

Car Design Glossary

A Century of Automotive Style: 100 Years of American Design – Lamm & Holls

Airdam: A foil or aerodynamic device, often positioned under the front bumper.

A-pillar: The first set of structural roof supports at either side of the windshield. The next set of pillars, behind the front doors, is called B-pillars, and those behind the rear doors are called C-pillars. Some limousines and station wagons have D-pillars.

Alloy wheel: A wheel cast from alloys of aluminum or magnesium, usually in one piece. (See also “Disc wheel” and “Wire wheel.”)

Applied (fender or trim): Fastened onto or stamped into the surface of the body.

Armature: The wooden, metal or hard-foam supporting structure under a clay model.

Attitude: When a vehicle has a noticeable demeanor and is said to be aggressive, playful, intimidating etc. Can also describe the vehicles overall relationship to the ground.

Axes: In locating points on a car body, designers and draftsmen use the conventional three 3D reference lines: longitudinal, vertical and cross-car. These lines or axes are labeled X-Y-Z. (See also “Zero point.”)

Backlight: The rear window opposite the windshield.

Badge engineering: The practice of applying different nameplates to cars with identical or very similar sheetmetal.

Bakeoff: A showdown between design proposals, usually held in the form of a show with clay models from rival studios or designers.

“Banana”: The opening between the top of the steering-wheel rim and the hub through which the driver can see the instrument panel.

Bead or beading: A formed, often ornamental molding, usually pliable, sometimes fitted as a sealer (“welting”) between two exterior body panels; e.g. between fenders and body. May also be rigid as in “fender beading”. Flexible beading is sometimes used to trim car upholstery.

Bellypan: A partial or full surface, usually of sheetmetal, affixed to the underside of a car body. The bellypan acts as an aerodynamic aid.

Beltline: The horizontal area of the body along the door just below the side-window glass.

Bezel: A shaped, usually ornamental, often bright edging around a functional body component, e.g. lights, gauges, emblems, medallions, etc.

Black metal: The structural, supporting inner sheetmetal of a body usually painted black.

Blind quarter: A wide sail panel, q.v.

Bling: When certain details of a vehicle such as the grill, wheels, trim, moldings, badges and other ornamentation are finished with particular flare with the use of in chrome or any bright scintillating finish. The scale of the details in question must typically be outsized to increase notability. When a vehicles details are deliberately designed to catch attention and suggest wealth and status.

Boattail: The rear of a carbody shaped like the upside-down prow of a boat.

Body in white: The finished but unmounted and unpainted body. It’s called “in the white” because the original protective undercoat was white or light yellow.

Body sweeps: (See “Sweeps.”)

Bone line: A hard, raised longitudinal peak in the sheetmetal, usually along the side of the car body; more massive than a character line (q.v.).

Boot: (See “Top boot.”)

Box, one-, two-, three-: Body morphology is often described in terms of one-box, two-box and three-box. A one-box body usually refers to a van, whose body looks like one big box. A station wagon or something like the VW Rabbit qualifies as a two-box body, the hood being one box and the cabin the second. And a three-box body is usually a conventional sedan or coupe: hood, cabin and trunk. Also called “one-, two- and three-shape.”

B-pillar: (See “A-pillar.”)

Bridge: An upside-down-U-shaped device that rides on side rails over a clay model. It’s used to take reference points and make accurate measurements of the model.

Brow: A raised or protruding area above or around an arch, like a headlamp or wheel well.

Buck: (See “Seating buck.”)

Bumper: A protective bar or area protruding from the extreme front or rear of a car body.

Bumper pan: Sheetmetal that extends downward from the bumper. (Sometimes called “modesty panel” or “modesty skirt.”)

Bustleback: A car body with an attached luggage compartment.

Bulkhead: A large, reinforced, crossbracing sheetmetal panel, typically behind the rear seat of a car body.

Cast (to): To form metal or plastic by pouring the molten substance into a mold and letting it solidify. (See also “Die-casting.”)

Catalogue custom: A coachbuilt custom body displayed in and sold through an automaker’s dealer catalogue. (See also “Series custom.”)

Catwalk: The area between the front fender and hood. The word was commonly used for cars of the late 1930’s and early 1940’s, when catwalks extended from the front bumper to the door cuts.

Centerline: A hypothetical line drawn longitudinally through the center of a developing car body, also known as the X axis.

Chamfer: The juncture of two angled or beveled flat surfaces.

Channel (to): To lower a car body by cutting out the floor and dropping the body down over the frame rails.

Character line: A raised or indented, creased or peaked line on a smooth surface that adds stronger-than-normal interest to the car’s aesthetics.

“Cheat” (to): To exaggerate a design feature in a sketch or model in order to improve the car’s appearance or proportions, such as stretching the wheelbase and lowering the height of the body.

CHMSL: Center high-mounted stop light (pronounced Chimsel).

Chop (to): To lower the top or greenhouse of a car body by cutting out a few inches horizontally and re-welding the pillars and panels.

Coefficient of drag (Cd): A numerical value representing aerodynamic efficiency. The lower the value, the more efficient the shape.

Coordinate measuring machine: (See “Scanner.”)

Couple distance: The distance between the front- and rear-seat H-points (q.v.); a critical interior packaging dimension.

Coved: Recessed.

Cowl: The surfaced and structural body component at the front of the passenger compartment between the engine hood and the main body back to the windshield. Cowls vary tremendously in detail and construction, but the typical cowl is made up of the firewall and extends back to meet the instrument panel.

C-pillar: (See “A-pillar.”)

Crown: A domed area of the hood, fenders or roof. Also a subtle rise or convexity in a surface to make it look straight or flat instead of sunken.

Custom (body): A special or coachbuilt automobile body uniquely designed and fabricated, as opposed to mass-produced bodies. (See also “Catalogue custom” and “Series custom.”)

Cutline: The line around an openable body panel; e.g. doors, hood and decklid.

“Dash” (in body engineering): In some car companies, the “dash line” is an all-important measuring marker from which body-length dimensions are taken. During design, the actual “dash” (firewall) is extensively altered to accommodate intrusion by the transmission, ducting, controls, etc., so it rarely coincides with the theoretical “dash” and should never be confused with “Instrument panel,” q.v.

Dashboard: In very early cars, an upright wooden or metal panel at the front of the body. This was a holdover from days when the dashboard literally shielded the carriage from the horse and road splash. In more modern cars, the word “dashboard” is sometimes used interchangeably with the more correct term, “instrument panel,” q.v.

Dash-to-axle: The distance from the “dash” line or point to the front-axle centerline in side view. This is a crucial dimension in creating interchangeable body programs.

Daylight opening (or DLO): The perimeter of any car window, including the windshield and backlight.

Deck: The upper surface of the luggage compartment.

Deck (to): To clear the decklid of ornamentation.

Decklid: The lid of the luggage compartment.

Diecast (to): (See “Cast.”)

Diecasting: A part formed by pouring a molten metal alloy, often bronze or zinc, into a mold.

Die model: The master model, traditionally hand carved from mahogany that served as the final, correct guide for making sheetmetal stamping dies.

Di-Noc: A registered trade name by 3M for a thin, highly flexible, stretchable, paintable plastic film used to cover clay models to give them color and gloss. Di-Noc can be painted after adding an elasticizer. Painted, it's usually soaked in a hot-water solution to make it pliable. The name Di-Noc also refers to an ornamental film used in the 1930's through the early 1950's to bond woodgrain and other ornamental patterns to garnish moldings, instrument panels, station-wagon exteriors, etc.

Disc wheel: A steel wheel whose center is stamped on one piece. (See also “Artillery wheel” and “Wire wheel.”)

DLO: Daylight opening, q.v. side window area.

Dogleg: An angled bend, often at the trailing edge of a window; also where the rear door curves around the rear wheelhouse of a four-door body style.

D-pillar: (See “A-pillar”.)

Draw depth: The depth to which a stamping press can push or fold a metal sheet or panel.

Drip molding: The molding-like, U-shaped trough or gutter at the lower edge of the roof that catches rainwater and carries it away from the windows and doors.

Dutchman: On a sedan or coupe, the sheetmetal surface or panel between the backlight and the top edge of the decklid.

Eggcrate: A geometric, crosshatch pattern of squares or rectangles, usually used in reference to grille texture.

Elevation: As seen in front, rear or side views. A side elevation, for example, is a side view. (The plan or top view is not defined as an elevation.)

Envelope body: A car body whose sides have no visual or actual side-surface interruptions or breaks.

Escutcheon: An ornamental, protective plate or surround, like the bright, raised area around a keyhole.

Extrusion: A part, like a molding, formed by forcing or extruding the material through a shaped orifice.

“Eye envelope”: The oval area on an instrument-panel drawing that theoretically shows the range of human vision. The idea is to keep controls and gauges within the eye envelope.

Facelift: Design changes that make a familiar style or ornament look fresh and different.

Fascia: The instrument panel (q.v.); usually British; also a flexible material that covers a bumper.

Fast: A word used to describe the angle or tilt of a windshield or backlight. The “faster” the glass, the more nearly horizontal it is. Its “fastness” is measured between zero degrees (horizontal) and 90 (vertical); i.e. a 57 windshield is faster than one standing more upright at 80 .

Fastback: A body shape in which the roof slopes downward at the rear and blends into the deck or luggage compartment with no notch or visual break.

“Fease out” (to): To determine the feasibility or manufacturability of a design. This is usually an engineering function.

Fender: The panel or area over the wheel that constrains road splash at speed. (See also “pontoon fender” and “Suitcase fender.”)

Fender beading: (See “Beading.”)

Fender crown: (See “Crown.”)

Fender skirt: A panel or covering, usually of sheetmetal, that covers a wheel arch (q.v.) or fender opening.

Fender valance: (See “Valance.”)

Fillet (to): A concave, transitional surface that fills, mates or blends two intersecting surfaces.

Firewall: The vertical wooden or sheetmetal panel that separates the engine compartment from the passenger compartment.

Five-axis (milling machine): A milling machine that can be programmed not only to follow the conventional X-Y-Z axes but which also keeps the milling head perpendicular (normal) to the surface at all times. These additional two “axes” are programmed into the computer as front-to-rear and side-to side instructions. (The concept of five actual axes is misleading; there are still only three.)

Flag: The triangular area of a car’s front door, just above the beltline and behind the A-pillar, to which the outside rearview mirror is often attached. The flag also shortens the front-door glass, allowing it to lower completely into the door.

Flange: A collar, rim or other body component that adds strength or provides a means of attaching another part.

Fome-Cor: A trade name for a material used in the designing of interior bucks and mockups. Fome-Cor typically consists of a 1/8 to 1/2 inch sheet of Styrofoam sandwiched between two layers of heavy, white paper.

Frame-integral: Another term for “unitized body,” q.v.

Garnish molding (or garnish rail): Trim moldings on doors, usually to ornament interior window frames.

Gesture: When a vehicle has implied motion in its styling lines and shapes.

Greenhouse: That part of the car body above the beltline that includes the roof, pillars and glass.

Grille: A perforated panel or area usually ornamented. (See also “Radiator grille.”)

Ground clearance: The distance from the lowest point on the chassis, excluding wheels, to a level road surface.

Gutter: (See “drip molding.”)

Halo car: An automobile intended to stimulate interest in or lend prestige to an automobile line. Example: The viper is a halo car for Dodge.

Hard points: Specific locations, usually called out on a full-sized body draft, of points that have to be adhered to when designing surfaces. Hard points include axle centerlines, seats, pedal locations, roof and sill heights, luggage-compartment dimensions, etc.

Hardtop or hardtop convertible: A body style that lacks B-pillars so that, although the roof is rigid (usually steel), it has the configuration of a convertible.

Header: The horizontal beam or structural member above the windshield.

Headliner or headlining: The inner trim lining of a car roof usually made from cloth and suspended by stiff, hidden wires. Late-model headliners are often molded from foam or cardboard and faced with fabric.

Highlight: Light that bounces noticeably off a peak or line or convex surface.

Hinge pillar: A body pillar to which door hinges are attached.

Hood: The openable covering over the engine compartment in a front-engined car, usually made of sheetmetal and hinged at the front, rear or sides.

H-point: The point, usually called out on a full-sized, side-view body draft, where the driver's hip socket rests near the junction of the front-seat cushion and the seatback.

Instrument panel (also "i.p."): The board or metal panel ahead of the front seat that houses the gauges, controls and glove compartments. (See also "Dash" and "Dashboard.")

Kick panel: The protective interior panel ahead of the front door.

Line drawing: An outline sketch without shading or color.

Lip molding (also "wheel-lip molding"): Ornamental bright trim that outlines and visually reinforces a fender wheel cut.

Louver: A slit or narrow opening to let air, light or water in or out. Some louvers are hinged and adjustable.

Mathematical (or "math") model: A computer model, based on an X-Y-Z coordinate system, of a surface or surfaces. (See "Scanner.")

Metalflake paint: Paint that has tiny flakes, usually of bright aluminum, suspended in the liquid.

Mockup: A representation, usually of the final shape of a styled or engineered body. Can be made of wood, fiberglass, metal or any combination.

Molding: An applied, raised strip, sometimes to cover a joint between body panels or in later cars pressed in for ornamentation.

Monochromatic: Of a single color.

Monocoque: A type of body construction in which the skins are stressed to form part of the supporting structure.

Motif: A repeated pattern or theme.

Mule: A prototype car, usually built with new mechanicals under an old, cobbled body.

Muscular: when a design mimics human and animal forms. The designs surfaces are handled in a way that has muscle-like definition.

Noble: When a vehicle overall aesthetic and proportions commands attention, suggest financial success and social distinction.

Notchback: A body style in which a relatively upright backlight joins a more horizontal rear deck, the join forming a notch.

Offsets: A numerical system of locating points (q.v.) along X-Y-Z axes (q.v.) on a 3D body surface.

Ogee: Any S-shaped curve.

One-off: A one-of-a-kind car, body style or body type.

Organic: when surfaces are made to blend together seamlessly. Forms that appear to have grown biologically.

Oscar: The name given by car designers to the 90th-percentile human form that determines standard interior and seating dimensions. Oscar can take the form either of an articulated plastic mannequin or a line-defined drawing in the CAD computer.

Overcrown (to): To raise above the surrounding crowned surface.

Overhang: The amount of body/chassis structure, including bumpers, as seen in side view ahead of the front axle centerline and behind the rear axle centerline.

"Package" (the): A drawing or series of specifications that tell where a car's "hard points" (q.v.) are: locations of axles, running gear, seats, instrument panel, roof height, door sills, etc. The package is often determined by engineering, and the design staff has to make surface details conform to the parameters called for.

Peak: A sharp ridge stamped into a body surface, usually directed upward (See "Windsplit.")

Pillar: An upright, usually structural body member that separates doors or windows.

Pinstripe: A narrow applied or painted stripe, usually in a bright, contrasting color.

Plan view: As seen from the top.

Platform: The engineering bases for a car. The word is used both for the theoretical car during its planning stages and for the finished car as built.

Platform-team concept: The idea of developing a new car or car line by a multi-disciplinary product team. Instead of having each discipline (design, engineering, marketing, manufacturing, advertising, etc.) work separately and sequentially, the platform team comes together at the beginning and sees the car through from concept to showroom. The idea has long been used in Japan. Among the advantages: greater speed of development, better communications, and fewer procedural mistakes.

Points: Specific surface locations on an automobile body's X-Y-Z axes, designated numerically. (See "Hard points.")

Point taker: (See "Scanner.")

Pontoon fenders: Rounded, tapered, teardrop-shaped fenders popular during the 1930's.

Prismacolor: A trade name for colored pencils commonly used by auto designers.

Prototype: In automobile design, a realistic, sometimes running full-sized, three-dimensional representation of an entire car, usually made of wood, fiberglass, metal or a combination.

Proveout model: A model made to confirm that a drawing or numerical model appears as expected.

Pull cup: A handle or area of the door inner trim panel, often recessed into the armrest, used to pull the door shut.

Quarter panel: That part of a car bodyside comprising the rear fender from the rear door opening back.

Quarter window: A small, usually movable glass pane next to a larger window that allows the directing of air into or out of the cabin. Technically, the quarter window is in or behind the rear door, but the terms is also used to refer to the front ventipane (q.v.)

R&D: Research and development.

Radiator grille: The protective, often ornamented area or structure ahead of the engine radiator, usually at the front center of the body.

Radiator shell: An ornamental, conforming case that ensheathes the radiator. It's often plated and has some form of grille or mesh over the front.

Rake (windshield or glass): (See "Fast.")

Ramp angle: The angle of a driveway or ramp that can affect body overhang (q.v.). Overhang that's too long or too low will scrape a sharply angled ramp when the car passes over it.

Rendering: A drawing or illustration that includes shading and detail.

Restrike: A term used in metalstamping. After a body part like a hood or fender has been pressed, a restrike—an additional stamping action—can change the original part so that it looks different or fits a different car.

Reveal: (See "Window reveal.")

Reveal molding: The molding or trim surrounding or incorporated into a window reveal.

Rocker (also "rocker panel"): The longitudinal sill along the bottom of the body, beneath the doors. On cars with runningboards, the rocker area covered the chassis frame. On more modern cars, it finishes the area below the doors.

Rocker molding: Ornamental trim fastened to the rocker panel.

Sail panel: The solid areas at the rear of the greenhouse that cover the C- or D-pillars and join the rear side windows to the backlight.

Scanner: An electronic machine that can take and record precise measurements of three-dimensional surfaces. Typically, a scanner has an articulated arm with a probe at the end that either physically touches the surface or "scans" it with a laser probe. The scanner, by assigning digitized numbers based on an X-Y-Z coordinate system and a zero point, forms a point-by-point mathematical model of the surface. (Also called "point taker" and "coordinate measuring machine.")

Scoop: An open-fronted area of the body designed to let in air.

Seating buck: An accurate representation of the interior of a car, including seats, pedals, instruments, steering wheel, doors and floor. Some seating bucks are created to evaluate style; others can be used to prove out ergonomics, comfort, door openings, etc.

Section (to): To lower a car body by cutting a horizontal strip out of the sheetmetal all the way around and then rewelding the remated surfaces.

Section (in diagram form): representation of a body or part of a body as if it were cut and viewed at 90°.

Series custom: Custom bodies made up in small batches, usually ranging from five to 25. Also called “semi custom.”

Sightlines: Theoretical lines from the driver’s eyes to objects inside the car (instruments and controls) and also beyond or outside the car windows.

Sill: The longitudinal body rail below in the door openings and above the rocker (q.v.).

Speed streaks: Pressed-in body moldings that represent trails of water swept back by the rush of wind at speed.

Spinner: The ornamental, usually raised or projecting center of a wheel, wheel covering or radiator grille.

Spline: A gently curved or arched surface. The word also refers to a long metal or wooden strip used to form a curve or arch.

Spoiler: A low wing, usually fixed to the top rear surface of the decklid. Its function on race cars is to reduce aerodynamic lift. In most production cars, the spoiler is ornamental.

Subframe: A chassis structure bolted or welded to the front or rear underside of a unitized body (q.v.) that carries the engine and/or suspension.

Suitcase fender: A fender with a basically rectangular shape, although usually rounded along the leading edge. The suitcase fender was popular in the late 1930’s.

Surface plate: A large, precisely machined steel or granite plate that forms the base for making accurate dimensional body measurements.

Swage: A raised molding or windsplit (q.v.) used to stiffen a large panel of sheetmetal.

Sweeps: Long templates, usually made of wood, metal or plastic, used for laying in different curvatures or radii to a full-sized drawing or clay model. Standard sweeps are numbered 1 through 100. Each sweep number represents a 1/8-inch rise in a 60-inch arc. (Example: a #8 sweep has an 8/8 or one-inch rise.) So-called “favorite sweeps” are also designated A through U. All sweeps are based on a chordal length of five feet.

Sweepspear: A typically horizontal body ornamentation, usually with a kickup, often consisting of a bright, applied molding but sometimes also having a contrasting paint color outlined by and contained inside bright trim.

“Sweeten” (to): In design, to smooth and improve the aesthetic flow of a surface or line.

Tape drawing: Full-sized “drawings” of side and end car-body elevations made with long, thin strips of flexible adhesive tape. The tape—usually in rolls, black and about 1/8 inch wide—can be repositioned, so it’s handier than drawing with pencil or pen.

Template: A hard, cut-out representation of a body surface at a certain section. Taken vertically, templates are made on one side of a clay model to accurately reproduce sections either on the other side of the model or in a drawing.

Tension: A purposefully imperfect design feature. A conflicting set of themes combined to generate interest and controversy. When two surfaces meet in an unexpected way, or a detail is deliberately exaggerated the resultant aesthetic is some times at odds with the rest of the theme.

Theme: A loose design idea, usually in sketch or model form, that captures the essence of a project goal; that inspires and points toward further development.

Through fender: A front fender that flows back onto the door and sometimes beyond it, often to blend into or touch the applied (q.v.) rear fender.

Top boot: A covering over the lowered convertible top. Can be flexible (canvas or vinyl) or rigid (fiberglass or metal).

Tread: The distance, center to center, between both front or both rear tires (or wheels) of a car. Also called "track."

Trim buck: Same as a "seating buck" (q.v.) but trimmed in fabric.

Tumblehome: The inward tilt or angle of the roof from the beltline up as seen in front or rear view.

Turn-under: The inward curvature of a car body below roughly mid door as seen in front or rear view.

Unitized body: A type of construction in which the frame and body form a single unit; also called "frame-integral". (See "Monocoque.")

Valance: A front-fender extension hanging down behind the wheel, intended to hide the undersurface and chassis.

Vee or vee angle: An angle shaped like the letter V.

Ventipane or vent pane: The small, hinged, front window behind the A-pillar that allows air to be directed into the passenger compartment. (See also "Quarter window.")

Wheel arch: The fender cutout to the outside of each wheel.

Wheelbase: The distance between the front and rear axle centerlines.

Wheelcover: An ornamental, protective metal disc that covers an entire wheel, as opposed to a hubcap which covers only the center.

Wheelhouse: The bottom surface of a fender or the sheetmetal or plastic pan inside a fender.

Window regulator: The door mechanism that raises and lowers the glass.

Window reveal: An enframed window area in the door, usually recessed and often stepped, surrounding the side glass. (See also "Reveal" and "Reveal molding.")

Windshield rake or angle: (See "Fast.")

Windsplit: A raised crease that runs longitudinally along a body surface, typically in the center of the hood, decklid or fender top. A windsplit is lower than a fin.

Windwing: Same as "quarter window," q.v.

Wire wheel: A wheel with multiple, interlaced wire spokes and a steel rim. (See also "Alloy wheel" and "Disc wheel.")

Working drawings: The mechanical drawings used to complete the body engineering drafts.

Wraparound: A window or molding or surface that stretches partially around the body surface.

Zero line (horizontal): A locating line at the top of the chassis frame as seen in side view. Also called "waterline" and "datum line."

Zero line (vertical): A locating line established at the front of the dashboard.

Zero point: A point that serves to locate all other parts and surfaces of the body. The zero point is often at the very center of the theoretical front axle, but it can also be ahead of the car to prevent minus numbers.