



## A

**Adaptive cruise control:** An advanced cruise control system that maintains a preset distance or time interval from the vehicle ahead by automatically controlling the brakes and throttle.

**Adaptive headlights:** Headlights that steer in the direction the front wheels are turned to improve visibility when going around corners.

**Advanced Driver Assistance Systems (ADAS):** A variety of safety-related systems that monitor vehicle performance and the surrounding environment. ADAS provide a variety of driver alerts when potentially hazardous conditions exist, and some (such as automated emergency braking) can take corrective action when the driver fails to respond appropriately to a dangerous situation.

**Air filter:** A paper or synthetic fabric baffle that captures dust, dirt and debris from the airstream entering the engine.

**Aftermarket part:** Any service replacement part not obtained from the vehicle manufacturer through a franchised dealer. Many aftermarket parts are made by the same companies that supply the original equipment part to the vehicle manufacturer.

**All-wheel drive (AWD):** A permanent, four-wheel drive system designed for improved traction on all surfaces and at all times. The main difference between AWD and 4WD systems is that the driver cannot disengage AWD.

**Anti-freeze (coolant):** The liquid in the engine cooling system that dissipates heat. Engine coolant prevents freeze-up in winter, raises the boiling point in summer, and protects the cooling system from rust and corrosion year round.

**Anti-lock braking system (ABS):** System that prevents wheel lock-up by automatically regulating the brakes. ABS can decrease braking distances on slippery pavement, prevent skidding and provide greater control during sudden stops.

**Automated emergency braking:** A system that automatically applies the brakes to prevent or mitigate a collision when the car is approaching another vehicle or object at too high a rate of speed.

**Autonomous vehicles:** Cars that use advanced technology to accelerate, brake and steer themselves to a preset destination. Still in the prototype stage, Google has been the most visible developer of autonomous vehicle technology.

**Axle shaft:** On front-wheel drive vehicles, the shafts that connect the transaxle to the driven wheels. Axle shafts are also used on some rear-wheel drive vehicles with independent suspensions to connect the differential assembly to the driven wheels. Axle shafts commonly have a universal joint at each end.



to accommodate suspension movement. In front-wheel drive applications, constant velocity joints are used that smooth power delivery and allow the wheels to be turned for steering.

## B

**Backfire:** Gunshot-like sound from the engine air intake or tailpipe.

**Balancing (tires):** Adding small amounts of weight to a wheel to offset any imbalance present in the tire and wheel assembly. Proper balance eliminates wheel and tire vibrations that are annoying, can reduce traction in certain circumstances and cause increased tire and suspension wear.

**Battery:** The component that stores the electrical power needed to start the engine. The battery also powers vehicle accessories when there is insufficient power output from the charging system, and acts as a “shock absorber” for the vehicle electrical system.

**Battery acid (electrolyte):** The fluid in automotive batteries, a mixture of sulfuric acid and water.

**Battery Electric Vehicle (BEV):** A car without an internal combustion engine that is powered exclusively by electricity stored in a large onboard battery pack. Most of today's BEVs have a range of about 60-100 miles. An exception is the Tesla Model S which comes with a choice of several larger battery packs that offer an estimated 140 to 265 miles of range. The Nissan Leaf is another example of a BEV.

**Battery hold-down:** A fastening device used to secure the battery firmly in place. The two most common types are the wedge, which clamps over a protrusion near the bottom of the battery, and the bracket, which fits around or across the top of the battery and is secured with long threaded rods.

**Biodiesel:** Vegetable oil- or animal fat-based diesel fuel. Biodiesel is typically blended with petroleum-based diesel fuel in 5 or 20 percent concentrations that are commonly referred to as B5 and B20.

**Blind spot monitoring:** An ADAS system that monitors the driver's blind spots at the rear quarters of the car and provides visual, audible and/or tactile alerts when a vehicle is present in them.

**Bottoming:** When your vehicle reaches the limits of the suspension travel (such as when going over bumps), and the vehicle's springs are completely compressed. This results in a sudden transfer of noise/harshness, particularly through the steering, and possible contact of the vehicle undercarriage with the pavement.

**Brake Assist:** An ADAS system that automatically applies full braking power when it detects that the driver is executing a panic stop.

**Brake booster:** A vacuum or hydraulic powered device that multiplies the foot pressure applied to the brake pedal to increase braking power while reducing the required driver effort.



**Brake caliper:** The hydraulic assembly that contains the brake pads and applies them against the brake rotor to slow or stop the car.

**Brake drag:** Brakes that do not completely release after application.

**Brake fade:** A loss of braking efficiency caused by high brake temperatures. Fade typically occurs during extended and/or repeated heavy brake usage. Brake fade requires increased pedal pressure to maintain the same level of braking action, and in extreme cases the brake pedal may sink to the floor causing a near total loss of braking ability.

**Brake fluid:** The liquid in the brake system that acts as a hydraulic fluid. As you step on the brake pedal, brake fluid is forced through the system to apply the brake assemblies at the wheels.

**Brake fluid reservoir:** The container that stores a supply of brake fluid until it is needed. On most vehicles, the reservoir is attached to the brake master cylinder.

**Brake master cylinder:** The brake system component that turns the mechanical power provided when you step on the brake pedal into the hydraulic power that is needed to apply the brakes and slow or stop the vehicle.

**Brake shoes:** Curved metal platforms faced with a friction material that is pressed against the inside of a brake drum to slow or stop the car. Brake shoes are applied by the wheel cylinder.

**Brake pads:** Metal backing plates faced with a friction material that is pressed against a brake rotor to slow or stop the car. The brake pads fit into, and are applied by, a brake caliper.

**Bucking:** Engine miss or hesitation, or transmission slip then engagement, that causes the car to lurch repeatedly as it accelerates.

## C

**Camshaft:** A machined shaft with eccentric lobes that are used to open the valves in the cylinder head.

**Catalytic converter:** An exhaust system component that plays a major role in vehicle emissions control. Catalytic converters use chemical oxidation and reduction processes to cleanse the engine exhaust gasses before they leave the tailpipe.

**Chassis (undercarriage):** The vehicle frame that carries all suspension and power train components. Trucks still use a frame that is separate from the body, but virtually all modern passenger cars use unit-body construction in which the body itself serves as the main chassis member.

**Cold cranking amps (CCA):** A rating that indicates the amount of power a battery can provide for engine cranking in cold-start conditions.



**Compressed Natural Gas (CNG):** A purified and pressurized version of natural gas suitable for use as an automotive fuel. Most light-duty vehicles that can use CNG have a “bi-fuel” system that allows operation on either gasoline or CNG.

**Coolant (anti-freeze):** The liquid in the engine cooling system that dissipates heat. Engine coolant prevents freeze-up in winter, raises the boiling point in summer, and protects the cooling system from rust and corrosion year round.

**Coolant recovery reservoir:** A tank that stores additional engine coolant and allows the radiator to be completely filled at all times for maximum efficiency. As the engine warms up and the coolant expands, excess is directed to the reservoir. As the engine cools and the coolant contracts, surplus in the reservoir is drawn back into the radiator.

**Compression ratio:** The ratio between the largest and smallest possible volumes in the cylinder of an internal-combustion engine. For example, a compression ratio of 9:1 means the piston will compress the air/fuel mixture into a space that is nine times smaller than the maximum cylinder volume.

**Constant velocity (CV) joint:** Typically used in front-wheel drive applications, constant velocity joints are a form of universal joint that smoothes power delivery and allows the wheels to be turned for steering.

**Continuously Variable Transmission (CVT):** an automatic transmission that uses two variable-diameter pulleys and a steel belt to continuously alter its gear ratio. This provides smooth power delivery and allows the engine to operate at the optimum speed for any given driving condition.

**Control arms:** Pivoting suspension components that connect the vehicle chassis to the spindle that supports the wheel and tire assembly.

**Crank:** The car “cranks” when the starter motor is able to spin the engine or cause it to “turn over.” If the car “will not crank” when you turn the ignition key, you hear either a clicking sound, or nothing at all. The term “crank” is also used as a short form of the word crankshaft.

**Crankcase (engine block):** Largest assembly of an internal combustion engine. Consists of the lower part of the engine which contains the crankshaft, connecting rods and pistons in an oil-tight housing.

**Crankshaft:** The central machined shaft in an internal combustion engine. The crankshaft converts the reciprocating motion of the pistons and connecting rods into rotary motion that is directed to the transmission and ultimately to the wheels.

**Curb weight:** The weight of a vehicle carrying a full tank of fuel but no passengers or cargo.

**Cuts out:** When an engine loses power or misfires and feels like the engine is shut off momentarily.



**Crossover Utility Vehicle (CUV):** A vehicle similar to an SUV but built with unit-body construction (no separate frame) and often based on existing passenger car structures. CUVs offer styling similar to that of an SUV, but come in various sizes with fuel economy, ride and handling more like a sedan than a truck. CUVs are typically used as “people-haulers” and most have reduced off-road capabilities in comparison.

## D

**Daytime Running Lights (DRL):** Front lighting designed to operate during daylight hours to improve a vehicle’s visibility to other drivers. DRLs may be normal-intensity headlights, reduced-intensity headlights or separate lighting assemblies that may include LED arrays.

**Detonation (knocking, pinging):** Rapid, uncontrolled combustion of the air-fuel mixture in the cylinder that results in a hard, rattling sound. Detonation can cause severe engine damage if left unchecked for long.

**Diesel (engine):** An engine design in which the fuel is ignited by heat generated in compressing air rather than by a spark plug as in a gasoline engine. Diesel engines are more efficient than gasoline engines, and provide more torque at lower rpm. Modern “clean diesels” meet the same emission standards as gasoline engines and require the use of ultra-low sulfur diesel (USLD) fuel which has been mandated for on-road diesels since 2007.

**Dieseling:** When the engine continues to run for a short time after the ignition is turned off. Caused by high combustion chamber temperatures igniting residual fuel drawn into the cylinders. Usually occurs only on carbureted engines.

**Differential:** A system of gears that allows the outside driven wheel to rotate faster than the inside driven wheel when turning a corner. Conventional “open” differentials direct engine power to the wheel with the least traction, which can be a problem on slippery surfaces. To combat this, some vehicles are equipped with “limited-slip” differentials that ensure some power is always delivered to both driven wheels.

**Differential lube (gear oil):** Heavy-duty lubricant specifically designed to handle the requirements of the gears and mechanisms located within the differential case.

**Dipstick:** Calibrated rod used to measure the level of a fluid. On automobiles, dipsticks are commonly used to check the oil level in the engine, transmission and power steering reservoir.

**Disc brake:** Brake design in which brake pads press against a disc (commonly called the brake rotor) to slow or stop the vehicle.



**Driver alertness monitoring:** An ADAS system that monitors driver behavior for indications of drowsy or distracted driving. When warranted, the system provides visual and audible alerts advising the driver to take a rest stop.

**Drivetrain (powertrain):** The combination of the engine, transmission, driveshaft, differential and axles that deliver power to the wheels.

**Drum brake:** Brake design in which brake shoes press against the inside of a cylindrical drum to slow or stop the vehicle.

**Drive shaft:** On rear-wheel or all-wheel drive vehicles, the shaft that couples the transmission to the rear axle differential assembly.

**Dual overhead camshafts (DOHC):** An engine with two camshafts located in the upper portion of the cylinder head.

**DUBs:** A slang term for twenty-inch (“double dime”) or larger custom wheels fitted with low profile tires for a custom look. Ride quality can suffer with larger wheels and tires, although a low profile performance tire may offer an improvement in handling (especially on dry roads) if its diameter is close to that of the original equipment tire. Tires and wheels more than an inch or two taller than stock can cause ride and handling to degrade due to their increased weight.

## E

**Electrolyte (battery acid):** The fluid in automotive batteries, a mixture of sulfuric acid and water.

**Electronic brake force distribution:** A system that helps reduce stopping distances by using antilock brake system components to vary front-to-rear braking force. The system compensates for different vehicle loads, and normal weight transfer to the front axle during a stop.

**Electronic fuel injection (EFI):** A fuel delivery system in which electrically controlled nozzles (injectors) spray fuel into the intake manifold or cylinders as needed, allowing for more precise fuel control and better fuel efficiency than can be achieved with a carburetor.

**Electronic Stability Control (ESC):** A system that provides selective wheel braking to improve vehicle handling and help drivers regain control in certain extreme circumstances. ESC employs components of the anti-lock braking system and is required on all passenger vehicles starting with the 2012 model year. Systems on SUVs generally also provide incorporate Rollover Mitigation.

**Engine block (crankcase):** Largest assembly of an internal combustion engine. Consists of the lower part of the engine which contains the crankshaft, connecting rods and pistons in an oil-tight housing.



**Ethanol:** Ethyl alcohol sourced primarily from corn that is blended with gasoline in varying proportions (E10, E85, etc.) to reduce exhaust emissions from older vehicles while supporting energy independence by reducing the need for imported oil.

**Extended-Range Electric Vehicle (EREV):** Similar to a plug-in hybrid electric vehicle, an EREV has a much bigger battery that typically provides an electric-only driving range of around 30 to 40 miles. Once the battery is discharged, a gasoline engine powers a generator that gives the vehicle an additional 200-300 miles of “extended-range” driving. Unlike a PHEV, the gasoline engine in an EREV does not directly drive the vehicle; it simply provides power to the battery which continues to propel the car using an electric motor. The Chevrolet Volt is an example of an EREV.

## F

**Fast idle:** An increased idle speed that typically occurs for a short time after a cold engine start to improve drivability and speed engine warm up.

**Flooding:** Excess fuel in the cylinders that makes starting difficult or impossible.

**Four-wheel drive (4WD or 4X4):** A part-time system that powers all four wheels for improved traction during adverse road conditions and off-road use. Four-wheel drive systems differ from all-wheel drive (AWD) systems in two ways: they can be disengaged when not in use, and they are not suitable for use on dry pavement.

**Front-wheel drive (FWD):** Drive system that provides power to only the front wheels of the vehicle. Front-wheel drive systems incorporate a differential into a transmission, creating a transaxle. A transaxle can be automatic or manual shift.

**Fuel injection (FI):** A fuel delivery system in which nozzles (injectors) spray fuel into the intake manifold or cylinders, allowing for more precise fuel control and better fuel efficiency than can be achieved with a carburetor. Fuel injection systems come in a variety of forms, but virtually all modern vehicles use some form of electronic fuel injection.

## G

**Gasoline Direct Injection (GDI):** An fuel delivery system that injects gasoline under extremely high pressure directly into the engine combustion chamber. This technology generates more power with better fuel economy and lower emissions.

**Gear oil (differential lube):** Heavy-duty lubricant specifically designed to handle the requirements of the gears and mechanisms located within the differential case.

**Grab:** Brakes engage suddenly and strongly, even when applying light pressure on the brake pedal.



**Green House Gas (GHG):** Any gas in the atmosphere that absorbs and emits radiation within the thermal infrared range, thereby contributing to climate change/global warming. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

**Gross Vehicle Weight Rating (GVWR):** The total maximum allowable weight capacity of a vehicle, including the weight of the vehicle itself plus the weight of its fuel, passengers, and cargo.

**Group number:** A number established by the Battery Council International (BCI) that identifies a battery based on its battery length, height, width, terminal design/location, and other physical characteristics..

## H

**Hesitation:** Momentary loss of power on acceleration.

**High Intensity Discharge (HID) headlights:** Headlights that use high voltage to ionize a mix of gases, including xenon, in a special bulb to produce an extra-white or even bluish light that is several times brighter than a conventional halogen headlight.

**Horsepower:** The measurement of the engine's ability to produce work.

**Hybrid Electric Vehicle (HEV):** A vehicle that achieves improved fuel efficiency by using an electric motor to help the engine propel the car. The motor receives power from a modestly sized battery that is automatically recharged during vehicle operation using a generator driven by the car's engine. The battery is also recharged by "regenerative braking" that turns the electric motor into a generator during coasting and braking. HEVs have no provision to connect an external charger, and the energy contained in the battery can propel the vehicle under electrical power alone for only a very short distance, if at all. The Toyota Prius is an example of an HEV.

**Hydrogen fuel cell:** An advanced "battery" that uses hydrogen and oxygen to generate electricity that powers an electric motor to propel the car. The only exhaust emissions of a hydrogen fuel cell are heat and water vapor.

## I

**Intermittent:** A problem that comes and goes with no obvious pattern.

## K

**Knocking (detonation, pinging):** Rapid, uncontrolled combustion of the air-fuel mixture in the cylinder that results in a hard, rattling sound. Detonation can cause severe engine damage if left unchecked for long.





## L

**Lane departure warning:** An ADAS system that monitors lane markings and provides the driver with visual, audible and/or tactile alerts if their car begins to leave its lane and the turn signal is not on.

**Light Emitting Diode (LED) headlights:** Headlights that use an array of LEDs to provide forward illumination. LED headlights provide a “whiter” light than HID units, but they are more directional and typically produce less light overall.

**Lightweighting:** The process of reducing vehicle weight using high-strength steels, aluminum, plastics, carbon fiber and other materials to achieve fuel economy gains that reduce greenhouse gas emissions.

**Limited-slip (differential):** A system of gears that allows the outside driven wheel to rotate faster than the inside driven wheel when turning a corner. Compared to a conventional “open” differential (which directs power to the wheel with the least traction), a “limited-slip” differentials ensure that some power is always delivered to both driven wheels.

**Liquefied Petroleum Gas (LPG):** Liquefied petroleum gas, also called propane, is a combustible by-product of natural gas processing and crude oil refining. LPG has been employed as a motor fuel for over 90 years, and outside the U.S. it often goes by the name “autogas.”

## M

**Master cylinder (brake master cylinder):** Master cylinders are used on braking systems to turn the mechanical power that is provided when you step on the brake pedal into the hydraulic power that is needed to apply the brakes and slow or stop the vehicle. The brake master cylinder is where the brake fluid reservoir is located on most vehicles. The reservoir stores the fluid until it is needed.

**Miles per Gallon (MPG):** A measure of fuel efficiency based on the number of miles a vehicle can travel using one gallon of fuel. Federal fuel economy estimates are based on standardized tests that enable the use of EPA fuel economy estimates to compare vehicles. See [www.fueleconomy.gov](http://www.fueleconomy.gov).

**Misfire (miss):** The failure of the fuel charge in one or more engine cylinders to ignite at the proper time.

**Multi-point injection:** A fuel delivery system that utilizes a fuel injector for each cylinder.

## O

**On Board Diagnostics (OBD):** A built-in diagnostic system on all 1996 and newer vehicles that monitors vehicle emissions control systems for proper operation. Problems that cause an increase in emissions will illuminate the “check engine” Malfunction Indicator Light (MIL) on the dash. The OBD system also provides a standardized Diagnostic Link Connector (DLC) for attaching diagnostic tools to the vehicle.



**OE or OEM:** Original equipment or original equipment manufacturer. Typically refers to components used to build the vehicle at the factory, and available as service replacements through franchised dealers.

## P

**Park assist:** A system of ultrasonic sensors on the front and/or rear bumpers that provide the driver with visual, audible and/or tactile alerts as their vehicle approaches a stationary object.

**Play:** Degree of “looseness” in a movable component or series of components. Often used to describe suspension or steering wear. In the case of steering, play is the amount of free movement at the steering wheel before the vehicle wheels actually begin to turn.

**Plug-in Hybrid Electric Vehicle (PHEV):** Similar to a conventional hybrid electric vehicle, a PHEV has a larger battery that can be charged by plugging the car into an external power source. PHEVs have an electric-only range of around 10-20 miles. Once that range is exhausted, the vehicle reverts to normal hybrid operation with a gasoline engine that drives the car and combines with regenerative braking to charge the battery for a limited amount of electrical power assist. The Toyota Prius Plug-in is an example of a PHEV.

**Port fuel injection:** A fuel delivery system that uses a separate fuel injector for each cylinder, and injects fuel into the intake ports upstream of the intake valves.

**Positive crankcase ventilation (PCV) valve:** Emission control system that redirects crankcase vapors back into the engine to be burned. Often controlled by a PCV valve that requires periodic replacement. PCV valve problems can cause a car to run rough, stall, use excess engine oil, smoke, and have high exhaust emissions.

**Power loss:** Engine runs at reduced speed or requires more throttle to maintain constant speed.

**Powertrain (drivetrain):** The combination of the engine, transmission, driveshaft, differential and axles that deliver power to the wheels.

**Pull:** Vehicle self-steers to one side or the other when driving or braking.

## R

**Radiator:** An assembly of tubes and fins that transfer heat from the engine coolant into the passing air stream. This process is aided by mechanical and/or electrical fans that pull/push additional air through the radiator as needed.

**Rain-sensing wipers:** Windshield wipers whose rate of operation is electronically controlled based on the amount of moisture on the windshield.



**Rear view camera:** A camera mounted at the back of the vehicle that displays a picture on a screen in the dash or rear view mirror of what is behind the car when the transmission is in reverse.

**Rear-wheel drive (4X2):** Drive system that provides power to only the rear wheels of the vehicle. In trucks, this type of powertrain is sometimes referred to as “4X2” in comparison to a four-wheel drive “4X4” system.

**Recall:** A safety- or emissions-related bulletin issued by the vehicle manufacturer, the Environmental Protection Agency (EPA) or the Department of Transportation (DOT). A recall involves work that must be done at no charge to the consumer by an authorized dealer of the vehicle make involved.

**Revolutions per minute (RPM):** The speed at which the engine crankshaft is turning.

**Ride:** The quality of the vehicle’s movement as it is driven down the road. Based on their intended use, vehicles can have a variety of different ride characteristics. Factors that affect a vehicle's ride include the suspension, steering and brakes.

**Rough idle:** When the engine vibrates or shakes while running with the drivers foot off the gas.

**Rust proofing:** Protective coating applied to vulnerable areas of the vehicle to protect them from rust and corrosion. Undercoating products are typically used on the undercarriage and inside body parts such as fenders, doors and rocker panels, that are exposed to winter road chemicals and can trap moisture.

## S

**Shimmy:** Side-to-side shaking in the suspension or steering.

**Shock absorber:** Suspension component that damps spring oscillations. Shock absorbers work by forcing a fluid through calibrated orifices that limit the rate of movement. Some designs place the fluid under gas pressure to prevent or reduce fluid foaming which can greatly reduce efficiency.

**Sidewall:** The most visible part of the tire when viewing the vehicle from either side. The sidewall contains information about the tire size, grade, and ratings as well as the manufacturer's name.

**Single overhead camshaft (SOHC):** An engine with one camshaft located in the upper portion of the cylinder head.

**Sluggish:** Vehicle does not accelerate smoothly or with authority.

**Specific gravity:** Term used in connection with testing a battery's electrolyte. A specific gravity test is used to determine the battery's state of charge. Sealed “maintenance free” batteries sometimes have an indicator on top that indicates the state of charge.



**Spindle:** The suspension component on which the hubs, wheels and tires mount and rotate. Spindles on the front suspension are turned side to side to steer the vehicle.

**Strut (MacPherson strut):** A type of shock absorber that also serves as a suspension locating member.. Most struts incorporate the suspension spring around their shaft, a design called the MacPherson strut. A “modified strut” mounts the spring separately from the strut.

**Stumble:** Engine begins to stall but then kicks back in.

**Supplemental Restraint System (SRS):** A system of passenger protection air bags that supplement the conventional seatbelts. Modern cars can be equipped with 10 or more airbags that protect occupants in frontal, side and rollover crashes.

**Sport Utility Vehicle (SUV):** An enclosed body on a truck chassis that provides ruggedness and ground clearance with room for up to 9 passengers and their cargo. These vehicles usually have fuel economy and ride/handling traits similar to the trucks on which they are based. The Chevrolet Tahoe/Suburban, GMC Yukon/Yukon XL and Ford Expedition/Expedition are common SUVs.

**Supercharger:** An engine driven compressor that forces additional air into the engine, allowing more fuel to be burned for greater power output.

**Surge:** Engine speeds up and slows down with no change in accelerator position or brake application by the driver.

**Suspension:** The combination of tires, wheels, hubs, spindles, control arms, springs, struts, shock absorbers and related parts that support the chassis and body as the vehicle moves down the road.

## T

**Technical service bulletin (TSB):** An advisory bulletin issued by a vehicle manufacturers that describes updated processes and/or parts to address specific problems that may occur on some models. Repairs based on a TSB are covered under a new-car warranty. However, once the factory warranty has expired, TSB repairs are performed at the owner’s expense in most cases.

**Telematics:** The wireless transmission of useful information to and from a vehicle.

**Thermostat:** A component that helps regulate engine temperature by controlling the speed at which coolant circulates through the engine.

**Torque:** Twisting force produced by the engine.



**Traction Control System (TCS):** A system that uses the anti-lock braking components to limit wheel spin when accelerating on slippery surfaces. More advanced systems can also retard engine spark timing and automatically back off the throttle when necessary to control wheel spin.

**Transaxle:** Used in front-wheel drive and rear-engine, rear-wheel drive vehicles. Transaxles incorporate both a transmission and a differential into a single unit.

**Transverse mounted engine:** An engine mounted so that its crankshaft is positioned side-to-side in relation to the vehicle. Transverse engines are typically found in front-wheel drive vehicles.

**Tread:** The pattern molded into area of the tire that contacts the road. The tread patterns is designed to increase traction based on the tire's intended use.

**Turbocharger:** An exhaust-driven supercharger that forces additional air into the engine, allowing more fuel to be burned for greater power output.

**Undercarriage (chassis):** The vehicle frame that carries all suspension and power train components. Trucks still use a frame that is separate from the body, but virtually all modern passenger cars use unit-body construction in which the body itself serves as the main chassis member.

## V

**Vacuum:** The lower than atmospheric pressure that exists in the intake manifold when the engine is running. On most cars, engine vacuum is used to operate a variety of components and systems.

**Vacuum hose:** A hose (usually rubber or hard plastic) that transfers vacuum to various vehicle components.

**Variable Valve Timing (VVT):** An enhanced engine valve train system used on most modern automobiles that allows the lift, duration or timing (any or all) of the intake and/or exhaust valves to be changed during engine operation. This engine feature provides smoother operation, more power, better fuel economy and reduced exhaust emissions.

**Vehicle Identification Number (VIN):** A 17-character "serial number" that is unique to each vehicle. The VIN characters are broken down into several sections: the first 3 identify the manufacturer; the next 5 are vehicle attributes; check digit, model year and plant codes each have their own single identifier; and the final 6 are the actual sequential number in the vehicle production run.

**Viscosity:** The measure of a liquid's ability to flow under varying temperature conditions. In automobiles, viscosity most often refers to the "weight" of a motor oil, which is designated using number and letter grades established by the Society of Automotive Engineers. Oils with low numbers such as 5W or 10W flow easily at low temperatures (the "W" stands for winter). Oils with high numbers such as 30 or 40



resist thinning at high temperatures. Most modern engines call for multi-grade oils such as 5W-30 that perform well at both low and high temperatures.

## W

**Water pump:** The pump that circulates coolant/antifreeze through the engine, radiator and heater.

**Wander:** Vehicle tendency to drift from side to side without any steering input change from the driver.

**Wheel cylinder:** The hydraulic component in a drum brake assembly that presses the brake shoes against the drum to slow or stop the car.

**Wheel (rim):** What the tire is mounted on. Wheels can be made of steel or a light alloy, such as aluminum.