

Intro To Vehicle Parts Terminology - Part 2

Video Scripts



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Video: Radiator Core Support

The radiator core support serves as the front-end cross structure, helping maintain the rigidity of the front body structure.

A basic radiator core support has an upper and lower tie bar, and some may even have side supports. However, some do not have a lower tie bar.

This radiator core support is made up of steel and composite materials. However, some may be made of aluminum or magnesium.

Video: Front Lower Rails

Front lower rails, seen here in green, are the lower structures that run alongside the engine compartment. They may hold the engine mounts and the engine cradle.

Front lower rails may be made up of an inner and outer portion that is welded together. The inner rail is the portion that is closest to the engine compartment.

This set of formations on the end of the lower rail is called a crush zone. These are designed into the structure to allow the front portion of the rail to crush in this area during a frontal collision.

Video: Engine Cradle

An engine cradle, or subframe, on a unibody vehicle is usually a four-sided structure that holds the engine in place and attaches to the front lower rails.

An engine cradle may also contain a part of the front suspension or steering system.

On unibody vehicles that don't contain a subframe, or engine cradle, the engine mounts and other parts mount to the lower rails.

Video: Front Upper Rails

Front upper rails are the upper structures alongside of the engine compartment. They extend forward of the passenger compartment and contain mounting points for the fenders.

Video: Aprons And Strut Towers

The aprons connect to the upper and lower front rails, as well as the strut towers.

The strut tower is the raised portion of the apron assembly, which is used for attaching the top of the front suspension on some vehicles.

The strut tower may be formed as part of the stamping of the apron, or a separate welded part to the apron, such as we see here.

Video: Cowl Panel

The cowl is an assembly that separates the engine compartment and passenger compartment. Holes are designed into the cowl so that mechanical parts and wiring can pass through.

Video: Pinchweld Flanges

Pinchweld flanges are located along the edges of stamped body panels, such as on this A-pillar. During the manufacturing process, the multiple layers are spot welded together along the flange, joining them, creating the pinchweld.

We can also see pinchweld flanges along this door opening and rocker panel.

Video: A-Pillars

A-pillars extend from the top portion of the vehicle to the lower portion, and may also be called windshield pillars. The lower portion is sometimes referred to as a hinge pillar. A-pillars form the forward corner of the passenger compartment and support the front door hinges, windshield, cowl, and front corner of the roof.

There are generally multiple layers, including outer and inner panels, an upper reinforcement, seen here in red, and a lower reinforcement, seen here in blue.

Video: B-Pillars

B-pillars are the pillars located near the middle of the vehicle that support the roof rail, as well as protect the vehicle occupants. They contain the front door strikers and the hinges for the rear doors.

B-pillar construction typically includes an outer panel, inner panel, and one or more reinforcements. This cutaway allows us to see the multiple layers. The outer and inner panels are colored in white, while the primary B-pillar reinforcement is seen here in yellow. An additional reinforcement can be seen here in red.

Video: C-Pillars

The C-pillars are located rearward of the B-pillars. On this four-door structure, the C-pillars are part of the rear door opening and support the strikers for the rear doors. The

lower area of the C-pillar that merges with the rocker panel is commonly called the dogleg.

C-pillars may be designed differently on a two-door vehicle. In this example, the C-pillar contains the opening for the quarter panel glass.

Video: Rocker Panels

Rocker panels are located below the doors, and serve as the lower support for the pillars, as well as the side support for the floor pan.

Similar to pillar construction, rocker panels may be a multi-part assembly, consisting of an outer panel, inner panel, and reinforcements. The inner panel may or may not be part of the floor pan. We can see that it is a separate piece on this vehicle structure.

Rocker panels may also have one or more reinforcements. We can see the front portion of the rocker panel reinforcement here, colored in orange, and it extends rearward along the inside of the rocker panel.

Video: Floor Pan Assembly

The floor pan assembly consists of the floor of the vehicle inside the passenger compartment. Depending on the vehicle design, the floor pan may be multiple sections.

Crossmembers on unitized structures serve as structural or stiffening parts across the width of the vehicle. There may be crossmembers over or under the floor pan that run between the rocker panels. Floor pan crossmembers may include mounting points for the seats. Floor pan crossmembers may run the entire width of the floor pan, or be two separate pieces that connect to the raised center section, such as we see here.

Video: Rear Rails And Trunk Floor

The rear rails, seen here in green, together with the crossmembers, form the rear underbody structure of a unibody vehicle. They also support the floor pan and trunk floor.

This set of formations on the end of the rear rails is called a crush zone. These are designed into the structure to allow the rearward portion of the rail to crush in this area during a rear-end collision.

The rear rails may be closed out on the rear end by a bumper bracket, rear body panel, or a simple closeout panel that serves only that purpose.

The trunk floor is commonly a separate floor panel and may be formed to hold the spare tire.

Video: Rear Body Panel

The rear body panel serves as the rear cross structure of the vehicle. It connects the rear rails and quarter panels. It is also attached to the rear of the trunk floor.

The rear body panel can be a closeout panel for the rear rails on some designs, such as we see here.

The panel is typically located behind the rear bumper cover and can only be seen once the bumper cover is removed.

Video: Controls

Controls include the electrical switches and mechanical levers within the reach of the driver. This may include the multifunction switch, which is located on the steering column. This switch will typically run the lights, turn signals, and may also include other features such as windshield wipers. Also typically on the steering column or steering wheel are the cruise control settings, the horn button, and buttons to control the radio.

Other controls on this vehicle to the left of the steering wheel include a switch for the headlamps and fog lamps, a dimmer switch for the illumination light on the instrument panel, and a button to open the trunk.

Some vehicles have electrical switches to adjust the seat as well.

Electrical controls on the door include the door mirror position adjuster, the power window settings, and the door locks.

On the instrument panel of this vehicle, we have controls for the hazard warning flashers, various controls for the radio, and controls for the heating, ventilation and air conditioning systems.

Controls also include the gear shifter on the center console, and the interior lamps on the overhead console.

On this Ford vehicle, there is a SYNC connection which links a smart phone, for example, to the vehicle. A phone call can be made using this speaker in the headliner.

Video: Breaking Glass

This windshield is a typical piece of laminated safety glass. Let's attempt to break it by striking it with a pointed punch. Notice the toughness of the glass as the first hit fails to break it. The second strike breaks the glass into large pieces that are held intact by the inner plastic laminate layer. This type of damage is typical of laminated safety glass.

Next, let's see how a piece of tempered safety glass breaks. This minivan quarter panel vent glass is placed in a plastic bag for safety reasons before the glass is broken. It's struck with the same punch that was used to break the laminated windshield glass. Notice how the glass explodes into small fragments. While the tempering process toughens the glass, it also places it in tension. Once the hardened outer skin of the glass is penetrated, the glass shatters. This is the typical type of damage that results.

Video: Urethane Adhesive

Stationary glass may either be bolted to the vehicle structure or bonded with urethane adhesive. Urethane adhesive is dispensed from a tube using either a manual or powered dispensing gun.

When the adhesive is cured, it is flexible like rubber. It is also very strong. The cure time must be observed before the vehicle is driven.

Glass, such as a windshield, is commonly bonded to the vehicle on a pinchweld flange. A pinchweld is formed where two mating flanges are welded together.

Video: Window Regulator Operation

There are several different designs of window regulators. Let's first look at the operation of a single-arm, gear-operated window regulator. The spring applies pressure on the lifting arm gear assembly, which reduces the effort needed to raise the window glass.

Another design is the dual-arm, gear-operated window regulator. The arms connect at a pivot joint, and there are additional tracks in the door for the guides to run in. The dual-arm design pushes and pulls the glass from two points instead of one, allowing the force to remain evenly distributed along the glass bottom.

This window is raised and lowered using a cable-and-pulley style window regulator. Two cables run from the drive motor over pulleys to the glass panel. The upper cable is used to pull the glass up and the lower cable pulls the glass down.