

Intro to Vehicle Parts Terminology - Part 1

Textbook



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Introduction

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Obligations To The Customer And Liability



The Collision Repair Industry has an obligation to correctly repair the customer's vehicle. Collision repairs must be performed using:

- recommended or tested procedures from vehicle makers, I-CAR, and other research and testing organizations.
- quality replacement parts and materials.
- repair processes and parts as written and agreed upon in the repair order.
- If items on the repair agreement are not consistent with the repair order, it can be considered fraud.

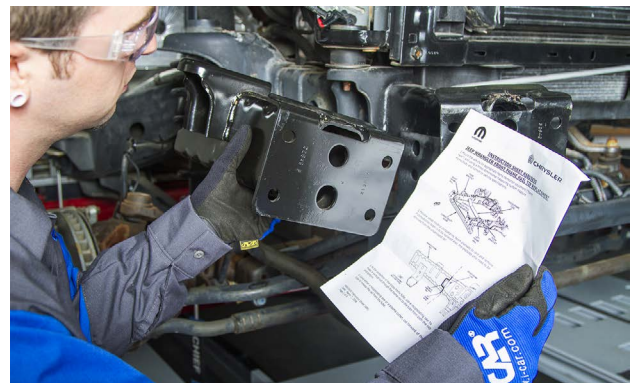
Performing proper collision repairs requires using parts and procedures that keep remaining warranties intact. Collision repairs must restore:

- safety.
- structural integrity.
- durability.
- performance.
- fit.

- finish.

Throughout the damage analysis and repair process the repairer and insurer must: communicate with each other.

- maintain constant communication with the customer.
- be in agreement with each other and the customer on how repairs will be performed.
- inform the customer of any changes in the repair plan from the original repair agreement, and explain the changes and why they have to be made.



To reduce liability:

- make sure that all repairs are performed thoroughly, correctly and as listed in damage report.
- follow proper procedures.
- use quality replacement parts and materials.
- have documentation of required repairs with detailed record keeping available for customers.

Technicians are considered the experts and are expected to be knowledgeable on how to perform a quality repair.

Keeping thorough records includes more than recording the date, mileage, and pre-existing damage. Record keeping also includes: making sure all notes are legible.

- verifying the repairs that were made or not made.
- having the customer sign a waiver for repairs that they do not want performed. Repairers must determine their liability on not repairing safety systems such as restraint and anti-lock brake systems.
- keeping computer printouts or worksheets on file showing wheel alignment readings or vehicle dimensions before and after repairs.
- keeping scan tool printouts and records of computer codes for airbag, anti-lock brake, emission, and powertrain control module (PCM) systems. attaching the OEM or other tested procedure printout to the vehicle repair order.
- keeping receipts for all sublet work performed.

Liability insurance that covers the repair facility may not always cover all damages. For example:

- the policy may not cover faulty repairs, leaving liability responsibility completely on the facility.
- a shop owner may find that repair facility liability coverage may not cover the full amount awarded in a lawsuit. The shop owner would have to pay the difference.

Intro To Vehicle Parts Terminology - Part 1

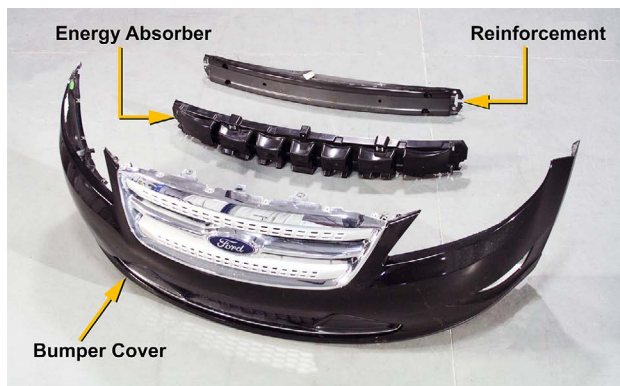


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Bumpers, Front Body, And Roof Panels

Learning objectives for this module include:

- identifying parts of bumper assemblies.
- identifying parts of the hood.
- identifying parts of a fender.
- identifying parts the outer roof panel.



Various parts of the front bumper assembly are shown in this photo.

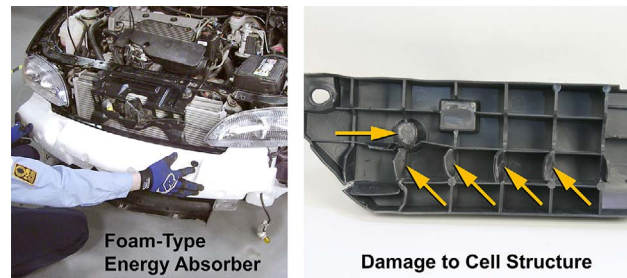
Bumpers are located at the front-most and rear-most parts of the vehicle. Bumper assemblies are designed to absorb collision forces from low-speed impacts.

Both front and rear bumper assemblies typically include a cover, reinforcement, and an energy absorber.

Bumper Covers

A bumper cover, also called a bumper fascia, is made of a plastic material and is designed to cover or contain parts of the bumper assembly. Some bumper covers

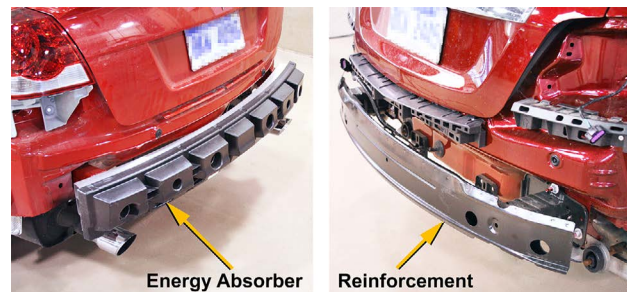
have lamps or the grille attached as an assembly.



This foam-type energy absorber looks similar to Styrofoam (left). The cell structure on this molded plastic energy absorber is damaged (right).

Energy absorbers were developed to reduce collision shock to the vehicle structure and occupants, and absorb minor collision energy, thus reducing damage to the vehicle structure.

Energy absorbers are located behind the bumper cover and may be made of a material that looks similar to Styrofoam. Energy absorbers may also be a molded plastic, in the form of a square cell structure or "egg crate."



A molded plastic energy absorber is attached to the rear bumper reinforcement (left). The bumper reinforcement is bolted to the rear of the vehicle (right).

The bumper reinforcement, also called an impact bar, attaches to the front and rear vehicle structure and is located behind the energy absorber. The reinforcement

provides the majority of the bumper assembly strength.

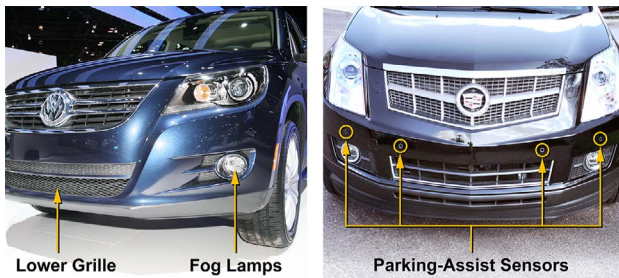
Toyota Tundra



This pickup truck has a chrome-plated steel facebar (left). The front bumper cover on this pickup truck is made of plastic (right).

Steel bumpers are found on trucks and sport utility vehicles (SUVs). This type of bumper may:

- be chrome-plated, or painted with the body color or an accent color.
- have a plastic cover or trim pieces attached.



A lower grille and fog lamps are attached to this bumper cover (left). Parking assist sensors are attached to the front bumper cover (right).

Bumper covers are often supplied in accordance with various options and equipment. Depending on the vehicle, some bumper or fascia accessories may include:

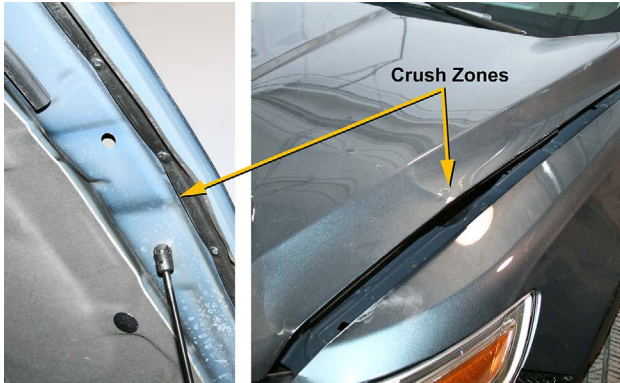
- fog lamps.
- lower grille inserts.
- sensors for a parking assist system.
- headlamp washers.
- an air dam or air deflector underneath the bumper cover.



This grille is attached to the hood (left). This grille is attached to the bumper cover (left).

Grilles allow for airflow into the engine compartment and may be:

- plastic.
- a part of, or attached to, the bumper cover.
- attached to the hood.
- attached to the front vehicle structure.

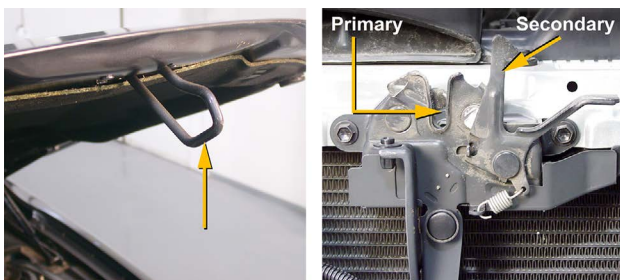


The area under the hood that is designed to collapse in a collision (left). The damage on the topside of the hood, which indicates that the hood started to collapse at the designed area (right).

The hood is the front, top closure panel that covers the engine compartment. Most hoods have rear-mounted hinges. However, some have front-mounted hinges where the hood opens from the back.

Hoods may be made of steel, reinforced plastic, composite material, or aluminum.

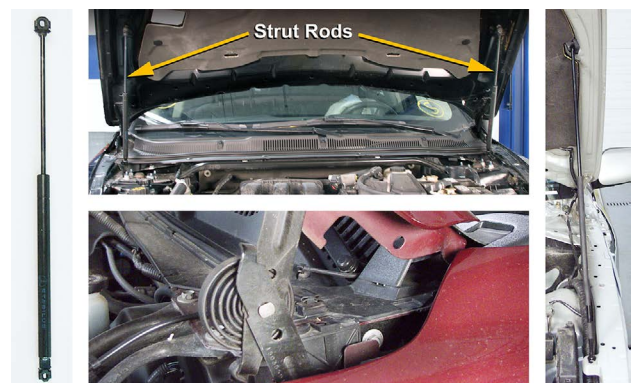
Hoods are designed to fold, or collapse, during a collision. This reduces the likelihood of the hood entering the passenger compartment.



This is a hood striker (left). This hood latching system has a primary and secondary latch (right).

The hood latching system keeps the hood closed. On most vehicles, the hood latch area is located in the middle of the hood on the front structure. A typical hood latch system consists of:

- a striker. The striker is attached to the hood and is secured by the hood latch when the hood is closed.
- the primary latch and a release cable. The primary hood latching system holds the hood in the closed position. The release cable is routed from the latch into the passenger compartment. When the cable is pulled, the primary latch releases the striker.
- a secondary latch. In the event of a primary latch failure, the secondary latch retains the striker and prevents the hood from opening.



This is an example of a piston-type hood prop (left). A conventional prop rod attaches to the front of the vehicle (top middle). This hinge is attached at the cowl and uses a coil spring to keep the hood open (bottom middle). Two strut rods assist with raising the hood and keeping it open (right).

Hood props hold the hood in the open position. Types of hood props include:

- a piston-type. Piston-type hood props require no manual operation. They extend automatically once the hood is released from the secondary latch.
 - strut rods. Strut rod hood props are used to hold the hood in the open position, similar to piston-type hood props.
 - a conventional hood prop, which is located on the underside of the hood or on the top of the front or side structure inside the engine compartment.
 - a coiled spring at one pivot point. This provides tension to hold the hood open. Excluding the spring, there may be up to three additional pivot points.
- emblems.
 - grilles.
 - windshield washer spray nozzles.
 - underhood lamps to illuminate the engine compartment when the hood is open.
 - insulation pads, which may also be called hood insulators. These may be attached to the underside of the hood with clips and / or adhesive.
 - underhood labels. Labels are often attached to the underside of the hood. These may include warning labels, or routing diagrams for hoses and belts.
 - adjustable stops. Adjustable stops are used to align the hood height to the fenders.
 - aftermarket parts. A bug shield is an example of an aftermarket part that attaches to the hood.



The hood insulator is being removed (top left). Various labels are attached to the bottom side of this hood (bottom left). The hood stop is being adjusted to align the hood to the proper height (right).

Other parts that may be attached to the hood include:



The fender that has been removed from a vehicle (left). The highlighted area shows a fender attached to a vehicle (right).

The fenders are the outer panels located above the front wheels and are commonly bolted to the vehicle structure. The fenders may use elongated mounting

holes for making adjustments for proper fitup. Fenders may be made of steel, plastic, or aluminum.



This fender liner is being removed (left). This is an example of a hood cushion attached to the fender (right).

There may be a number of different parts attached to a fender including, but not limited to:

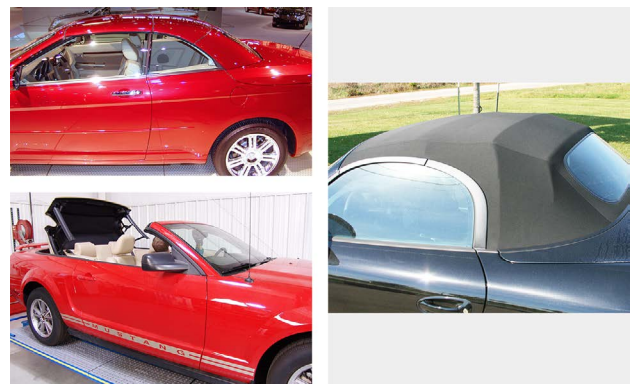
- moldings and emblems.
- side-marker lamps and reflectors.
- the radio antenna.
- front bumper covers.
- a fender liner. A fender liner may also be called a splash shield, which is designed to protect the inner front structure from road contaminants. Mud flaps are also often attached to the fender.
- hood cushions. Hood cushions are used to support the center section on each side of the hood and protect the fender and hood finish.



The roof on this vehicle has a sunroof and an antenna.

The outer roof panel is located on the top of the vehicle, above the passenger compartment. These are generally made of steel or aluminum and are typically supported by a framing structure on the underside of the part.

Common parts that attach to the outer roof panel include antennas, roof racks, and sunroofs. An entire section of a roof panel may be made of glass, and is called a panoramic roof.



This convertible has a three-piece hardtop (top left). A fabric cover is being retracted on this convertible (bottom left). The movable roof bows can be seen through this fabric top (right).

Parts of a convertible top assembly may include:

- a retractable hardtop. Hardtops have multiple exterior panels, which may be made of steel, aluminum, or composite material.
- a fabric or vinyl outer cover.
- a framing structure. Parts of the framing structure may include a front panel and roof bows.
- lifting mechanisms. These may be power-assisted with an electric motor and hydraulic cylinders.
- a rear compartment, which contains the top when it is retracted.
- a rear window.

Topics discussed in this module included:

- bumper assemblies.
- the hood.
- fenders.
- the outer roof panel.

Doors

Learning objectives for this module include:

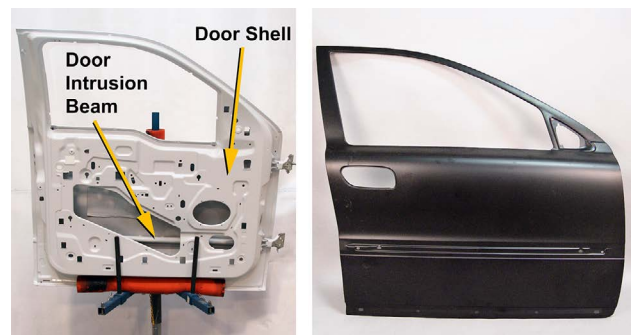
- identifying parts of the door structure.
- identifying mechanical parts of a door assembly.
- identifying door accessories.



The front and rear side doors are opened on this vehicle.

The doors are the closure panels designed to allow entry and exit for the vehicle occupants. Most vehicles have two or four side doors to access the front and rear seats. Other door types include sliding doors and rear doors. Sliding doors are commonly found on minivans and are typically located on the side of the vehicle, behind the front passenger door.

Rear doors may be found on cargo vans and some sport utility vehicles (SUVs). Rear doors operate like side doors and have similar parts.



A door shell is shown here (left). This is an example of a replacement door skin (right).

The basic structure of a door includes the door shell, door skin, and door intrusion beams.

Door Skin

The door skin, also called the outer door panel, is the outer panel of the door assembly. Door skins are commonly available as a separate replacement part and may be made from steel, aluminum, or plastic.

Door Intrusion Beams

Door intrusion beams are located in the door shell, behind the door skin. Intrusion beams are usually made from high-strength metal and provide occupant protection in side-impact collisions.

Door Shell

The door shell is the door assembly without the trim panel and electrical / mechanical parts. The door shell includes the door skin, inner door structure, and door intrusion beam(s).



An information label is located on the doorjamb area of this door (left). The doorjamb areas on the vehicle are highlighted (right).

The doorjamb is the side areas of the door shell that are concealed when the door is closed. The doorjamb is also the door framing structure on the vehicle that is concealed when the door is closed.

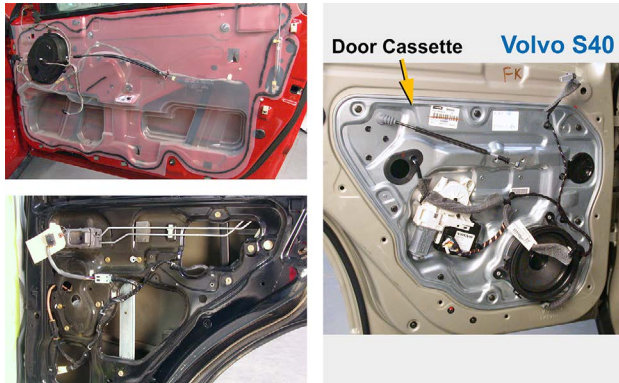
Vehicle information labels are often located on the doorjamb. Information on doorjamb labels may include tire inflation specifications and paint codes.

Door hinges and door latches are located in the doorjamb areas on the door.



The interior door trim panel is being removed from the door.

Interior door trim panels are attached to the inside portion of the door shell with plastic clips or fasteners. An interior door trim panel will often have switches for the power door locks, windows, and mirrors. Electrical connectors attach to the switches on the inside area of the panel.



The moisture barrier is attached to this door shell with adhesive (top left). Mechanical linkages and electrical wiring are attached to the inner portion of this door shell (bottom left). The inner parts for this door are contained in a door cassette, which can be removed as one piece (right).

Moisture Barrier

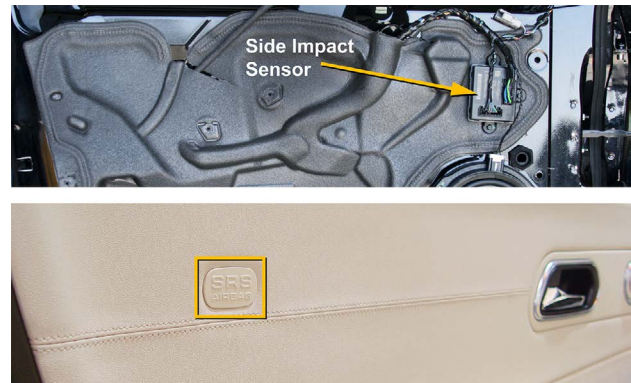
Moisture barriers are typically attached to door shells with adhesive to protect the door trim panel from dirt and moisture.

Mechanical And Electronic Parts

The door shell contains mechanical parts, such as the latch and lock linkages and run channels for movable glass.

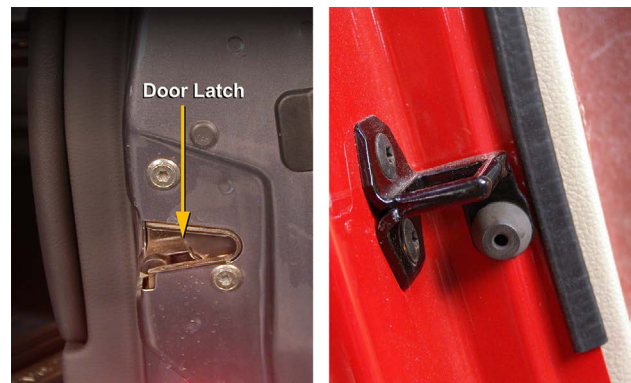
Electrical wiring and connectors for power windows, locks, door mirrors, and speakers are also located in the door shell. The amount of door wiring will vary depending on the accessories located

in the door. On some vehicles, inner door parts are contained in a one-piece door cassette. The door cassette may also provide protection from dirt and moisture for the inner door parts.



A side impact sensor is attached to this door shell (top). The airbag label embossed on this door panel indicates an airbag within (bottom).

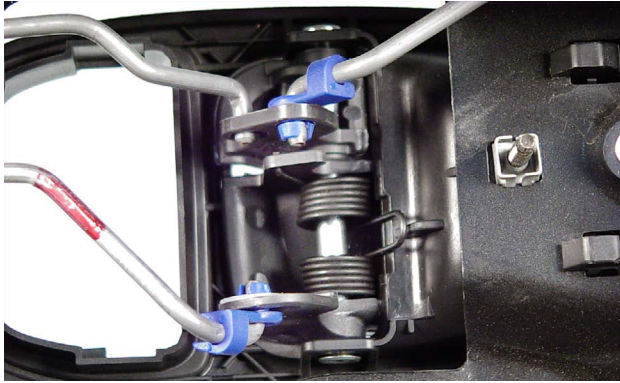
Side impact sensors may be located in the door shells. Some doors have a side airbag that deploys through the interior door trim panel.



The door latch is bolted to the door shell on the jamb area (left). The striker is bolted to the vehicle structure (right).

Doors are secured in the closed position to the vehicle structure with a latch and striker. The latch is connected to the door handles, inside and outside, and lock linkages in the door shell. The door latch

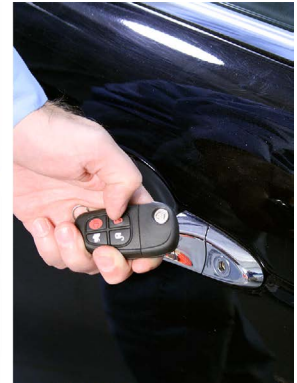
usually has two positions, pre-latched and latched. The pre-latched position will line the door up with the striker and the latched position will secure the door in the closed position.



Linkage rods are attached to the interior door handle.

The door handle and lock linkages connect the inner and outer door handles and the lock assembly button or cylinder to the latching mechanism. Types of linkages include:

- rods that run from the handle or lock assemblies to the latch. These connect to the latch and the handle or lock assembly with a retainer.
- cables with a ball on the end.



This shows a door lock cylinder (top left). A linkage rod is connected to the door lock cylinder (bottom left). The door is being locked with the remote control key fob (right).

Door locks prevent the latch from operating when activated. The door lock may be connected to the latch with rods or cables. Door locks may be:

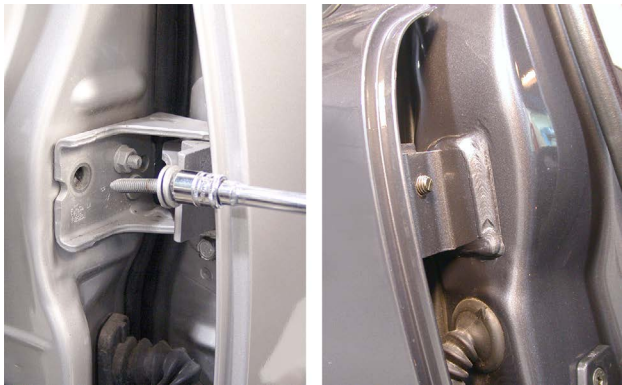
- designed with a lock cylinder for the key.
- electric or mechanical. Some electric locks can be operated with a remote control key fob.
- attached to the door handle or door shell.
- designed to be controlled by the driver. For example, the driver may have the option to prevent the rear doors from unlocking. This is to prevent children from unlocking the doors while the vehicle is being driven. This is one example of a child safety lock.



This check strap is bolted to the vehicle structure.

Check straps are located between the two hinges on the vehicle structure. Check straps have a dual purpose. The check strap holds the door open at the midway point to prevent the door from closing. Check straps also prevent the door from opening too far.

There are hinge stops on the hinge that assist the check straps by preventing the door from opening too far.



Examples of welded-on and bolted-on door hinges are shown here.

The door hinges connect the door to the vehicle structure and allow the door to be opened and closed. Most door hinges are front-mounted. Rear-mounted hinges are most common on vehicles with a third door.

Door hinges are typically bolted to the vehicle structure, but some are welded.



This turn signal is a series of LEDs (top). An indicator lamp for the blind spot detection system is on this mirror (bottom).

Door mirrors are attached to the front doors and may include mechanical or electronic systems such as:

- adjustment controls. This may be a pivot-action control, or an electronic system using motors to adjust the mirror.
- heating elements. A heating element may be located on the backside of the glass to defrost the mirror.
- turn signals. These may be displayed as a single turn signal lamp or with a series of light emitting diodes (LEDs).
- blind spot detection system indicator lamps.
- courtesy lighting to illuminate the outside area near the door when approaching the vehicle in the dark.

- being retractable. Some door mirrors can be retracted close to the door. This is common on larger vehicles, such as minivans, SUVs, and pickup trucks. This reduces the chance for damage to the mirror or interfering with people walking between parked vehicles.



Energy absorbing foam is located in the door shell on this vehicle (left). The weatherstripping is being removed from this door (right).

Other parts of a door assembly may include:

- moldings, cladding, and emblems.
- weatherstripping around the door.
- an energy absorber. An energy absorber may be located inside the door shell to offer occupant protection in a side-impact collision.
- noise, vibration, and harshness (NVH) materials inside the door shell.



The sliding door is open on this minivan (left). These are the controls for an automatic sliding door (right).

Sliding doors are commonly found on minivans and cargo vans. Sliding doors may be:

- manual. Manual sliding doors require the occupant to open and close the door.
- automatic. Automatic doors may be opened with a remote control on the key fob, from a switch near the driver's seat, or from a switch next to the door. Automatic doors may also assist opening the door manually. If an occupant pulls the door handle, the motor will open or close the door.



This van is equipped with a power window in the sliding door (left). The bottom track for the sliding door (top right). The top track for the sliding door (bottom right).

Sliding door parts include:

- stationary and movable glass.
- top and bottom tracks that the door slides on.
- the rollers that run along the tracks.
- the latch and striker mechanism. These are similar to other latches and strikers.

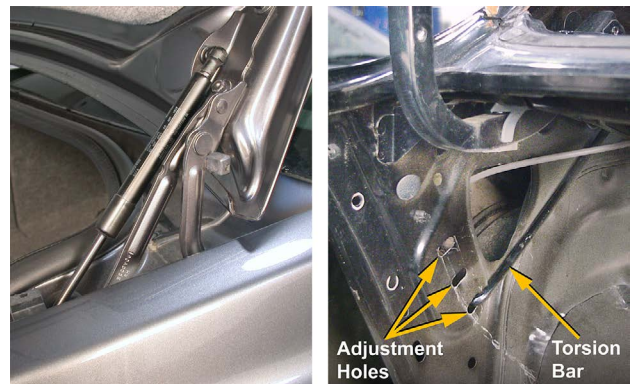
Topics discussed in this module included:

- the door structure.
- mechanical parts of a door assembly.
- door accessories.

Rear Closure Panels, Box Assemblies, and Exterior Trim

Learning objectives for this module include:

- identifying various types of rear closure panels.
- identifying parts of a pickup truck box assembly.
- identifying various types of exterior trim and moldings.



This is an example of a piston-type of deck lid hinge (left). The torsion bar for the deck lid is called out in this photo (right).

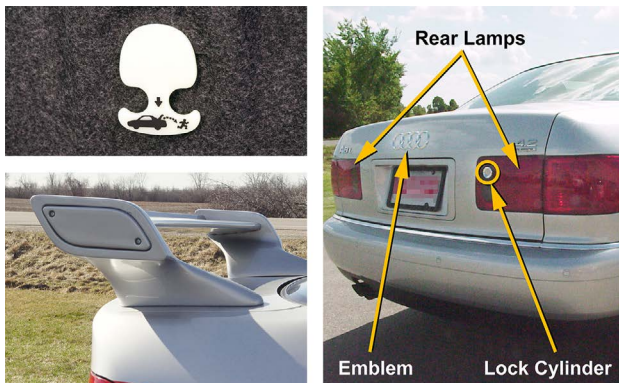
The deck lid or trunk lid is the rear closure panel that covers the trunk area.

Deck Lid Hinges

The deck lid typically opens from the rear. This means that the hinges are mounted in front of the deck lid, either on top of the quarter panel or under the rear package tray. The deck lid hinges allow the deck lid to open and keep it in the open position. Deck lid hinges may:

- work with a strut to assist with lifting the deck lid and holding it in the open position. These are similar to hood piston prop

- rods. These may also have a hinge attached to the prop rod.
- be designed to work with torsion bars to assist with lifting and holding the deck lid in the open position. Torsion bars are commonly mounted under the rear package tray and may have adjustments to accommodate for wear. The torsion bars attach to the hinges and the hinges are attached to the deck lid. Examples of vehicles that use torsion bars for the deck lid include the 2011 Chevrolet Cobalt and Cruze.
- work with a spring to assist with lifting the deck lid.



This photo shows an emergency release lever located in the trunk (top left). A rear spoiler is attached to this deck lid (bottom left). Several parts are attached to this deck lid (right).

Accessories or other parts attached to the deck lid may include:

- a rear spoiler.
- information labels.
- emergency release levers.
- the lock cylinder.
- the license plate and license plate lamp(s).
- vehicle lighting and associated wiring. Some tail lamps are part of the deck lid.
- emblems. These are found on most deck lids and are typically the vehicle model emblem.
- the latch. Most deck lids have the latch installed on the deck lid, but some deck lids have the striker installed. The striker and latch assemblies are similar to the type used on hoods and some doors.

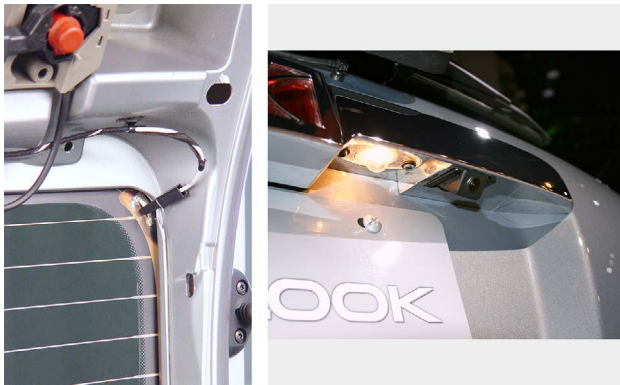


This photo shows the liftgate on a 2010 Lincoln MKT (left). This photo shows one of two strut rods used to hold the liftgate open (right).

Liftgates and hatches are of similar construction. Liftgates and hatches may:

- have latches and strikers that are similar to doors.
- have strut rods that hold the liftgate or hatch open. Most of these are similar to piston-type hood props.
- have stationary glass or movable glass.

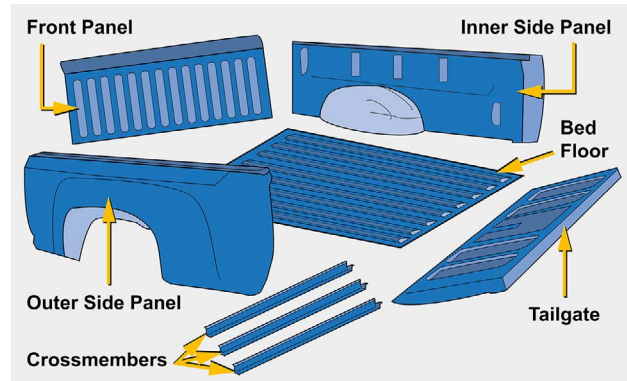
- be made of steel, aluminum, magnesium, composite material, or a combination of materials.
- automatically open and/or close by pressing a button or lifting the outer handle.



The heating elements and associated wiring for a liftgate glass are shown in this photo (left). This liftgate has a lamp for the license plate area (right).

Accessories and other parts attached to the liftgate may include:

- a rear wiper and fluid nozzle.
- a radio antenna grid.
- heated glass elements.
- tail lamp wiring when the tail lamps are located on the liftgate or hatch.
- the license plate lamp.
- an automatic latch release.



This illustration shows various parts of a pickup truck box assembly.

The pickup truck box assembly is bolted to the frame separate from the passenger compartment. Common parts of a pickup truck box assembly include the:

- front panel. This is the front panel of the box assembly and is located behind the rear panel of the passenger compartment.
- outer side panels, or boxsides, that face the exterior of the vehicle.
- inner side panels that face the interior of the box assembly.
- bed floor. The bed floor may be made of steel or composite material.
- tailgate.
- crossmembers located under the box assembly.



*This is an example of a drop-in bedliner (top left).
This is an example of a spray-on bedliner (top right).
This pickup truck has a cover attached to the box assembly (bottom).*

To protect a bed floor and inner side panels from damage, there may be a bedliner. A bedliner may be:

- original or aftermarket.
- a plastic drop-in type.
- a sprayed-on material.

Cap Or Cover

Pickup truck box assemblies may have a cap or cover attached. These cover the entire inside of the bedfloor. A cap will normally have windows and a liftgate. Bed covers are another way of covering and securing the contents of a box assembly. These may be made of composite material or heavy duty vinyl, which is called a tonneau cover. It is common practice to paint a cap or composite cover to match the body of the pickup truck.

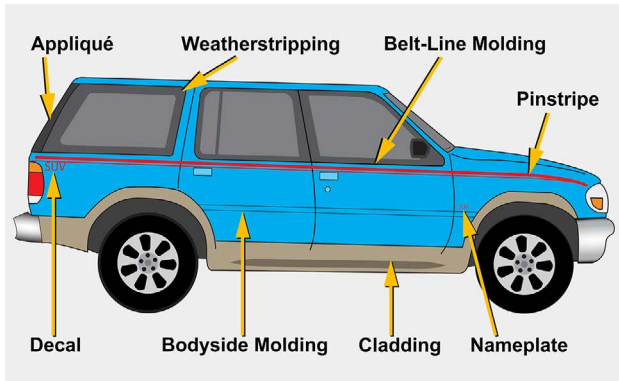


The cup that forms a pivot point is circled in this photo (left). A cable is attached to the box assembly and tailgate to prevent it from opening too far (right).

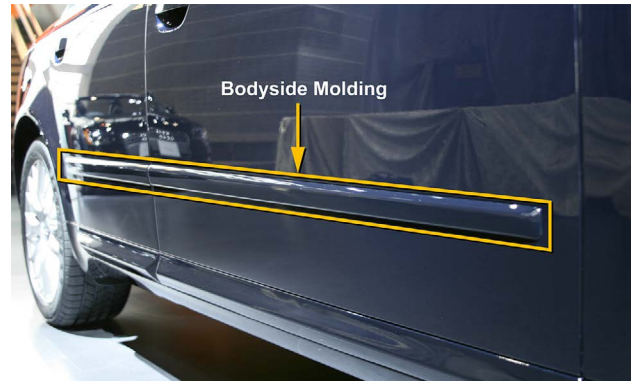
Tailgates are most common on pickup trucks. Tailgates on trucks drop down to allow entry to the truck box. Tailgates may be made of steel, composite material, or aluminum.

The tailgate may be designed with:

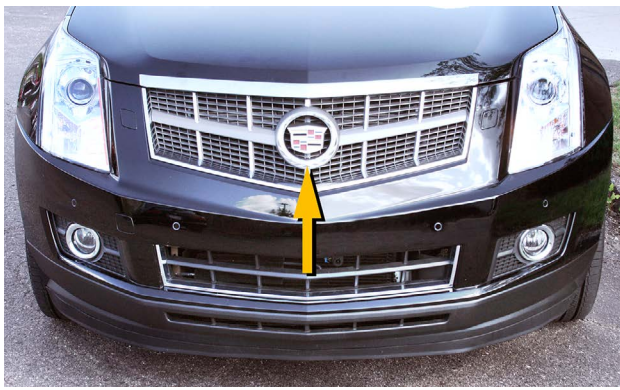
- cups that make a pivot point that the tailgate hinges on. Other tailgates have welded hinges that have pins and bushings that the tailgate pivots on.
- latches and strikers on each side.
- cables to prevent the tailgate from opening too far.
- torsion bars to assist with lowering and raising the tailgate.



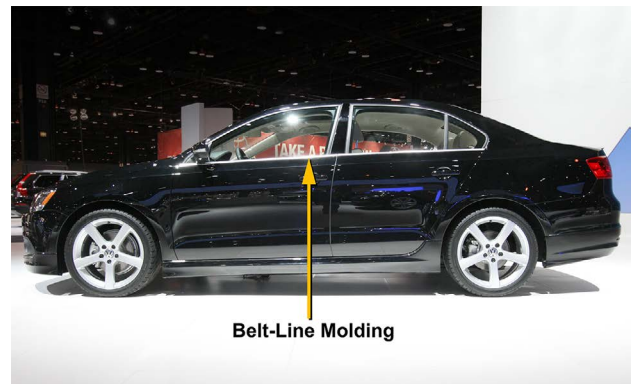
Various types of trim and moldings are shown here.



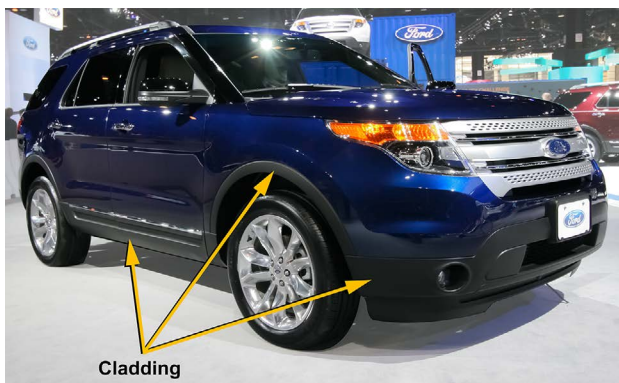
Bodyside molding is attached to the side of this vehicle.



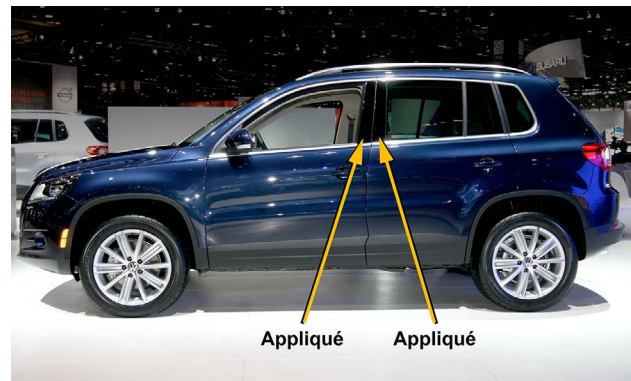
The emblem is called out in this photo.



Chrome belt-line molding surrounds the door glass.



Cladding is attached along the lower parts of the vehicle.



Appliques adjacent to the front and rear door glass are called out in this photo.

Many parts of the vehicle exterior commonly have trim and moldings attached. Exterior trim and moldings are attached with adhesive, or a combination of adhesive and mechanical fasteners.

Examples of trim and moldings attached to parts of the vehicle exterior include:

- emblems and nameplates. The emblem is the vehicle maker symbol and may be attached to the front or rear of the vehicle. A nameplate is any lettering, such as the model name, or feature description. These are commonly found on the fenders or the rear of the vehicle. The term emblem is sometimes used as a collective term for both emblems and nameplates.
- pinstriping and other types of graphics. Pinstriping may be painted on, or applied as a decal.
- cladding. Claddings are decorative pieces that can create contours on flat exterior panels.
- bodyside moldings. Bodyside moldings are decorative pieces applied to the mid-section of the vehicle.
- belt-line moldings. Belt-line moldings are decorative pieces that run along the window sill or entire window frame. These may be painted, chromed metal, or rubber pieces.
- weatherstripping located in closure panel gaps. Weatherstripping is the rubber material designed to prevent moisture and air from entering the passenger compartment.
- appliqué. Appliqués are decorative pieces used near glass. These may be plastic pieces or decals.

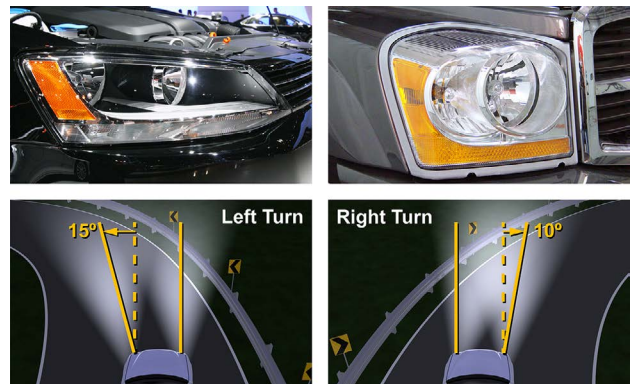
Topics discussed in this module included:

- rear closure panels.
- parts of a pickup truck box assembly.
- exterior trim and moldings.

Lighting

Learning objectives for this module include:

- identifying the different lamps that are on the front section of the vehicle.
- identifying the different lamps that are on the rear section of the vehicle.
- identifying the different lamps that are on the interior of the vehicle.



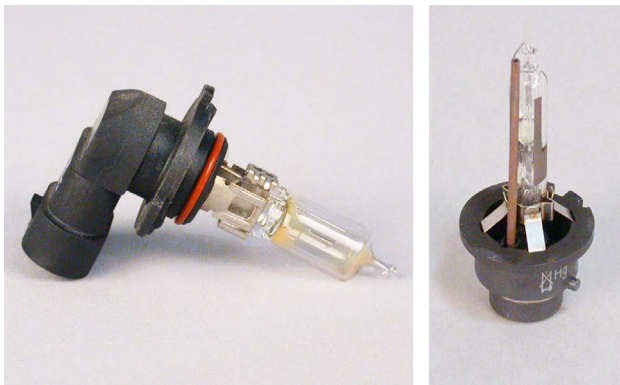
Headlamps can have a smooth surface or have pegs for headlamp aiming (top left). This headlamp has a dual filament bulb (top right). This is an example of how much an adaptive lighting headlamp may move the beam of light (bottom left and right).

Headlamps may also be called headlights. Headlamps include:

- low beam.
- high beam. These are brighter than the low beam headlamps and shine higher to allow the driver to see further down the road.

High beam and low beam headlamps may be made with two filaments in the same bulb. They can also be created from two separate bulbs. Bulbs that contain two filaments are often called dual-filament bulbs.

Some headlamps have adaptive lighting capabilities. Adaptive lighting headlamps will move the beam of light as the steering wheel is turned. This is done to illuminate the corner that the vehicle is turning towards. The degree that the beam of light turns can vary from side-to-side.



*This is an example of a typical halogen bulb (left).
This is an example of a typical HID bulb (right).*

Types of headlamp bulbs include:

- halogen. Halogen bulbs are the most common headlamp and fog lamp bulb.
- high-intensity discharge (HID), which are also called xenon or bi-xenon headlamps. HID headlamps may have a bluer hue compared to traditional headlamps. This type of bulb may also be used for fog lamps.



This vehicle has an amber-colored daytime running lamp (left). This is an example of an ambient light sensor (right).

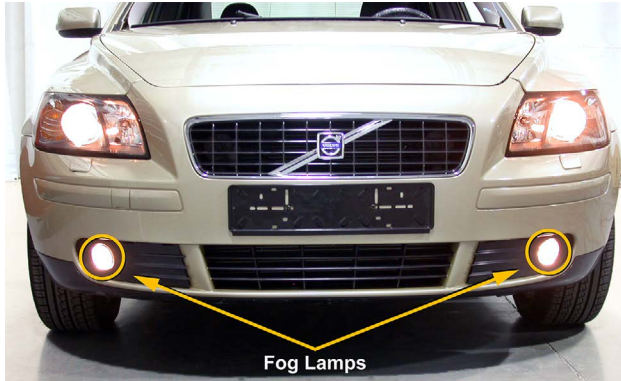
Daytime running lamps are:

- on when the vehicle is running or in gear depending on the make and model of the vehicle.
- deactivated by placing the vehicle in park and turning the headlamp switch OFF. Some systems have a light-sensitive sensor that turns the headlamps ON and OFF based on ambient lighting outside the vehicle.

Daytime Running Lamp Bulbs

Daytime running lamps may:

- be a separate bulb.
- use the high beam headlamps at reduced power.
- use the turn signal lamps.
- use the low beam headlamps.

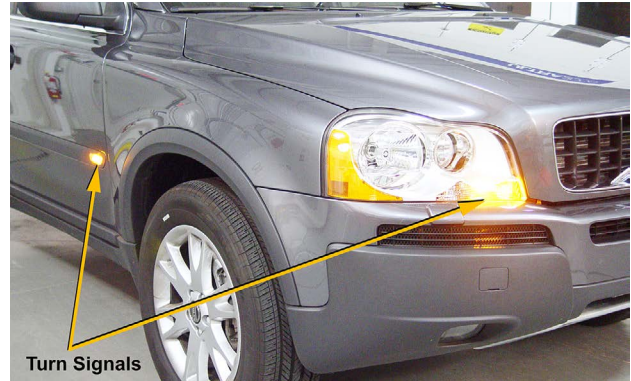


Fog lamps can be round or rectangular shaped.

Fog lamps:

- are white or amber in color.
- are designed to shine a flat, wide beam of light under the fog.
- are turned ON and OFF manually with a switch inside the vehicle.
- turn OFF automatically when the high beams are turned ON.

There are also rear fog lamps that are a red or amber lamp that can be separate from the stop lamp or integrated lamp. These lamps are used to give greater visibility to other vehicles in foggy conditions.



This vehicle has a turn signal lamp on the front part of the door and as part of the headlamp.

Turn signal lamps are operational when the turn signal switch is turned ON. These lamps are amber in the front of the vehicle and amber or red in the rear of the vehicle.

Additional turn signal lamps may be located in the door mirrors, along the fenders, or on the bumper covers. Multiple turn signal lamps located on the front bumper cover and the headlamp on the same side of the vehicle may be designed to alternately flash.



Some vehicles have a turn signal lamp as part of the mirror glass or as a separate lamp on the bottom of the mirror housing (left). The hazard switch will often flash with the exterior lamps (right).

Hazard Lamps

Hazard lamps are located on both the front and rear of the vehicle. These lamps flash on and off when the hazard lamp switch is ON. Hazard lamps use the same bulbs as the turn signal lamps.

Cornering Lamps

Cornering lamps are white lights that are operational when the corresponding turn signal is turned ON to illuminate the area the vehicle will be turning.



This vehicle uses the same bulb for the parking and marker lamps (left). Some vehicles will have a reflector instead of a side marker lamp (right).

Parking Lamps

Parking lamps are operational when the headlamp switch is in the PARK position and when the headlamps are ON. These lamps are often the same lamps that are used as turn signals or marker lamps.

Marker Lamps

Marker lamps include:

- side marker lamps. Side marker lamps are operational when the parking lamps or headlamps are ON. Side marker lamps may be separate from the parking lamps.
- additional marker lamps. These lamps are any lamps that are on the vehicle that shows where a vehicle is located. They include the lamps above the windshield in exterior visors, lamps on the roof of a truck, lamps along the running boards, and lamps along the sides of conversion vans.

Turn, parking, and side markers may all use the same bulbs to do different functions. These lamps are amber in the front of the vehicle and amber or red in the rear of the vehicle.



These lamps will light only when the mirror is visible to the occupant (top left). The lamps in an overhead console are often called reading or map lights (top right). Lamps in door trim may be red, white, or amber (bottom left). Dome lamps often have an ON/OFF switch that will only control the dome light (bottom middle). This lamp is used to illuminate the ground by the driver's door (bottom right) .

Courtesy lighting may be located:

- in the door trim panel.
- under the instrument panel.
- in the middle of the headliner.
- in the overhead console.
- in the sun visors.
- on the interior or exterior mirror.

Illuminated Entry Lamps

Illuminated entry lamps often use the courtesy lamps to provide the occupants light as they approach and get into the vehicle. These lamps are activated by a keyfob, keyless entry, or by lifting up on the door handle. Turning the ignition switch to RUN turns off the illuminated entry lamps. If the vehicle is turned off, the lamps are on a timer and will automatically shut off after a set amount of time.



Some instrument panels have a customizable display (top left). Dimmer switches often are located next to the headlamp switch (bottom left). All of the indicators will light when the vehicle is first started. This is an indication that the vehicle is doing a system check (right).

There are lamps on the instrument panel that illuminate the gauges when the headlamps are on. A dimmer switch controls the brightness of the instrument

panel lamps. Some vehicles may automatically dim the instrument panel lamps according to outside ambient light. When the dimmer switch is turned to the highest setting, the dome lamp is also turned on.

Indicator Lamps

Indicator lamps are located on the instrument panel. Indicator lamps are used to identify that:

- the high beam headlamps are on.
- a right or left turn signal is on.
- a problem has occurred within a vehicle system, which turns on a warning lamp. These types of lamps let the driver know that the vehicle may need to be repaired.



Most of the controls will be illuminated for ease of operation at night (left). The shifter position lamp may be next to the shifter or on the instrument panel (right).

Accessory lamps may include lamps for instrument panel switches, the clock, radio controls, the floor shifter position,

and beverage holders. These lamps are operational when the headlamps are ON.



There may be multiple brake lamp lenses (top left). The reverse lights on this vehicle are at the bottom of the bumper cover (top right). High-mount brake lights may also be called a third brake light (bottom).

Brake Lamps

The brake, or stop, lamps are red lights that are on when the brakes are applied.

The brake lamps may use the same bulb as parking lamps, but brighter. Brake lamps may also use light emitting diodes (LED) instead of a traditional bulb. LEDs are small lights that are usually used in a group assembly to have the same effect as a single bulb. Typically, if one LED in the assembly is burned out, the remaining LEDs will remain lit. An individual LED cannot be replaced, the entire assembly must be replaced.

Reverse Lamps

Back-up, or reverse, lamps are white lights that are on when the transmission is in REVERSE. These lamps can be part of the tail lamp, separate lamps, or both.

High-Mount Brake Lamps

High-mount brake lamps are red lights that are on when the brakes are applied. These lamps may be mounted in the rear closure panel, in a spoiler, above the backglass, at the top of the backglass, or on the interior rear shelf.



Trailers may come equipped with its own set of marker lamps (left). A special connector is required for proper trailer lamp operation (right).

Trailer lamps:

- serve as the rear lighting for the vehicle. The lamps turn on when the parking lamps or headlamps are turned on.
- function with the brake lamps and turn signals.
- may be wired using a wiring harness kit available from the vehicle maker or aftermarket.



Underhood lights typically turn ON automatically when the hood is opened (top left). Typically, trunk lamps automatically turn ON when the trunk is opened (top right). A license plate lamp may have one or two bulbs (bottom left). Cargo lamps may turn ON with the illuminated entry system (bottom right).

Other types of lamps found on vehicles include:

- underhood lamps. The underhood lamp turns on when the hood is open.
- license plate lamps. The license plate lamps are white lights that illuminate the rear license plate. These lights are on when the parking lamps or headlamps are ON.
- trunk lamps. The trunk lamp is a white light that is on when the trunk is open.
- cargo lamps. The cargo lamp is a white light that is on when the switch is ON. The cargo lamp lights the bed of the truck.

Topics discussed in this module included:

- the different lamps that are on the front section of the vehicle.
- the different lamps that are on the rear section of the vehicle.
- the different lamps that are on the interior of the vehicle.

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