

## Glossary for the Auto Gear Company web site

### A

**additive:** A product added to another substance with the intent to improve performance. Some examples are: additives for lubricating oils, and various metals to make alloys.

**aftermarket:** A term the automotive industry uses for parts that are no longer being supplied by the car maker but are available to add to the vehicle after it has been purchased.

**air-cooled engine:** Engines that cool by radiating excess heat into the atmosphere rather than using a liquid to assist with the cooling process. Usually air vents or fins are used with this design.

**alignment:** Adjustment made to the relationship between two or more objects in order to form single or parallel lines.

**alloy:** A blend of two or more metals with the intent to attain a specific new attribute or improvement.

**anti-friction bearing:** A bearing usually containing balls or rollers.

**anti-rattle spring:** A spring used in clutches and disc brakes that holds parts together and keeps them from moving or rattling excessively.

**assembly:** a group of parts that are put together to function as one unit. Some examples are a transmission assembly or an input gear assembly.

**automatic transmission:** Refers to a type of transmission designed to multiply the torque power produced by an engine and direct that power to turn the wheels of a vehicle.

**axle ratio:** A number that represents the speed in revolutions per minute (rpm) of the drive shaft in relation to the speed of the drive wheels. An example is 4.5 which indicates that the drive shaft turns four and a half times while the wheels of the vehicle turn only once.

### B

**babbitt:** A soft low-friction metal alloy. This material can be up to 90% tin to with small amounts of other metals have been added, such as cooper, zinc and/or lead to change its attributes. Babbitt is often used to coat friction and sleeve bearings which are made of harder metals, because it has a low melting point.

**backlash:** The distance one gear tooth can move before it moves another gear tooth.

**ball bearing:** 1. A spherical bearing, usually metal. 2. One or more rows of steel balls held together between two races to form a bearing assembly.

**ball joint:** A design that permits rotation in all planes by joining the spheres of each side with matching sockets on the other sides.

**bearing:** An object designed to fit between two moving parts to reduce friction.

**bearing clearance:** The space that is between a shaft and a bearing. Lubricant is often added to this space to improve movement and reduce friction.

**bell crank:** An L-shaped arm that pivots on a point at its elbow. It often is applied to change linear motion to rotational motion such as to transfer motion from a wheel to a connecting rod assembly.

**bevel gear:** A gear with teeth that are at an angle. These gears are usually used in pairs in order to transmit power at angles.

**bore:** In terms of the auto industry it is a specification for the diameter of a cylinder. For example the cylinders of an engine block.

**bore cut:** To increase the size of a cylinder by a boring or re-boring process.

**boring bar:** A tool used to bore out a hole or cylinder.

**breather pipe:** An open ended pipe to vent fumes or air.

**bushing:** A removable sleeve that is placed between two parts that may be moving or not. The sleeve intent can be to act as a bearing, help in positioning or used to absorb shock. Bushings are usually made of metal, rubber or plastic.

### C

**caliper:** An instrument that has two movable arms used to measure distances.

**cam:** A lobe or raised section on a shaft or wheel.

**centimeter:** A metric unit of measure equal to 1/100 meter. If converted to inches it is equal to 0.390 inches. The symbol **cm** is often used for the abbreviation of centimeter.

**chassis:** In the automobile industry a chassis is often referring to a combination of the frame, running gears, steering and the suspension of a car.

**clearance:** A space between two parts that is defined and measured.

**clutch:** A mechanical device used to connect or unconnected a drive shaft from the power source.

**clutch disc:** A plate mounted on the transmission input shaft between the engine flywheel and a movable pressure plate. When pressed between the flywheel and the plate, the disc transmits power from the engine to the transmission.

**clutch fork:** A part with two arms that often looks like a tuning fork. One use is to position the throw-out bearing behind the pressure plate. It is usually metal and touching pads can be metal or removable plastic.

**conduction:** The physical exchange of heat or electrical energy from one object to another. This exchange can be measured.

**conductor:** A device or material designed to permit or assist exchange of heat or electricity from one point to another.

**control arm:** In the automotive industry it is a part of the suspension that supports a wheel.

**convection:** Heat transfer by circulation of a fluid.

**coolant:** Liquid that carries heat from one point to another for example from the heat of the engine to the radiator. In a car this coolant is usually a mixture of water and antifreeze.

**countershaft:** In a manual transmission it is the secondary shaft - the primary shaft being the main shaft. Usually a cluster of gears rotate on the countershaft. These gears are in constant mesh with freewheeling gears on the transmission's input and output shafts. When the transmission is shifted into a gear, one of the freewheeling gears is locked to a shaft, which makes it possible for power to be transmitted from the engine to the wheels.

**crabbing:** Attitude of a car when the back wheels are not in line with the front wheels.

**crankshaft:** A part of an engine that converts power produced by its pistons into rotary power, which then can be transmitted to the drive wheels.

**cross-thread:** Threads that are mismatched. For example trying to put a mismatched nut on a bolt can damage the threads as they cross.

**CVT:** Abbreviation for a Continuously Variable Transmission. The flexibility of a CVT allows the driving shaft of the vehicle to maintain a constant angular velocity over a range of output velocities. This type of transmission is designed

to change gears effortlessly through an infinite number of gear ratios.

**cycling clutch system:** A design used for air conditioners in which cooling is controlled by a sensing thermostat to open or close a solenoid. The solenoid will engage or disengage a magnetic clutch to produce cycles of on or off.

## D

**deceleration:** A decrease in speed.

**degree:** 1. A measurement of the angle between two intersecting lines. 2. A measurement of temperature.

**detent:** a depression or hole designed into a mechanical device with the intent to restrain something. For example a shaft with a detent may have a ball that can be moved into position to set in a detent/depression, which in turn will hold a lever in place firmly until it is pushed off the detent again.

**differential:** In the automotive industry the differential is a device that splits the engine power two ways, allowing each output to spin at a different speed. Some vehicles need a differential between each set of drive wheels for the front and the back wheels. This device contains a variety of gears, housings, gaskets and shafts.

**dowel pin:** Usually a metal rod or pin used to keep two parts together.

**downshift:** To shift to a lower gear.

**driveability:** A term used in auto engineering to describe the engines response to the accelerator. For example if the accelerator is held steady the vehicle engine is expected to run without hesitation and at a constant speed. If the vehicle engine hesitates when the accelerator pedal is pushed away from a steady point, the engine would be described as having poor driveability.

**driveline:** Refers to the shaft or a shaft configuration, that carries power from the transmission to the wheels. or a device such as a transaxle.

**drive shaft:** A metal rod designed to connect the transmission to the differential.

## E

**eccentric:** Off center, such as a hole drilled in a disc that is not drilled with the same centerline as the outside circumference of the disc.

**end play:** Movement, such as the amount of movement a shaft moves longitudinally within a bearing.

**energy:** The capacity to exert force.

## F

**feeler gage:** A strip of metal designed to measure clearances between two parts. This automotive tool usually made up of a number of strips each marked with its thickness.

**female:** A hollow component designed to receive a mating male part.

**fins:** Metal projections designed to conduct heat away from the main object.

**flat rate:** In the automotive repair industry, it is a predetermined method used to estimate the cost of the labor required to complete a particular job, prior to the job actually being done.

**force:** The exertion of power.

**force fit:** A method of joining two parts that are almost the same size by forcing them together. This type of fit is used to hold the parts in place by friction alone.

**four wheel drive:** A vehicle that has been designed to have all four wheels driven by the engine.

**free play:** Clearance for movement prior to engagement.

**free-rolling wheels:** The wheels that are not being driven by the engine. Such as the rear wheels of a front wheel drive vehicle.

**freewheeling:** A part that rotates freely, not transmitting power or being driven by power. For example early automobiles could coast downhill because the transmission was designed to disengage the wheels from being driven.

**friction:** Resistance to movement between two contacting parts. This often creating heat and loss of power.

**front wheel drive:** A vehicle designed to the engine transmit its power to the front wheels.

**FWD:** An abbreviation for front wheel drive.

## G

**gasket:** A part made of compressible material that is designed to seal mating surfaces.

**gear ratio:** A measurement that indicates the number of turns made by the driving gear compared to the turns made by the driven gear. For example a ratio of 2:1 represents the driving gear makes two turns while the driven gear makes one.

**gearshift:** A lever used that is to move gears from a position of engaged to disengaged. However it can also refer to a combination of

parts between the shift lever and the transmission.

**gear-type pump:** A design having two gears that mesh with a force that can be used to pump liquid. For example a gerotor type gear is often used to pump oil throughout transference assemblies.

**gpm:** An abbreviation for gallons per minute often indicating rate of flow.

## H

**helical gear:** A gear with teeth that are designed in a spiral or helix pattern.

**hesitation:** A momentary pause or stutter upon acceleration of a vehicle.

**horsepower:** A measurement used to indicate work or power the abbreviation of which is hp. One unit of horsepower equals 33,000 foot-pounds of work per minute.

**Hotchkiss drive:** A unique suspension design that uses rear springs to transmit force to the drive wheels.

**hydraulic clutch:** A clutch design that uses fluid to transmit the power to operate the clutch.

**hypoid gear:** A gear with a center that is lower than normal. For example rear driven cars often have an input shaft with pinion gears that are below the center of the driven gears they mesh with.

**hydrostatic CVT:** Hydrostatic transmissions use a variable displacement pump and a hydraulic motor design to aid the change gears and enhance the number of ratios.

## I

**impact wrench:** A tool often used in garages that uses compressed air in a series of hammer like strokes or impacts to turn bolts or nuts.

**insulator:** A part or material designed to inhibit or prevent transfer of heat or electricity.

**IVT:** Abbreviation for Infinitely Variable Transmission. This is a specific type of CVT in which the range of gear ratios includes a zero ratio. This low ratio often results in a neutral or non-driving gear.

## J

**journal:** A section or area of a shaft that has been finished specifically for a bearing to turn smoothly on that area.

## K

**key:** Usually a small part made of metal designed to fit into a slot or keyway of a matching part, with the intent of holding two

parts in a fixed position. The key can be a separate piece or attached to one of the parts. In the automotive industry keys are often used to make a gear turn with a shaft.

**kingpin:** A design using a rod or pin for the steering knuckle to turn on.

**knuckle:** A component of the steering suspension that has a spindle and a ball joint that can pivot, in order for the axle to turn the vehicle wheels.

## L

**lash:** The amount of free movement between parts.

**linkage:** Levers, rods and various linkages assemble together with the intent to transmit motion.

**live axle:** A drive axle with the wheel firmly attached.

**lobe:** A projection, bump or projection on a shaft.

**locknut:** A nut specifically designed to resist loosening once it has been tightened.

**lock washer:** A washer used to help secure a nut. This washer usually has a split or slight projections designed in it.

## M

**main bearings:** Bearings on which the crankshaft usually turns.

**male:** A protruding portion of a part designed to fit into a hollow area of a part (also referred to as a female part).

**manual transmission:** Refers to a type of transmission designed to multiply the torque power produced by an engine and direct that power to turn the wheels of a vehicle.

**mesh:** When the teeth of one gear fits together with the teeth of another gear.

**meter:** Abbreviation for meter is m or M. It is a unit of measurement in the metric system that is equal to 39.37 inches.

**millimeter:** Abbreviation for meter is mm or MM. It is a unit of measurement in the metric system that is equal to .039 inches.

**modulator:** In automatic transmissions it is a diaphragm like device connected to the source of vacuum on the engine. It is designed to provide an engine-load signal to the transmission.

**motor:** An electromechanical device designed to convert electricity into mechanical movement.

## N

**needle bearing:** A roller bearing designed with rollers that have small needle like diameters.

**neutral:** When a transmission is in the state where there is no connection or engagement between the output and the input shafts.

**no-load test:** A test for starter motors in which current draw is measured at the point the starter's pinion gear is not engaged.

**nut:** A piece of metal designed with a threaded hole to fit on to a bolt.

## O

**OEM:** Abbreviation for original-equipment manufacturer. An automotive term used to describe replacement parts supplied by the carmaker. Aftermarket parts are supplied by firms and distributors other than the original manufacturer.

**one-way clutch:** A clutch that transmits power between shafts in only one direction or that permits a rotating part to turn in only one direction.

**oil seal:** Device designed to prevent oil from leaking from a shaft, capped hole, bolt, or a moving part.

**overcenter spring:** Some clutch designs have this component designed to reduce the effort required to depress a pedal without reducing the pressure of the clutch plate.

**overdrive:** Usually referring to a gear ratio in which the drive shaft is turning faster than the crankshaft.

**overrunning clutch:** same as one-way clutch.

**oversteer:** A condition sometimes found in rear engine cars or tail heavy vehicles. Unless the suspension has been designed to overcome this condition, handling in these vehicles rear wheels can skid in a turn at lower speeds than the front wheels.

**oxidation:** On material that is made of iron it is more often referred to as rust. When a change has occurred in a compound by a chemical increase of oxygen.

## P

**pad:** A piece of material used to cushion. When referring to a disc brake, it is the friction material that is pressed against the spinning disc to slow it down.

**parallelogram linkage:** This refers to steering linkage. The linkage elements have been designed to have components quadrilateral, with opposite sides parallel and equal, but not necessarily square.

**peen:** A method used to flatten or smooth metal by using a hammer.

**pinion:** Usually refers to the smallest gear in any gear assembly.

**pitch:** There are various definitions for pitch that are used in the automotive industry. 1. The number of threads per inch on a bolt. 2. The variation in degrees from a flat plane of a fan or blade. 3. A bevel gear at the end of a drive shaft that engages a ring gear.

**pivot:** A shaft, rod, pin or projection on which something turns or moves.

**planet gear:** Refers to a gear in the planetary gearset. Its teeth mesh with a sun gear and a ring gear.

**planetary gearset:** An assembly of gears that have been designed with ring gears, sun gears and planet gears.

**power:** The ability to exert force. In the automotive industry it is often measured by horsepower or kilowatt.

**preload:** To put a small amount of pressure on a mechanism prior to the full working load.

**press-fit parts:** When parts very similar in size are forced together. This fit holds due to friction alone, with out using pins or glue.

**progressive linkage:** When one barrel after another is brought into operation as the throttle opens in the primary barrel of a carburetor.

## Q

**quench:** A method used in heat treat processes. A quick removal of excess heat from an object with a coolant or liquid.

## R

**rack and pinion:** A design used in some steering systems. This design has a pinion gear at the end of a column which controls the movement of a bar or rack to move back and forth, left or right. The bar has teeth on it that mesh with the pinion gear.

**ratcheting CVT:** A CVT transmission design that uses static friction devices to engage and disengage. It often transfers substantial torque, because the static friction increases relative to the torque throughput.

**ratio:** A measure or equation used to express the relationship between two or more amounts. It is often used to express the relationship between two gears that mesh.

**recirculating ball:** A type of steering device that has steel balls placed between a worm gear and a nut.

**reinstall:** To replace a part that was previously removed.

**release levers:** Parts of a clutch that release spring pressure as the pedal is pressed to disengage the clutch.

**retainer:** A part designed to hold other parts together.

**revolutions per minute:** A measurement used to designate the rotational speed of a shaft. The abbreviation is rpm.

**ring gear:** The large gear that resemble a ring in a gearset such as in a planetary gearset or flywheel.

**rpm or RPM:** Revolutions per minute.

**R&R:** Abbreviation for remove and reinstall often used when calculating labor on a repair bill.

## S

**SAE:** The abbreviation for Society of Automotive Engineers.

**seat:** The final mating of parts.

**sector gear:** A gear that looks like a segment of a circle.

**shim:** A thin piece of material used to separate one component from another or change the angle of one component to another.

**shrink fit:** A type of fit between parts that has used heat to expand one of them temporarily. After the part cools it shrinks to fit tightly with the other part.

**sleeve:** A part designed to fit into a hole of cylinder usually used to go between the cylinder and a shaft or rod. Sleeves are usually designed to be easily replaceable.

**spline:** Grooves or ruts cut into a shaft. The intent of the grooves is to mesh two parts together, then as the parts slide along each other they rotate.

**spindle:** A rod with tapered ends. In the automotive industry it often refers to the part of an axle on which a vehicle wheel turns.

**spur gear:** A gear designed with teeth that are cut parallel to the shaft.

**steering arm:** A component in a steering system design that links the steering knuckle and the tie rod.

**steering column:** A shaft between the steering gear and the steering wheel.

**steering knuckle:** A component in the steering system designed to support a front wheel and also pivot, so the wheels can steer.

**sun gear:** Refers to the gear in the center of a planetary gearset.

**suspension:** A system designed to support a vehicle's body frame to its wheels and axles. It usually consists of numerous springs, arms, absorbers and other components.

**synchromesh:** Referring to a transmission design in which the speed of the gears are synchronized, or made to be similar to each other, before they mesh.

## T

**thrust bearing:** A bearing that is designed to resist end or side movement.

**tie rod:** A component that moves the steering arms.

**tie-rod end:** The ball and socket component at the end of a steering rod.

**timing gears:** Gears on a crankshaft for the timing chain or belt to run on. Sometimes these gears are called sprockets.

**torque:** A force to produce a rotating or twisting movement. The measurement used for torque is pound-feet or Newton-meters.

**torque converter:** Device usually found in automatic transmissions designed to couple engine power to the transmission.

**torsion vibration:** Refers to when a shaft twists back and forth along its length.

**torsion bar:** A steel rod used to resist twisting motion in a suspension design.

**transfer case:** A gearbox assembly designed to divide power between the front and the rear wheels of a four wheel drive vehicle.

**transmission:** An assembly of gears, shafts and other components designed to multiply the torque power produced by an engine and direct that power to turn the wheels of a vehicle.

## U

**u-bolt:** A rod with both ends threaded that has been bent in the design of the letter U. It is often used to connect suspension and exhaust systems.

**universal joint:** A flexible shaft or rod used to couple two shafts, while permitting them both to still move about each other, in a swivel like manner.

## V

**VIN:** Abbreviation for vehicle identification number. It is the serial number given to a vehicle.

**variable transmission:** It is a transmission that can change to an infinite number of effective gear ratios with seemingly effortless movement. Advantages of a variable transmission is its

flexibility and allowing the engine speed to remain at peak efficiency to provide better fuel economy.

## W

**wheelbase:** The distance between the centers of the front and rear wheels of a vehicle.

**worm gear:** A gear designed with a long thin cylinder that has spiraling threads sometimes referred to as helical threads.

## XYZ

**yoke:** A component that looks like a split fork used to hold or apply pressure to another part.