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Glossary of common
MACHINERY
TERMS



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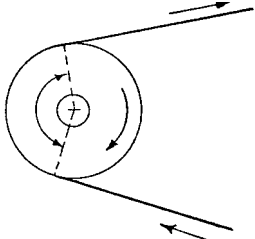
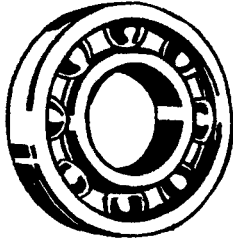
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INTRODUCTION

This glossary has been prepared to familiarise factory inspectors with the common machinery terms they may come across in their work.

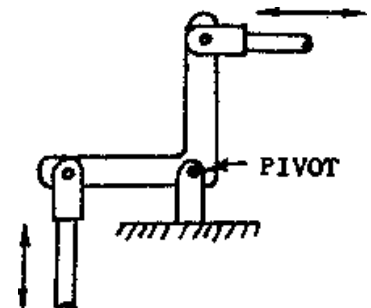
It replaces the earlier *Machinery Terms Glossary* published by the Department, and includes more terms, extended definitions and sketches which were not featured in the earlier glossary.

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ABRASIVE	Mineral or other substance used for grinding, sharpening etc. e.g. aluminium oxide, silicon carbide, diamond dust.	
ACCUMULATOR (Hydraulic)	A device or vessel used to store fluid at a constant pressure, and to even out pressure fluctuations.	
AGITATOR	A device for stirring or shaking liquids, powders or mixtures.	
ALLOY	A combination of metals mixed together in desired quantities to achieve a product with required properties, e.g. hardness, strength, fatigue resistance, etc.	
ANGLE BRACKET	A bracket used to join or support two objects at an angle, usually a right angle (90 degrees).	
ANGLE IRON	Rolled steel of "L" shaped cross section. The two "legs" may be of equal or unequal length.	
ANGLE OF CONTACT	The angle around the rim of a pulley where the belt is touching (viewed from the centre of the pulley).	
ANGLE PLATE	An accurate angle bracket with slotted faces used to hold a workpiece, say, to a machine.	
ARBOR	A shaft on which a cutter, wire brush, grindstone, etc. can be mounted. Usually removable from a machine.	
AXLE	A stationary shaft or pin around which a wheel or similar revolves.	
BACKLASH	"Lost" motion or play between two parts of a mechanism; the amount the first part has to move before transmitting its motion to the other.	
BALING PRESS	A machine, usually hydraulic, for compressing loose materials, e.g. wool, waste papers, into bales.	
BALL-BEARING	A bearing comprising two steel rings or races, one usually pressed onto a shaft, the other supported in a housing, separated by hardened steel balls running in grooves in the races.	
BALL JOINT	A connection between two links in which the end of one member is partly spherical and fits into a corresponding cavity in the other member, thus allowing angular movement between them.	

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BALL MILL	A rotating vessel containing balls of stone or steel, used to crush material placed inside it.
BAND BRAKE	A flexible band lined with friction material, wrapped partly around a drum. One end is anchored, and braking force is applied at the other.
BAND SAW	A strip of flexible sawblading running on, and driven by two pulleys, usually vertical and one above the other. The down-running portion of the saw band between the pulleys is used for cutting wood, meat, metal and other materials into desired lengths or shapes.
BARRING	Turning of a shaft or flywheel by hand, using a steel bar (tommy bar).
BEADING	Thickening the edge of a thin sheet of metal, usually by folding it over, to strengthen it.
BEAM	(1) A structural member, usually horizontal, supported at the ends and loaded vertically. (2) A focused transmission of light or other energy. (3) The main moving member of a down-stroking press brake. The tool is attached to its lower edge.
BEARING	A device to support a shaft in its correct position and allow it to rotate with as little friction as possible. (See ball-bearing, bush, roller bearing.)
BEARING METALS	Metal alloys, used for the surface of plain bearings which are in “contact” with the shaft, selected for long life and low friction, e.g. bronze, white-metal.
BELL CRANK LEVER	A two-armed lever with the arms usually set at right angles to each other, pivoted at the meeting point.
BELL MOUTH	An open-ended vessel or pipe, with the end shaped in the form of a bell, or trumpet.
BELT	An endless strip of leather, reinforced rubber or other material used to transmit rotary motion from one shaft to another by running over pulleys having flat or grooved rims.

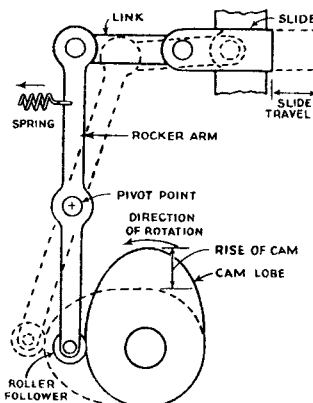


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BELT CREEP	A gradual movement of a belt relative to the face of the pulley on which it runs, caused by the change in the stretch of the belt as it passes from the tight to the loose side of the belt.
BELT SLIP	The slipping of a driving belt on the face of a pulley due to insufficient frictional grip to overcome the resistance to motion offered by the pulley.
BELT STRICKER (Shifter)	A device for shifting a flat belt from a fast pulley to a loose pulley of the same diameter, mounted beside it.
BILLET	An intermediate product in the rolling of steel, larger than a bar and smaller than a bloom. Also applied to certain ingots.
BLANK	A piece of metal, roughly shaped, ready for further machining.
BLANKING	The process of forming blanks, usually by punching from strip or plate in a press.
BLIND HOLE	A hole drilled only part-way through a component — one that has a solid bottom.
BOLSTER	The main support for a die on a press.
BOND	Refers to the material which binds the abrasive particles together in a grindstone.
BELT DRESSING	Substance used to prolong the life and improve the frictional grip of belts on their pulleys
BELT FASTENERS	Connecting devices used to join the ends of a strip of belting to form a “loop” or endless belt.
BELT POLISHER	See LINISHER.
BORE	Internal diameter of a hollow cylindrical component.
BORING	The operation of making large round holes in a workpiece with an offset single-point tool (as opposed to drilling a hole) either on a lathe or in a boring machine.
BOSS	A projection, usually cylindrical, on a machine part, in which a pin or shaft is to be supported.
BOTTOMING	When a reciprocating part, such as a press tool, touches a solid object at the extreme end of its stroke.
BRAKE	A device for slowing or stopping a moving part, usually a rotating component.

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BRAKE DRUM	A cylindrical drum against which brake shoes are forced, or a brake band is tensioned, to slow the shaft or component on which the drum is mounted.
BRAKE HORSEPOWER	Imperial unit for effective power available at the output of a prime mover.
BRAKE LINING	Strips of friction material, usually asbestos-based, fixed to the brake shoes or band, used to increase the friction between the brake drum and brake shoes and provide a renewable wearing surface.
BRAKE SHOE	A member lined with friction material which is forced against the brake drum to cause friction and slow it down.
BRANCH	An outlet from the side of a pipe, usually formed by welding another pipe to the side of the main one.
BUFF	A “wheel” made of layers of cloth or similar material used for polishing.
BUFFING	Polishing, by applying polish to a buff and running it over the surface to be polished.
BURR	(1) A rough or sharp edge left on a workpiece by a cutting tool. (2) To deform the end or edge of a component by hammering, usually to help it grip another component.
BUSH	A plain bearing in the form of a cylindrical sleeve, inside which the shaft rotates.
CAM	A specially shaped plate or drum, or a plate or drum having a specially shaped groove, used to cause a desired linear motion to a “cam follower”. May be mounted on a shaft, i.e. rotary cam, or on a sliding member, i.e. linear cam. May be used to operate limit switches or hydraulic and pneumatic valves in interlock mechanisms.



How a simple plate cam converts rotary motion into straight-line motion. Dotted outline shows the position of the cam follower and rocker shaft after the cam has made a quarter turn counterclockwise. On the next quarter turn, the cam follower returns to its original position.

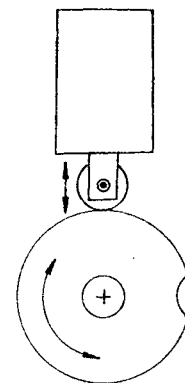


Plate cam operating normally closed limit switch

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CANTILEVER	Beam or member supported firmly at one end and unsupported at the other, carrying a 'sideways' load.
CASTING	(1) The production of metal components by pouring molten metal into moulds and allowing it to solidify. (2) A metal component produced by casting.
CENTRE (Machine Tools)	A tapered device which is fitted to the headstock or tailstock of a lathe or other machine tool, to support and centralise a component whose ends have been centre drilled.
CENTRE DRILL	A drill which drills a tapered hole in a workpiece, usually in the centre, subsequently used to mount the workpiece in a lathe, between "centres", or as an accurate starting point for a drill.
CENTRE LINE	A marked line on workpiece about which dimensions can be equally divided.
CENTRE PUNCH (Centre Pop)	A hardened steel punch, tapering to a point at one end used for marking the centres of holes to be drilled.
CENTRIFUGE	A device used for separating heavier from lighter parts of a mixture, e.g. solids from liquids, by rotating a container at high speeds. The centrifugal force is greater on the heavier parts, so they move to the "outside" of the container furthest from the axis.
CHAIN	A series of interconnected metal links, producing a "flexible cable" used for supporting loads in tension or for transmission of power between shafts, by running over sprockets (chain wheels).
CHAIN CONVEYOR	A conveyor built up in the form of a chain — usually overhead, supporting the components being conveyed on hooks below.
CHAIN SAW	A powered woodcutting saw, the cutting teeth of which are carried around the edge of a flat steel blade on a drive chain. Usually petrol driven but may be electric. Used for felling trees, etc.
CHANNEL STEEL	Steel bar rolled into the form of a flat bottomed 'U'.
CHEQUER PLATE	Steel plate with the surface roughened in a diamond pattern, used for 'non-slip' flooring.
CHUCK	A device attached to the spindle of machine tools used for gripping revolving workpieces, cutting tools, twist drills etc.
CLUTCH	A device used to connect or disconnect (engage or disengage) two rotatable parts so they revolve as one unit or separately, as required. Generally one of two types:

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(1) **FRICTION CLUTCH:** A clutch which relies on friction to transmit movement from one part to another, thus it may be partially engaged if required to transmit only some of the available torque (rotary force), or engaged progressively to provide smooth engagement as in the clutch of a car.

(2) **POSITIVE CLUTCH:** A clutch in which the movement is transmitted between the members by a positive mechanical action. It is either fully engaged or fully disengaged and cannot be slipped or engaged smoothly like a friction clutch.

CLUTCH EXTRACTOR Part of the mechanism of a positive clutch found on presses and similar machines used for disengaging the clutch at the end of a stroke, and holding it disengaged until the next stroke is initiated.

COG A tooth on a gear wheel (more properly— a wooden tooth on a wooden wheel).

COLLAR A raised ring on the surface of a shaft. May be an integral part of the shaft or fixed to it in some way, often used to locate a component on the shaft.

COMPRESSOR A device for compressing (pressurising) a gas.

CONCENTRIC Two parts are concentric if they rotate about the same axis, or if they are mounted so that their centre lines coincide.

CONE PULLEY See **STEPPED PULLEY**.

CONNECTING ROD A rigid rod connecting a crank pin to a piston, crosshead or slider. One end describes a circular path, travelling with the crank pin, and the other end travels in a straight line with the piston or slider.

CONTRACTION Shrinkage of metal during solidification and subsequent cooling causes castings to finish up smaller than the original moulds.

CONVEYOR A device for moving materials or objects from one place to another by means of a moving belt, chain etc.

COTTER-PIN A tapered pin or wedge, used to locate and connect a pulley etc. shaft.



Counterbore

COUNTERBORE (1) A parallel enlargement of the mouth of a hole.
(2) Tool to produce this parallel enlargement.

COUNTERSINK (1) A tapered enlargement of the mouth of a hole.
(2) Tool to produce this tapered enlargement.



Countersink

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COUNTERSHAFT

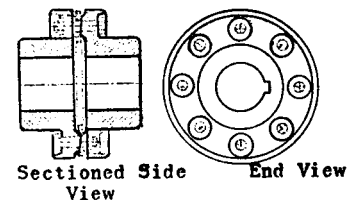
A short, intermediate shaft in a drive, usually fitted with gears, pulleys or sprockets.

COUNTERWEIGHT

A weight used to balance part or all of the weight of an object which must be lifted, to ease the job of lifting it.

COUPLING

A semi-permanent connection between two shafts to transmit rotary motion between them. May be solid, or may allow a small amount of misalignment view between the shafts by incorporating flexible members.



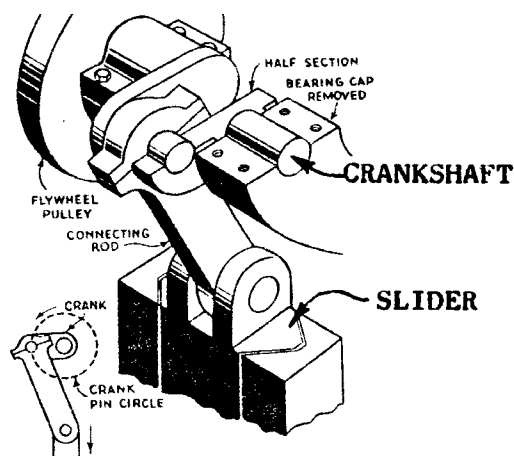
Details of one type of coupling

CRANK

A lever attached to a shaft, carrying a pin whose axis is offset from but parallel to, the axis of the shaft. In general, the radius of the crankpin is smaller than the offset between the axes (throw).

CRANKSHAFT

A shaft to which a crank and crankpin are fitted and about which they rotate.



Slide motion of most single-action punch presses is obtained from a simple crank motion. One of the crank "throws" is shown cut away to reveal the construction.

CROSS SECTION

The shape of a part seen when "cut" or "sectioned" in a specified place, usually at right angles to the axis.

CUTTING FLUID

Oil or other liquid applied to a cutting tool to cool and lubricate it.

CYCLE

One of a repeating series of events or sequence of operations performed by a machine, from start to finish.


CYCLONE

A large conical container used to separate dust or powder from an airflow.

CROW-BAR (Pinch bar)

A steel bar, flattened at one end, used for levering or prizing.

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- DAYLIGHT** The distance between the bottom of the tool and the top of the die in a press when they are furthest apart. (N.B. Daylight may not equal the stroke of the machine.)
- DEAD CENTRE**
(Top and bottom) Innermost and outermost positions of a crank-driven slide or piston. The crank pin, crankshaft axis and connecting rod will all be in line.
- DIE** A specially shaped steel device which when used with a matching die, tool or punch in a press will form, punch or bend a workpiece. On other machines, the die is that component which gives the workpiece its shape (e.g. extrusion dies, injection moulding dies etc.).
- DIE CASTING** A process in which molten metal is forced into a metal die, which gives the final shape of the product, and allowed to cool and solidify.
- DIE NUT** A tool, resembling a nut, used to cut a screw thread on a bar or shaft.
- DRAWING** A process where metal is stretched and formed into cup-like shapes by drawing dies in a press.
- DRILL** A revolving tool used for cutting (twist drill) cylindrical holes in the workpiece. It has cutting edges at one end, helical grooves to allow the cut material to escape, and the other end is formed for holding in a drill chuck or the tapered bore of a machine spindle.
- 
- DRILL CHUCK** A small self-centering chuck having three jaws which grip a drill shank. The chuck is mounted on the spindle of a drill press, hand drill etc.
- DRILL PRESS** A machine tool for drilling holes, generally consists of a vertical pillar, carrying an adjustable table to support the workpiece and a "head" at the top containing the motor, transmission, and the spindle on which the drill or chuck is mounted. The side under tension, running from the driven pulley to the driving pulley.
- DRIVER AND DRIVEN**
(gears etc.) A pair of gears, one driving the other. The term is also used for other transmission types.
- DRUM** A spool on which chain or rope is coiled, in a winch or crane, etc.

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DRUNKEN SAW

A circular saw blade mounted not exactly at right angles to its spindle, consequently cutting a wide kerf (groove).

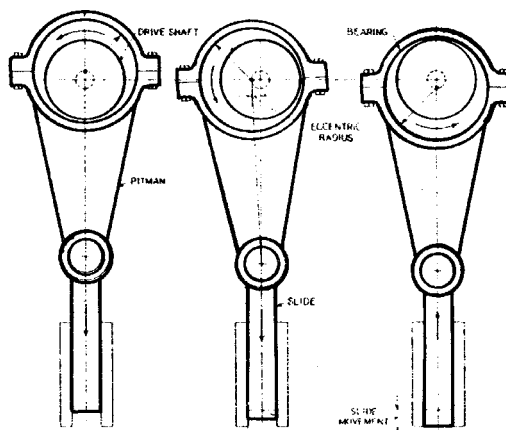
DRIVING SIDE (belt or chain)

The side of a transmission belt or chain which transmits the power.

ECCENTRIC

(1) Displaced with respect to a centre, not concentric.

(2) A crank in which the pin diameter is so much greater than the offset (throw) that the result is a drum or disc mounted eccentrically on the shaft.



An eccentric is a machine element for converting rotary motion into straight-line motion. As the shaft carrying the eccentric is rotated, the slide moves up and down. This mechanism is applied to shears and various power presses.

ELASTIC LIMIT

The limiting value of deforming stress applied to a material beyond which it will not return to its original shape, i.e. permanent deformation occurs.

ELEVATOR

(1) A cage or platform which can be raised and lowered, carrying people or goods, usually vertically between floors in a multi-storey building.

(2) A type of conveyor for lifting loose material in buckets or scoops.

EMBOSSING

Stamping words, letters (e.g. manufacturer's name), or ornamentation onto the surface of a workpiece, either in a press with specially made dies, or in a specially built machine.

EXPANDED METAL

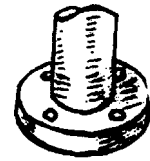
Metal sheet which has been pierced then stretched, resulting in a larger sheet with "diamond" shaped openings, resembling mesh. May be used for machine guarding.

EYE BOLT

A bolt with a ring or eye at the head end, usually used to screw into a component so it can be lifted.

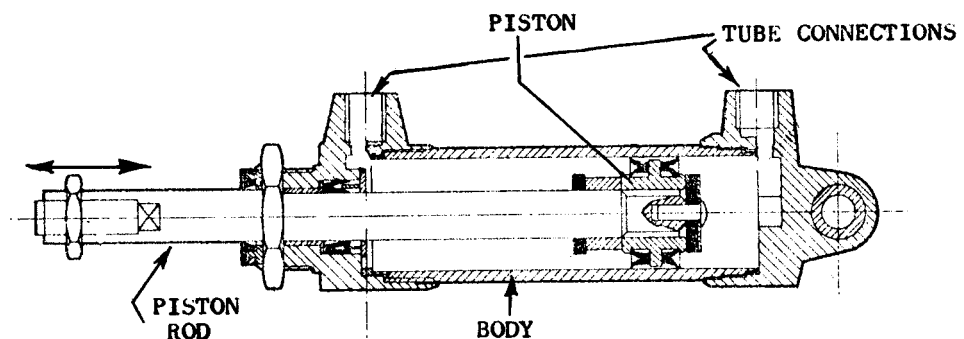
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FACE	That part of a component in contact with a mating component, e.g. (1) Of a flat belt pulley — the outer rim. (2) Of a friction clutch — the flat side.
FAST PULLEY	(Opposite to loose pulley) — a pulley keyed or otherwise fixed to a shaft so motion is transmitted from one to the other.
FETTLING	Removing rough patches and unwanted metal (Foundry work) from castings.
FLANGE	A projecting rim or edge for stiffening or fastening, in which case it may have bolt holes drilled in it to connect to the next (matching) part, e.g. a pipe flange.
FLUID	A fluid is something capable of flowing, i.e. a liquid or gas. Powders could also be considered fluids.
FLYWHEEL	A heavy wheel used for storing rotational energy. it is used on a machine where the energy requirement varies greatly during the cycle to supply energy during the period of heaviest load. The prime mover may be reduced in size, as it only has to supply power to match the average load, not the peak load.
FORGING	Shaping metal by impact, under a hammer or in a press. The metal may be pre-heated to “soften” it.
FORKLIFT TRUCK	A self-powered materials handling vehicle, having two steel ‘forks’ projecting from one end or side which are inserted under a load then raised to lift the load.
FREE AIR	Air at normal atmospheric pressure.
FULCRUM	The pivot, or point of support, of a lever.
FULL LOAD	The maximum load under which a machine is designed to run.
GANG MILLING	The use of several milling cutters on one spindle to produce a surface with a required profile or to machine the face and sides of a workpiece in one operation.
GANG SAW	A series of parallel saws secured in a frame which is moved backwards and forwards. Used to saw a log into planks in one operation.
GEAR	A toothed wheel which, when meshed with other gears, transmits rotary motion from one shaft to another. The design of the gears determines whether the speed or direction of motion is changed. Different types include spur, helical, bevel, herringbone, worm and wheel, rack and pinion, etc.



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- GIBHEAD KEY** A key (for locating pulleys, etc. on a shaft) having a head formed at right angles to the length of the key at one end which projects above the surface of the shaft to aid removal.
- GOVERNOR** A device for regulating the speed of an engine to a preset fixed level, or ensuring it does not exceed a certain maximum speed.
- GRADE (Abrasive Wheels)** A measure of the strength with which the grains of abrasive are held together by the bonding material.
- GRIT** Measure of the size of the abrasive particles in an abrasive wheel.
- GRUBSCREW** A fully threaded, headless screw used to secure a component to a shaft.
- HEAT TREATMENT** The controlled heating and cooling of metals to change their physical properties (e.g. to harden/soften, toughen, etc.) to suit their intended use.
- HIGH-FREQUENCY PLASTIC WELDER** A machine used for “welding” sheets of plastic together. The sheets are overlapped then clamped between a metallic table top and a metallic element which is formed to the shape of the weld required. A high-frequency alternating electric field is set up, between the element and the table top, which heats and “welds” the plastic sheets together. Clamping is usually achieved by a pneumatic cylinder.
- HORSEPOWER** An imperial measure of work. (One h.p. = 0.7457 kW).
- HYDRAULIC CYLINDER** A hollow cylinder containing a sliding piston which is connected to a piston rod protruding through a bearing in one or both ends of the cylinder. Pressurised fluid can be introduced to either end of the cylinder, forcing the piston to move in the required direction.



- HYDRO-EXTRACTOR** A centrifuge for removing water or other liquid from “wet” objects. The water is thrown outwards through holes in the rotating “basket” while the material to be dried is retained in the basket, e.g. a spin-dryer.

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HYDRAULIC MACHINERY

Machinery producing, controlling, or powered by pressurized liquid. The working liquid is usually oil based. Includes pumps, control valves, motors, cylinders etc.

INCHING

Adjusting by small amounts, usually under power at slow speed.

INDEXING

Rotating a workpiece by a predetermined accurate amount, usually dividing the circle into an integral number of divisions for cutting the teeth of a gear wheel or similar operations.

ISOLATE (Electrically)

Positively disconnect a machine from its power supply to ensure that maintenance, toolsetting or adjustments can be carried out without risk of accidental starting.

ISOLATING TRANSFORMER

An electrical transformer which, when connected between a wall socket and an electrical power tool will supply power to the tool at the normal voltage but drastically reduce the risk of the operator receiving a dangerous shock if the insulation of the tool or cord breaks down. Should be used especially in damp places and on building sites etc. where there is a high danger of the cord or tool being damaged.

JACKET

A sleeve around a cylinder or vessel arranged so that steam, water, air, refrigerants or other fluids can be circulated between them to heat or cool the contents of the vessel.

JOCKEY PULLEY

An “extra” pulley placed between two others used to tension a driving belt.

JIG

A device attached to a machine tool to hold the workpiece in the desired position while machining operations are being carried out. Sometimes also used to guide the tool, e.g. a drilling jig.

KEY

A piece of metal, usually square in cross section or half-round, used to locate a pulley, gear etc, on a shaft and prevent it rotating relative to the shaft.

KEYWAY

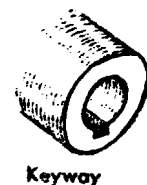
A slot or groove cut into the surface of a shaft or the bore of a pulley, gear etc, into which a key fits. Usually flat bottomed and rectangular in cross section but may be half round in a shaft to take a half-round key (Woodruff key).



KNURLING

(1) Corrugations around the edge of a knob or handle, etc. to aid gripping.

(2) The operation which produces a knurled surface.



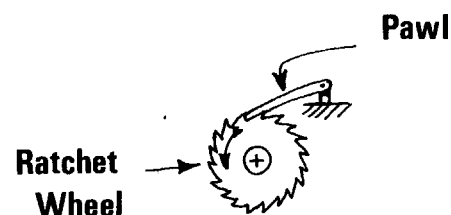
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KILOGRAM (kg)	Standard unit of mass in the S.I. system (1kg = 2.205 Imperial pounds).
KILOWATT (kW)	<p>An S.I. unit commonly used in engineering for measuring power (rate of doing work) because the basic unit, the watt (W) is less convenient.</p> <p>1kW = 1,000 Watts = 1,000 Joules/second</p> <p>= 1,000 Newton metres/second</p> <p>= 1.341 horsepower</p>
LAPPING	Smoothing and truing a surface by rubbing it on a flat surface covered lightly with grinding paste, or by rubbing two mating parts together with grinding paste to fit them to each other.
LATHE	A machine tool used generally for producing round parts. The workpiece is mounted between centres, or gripped in a chuck, and rotated. “Stationary” tools made of special metals and sharpened are moved slowly along the length of, or across the face of, the revolving workpiece, cutting metal off the workpiece as it moves (hence the term “turning” applied to work carried out on a lathe).
LINISHER	A continuous loop of sandpaper, in the form of a belt, is driven over pulleys. In general, hand held parts are held against the moving sandpaper to smooth off rough edges or surfaces.
LITRE (l)	S.I. Measure of volume or capacity, 1,000 litres = 1 cubic metre (m ³). 1 litre = approximately 1.76 Imperial pints.
LOOSE PULLEY	(Opposite of fast pulley). A flat belt pulley running free on a shaft, so that when a belt is shifted on to it, no motion will be transmitted between the pulley and the shaft.
LINK BELT	Transmission belting made up of short links, usually of leather, riveted together.
LINKAGE	A device, usually a solid rod, for transmitting movement from one machine part to another.
MAGNETIC CHUCK	A workholding device which holds the workpiece by magnetism. Used only with iron and steel.
MANDREL	A special shaft used for mounting a workpiece which is rotated during machining, e.g. a workpiece in a lathe, or a gear wheel while the teeth are being cut.
MESH	(1) Woven or welded wire mesh (which is commonly used for guards.)

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(2) Two parts, e.g. gear wheels, chain and sprocket etc., which have teeth or similar devices which fit together snugly without being permanently fixed are said to “mesh” together.

METRE (m)	The base unit of length in the S.I. system. Correct multiple is the kilometre (km) and the correct sub-multiple is the millimetre (mm).
MOULD	A device in which castings are made. The mould (usually of sand held together with a binding agent) has hollow spaces in it into which molten metal is poured. The shape of the hollow spaces gives the shape of the final product.
MUTING	Some machines are only considered dangerous during part of their cycle. If they are fitted with presence-sensing guards, then the guard may be de-activated during the non-dangerous part of the cycle so that the operator can approach the machine, to feed or extract workpieces, without causing it to stop. The position at which the guard is de-activated is called the muting position.
NEWTON (N)	The basic unit of force of the S.I. system. On the surface of the earth, a mass of one kilogram exerts a downward force of 9.81 Newtons.
NUMERICAL CONTROL	Control of a machine by recording a complete work cycle on paper tape or other means, and causing the machine to follow this cycle repeatedly. Very complicated operating cycles can be used.
OVERHANGING PULLEY	A pulley carried on a shaft projecting beyond the last bearing.
PALLET	Platform on which goods are stacked for storage and/or transportation by fork lift truck.
PASCAL (Pa)	SI unit of pressure. 1 Pa = one newton per square metre (N/m ²). The kilopascal is more commonly used. (1PSI = 6.895 kPa.)
PARTING OFF	The process of cutting off a length from the workpiece in a lathe, using a parting tool.
PATTERN	Model of a part which is to be made by casting. Must be bigger than the required size to allow for the molten metal to shrink, due to cooling, after it solidifies.
PAWL	A small pivoted lever which engages in the teeth of a ratchet wheel to prevent it turning backwards.
PENE, PEEN	To burr over or deform the head of a component by hammering.



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PICKLING	Removal of dirt, rust etc. by immersion in acid.
PINION	The smaller of a pair of gear, wheels.
PITCH	Distance between centres of similar items, e.g. screw thread peaks, gear teeth, chain rollers, rivet holes. etc.
PLAIN BEARING	A bearing where the moving part is supported by a stationery sleeve made of a bearing metal and lubricated.
PLATEN	The work table of a machine, usually provided with “tee” slots for attaching jigs, dies, or workpieces. May be fixed or moving.
PLAY	Slack or wear between two parts of a machine.
PNEUMATIC CYLINDER	Similar to a hydraulic cylinder but uses compressed air as a working fluid.
PNEUMATIC MACHINERY	Machines producing or powered by compressed air or other compressed gases.
PRIME MOVER	The source of motive power for a machine, e.g. electrical motor, internal combustion engine, water wheel etc.
PULSING	Movement of a pressbrake beam in “steps” of 10mm or less, each movement to be separately activated by a movement of the control pedal. To be used when no other method of guarding is possible for a given operation.
PYROMETER	Instrument for measuring higher levels of temperature.
RACK AND PINION	A rack is a straight bar with gear teeth cut into it. A pinion is a small gear wheel. When meshed together, rotary movement of the pinion causes a linear movement of the rack or vice-versa.
RATCHET	A toothed wheel with angled teeth used with a pawl to allow rotation in one direction only. (See sketch with “pawl”)
RECEIVER	A pressure vessel, usually cylindrical, used to store compressed air from a compressor before use.
RESISTANCE WELDER	See spot welder.
RIVET	A pin with a head formed at one end which is inserted into a hole drilled through two or more components, then deformed at the other end to hold the components together.
ROLLER BEARING	A rotary bearing composed of two steel rings separated by a row of steel rollers, to allow them to turn relative to each other.

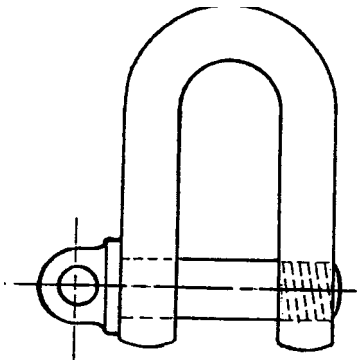
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SHACKLE

A length of steel rod bent into a 'U' shape, provided with eyes at each end through which a bolt is passed to close the loop. Used for connecting chains to hooks etc.

SHAFT

A machine component, usually round in cross section, rotating in bearings and used to transmit rotary motion from one point to another or support rotating components.



SHOULDER

An increase in diameter on a shaft used for locating a bearing, pulley, etc. on the shaft.

SPINDLE

A shaft, usually part of a machine, on which a removable component or cutting tool is mounted.

SPOT WELDING

Welding of two or more overlapping sheets of metal, by pressing them together and passing a large electric current through a small area of the sheets, thus heating them and welding them together in a small "spot".

SPROCKET

A chainwheel or chain pulley for transmission chain (e.g. those on a push bike).

STROKE

(1) The distance travelled by a reciprocating component between the extreme ends of its travel (e.g. on a press : the distance between TDC and BDC).

(2) Of a simple crank-driven slide equals twice the throw.

SPLINE

A shaft with teeth or serrations formed on the surface running along the shaft (similar to gear teeth), for transmitting rotary motion to a component (e.g. a gear wheel) sitting on the shaft with matching teeth formed on the inside of the bore. May be fixed or sliding on the shaft.

STEPPED PULLEY

A belt pulley (or series of pulleys) of differing diameters mounted on a shaft. When the belt is shifted from one 'step' to the next, the speed ratio between the driving and driven shafts is changed.

STUD

A length of rod with a screw thread formed on each end.

SWAGE

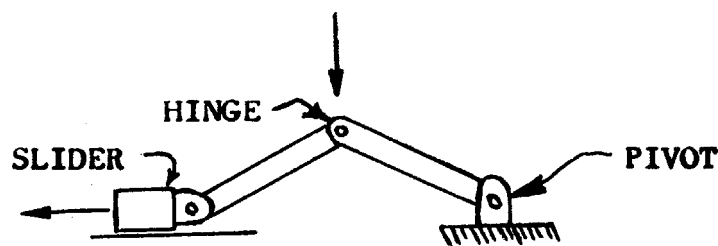
To shape a component (usually tubular) by deforming it by pressure or hammering with the aid of a special form or anvil.

SWARF

Metal removed from a workpiece during machining usually on a lathe. May be in the form of small 'chips' tightly curled strips, or long 'ribbons'.

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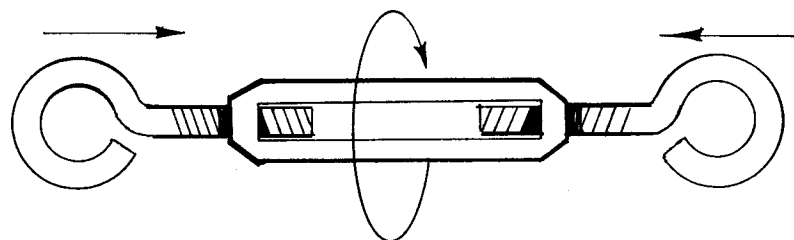
TACKLE	Any sling, shackle, swivel, ring, hook or other appliance used in connection with a lifting machine or from the hook of a crane.
TAKING UP	Adjusting for wear, removing play or backlash.
TANG	A prong; the shank of a tool (e.g. a file).
TAP	(1) a tool for cutting an internal (female) screw thread in a hole. (2) a valve for regulating or stopping the flow of a fluid.
TEE HEAD BOLT	A bolt with a specially shaped head designed to fit in tee slots. Used for clamping jigs, tools or workpieces to machine tables and plattens.
TEE SLOT	A slot cast or cut in the bed, platen or slide of a machine, shaped to accept a tee-head bolt.
TEMPLATE	An outline pattern usually made of thin sheet material, used to determine by comparison whether a workpiece is of the exact shape required.
THROW	The offset of the centre of the crank pin (of a crank) from the axis of rotation. Equals half the stroke.
THRUST	Force directed along a shaft or member.
THRUST BEARING	A bearing specially designed to resist thrust.
THRUST COLLAR	A collar on a shaft to locate against a thrust bearing.
TOGGLE JOINT	A system comprising two levers, hinged together. The outer end of one lever is pivoted on a fixed pin, the outer end of the other lever is pivoted to a slider arranged to slide towards/away from the fixed pivot. If the two levers start at an angle to each other, a force tending to bring them in line applied at their hinge will force the slider to move away from the fixed pivot, and when nearly in line, a small sideways force will cause a large outwards force on the slider.



Toggle joint

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TOLERANCE	Signifies allowable variation from nominal size on a machined component i.e. a statement of allowable inaccuracy.
TOMMY BAR	A rod used to turn a shaft or flywheel by hand. Tommy holes are provided in the shaft or flywheel for the rod to fit into.
TONNE	Metric unit of mass. Equals 1,000 kg. Very close to the imperial ton (1 ton = 1.016 tonne).
TOPPING POSITIONS	On machines with adjustable stroke, e.g. hydraulic presses, this is the uppermost position to which the tool rises. Equivalent to top dead centre on a mechanical press.
TRANSMISSION MACHINERY	Any belts, chains, gears, pulleys, sprockets, couplings, linkages, shafts or any other devices for transferring motion from the prime mover to the machine, or from one part of the machine to another.
TRUNNION	A bearing upon which a container or vessel swings or pivots.
TURBINE:	A device for extracting useful energy from moving fluid, either liquid or gas. In one type a jet of fluid at high pressure is directed onto a series of scoops or buckets fixed to the rim of a wheel, causing the wheel to turn (Pelton wheel). Another type has a series of angled blades arranged radially on a shaft (like a fan), and the fluid passing through them causes the shaft to turn. Commonly found in hydro electric power stations, “Jet” engines, and high-speed steam-powered machinery.
TURNBUCKLE	A device used for tightening ropes, stays, etc. It consists of a central portion tapped in each end with a screw thread, one left hand, one right hand. Matching bolts (usually eye bolts) are fitted, so that when the bolts are held still and the central body is turned, both bolts will be pulled inwards towards the centre of the device or vice versa.

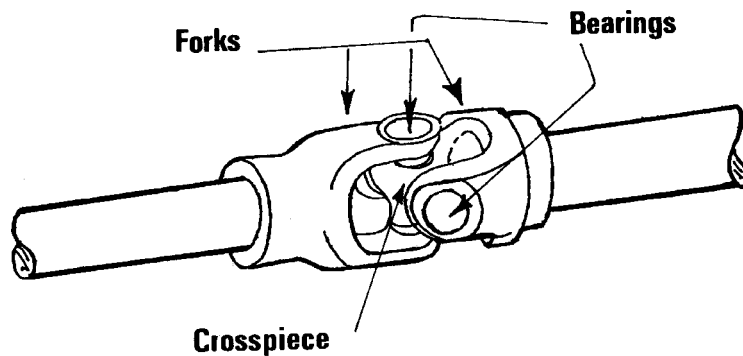


U-BOLT	A stud threaded at both ends and bent into a ‘U’ shape so both threads are parallel.
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UNIVERSAL JOINT

A coupling between two shafts, capable of transmitting rotary motion from one to the other even when the shafts are placed at an angle to each other. Usually used between shafts which may change their orientation during operation.



WING NUT

A nut formed with two projections or 'wings' for tightening by hand.

WORM AND WHEEL

A type of gearing system used when very large reduction in speed is required. The worm is a small gear resembling a coarse screw thread, which meshes with the teeth on the rim of the wheel which is of larger diameter, the shaft carrying the worm gear is perpendicular to the shaft carrying the 'wheel' and off-set from it. The 'worm' is rotated thus turning the wheel around at a slower rate.