

## PART A. SHOP TERMS

- anneal** (*v.*) To soften a metal piece and remove internal stresses by heating to its critical temperature and allowing to cool very slowly.
- arc-weld** (*v.*) To weld by electric-arc process.
- bore** (*v.*) To enlarge a hole with a boring tool, as in a lathe or boring mill. Distinguished from *drill*.
- boss** (*n.*) A projection of circular cross section, as on a casting or forging.
- brazed** (*v.*) To join by the use of hard solder.
- broach** (*v.*) To finish the inside of a hole to a shape usually other than round. (*n.*) A tool with serrated edges pushed or pulled through a hole to enlarge it to a required shape.
- buff** (*v.*) To polish with abrasive on a cloth wheel or other soft carrier.

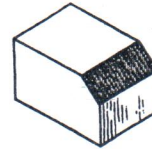
- burnish** (*v.*) To smooth or polish by a rolling or sliding tool under pressure.
- bushing** (*n.*) A removable sleeve or liner for a bearing; also a guide for a tool in a jig or fixture.
- carburize** (*v.*) To prepare a low-carbon steel for heat-treatment by packing in a box with carbonizing material, such as wood charcoal, and heating to about 2000°F for several hours, then allowing to cool slowly.
- caseharden** (*v.*) To harden the surface of carburized steel by heating to critical temperature and quenching, as in an oil or lead bath.
- castellate** (*v.*) To form into a shape resembling a castle battlement, as castellated nut. Often applied to a shaft with multiple integral keys milled on it.
- chamfer** (*v.*) To bevel a sharp external edge. (*n.*) A beveled edge.



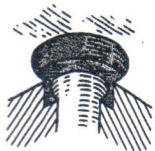
Boss



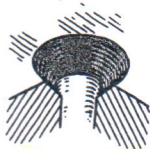
Bushing



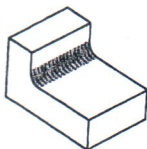
Chamfer



Counterbore



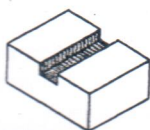
Countersink



Fillet



Flange



Kerf

- chase** (*v.*) To cut threads in a lathe, as distinguished from cutting threads with a die. (*n.*) A slot or groove.
- chill** (*v.*) To harden the surface of cast iron by sudden cooling against a metal mold.
- chip** (*v.*) To cut or clean with a chisel.
- coin** (*v.*) To stamp and form a metal piece in one operation, usually with a surface design.
- cold-work** (*v.*) To deform metal stock by hammering, forming, drawing, etc., while the metal is at ordinary room temperature.
- color-harden** (*v.*) To caseharden to a very shallow depth, chiefly for appearance.
- core** (*v.*) To form the hollow part of a casting, using a solid form made of sand, shaped in a core box, baked, and placed in the mold. After cooling, the core is easily broken up, leaving the casting hollow.
- counterbore** (*v.*) To enlarge a hole to a given depth. (*n.*) 1. The cylindrical enlargement of the end of a drilled or bored hole. 2. A cutting tool for counterboring, having a piloted end the size of the drilled hole.
- countersink** (*v.*) To form a depression to fit the conic head of a screw or the thickness of a plate so that the face will be level with the surface. (*n.*) A conic tool for countersinking.
- crown** (*n.*) Angular or rounded contour, as on the face of a pulley.
- die** (*n.*) 1. One of a pair of hardened metal blocks for forming, impressing, or cutting out a desired shape. 2. (thread). A tool for cutting external threads. Opposite of *tap*.
- die casting** (*n.*) A very accurate and smooth casting made by pouring a molten alloy (or composition, as Bakelite) usually under pressure into a metal mold or die. Distinguished from a casting made in sand.
- die stamping** (*n.*) A piece, usually of sheet metal, formed or cut out by a die.
- draw** (*v.*) 1. To form by a distorting or stretching process. 2. To temper steel by gradual or intermittent quenching.
- drill** (*v.*) To sink a hole with a drill, usually a twist drill. (*n.*) A pointed cutting tool rotated under pressure.
- drop forging** (*n.*) A wrought piece formed hot between dies under a drop hammer by pressure.
- face** (*v.*) To machine a flat surface perpendicular to the axis of rotation on a shaft. Distinguished from *turn*.
- feather** (*n.*) A flat sliding key, usually fastened to the hub.
- fettle** (*v.*) To remove fins and smooth corners on unfired ceramic products.
- file** (*v.*) To finish or trim with a file.
- fillet** (*n.*) A rounded filling of the interior angle between two surfaces.
- fin** (*n.*) A thin projecting rib. Also, excess ridge of material.
- fit** (*n.*) The kind of contact between two machined surfaces. 1. *Drive, force, or press*: When the shaft is slightly larger than the hole and must be forced in with sledge or power press. 2. *Shrink*: When the shaft is slightly larger than the hole, the piece containing the hole is heated, thereby expanding the hole sufficiently to slip over the shaft. On cooling, the shaft will be seized firmly if the fit allowances have been correctly proportioned. 3. *Running or sliding*: When sufficient allowance has been made between sizes of shaft and hole to allow free running without seizing or heating. 4. *Wringing*: When the allowance is smaller than a running fit and the shaft will enter the hole by twisting it by hand.
- flange** (*n.*) A projecting rim or edge for fastening or stiffening.
- forge** (*v.*) To shape metal while hot and plastic by a hammering or forcing process either by hand or by machine.
- galvanize** (*v.*) To treat with a bath of lead and zinc to prevent rusting.
- graduate** (*v.*) To divide a scale or dial into regular spaces.
- grind** (*v.*) To finish or polish a surface by means of an abrasive wheel.
- harden** (*v.*) To heat hardenable steel above critical temperature and quench in bath.
- hot-work** (*v.*) To deform metal stock by hammering, forming, drawing, etc., while the metal is heated to a plastic state.
- kerf** (*n.*) The channel or groove cut by a saw or other tool.



**key (n.)** A small block or wedge inserted between shaft and hub to prevent circumferential movement.

**keyway, key seat (n.)** A groove or slot cut to fit a key. A key fits into a key seat and slides in a keyway.

**knurl (v.)** To roughen or indent a turned surface, as a knob or handle.

**lap (n.)** A piece of soft metal, wood, or leather charged with abrasive material, used for obtaining an accurate finish. (v.) To finish by lapping.

**lug (n.)** A projecting "ear," usually rectangular in cross section. Distinguished from *boss*.

**malleable casting (n.)** An ordinary casting toughened by annealing. Applicable to small castings with uniform metal thicknesses.

**mill (v.)** To machine with rotating toothed cutters on a milling machine.

**neck (v.)** To cut a groove around a shaft, usually near the end or at a change in diameter. (n.) A portion reduced in diameter between the ends of a shaft.

**normalize (v.)** To remove internal stresses by heating a metal piece to its critical temperature and allowing to cool very slowly.

**pack-harden (v.)** To carburize and case-harden.

**pad (n.)** A shallow projection. Distinguished from *boss* by shape or size.

**peen (v.)** To stretch, rivet, or clinch over by strokes with the peen of a hammer. (n.) The end of a hammer head opposite the face, as *ball peen*.

**pickle (v.)** To clean castings or forgings in a hot weak sulfuric acid bath.

**plane (v.)** To machine work on a planer having a fixed tool and reciprocating bed.

**planish (v.)** To finish sheet metal by hammering with polished-faced hammers.

**plate (v.)** The electrochemical coating of a metal piece with a different metal.

**polish (v.)** To make smooth or lustrous by friction with a very fine abrasive.

**profile (v.)** To machine an outline with a rotary cutter usually controlled by a master cam or die.

**punch (v.)** To perforate by pressing a non-rotating tool through the work.

**ream (v.)** To finish a drilled or punched hole very accurately with a rotating fluted tool of the required diameter.

**relief (n.)** The amount one plane surface of a piece is set below or above another plane, usually for clearance or for economy in machining.

**rivet (v.)** 1. To fasten with rivets. 2. To batter or upset the headless end of a pin used as a permanent fastening.

**round (n.)** A rounded exterior corner between two surfaces. Compare with *fillet*.

**sandblast (v.)** To clean castings or forgings by means of sand driven through a nozzle by compressed air.

**shape (v.)** To machine with a shaper, a machine tool differing from a planer in that the work is stationary and the tool reciprocating.

**shear (v.)** To cut off sheet or bar metal between two blades.

**sherardize (v.)** To galvanize with zinc by a dry heating process.

**shim (n.)** A thin spacer of sheet metal used for adjusting.

**shoulder (n.)** A plane surface on a shaft, normal to the axis and formed by a difference in diameter.

**spin (v.)** To shape sheet metal by forcing it against a form as it revolves.

**spline (n.)** A long keyway. Sometimes also a flat key.

**spot-face (v.)** To finish a round spot on a rough surface, usually around a drilled hole, to give a good seat to a screw or bolt-head, cut, usually  $\frac{1}{16}$  in deep, by a rotating milling cutter.

**spot-weld (v.)** To weld in spots by means of the heat of resistance to an electric current. Not applicable to sheet copper or brass.

**steel casting (n.)** Material used in machine construction. It is ordinary cast iron into which varying amounts of scrap steel have been added in the melting.

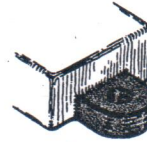
**swage (v.)** To shape metal by hammering or pressure with the aid of a form or anvil called a "swage block."



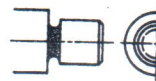
Keyway



Key and seat



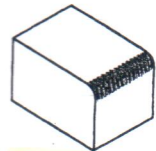
Lug



Neck



Pad



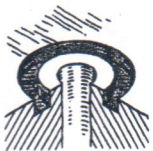
Round



Spline



Spot-face



Trepan



Undercut

**trepan (v.)** To cut an outside annular groove around a hole.

**tumble (v.)** To clean, smooth, or polish castings or forgings in a rotating barrel or drum by friction with each other, assisted by added mediums, as scraps, "jacks," balls, sawdust, etc.

**turn (v.)** To machine on a lathe. Distinguished from *face*.

**undercut (v.)** To cut, leaving an overhanging edge. (n.) A cut having inwardly sloping sides.

**upset (v.)** To forge a larger diameter or shoulder on a bar.

**weld (v.)** To join two pieces by heating them to the fusing point and pressing or hammering together.

**sweat (v.)** To join metal pieces by clamping together with solder between and applying heat.

**tack-weld (v.)** To join at the edge by welding in short intermittent sections.

**tap (v.)** To cut threads in a hole with a rotating tool called a "tap," having threads on it and fluted to give cutting edges.

**temper (v.)** To change the physical characteristics of hardened steel by reheating to a temperature below the critical point and allowing to cool.

**template, templet (n.)** A flat pattern for laying out shapes, location of holes, etc.