of the circle (ex. 1/4 bend = 90 degrees). Pipe commonly is found in sizes from 1 1/4" to 6" and 20 foot lengths.

Double Wye Hub
Used for connecting two lines at a 45 degree angle to a straight ABS pipe.

Male Adaptor-Hub X Male Pipe
Used to connect ABS pipe to female pipe threads.

Adaptor-Spigot X Female Pipe
Used to connect female ABS pipe fitting to male pipe thread. Often used for cleanouts.

Female Adaptor-Hub X Female
Used to connect ABS pipe to threaded pipe.

P Trap Hub With Union
Liquid is held in the base of the P Trap to prevent the passage of air or gasses.

Long Sweep 1/4 Bend Hub
Used to connect ABS pipe at a 90 degree angle and allows for easy clean out when using a drain auger or plumbers snake to clean out lines.

Wye Hub
Used for attaching a line at a 45 degree angle to a straight line.

Valves
Plumbing Tools And Supplies

**Ball Valve**
By rotating the ball with the handle the valve closes or opens.

**Gate Valve**
The flow is stopped when the wedge or gate is lowered into the seat.

**Check Valve**
Once liquid has passed through the valve it cannot flow back.

**Cock Valve**
Used to stop the flow of liquid or gas through a pipe. Also called a Stop Cock

**Gate Valve**
The flow is stopped when the handle is screwed in, forcing the disk over the vent.

**Globe Valve**
The flow is stopped when the wedge or gate is lowered into the seat.

**Hose Bib**
It has standard pipe threads on one end and hose coupling threads on the other.

**Drain Auger**
By rotating the auger while feeding it into the line the auger bit tip cuts away the obstruction in the line.

**Pipe Joint Compound**
Used to seal threaded fittings. May be formulated for use with plastic pipe or steel pipe only.

**Plumbers Tape**
A galvanized flexible steel tape with holes for screws or nails used to secure plumbing. It is cut to length on the job, wrapped around the pipe and secured with a nail or screw.

**Misc Plumbing**
**Electrical Tools**

**Continuity Tester**
A device used to the continuity of a circuit.

**Multi-Testers or Volt-Ohm Meter**
An analog or digital meter that commonly will measure AC volts, DC volts, Ohms, and milli-amps.

**Voltage Tester**
Used for testing voltage on electrical outlets, fuse clips, and circuit breakers will test voltage from 120 to 600 volts.

**Conduit Bender**
This enables an electrician to make accurate 45 and 90 degree bends. Bender may be designated for EMT or rigid conduit.

**Electric Soldering Iron**
It has a replaceable copper tip. Soldering irons are sized from very light duty for soldering fine wires to heavy duty for soldering sheet metal.

**Fish Tape**
Fish tapes come in 25, 50 and 100 foot lengths.

**Fuse Puller**
Made of plastic to prevent electrician from being shocked while installing or removing fuses.

**Hickey**
The Hickey or bender is used for short radius bends.

**Knockout Punch**
Sizes range from 1/2 to 2 1/2 inches. Used to create a hole in panel for connecting conduit.
Lineman's Pliers
They are used on both bare and insulated wire. Note: These tools are also used for fence work and tying concrete rebar.

Non-Metallic Cable Ripper
Made of a thin “U” shaped metal piece.

Wire Stripper And Crimping Tool
Used for stripping wire, cutting wire and crimping wire terminals on stripped wire ends.

Long Nose Pliers
Also used for stripping wire, making eyes in wire and holding wire in place while inserting screws.

Soldering Gun
It is fitted with a replaceable tip and operates on 115-volt AC. Used primarily for soldering wires.

Electrical Supplies

NM Cable Cutter
A cutter for cutting Type NM cable.

Wire Stripper
Used to strip plastic coating from solid electrical wires without damaging the wire. Can be adjusted to be used on various wire sizes.

Armored Cable
This cable must run from box to box without splices.

Circuit Breaker
Used to protect the wire in a circuit. Rated in amps.
Electrical

**Knife Fuse**
The knife fuse is made in several sizes for service of 60 to 600 amps and is not interchangeable with cartridge fuses or knife fuses of different capacities.

**Core Solder**
It is available in spools. Rosin core is used to solder wires and acid core to solder sheet metal.

**Ground Rod**
It is connected to the electrical service box or meter can by a shielded ground wire and a ground clamp.

**Cartridge Fuse**
It is a cylinder shaped like a cartridge case and has metal ferrules at each end and a soft fusible element inside.

**Electric Cord**
A flexible cable used for extension cords and connecting power tools. May be plastic (e.g. Type xx) or rubber covered (e.g.. Type SJ)

**Ground Rod Clamp**
Connects a ground wire to a grounding rod, reinforcing bar, or metal water pipe. This provides for a good ground in the event of a power spike or lightning strike.

**Conduit Straps**
Conduit is placed in the curved portion and strap is secured by nails or screws. Single foot and double foot styles. Sized for EMT and rigid/PVC conduit.

**Friction Tape**
Used over rubber insulating tape on wire Splices and is used to replace the outer braid.
Insulated Staple
Commonly used for low voltage wire used in applications such as door bells or sprinkler controllers. It should not be used 120-volt lines.

Solderless Connector
Used where a permanent connection is desired. Connectors can be insulated or un-insulated. Commonly used for wiring on mobile equipment.

Non-Metallic Clamp
The cable is secured by means of a bracket tightened with screws. Used to secure a NM cable to a box.

Plastic Covered Electric Wire
The larger the number the smaller the wire.

Wire Nut
Used to connect AC wires. Color coded to denote capacity.

Strap Nail Drive
Made of die cast zinc, it is driven into wood with a hammer with conduit resting in curved end.

Plastic Tape
It is used alone without friction tape.

Non-matelic Cable Staples
Staples used to secure type NM cable to wood.

Non-Metallic Cable
A cable with a plastic cover used for residential indoor wiring. Commonly found with 3 and 4 conductor in sizes 14-6.
Single Conductor
A single conductor with thermal plastic insulation. Wire may be solid or stranded. Typical types are TW and THHN. Common sizes 14-0

Service Panel
Used to distribute power in a building. Contains a main disconnect and circuit breakers.

Electrical Metallic Tubing
A thin walled conduit. Commonly abbreviated as EMT. It is coupled with special fittings and is smooth inside. Manufactured in 10 foot lengths. Common sizes 1/2”-2”. Approved for indoor use.

UF Cable
A solid plastic covering is used on this cable making it suitable for direct burial of the cable.

Flexible Conduit
It consists of a heavily zinc coated steel strip wound spiraling, with interlocked construction permitting greater flexibility.

EMT Connector
Used to connect EMT conduit to a box, panel, or other threaded fitting.

Rubber Tape
Used on high voltage connections. It is covered with friction tape or plastic tape.

EMT Coupling
A compression fitting used to join EMT conduit.
The difference being, it is made of thin wall conduit and has no threads.

Rigid Conduit

It is available in galvanized and enamel finishes.

Rigid Elbow or Sweep

Sizes range from 1/2 to 2 inch.

Service Entrance Cap

Made of cast aluminum or PVC.

PCV Conduit

PVC conduit is used inside, outside or underground. Gray in color. Glued connections make it waterproof.

Ridged Entrance Ell

Has female thread on each end and has removable cap for access to wire for splicing or pulling.

PVC Coupling

Used to connect PVC conduit, must be glued and once connected cannot be removed.
**PVC Elbow or Sweep**
It has a long radius and is connected by gluing couplings on elbow and pipe.

**Cord Cap**
It is sometimes called a male plug. Used on extension cords and power tool cords.

**Junction Box**
Usually made of metal in square or octagon shaped boxes.

**PVC Male Adaptor**
Adapts PVC conduit to a threaded fitting for connecting to a box, panel, etc.

**Cord Connectors**
This connecting body is designed to accommodate the cord cap and is sometimes called a female plug.

**Lampholder**
A plastic or porcelain device that holds a lamp.

**PVC Pull Elbow**
Used to make 90 degree bends and has removable cap for splicing or pulling wire. Glues to PVC conduit. Types denote the location of the cover (e.g. LB, LR)

**Duplex Receptacle**
Receptacles may be installed in outlet boxes flush with the wall or in surface mounted boxes or junction boxes.

**Switch Box**
Comes with knockouts for non-metallic sheathed cable or electrical metallic tubing.
Three-Way Toggle Switch
Traveler or go between wires connect to lighter colored brass screws; hot wire is connected to the darker colored brass screw.

Toggle Switch
When the toggle switch is pushed up the service is on and off when pushed down.
Power Mechanics Tools

Compression Gauge
Ranges from 0 to 300 pounds.

Power Timing Light
Operates on 6 or 12 volt DC producing a blue-white flash for reading of timing mark.

Torque Wrench
Comes in 1/4, 3/8, 1/2, and 3/4 inch drives.

Expansion or Adjustable Reamer
Used for reaming piston pin holes, king pin holes, holes for water pump bushings, valve stem guides and other precision reaming jobs.

Spark Plug Gauge Set
Usually ranges from .020 to .040 thick wire sizes.

Impact Wrenches
Available in 3/8, 1/2 and 3/4 inch drive.

Tachometer
Useful for checking speed on tools, machines, and engines.

Grease Guns And Fittings

Air Pressure Type Grease Gun
It is portable but must be attached to an air line.

Lever Type Grease Gun
It is filled by hand, cartridge, or from an air pressure gun.
Zerk Grease Fitting
This fitting will withstand high pressure. The grease gun "snaps on" to the fitting.
## Welding

### Arc Welding Tools

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<tr>
<th>Tool</th>
<th>Image</th>
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<td><strong>Arc Welder Power Supply</strong></td>
<td><img src="image" alt="Arc Welder Power Supply" /></td>
<td>Converts AC power to welding current. SMAW and GTAW processes use constant current power supplies and GMAW processes use constant voltage power supplies.</td>
</tr>
<tr>
<td><strong>Gas Regulator</strong></td>
<td><img src="image" alt="Gas Regulator" /></td>
<td>Used with GMAW and GTAW to control the flow of shielding gas.</td>
</tr>
<tr>
<td><strong>GTAW Torch</strong></td>
<td><img src="image" alt="GTAW Torch" /></td>
<td>Holds a non-consumable electrode and directs shielding gas to the weld.</td>
</tr>
<tr>
<td><strong>Chipping Hammer</strong></td>
<td><img src="image" alt="Chipping Hammer" /></td>
<td>One end of the head is shaped with a blunt point, and the other end is shaped like a cold chisel. Also called Slag hammer.</td>
</tr>
<tr>
<td><strong>GMAW wire feed</strong></td>
<td><img src="image" alt="GMAW wire feed" /></td>
<td>Used with a constant voltage power supply and a gas source (e.g. carbon dioxide, argon) for GMAW process.</td>
</tr>
<tr>
<td><strong>Ground Clamp</strong></td>
<td><img src="image" alt="Ground Clamp" /></td>
<td>Used to connect one of the cable leads from the welding machine to the welding table or the material being welded so as to make a complete circuit.</td>
</tr>
<tr>
<td><strong>Leather Gloves</strong></td>
<td><img src="image" alt="Leather Gloves" /></td>
<td>Gauntlet style gloves are recommended.</td>
</tr>
<tr>
<td><strong>Plasma Cutter</strong></td>
<td><img src="image" alt="Plasma Cutter" /></td>
<td>Uses an arc and compressed gas to create a plasma stream for cutting and gouging of ferrous and non-ferrous metals.</td>
</tr>
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**Electrode Holder**

Connected to the welding cable and holds the electrode for SMAW process welding.
Welding Helmet
A colored lens filters out harmful light rays. Lens shades

Arc Welding Electrodes

Hard Facing Electrode
Hard facing rod is not classified by a numbering system. Each manufacturer has their own nomenclature for their particular rod.

SMAW Electrode
Electrode used in the SMAW process for example E-6010. E meaning it is an electrode, 60 means it has a tensile strength of 60,000 PSI, 1 indicates welding in all positions, 0 indicates the coating to be cellulose sodium and the welding current is DCEP or direct current electrode positive.

Solid Welding Wire Electrode
Identified in a similar manner as SMAW rod. For example ER-70S-4. Solid wire is classified in an ER means it is an electrode, 70 is tensile strength, S means it is solid wire, 4 is type of shielding gas. Shield Gases: 2. C02-A-O2, 3. C02A-O, A-C02, 4. C02, 5. C02, 6. C02A-O, 7. C02A-O2 and C02=Carbon Dioxide, C02A-O=Carbon Dioxide, Argon and Oxygen, A-C02 = Argon and CO2.

Tubular Wire Electrode
Tubular electrode (e.g. E-70T-L) is flux cored., and the last number is position and usability capabilities, as no gas is required for tubular flux cored rod. See Solid Welding Wire Electrode. Also called innershield wire since the shielding flux is "inside".
**Tungsten Electrode**
Non-consumable electrode used for GTAW process welding.

**Oxyacetylene Welding Tools**

**Cutting Torch**
It consists of valves for mixing oxygen and acetylene, and a valve lever attached to the torch handle to release oxygen which does the cutting.

**Heating Tip**
A tip with multiple orifices used to for heating metal usually for bending. Also called a rosebud.

**Brazing Rod**
Available in 1/16 to 3/16 inch diameter and 36 inches long.

**Copper Coated Mild Steel**
Available in 1/16 to 3/16 inch diameter and 36 inches long.

**Cutting Tip**
The larger center hole is for pure oxygen to oxidize or cut the metal.

**Flux Coated Brazing Rod**
Generally available in 1/8 inch diameter rod.

**Acetylene Regulator**
The threads on the hose connector are left hand.

**Oxygen Regulator**
The threads on the hose connector are right hand. Commonly a two stage regulator.
Welding

**Tip Cleaner**
It consists of several needle-like round files of different sizes.

**Welding Tip**
The tips come in various sizes.

**Other Welding Equipment**

**Torch Handle**
Quite often called a torch butt.

**Spot Welder**
Used for welding sheet metal.

**Welding Goggles**
Used to protect the eyes from harmful rays and from spatter when using the welding torch.
### Painting

#### Non-woven Abrasive Pads
A plastic abrasive pad. Non-rusting and washable. Commonly called Scotch-Brite pads (3M brand name).

#### Airless Paint Sprayer
No thinning is required and very little over-spray is developed. Uses a positive displacement pump to pump the paint at high pressure.

#### Drop Cloth
Disposable cloths are made of paper or plastic and permanent cloths are made of canvas or soft cotton cloth.

#### Caulking Gun
One to two pound cartridge refills are available in various colors.

#### Glass Cutter
Pressure applied on the glass from beneath the scratch or tapping gently will cause it to break cleanly along the cutter line.

#### Dust Masks
This mask is disposable and should not be reused.

#### Glazier Points
The glazier points, triangular pieces of zinc coated metal, are driven into the sash about 6 inches apart to hold the glass in place.

#### Filter
Used to filter foreign material from paints, particularly those used in paint guns.

#### High Volume Low Pressure Sprayer
Similar in design to an compressed air sprayer, but low pressure produces less fine spray, causes less drift, and air pollution.
Painting

Masking Tape
It will adhere to paper, glass, walls and metal and is easily removed.

Paint Brush
Brushes should be cleaned immediately after painting with a suitable thinner or cleaning agent.

Mixing Paddle
Used in an electric drill to stir paint and other liquids.

Paint Roller And Pan
Special rollers are available for painting corners and trim.

Paint Brush
Natural bristle brushes are used for oil based paints. Polyester and nylon brushes are used with water based paints. Sizes are commonly found from 1” to 6” widths. Clean immediately after using with solvent appropriate for the type of paint used.

Putty Knife
Sizes range from 1 inch to 12 inches. Used to apply putty to the window sash to seal the glass. A flexible bladed knife for applying putty and spackle. Stiffer knives can be used for scraping.

Respirator
This filter system is far superior to the dust mask.

Sandpaper
Comes in various grits from very fine to very coarse.

Spray Gun
Should be used in a closed area with proper ventilation and good air filtration. Uses compressed air to spray the paint.
Steel Wool
Comes in pads or rolls and size is designated by 4/0, 3/0, 2/0, 1/0, 0, 1, 2, 3, 4, with 4/0 being the finest and 4 being very coarse.
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