

Removing And Installing Exterior Trim, Pinstripes, and Decals

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.

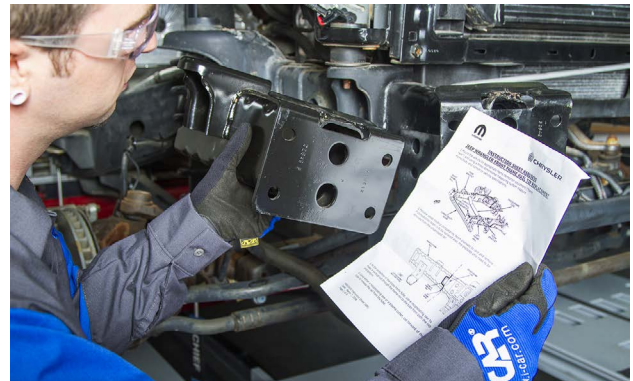
Performing proper collision repairs requires using parts and procedures that keep remaining warranties intact. Collision repairs must restore:

- 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.

Module 1 - Trim And Moldings

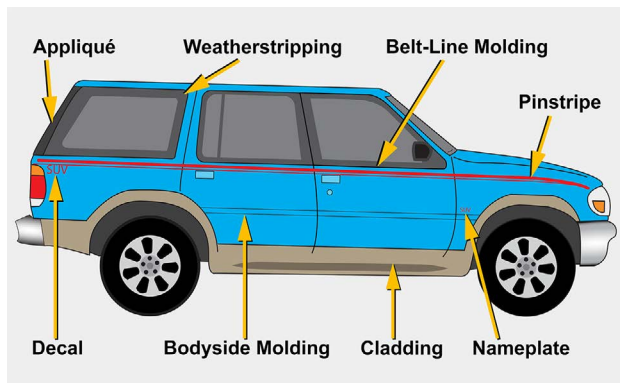


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Trim and Moldings

Learning objectives for this module include:

- locating and explaining vehicle trim code labels.
- identifying different methods for removing and replacing adhesively bonded emblems.
- identifying appliqués, moldings, cladding, and weatherstripping attachment methods.



Various types of trim and moldings are shown in the illustration above.

Exterior trim includes emblems, appliqués, bodyside moldings, belt-line moldings, cladding, weatherstripping, pinstriping, and decals. Exterior trim pieces may be referenced differently by the vehicle maker.

Operations that may need to be itemized on a damage report or estimate include:

- removing and installing or replacing cladding or antennas.

- removing and installing original exterior trim, including cleaning and retaping if it is to be reused.
- installing pinstripes and decals.
- drilling holes for installing exterior trim.
- removing and installing or replacing optional accessories.
- installing new exterior trim.

During damage analysis, always verify included and not-included operations.

Vehicle Protection

Some trim is impossible to remove without damaging the attachment method or part.



Label part numbers are located on the lower right corner of each label.

Identification of labels that must be removed and replaced should occur during the damage analysis process. Labels:

- must be replaced. Do not remove a label from a damaged part without reattaching the original or new label to the replacement part. If applying a new label, verify that the information on

the new label matches the information on the original label. Labels typically cannot be reused. If labels can be removed without damaging them and all information is legible, they may be reused by applying additional adhesive and reattaching.

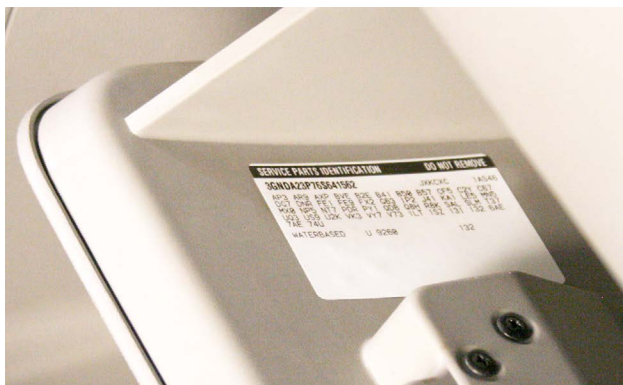
Typically, this is not possible and replacement decisions should not be overlooked during the damage analysis process.

- have their own part numbers and contain important vehicle information, such as emissions, specific vehicle parts, and refinishing codes.
- may be located on replacement parts.
- may not be provided by the vehicle maker. An independent company, such as Auto Data Labels, may provide vehicle information labels not provided by the vehicle maker.

- in the engine compartment.
- in the trunk.
- in the doorjamb.
- in the glove box.
- on the center console.
- under the carpet.
- under the spare tire cover.

Label location identification for specific makes and models can also be found in vehicle service information and collision repair estimating guides. These labels are used to properly identify the type of moldings and other trim used on a vehicle.

Mitchell publishes a Refinishing Materials Guide that references paint code label locations, paint code label explanations, and national and California material information.



Interior trim information is located on this label.

Trim code and paint code labels can be located:



Paint and trim codes are included on this label.

Paint code labels:

- are located in various locations on a vehicle and contain information to identify the color of interior and exterior parts. Not only are

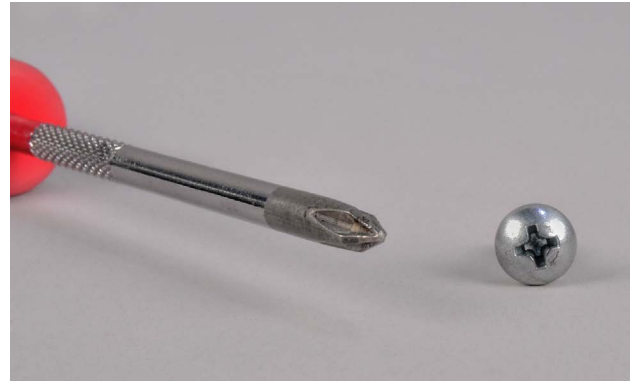
the paint code labels located in multiple locations, but they can be referenced in several different ways.

- may be referenced in service information. Service information is used to identify the location of paint code labels.
- use charts to decode the paint code and identify the information within the label.

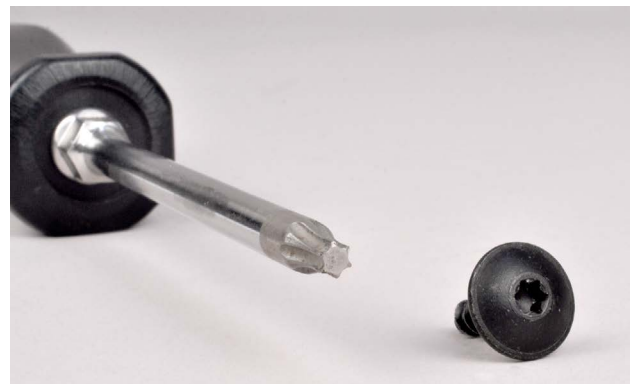
Always double-check the paint code, service information, and chart to ensure the correct paint code label location and letter/number combination have been identified.

There are various types of fasteners and fastening methods used to attach exterior trim and accessories. Fastening methods include mechanical fasteners, and plastic clips and retainers. Types of mechanical fasteners include:

- screws.
- bolts.
- nuts.
- rivets.
- studs.



A screwdriver and a screw with a phillips head are shown.



A screwdriver and a screw with a torx head are shown.



An allen wrench is used with fasteners that have an allen head.



A wrench with a hex socket and bolt are shown.



This is a torque wrench.



This is a hexagon nut.



This stud has a torx head on one end.

Various types of tools are used to remove mechanical fasteners. Common tools used to remove and install mechanical fasteners include:

- screwdrivers.
- socket wrenches.
- standard wrenches.
- allen wrenches.

To prevent damage to the fastener or adjacent panels, use the proper size and shape of tool when removing or installing mechanical fasteners. Vehicle makers provide torque specifications for many threaded fasteners on a vehicle. These must be observed to prevent damage and part failure. A torque wrench can be used to ensure fasteners are tightened to the proper torque.

Exterior trim and accessories may be attached using plastic fasteners. There are numerous shapes and sizes of plastic fasteners. Examples of plastic fasteners include:

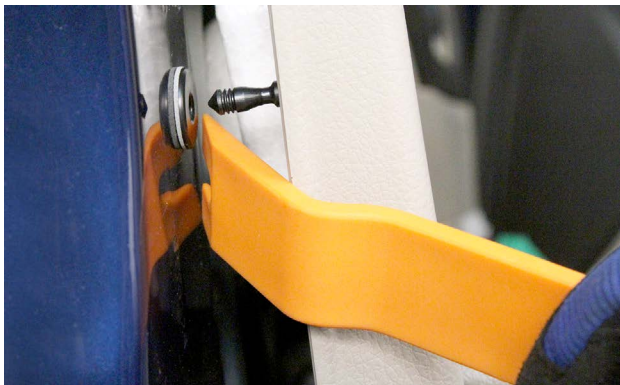
- clips. Plastic clips may be designed into a part or be

separate. Plastic clips are used to snap into holes on exterior body panels, or adjacent parts.

- retainers. Plastic retainers may temporarily deform during installation, such as a "Christmas tree" retainer. There are also mechanical plastic retainers that have moving parts, and may be removed and installed using standard tools.
- rivets.
- grommets.

Plastic Tools

Threaded plastic grommets may be used with mechanical fasteners, such as screws and bolts. There are a variety of prying tools to remove plastic clips and retainers. It is best to use plastic tools during removal to reduce damaging the fasteners or parts.



A plastic trim removal tool is being used to release the plastic fastener.



A needle nose pliers is being used to remove this nylon retainer.



This is a plastic rivet.



This Cadillac emblem is attached to the grille (left). This nameplate indicates the vehicle model (right).

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. Characteristics of emblems and nameplates include:

- being used to identify the vehicle make, model, special edition package, or features.
- individual sizes, thicknesses, and details. These vary from vehicle make, model, and trim package. Variations include recessed, body-colored, individual lettering, chrome, painted, and clearcoated.
- being located on any panel except the roof. Even horizontal panels, such as the hood, are used for emblems.
- being located in trim pieces such as cladding, grilles, and bumper covers.
- anodized gold or silver plating. The vehicle maker may not have applied these platings. A dealership may have aftermarket companies apply anodized plating to trim pieces as a promotional or package deal.



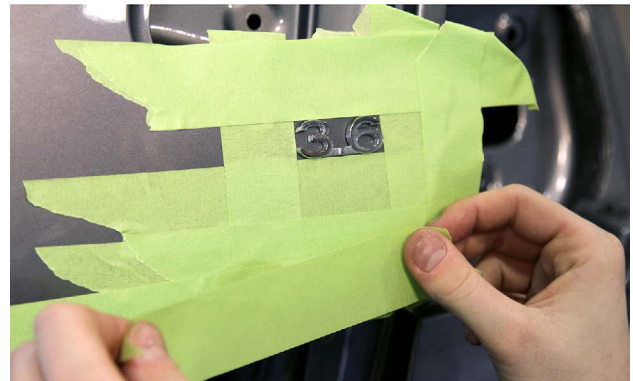
This emblem was attached with adhesive.

Typically, vehicle makers attach emblems using:

- adhesive.
- two-sided tape.
- alignment pegs to position the emblem properly.
- fasteners to hold the emblem to the panel.

Vehicle Protection

Because of the length and height of some emblems, it may be difficult to remove them without damage. Reattachment methods, correct alignment of individual letters, availability, and cost-effectiveness must be considered when determining whether to replace or reuse emblems.



A template for replacing the nameplate is being made with masking tape.

Emblems and nameplates must be attached to the vehicle in the exact location it was removed from. To ensure proper placement of emblems and nameplates:

- a template may be created by the technician.

- a template may be provided with the replacement part.
- the vehicle service information may specify the location.

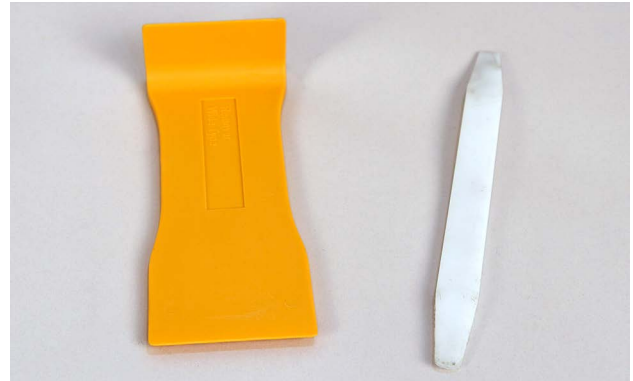


Refer to "Video: Creating A Template" in the presentation. This video demonstrates how a template can be made to record the position of an emblem.

Methods that can be used to remove adhered emblems include:

- cutting the adhesive with fishing line.
- applying heat to loosen the adhesive.
- using a plastic trim removal tool.
- separating with trim removal air chisel attachment and lubricant.

The vehicle maker may specify to protect the surrounding areas with protective tape or several layers of masking tape during removal.



Plastic tools will help prevent damage to the finish during removal.



Using an air chisel attachment with lubricant is one method for removing emblems.



Fishing line may be a useful tool for removing emblems.



A heat gun may be used to soften the adhesive during removal.

Vehicle Protection

Use special protective tape or several layers of masking tape to protect the painted surface around the emblem during removal.

Heat can be used to loosen adhesive. Tools used to heat adhesive include:

- a heat lamp.
- a heat gun.
- an induction heater.

Applying Heat

When applying heat to loosen emblem adhesive:

- the vehicle maker may specify a maximum temperature that can be applied to the area of the emblem, or what temperature the area of the emblem should be before heating. Chrysler warns that the temperature should not exceed 52°C (120°F) when heating nameplates.

- use a circular motion. This will allow even distribution of the heat and prevent the paint from blistering. The vehicle maker may specify the distance between the heat source and the part, and how long heat can be applied.
- pry the emblem at various angles to release it from the panel after heat has been applied.



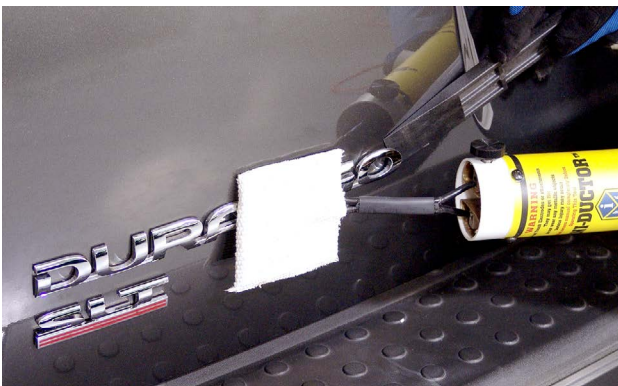
A heat lamp is being used to loosen the adhesive of this emblem.



The emblem is being removed with a plastic trim removal tool.



A heat gun and plastic tool is being used to remove the letters of this nameplate.



An induction heater is being used to loosen the adhesive on this nameplate.



Fishing line can be used to cut the adhesive in recessed areas (left). Two pieces of a wooden paint stir stick are used as makeshift handles for the fishing line (right).

Fishing line can be used to remove emblems without damaging the painted surface or the emblem. Fishing line may be preferable over a plastic tool or air chisel attachment when removing

large emblems, or when the emblem is positioned in a recessed area on the panel.

When removing emblems with fishing line:

- friction from the fishing line can cause it to break. To help prevent this, use heavy pound test line or braided fishing line. On large emblems, continuously use a new section of the line to prevent it from breaking. Positioning the line closer to the panel or emblem backing determines where the foam tape will be cut.
- protect hands by wrapping the ends of the fishing line around two small objects, such as pieces of paint stir sticks.
- use a see-saw motion to cut through the adhesive.



An air chisel attachment and lubricant are being used to cut the emblem adhesive.

When using an air chisel attachment to remove emblems:

- identify the location of all alignment pegs and use caution around them.
- the air chisel attachment can be used by hand or with an air chisel.
- apply lubricant before and while working with the tool if necessary.
- use an air regulator to set the proper air pressure.

Personal Safety

Use caution when applying lubricant. Wear safety glasses and proper respiratory protection. Refer to the product material safety data sheet (MSDS).



Refer to "Video: Removing Emblems" in the presentation. This video shows methods for removing emblems and nameplates.

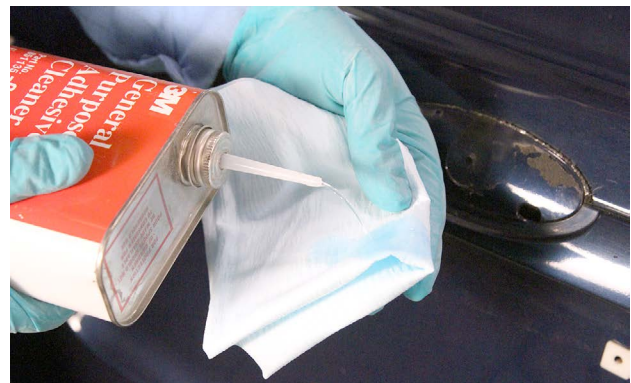


A variety of methods can be used to remove the adhesive from the panel and the emblem.

Methods of removing emblem adhesive from the panel or the emblem include:

- soaking with an adhesive remover.
- scraping with a razor blade.

An eraser disc is another method for removing adhesive from the panel, but is not the best option for removing adhesive from the emblem.



Proper personal protective equipment should be worn when using chemical adhesive removers.

General-purpose adhesive remover is used to loosen and remove adhesive. When using an adhesive remover:

- the surface must be cool.
- soaking time may be required.
- an aerosol can or pump spray bottle should be used on vertical panels.
- scrape the area with a plastic razor blade or squeegee to remove the adhesive residue.
- additional applications may be needed to remove all of the adhesive residue.
- clean the area with soap and water immediately after adhesive removal.

Personal Safety

- When applying a general-purpose adhesive remover, wear safety glasses, rubber gloves, and the proper respirator. Apply in a well-ventilated area.
- Check with local, provincial, and state motor vehicle refinishing regulations that limit the use of the volatile organic compounds (VOC) of surface prep solvents.

Vehicle Protection

- Use caution when applying adhesive remover on or near vinyl. Rubbing adhesive remover on vinyl parts can damage the textured finish.
- Use caution when applying adhesive remover to some anodized emblems. Adhesive removers can remove the gold or silver plating from the emblem.



An eraser disc is being used to remove the remaining adhesive from the panel.

An eraser disc can be used to remove the adhesive that is left behind after emblem removal. When used correctly, an eraser disc will not damage the painted surface. When using an eraser disc:

- follow the product maker's speed recommendation. One product maker recommends their eraser only be used at speeds between 1,800-2,200 RPM.
- use horizontal and vertical movements.
- apply light pressure. Heavy pressure will not assist in the removal efficiency.
- work against the rotation of the eraser disc.
- residue from the eraser disc can be removed by lightly rubbing the area with general-purpose adhesive remover or isopropyl alcohol, if needed. If a film remains, rework the area with the eraser disc after it has dried.

Personal Safety

The 3M "Stripe Off Tool" warns to never use it with tools that exceed 4,000 RPM.

Vehicle Protection

Eraser discs should not be used on lacquer coatings or thermoplastic polymers like polyolefin bumper covers.



Refer to "Video: Adhesive Removal" in the presentation. This video shows one product maker's procedure for removing emblem adhesive with an eraser disc.



This razor blade holder allows the razor blade to retract when not in use (top). Place the emblem on a table when using a razor blade to remove the adhesive (bottom).

Plastic or metal razor blades can be used to cut through the adhesive. When using a razor blade, protect the surrounding area

with protective or masking tape. Types of razor blade holders include:

- a break-off razor blade tool. These types are designed to break off at a certain point to supply a sharp, clean edge and retract into a holder.
- utility type knives. These types are typically retractable, and used to separate the adhesive around alignment pegs.

Personal Safety

- Use caution when removing adhesives with a razor blade. Razors can get jammed in the emblem adhesive or alignment pegs and break, possibly propelling blade fragments into the air.
- Razor blades are very sharp and can cut deep before you realize it. Do not hold the part in your hand when using a razor blade to remove the adhesive. Never cut towards the fingers on your other hand.

Vehicle Protection

Use caution to not damage the finish or cut off any positioning pegs on the emblem.

Plastic razor blades can be used instead of metal razor blades to reduce the chance of damaging the finish and the emblem. When cleaning with a plastic razor blade:

- the majority of the adhesive can be removed.
- adhesive remover may be required to remove excess adhesive residue.



Heat is being applied to this panel to remove the adhesive (top). A plastic razor blade is being used to remove the heated adhesive from this panel (bottom).

Heat can be applied with a heat gun or heat lamp to soften the adhesive. Safety precautions and additional removal tools when using a heat gun or heat lamp include:

- not overheating the panel and damaging the paint film. This can be done by monitoring heat settings, staying a safe distance from the panel, and using a circular motion during application.
- wearing gloves to avoid contact with the heated surface.
- using a plastic razor blade or squeegee to remove the warmed adhesive.

- applying adhesive remover to remove excess adhesive after the panel has cooled.

Personal Safety

Do not use chemical removers and a heat gun or heat lamp simultaneously.



A pre-made template is being used to properly position the nameplate on the vehicle.

When replacing emblems:

- clean the surface and the emblem. Also, allow freshly refinished surfaces to cure.
- vehicle-specific service information can be used to find the emblem location specifications.
- a template may be made with masking tape to ensure the emblem is replaced in the proper location.
- verify that the temperature of the panel and the emblem match the product maker recommendations during installation. Additional heating may be required to ensure proper adhesion. Chrysler recommends not exceeding 52°C

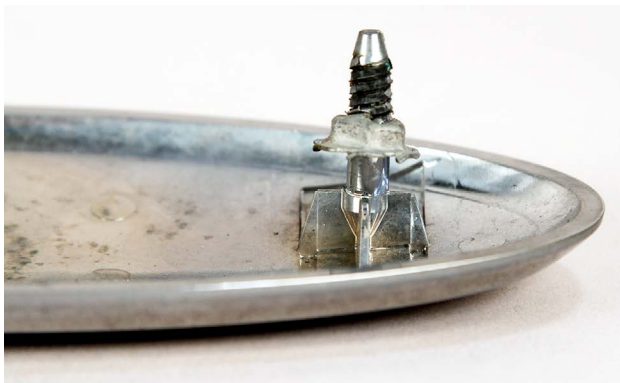
(120°F) when heating the emblem or the vehicle surface.



A variety of methods can be used to reinstall emblems.

Products that may be used to apply emblems include:

- mechanical fasteners.
- two-sided tape on factory or reused emblems.
- emblem adhesive.
- transfer adhesive.



This emblem is attached with nuts that thread onto alignment pegs.

Mechanical fasteners used to attach emblems to panels typically use nuts

that thread onto the emblem alignment pegs. When working with mechanically fastened emblems:

- verify that the emblem is mechanically fastened. A nut will be located on the backside of the panel.
- duplicate OEM attachment methods and fasteners.
- adhesives can be used with the fasteners.



Two-sided tape is being applied to this emblem (left). Adhesive promoter is being applied to the two-sided tape on the backside of this emblem (right).

Two-sided tape is commonly pre-cut or cut-to-size. Two different types of emblem application are:

- new emblems using the OEM pre-cut tape.
- reusing emblems, which will require a piece of two-sided tape to be cut to the proper size. For example, a removed emblem with damaged foam tape cannot be reattached with transfer adhesive. Two-sided tape would be a better

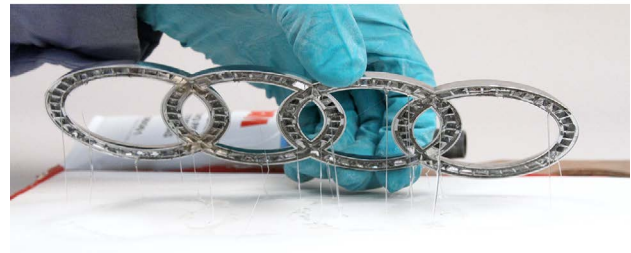
option for this type of situation. Common backing colors of two-sided tape include white, black, and gray.

It may be recommended to heat the surface when applying new emblems with adhesive or reusing an emblem with two-sided tape.

When using either of these types of application methods, do not touch or contaminate the exposed areas of tape. A primer may be available to increase adhesion between two-sided tape and the molding.

Chrysler specifies that a heat lamp or heat gun should be used to warm the emblem if the temperature is below 21°C (70°F).

General Motors specifies that the emblem and the panel should be 21°C (70°F) before installation. The vehicle should remain at that temperature for one hour after assembly to allow the adhesive to develop sufficient bond strength.



Emblem adhesive can be applied using a tube, spray, or brushable adhesive product (top). Emblem adhesive is being applied by dipping it into a tacky puddle of adhesive (bottom).

Emblem adhesive is typically a clear adhesive in a tube or brushable gel in a jar. When using emblem adhesive:

- apply a thin layer directly to the emblem. Avoid applying an excessive amount of emblem adhesive.
- the part can be dipped into a tacky puddle of adhesive, and then apply it to the panel.
- avoid using excessive amounts of adhesive. This is because squeeze-out from the sides of the emblem will be difficult to remove.
- use tape to hold the emblem in place while the adhesive sets. If tape is not used, the emblem may slide down vertical panels leaving a trail of emblem adhesive.

Personal Safety

Use caution when applying heat around adhesives. Some emblem adhesives are extremely flammable. Ensure that fire extinguishers are accessible and in

proper working order. Wear safety glasses, gloves, and the proper respirator. Also, apply in a well-ventilated area.

Vehicle Protection

Use caution when applying emblem adhesive. Some emblem adhesives contain solvents that can damage automotive finishes. Test a hidden area or removed damaged panel for possible marring or dulling. If adhesive comes in contact with painted vinyl surfaces, promptly clean the area.



Uniform appearance was maintained on this nameplate during removal (inset). To prevent contamination, the nameplate is placed on the transfer adhesive immediately after removal.

The main factor in using transfer adhesive to apply emblems is that the foam on the emblem must be uniform in appearance. To achieve this, razor blade tools, fishing line, or a trim removal air chisel attachment and lubricant can be used to remove the emblem. During the repair, transfer adhesive can be applied:

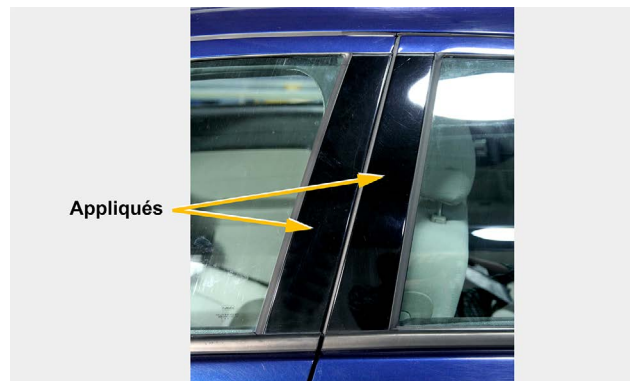
- immediately after removal, keeping the plastic strip attached to the emblem until it is time for application. This will help prevent

contaminants from adhering to the emblem.

- after all the repairs have been made. The emblem is stored during the repair process, then the plastic strip is applied and removed immediately, and the emblem is attached to the panel.



Refer to "Video: Emblem/Nameplate Installation" in the presentation. This video shows how templates can be used to position emblem and nameplates during installation.



Appliqués for the front and rear doors are shown.

Appliqués are decorative pieces used on the exterior of the vehicle near the windows. Appliqués can be:

- gloss or dull black.
- made of a plastic material. Generally, plastic appliqué can be removed and reapplied.
- a decal adhered to part of a panel. Decal-type appliqué requires replacement.

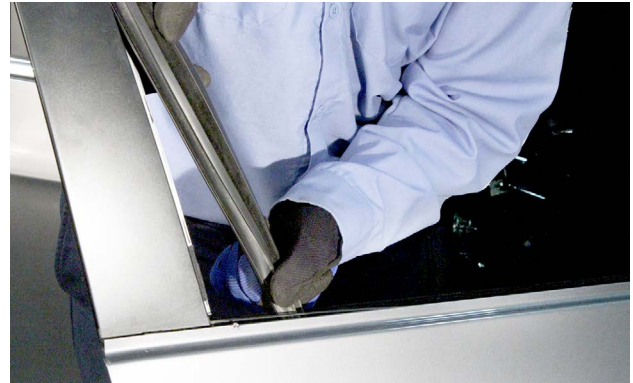


Heat is being applied to this adhered appliqué.

Appliqué attachment methods include:

- two-sided tape.
- clips.
- hidden fasteners.

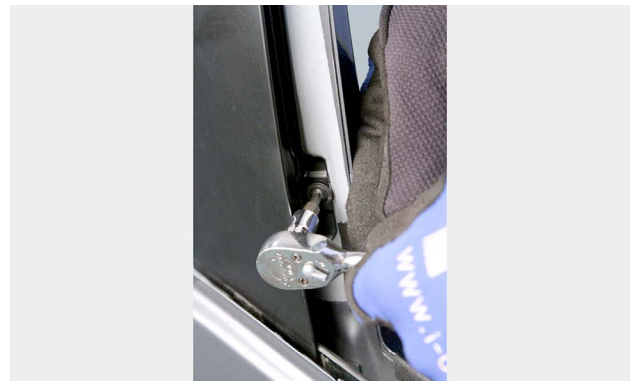
Fasteners, such as screws, can be hidden behind other parts, such as seals or weatherstripping. adhesives which are used to attach decals.



A run channel is being removed to access fasteners for the appliqué.

Appliqué removal depends on how they are attached. Removal can include:

- removing seals or weatherstripping to reveal hidden clips or fasteners.
- pulling plastic or peeling a decal-type away from the panel.
- heating the area to assist in removing decal-type appliqué. The vehicle maker may specify a specific temperature for heating or removal.



An appliqué fastener is being installed.

Appliqué installation methods vary according to the attachment methods. For example:

- new decal-type appliqués are applied similar to regular decals with the possible addition of edge locators to assist in correctly positioning the appliqué. Ensure the area is completely clean before applying decal appliqués. Dirt nibs can distort the surface of the decal.
- clips and fasteners may be used to attach appliqués. Fasteners typically require torquing. Remember to reinstall or replace any parts that were removed to access hidden fasteners, such as seals and weatherstripping.



This bodyside molding has two pieces (left). The thickness of the molding can be seen on the edge of the part (right).

Bodyside moldings are decorative pieces applied to the mid-section of the vehicle exterior. The appearance and attachment of these moldings vary by:

- color, width, and texture. Width can affect the ability to remove and replace the molding without damaging it. Moldings may be color-impregnated or painted. Texture must also be obtained if refinishing a repaired molding.

Textures, such as chrome, are difficult to remove without creasing the chrome plating and typically require replacement.

- location of trim pieces, such as the bodyside and rocker panel cladding.
- the containment of alignment pegs. The type of removal method may depend on whether or not the molding contains alignment pegs.

Bodyside moldings may also vary by:

- the reusability factor. Some moldings cannot be removed without damage or may not be cost-efficient to remove and reinstall. Some moldings are metal-backed and difficult to remove and reattach.
- refinishing requirements. Some moldings may require refinishing even if they can be ordered by color. The color that was used to refinish the molding may not be the same variance as the color on the vehicle.



This molding is being wrapped in plastic to protect the backside from dust.

When storing flexible moldings for reapplication, lay them flat and cover them with plastic in a clean and dry area. Some moldings contain metal inserts or a backing that may not allow for permanent repairs if they are twisted, bent, or have curled ends. Moldings can be prepared for reapplication after removal and before storage, or immediately before application.

Bodyside moldings may be adhered to the vehicle panels. Indications of an adhesively attached molding are a thin molding that is tightly fit to the panel. Methods of adhesion include two-sided, acrylic foam tape, and plastic and emblem adhesive on small pieces during reinstallation.

Adhered bodyside moldings are removed in the same way that adhesive emblems are removed. Methods of removal include:

- cutting through the adhesive with fishing line.

- applying heat to loosen the adhesive and prying it away from the panel.
- chiseling with an air chisel attachment and lubricant.



A heat lamp is being used to loosen the molding adhesive.



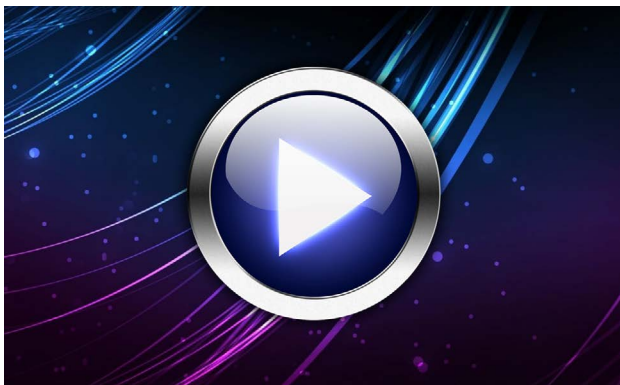
The molding is being carefully pried away from the panel.



Fishing line can be used to cut molding adhesive for removal.

Vehicle Protection

Use caution when removing adhered moldings with the air chisel attachment. Moldings can use positioning alignment pegs that can be sheared off with the tool.



Refer to "Video: Using An Induction Heater To Remove Bodyside Moldings" in the presentation. This video shows how an induction heater can be used to remove bodyside molding.

Adhesive must be removed from the panel surface. If the removed bodyside molding is going to be reinstalled, the adhesive must also be removed from the part. Methods for removing adhesive include:

- soaking with an adhesive remover solution. However, the solution may warp some types of moldings. Refer to the product maker instructions for acceptable material types and recommended soaking times.
- heating the adhesive.
- scraping the adhesive with a razor blade or other tool.



Heat is being applied to the adhesive residue on the panel surface.



Heat is being applied to the backside of this molding to loosen the adhesive.



A plastic razor blade is being used to scrape the adhesive residue off the panel.



The adhesive is being removed from the molding using a razor blade.

Vehicle Protection

Use caution when removing adhesives from moldings. Eraser discs generate excessive amounts of heat. Excessive heat can cause damage.



Two-sided tape is applied to the backside of this molding.

To ensure adhesion to the panel, do not apply moldings when the temperature is below 16°C (60°F). Ideally, the surface temperature should be 16 - 27°C (60 - 80°F). When replacing adhered bodyside moldings use:

- masking tape as a guide to properly align long, flexible moldings. Apply a length of tape on the body parallel to the top edge of the intended molding position and apply the molding.
- heat on the body and the molding, if required, for proper adhesion.
- two-sided tape if reapplying a molding.
- pressure to adhere the molding to the panel.

During installation, verify proper clearance of door or other closure panel moldings to adjacent panels.

When using plastic or emblem adhesive, use similar application methods as emblem adhesive. Use small amounts of adhesive and tape to hold the molding in place.

Allow freshly refinished surfaces to dry before installing adhesively bonded bodyside moldings. BASF recommends waiting 48 hours after a finish has been applied before installing moldings with two-sided tape.



A part of this bodyside molding is attached with clips.

Bodyside moldings may be attached with clips. A clipped attachment is identifiable by a slight gap between the panel and the molding. When locating and identifying clips, remember that:

- a variety of clips are available.
- removal methods vary according to the type of clip.
- clips may be attached to the molding or the panel.

Clip Replacement

When replacing clips:

- use all replacement hardware. One-time use hardware may be included but unidentified. These types of fasteners must be replaced.
- use adhesives with clips when duplicating the OEM installation.
- drill all holes before refinishing to prevent corrosion.
- replace all clips that were damaged during removal. Order

new hardware or remove it from inventory as soon as possible.



This screw attaches to the bodyside molding (left). Fasteners can be removed and replaced using basic hand tools (right).

Bodyside moldings can be mechanically fastened. With this type of attachment method:

- clips and adhesives may also be used with the fasteners.
- the fasteners may not be removable. Some fasteners are permanently fastened to the panel or the molding.
- fasteners can be attached to the panel or to the molding. Determine whether the fastener should be attached to the panel or the molding for proper installation.

Fastener Removal and Replacement

Removal and replacement of fasteners can be done with basic hand tools. When removing and replacing fasteners:

- duplicate OEM installation.
- repair or replace any damaged fasteners or fastener threads.

Belt-line moldings can be painted or chromed metal or a rubber piece. Belt-line moldings may be located on the window sill, framing the window, or inclusive of an applique. Removing a belt-line molding typically requires interior trim panel removal and possible window removal.



The belt-line molding runs from the front of the front door to the rear of the rear door.



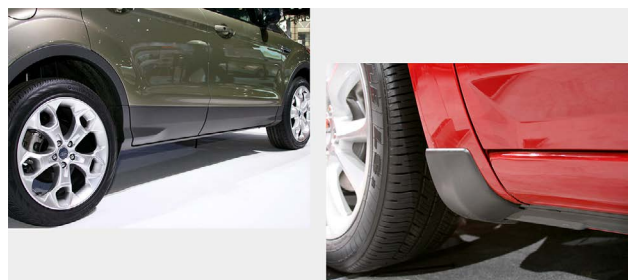
This belt-line molding is being removed.



The belt-line molding runs from the front of the front door to the rear of the rear door.



Refer to "Video: Removing Belt-Line Moldings" in the presentation. The video shows belt-line moldings being removed.



Cladding is seen on the rear wheelhouse, rocker panel, doors, and fender (left). The rocker panel cladding extends upward on the rear wheelhouse (right).

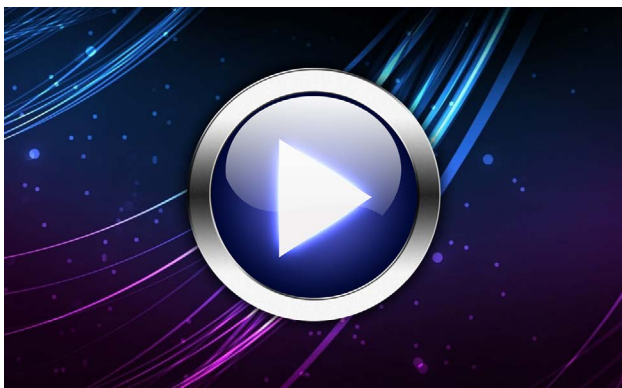
Claddings are decorative pieces that are attached to the vehicle in a variety of locations including the body, rocker panel, and tailgate. Claddings may be:

- molded to fit vehicle contours. Claddings can also create contours in flat sheet metal.
- a smooth or textured finished piece.
- a color-impregnated piece of plastic.

Cladding Locations

Cladding may be located on the:

- bottom of the doors.
- vertical side panels above the rocker panel area.
- sail panels.
- edge of the roof panel.
- rocker panel. Splash guards may also be attached to protect the body from road spray. Some rocker panel claddings extend to the wheelhouse trim.
- cladding may also be located on the tailgate.



Refer to "Video: Removing Claddings" in the presentation. This video shows various claddings being removed and reinstalled.

Plastic rivets may be used to fasten trim pieces to the vehicle exterior. Plastic rivets are one-time use fasteners and cannot be reused.

Plastic Rivet Removal

Some plastic rivets can be removed using a hammer and a punch to drive the center of the rivet inward, then prying it out of the hole. Another method for removing plastic rivets is using a side cutter to cut the rivet under the rivet head.

Plastic Rivet Installation

Rivet installation requires the use of a plastic rivet tool and replacement rivets. Replacement rivets should be the same size, and look similar to the original rivets. When using a rivet installation tool:

- insert the rivet into the tool.
- insert the rivet into the hole on the panel.
- squeeze the handles of the tool to set the rivet. Additional squeezing of the handles may be required to properly set the rivet.



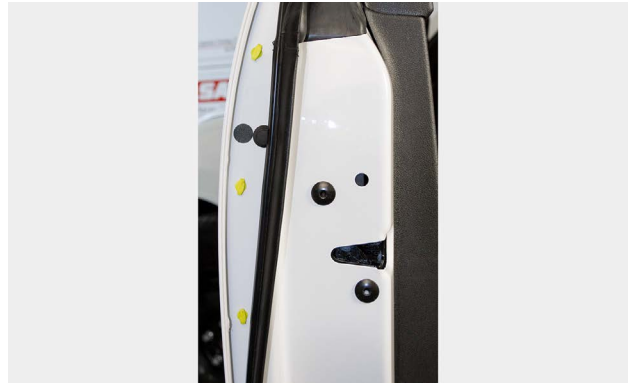
This plastic rivet attaches the wheelhouse flaring to the vehicle.



A side cutter is being used to remove this plastic rivet.



A plastic rivet tool is being used to install a new plastic rivet.



The weatherstripping has been detached and pulled aside to reveal the yellow clips that hold it in place.

Weatherstripping is a rubber material located around hinged panels and their mating surfaces. Weatherstripping is used to:

- seal like a gasket to prevent wind, water, and dust leaks.
- prevent noise and vibration.

Weatherstripping Original Attachment Methods

Weatherstripping can be attached with a combination of attachment methods or just one. Methods of attachment include:

- channeled to lock onto a flange.
- adhesives. Adhesives can be two-sided tape or a liquid adhesive inside a channeled groove.
- clips. Clip attachment is staggered along the length of the weatherstripping. The heads of the clips are typically not exposed.
- fasteners. Fasteners are typically in plain view and may be located at

the ends of the weatherstripping for positioning.



A forked tool is being used to pry the weatherstripping clips from the door (left). Heat is being applied to loosen the adhesive (right).

Removal methods vary according to the attachment method. Generally, to remove weatherstripping:

- pull it from the mating surface after any clips or fasteners have been removed. Channeled weatherstripping is used by itself or in conjunction with an adhesive or fastened at each end.
- use a small forked tool or needle-nose pliers to remove weatherstripping that is attached with a series of clips. Remove the clips and weatherstripping carefully to avoid tearing the weatherstripping.
- heat may be required for adhered weatherstripping that is attached with two-sided tape.

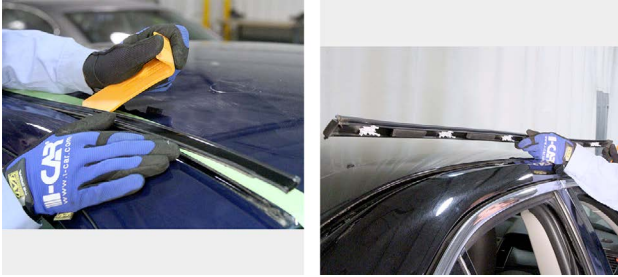


The weatherstripping is first applied at a pre-formed area during installation.

Installation of weatherstripping varies according to the attachment method. Generally, to install weatherstripping:

- excess adhesive from two-sided tape must be removed and new adhesive applied. Two-sided tape or weatherstripping adhesive can be used to duplicate an OEM weatherstripping application. New weatherstripping may already have the adhesive applied. If reusing a liquid adhesive, additional adhesive may be required.
- replace any damaged or missing clips and fasteners. If used with adhesives, adhesives should be applied before replacing clips and fasteners.
- the friction channel is used as a guide on the flange.
- begin with a pre-formed area of channeled weatherstripping or the color-coded locator dot.

Some weatherstripping may require the application of heat for adhesion.



The roof molding is being removed with a plastic trim removal tool (left). This roof molding is attached with clips (right).

Roof moldings may be located in the gap between the roof rail and the outer roof panel. This area may be called the roof ditch.

Attachment methods include:

- clip-on retainers.
- two-sided tape.
- seam sealer. Re-application may require noting the amount of seam sealer used to ensure proper depth during installation.

Removal may require heating and prying the molding from the roof ditch, or unclipping the molding from retainers located in the roof ditch.

Module Wrap-Up

Topics discussed in this module included:

- vehicle trim code labels.
- different methods for removing and replacing adhesively bonded emblems.

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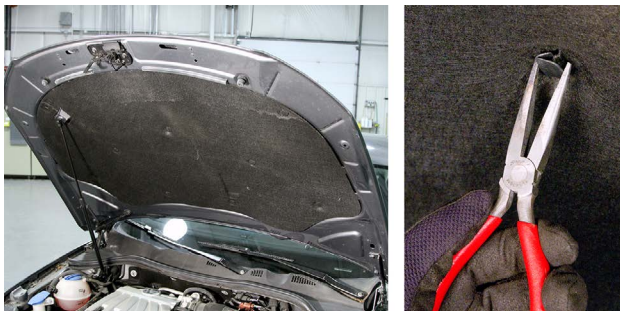
***Module 2 - Front,
Rear, And
Underbody Trim***

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Front, Rear, And Underbody Trim

Learning objectives for this module include:

- identifying trim attachment methods for the front of the vehicle.
- identifying trim attachment methods for the rear of the vehicle.
- identifying trim attachment methods for the underbody of the vehicle.



This underhood insulation pad is attached using flush-mount nylon retainers (left). A needle nose pliers is being used to remove this nylon retainer (right).

Underhood insulation pads are used to deaden the sounds of the engine. Typical attachment methods include:

- flush-mount nylon retainers.
- multiple types, sizes, and shapes of retainers.

A weatherstripping can also be attached to the insulation pad with nylon retainers.

Insulation Pad Removal / Installation

A variety of clip removal tools can be used that will not cause damage to the insulation pad.

Caution: Broken retainer pieces can fall into the hood frame causing a rattling noise.

Splash shields and fender liners are plastic coverings that protect the underbody from road splash or debris. Splash shields and fender liners are fastened to the vehicle with bolts, screws, or plastic fasteners. Fasteners damaged during removal must be replaced.

Fender liner removal may require removing adjacent parts, such as the wheel assembly, mud flap, or splash shield.



A splash shield is being removed from the underside of the vehicle.

Characteristics of rubber bumpers, adjustable stoppers, and grommets include:

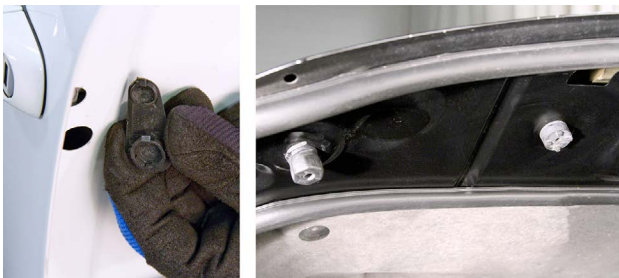
- adjustability. Adjustable stoppers are typically located under the hood and help align the hood to the fenders.
- protection against dust and moisture. Grommets prevent dust and moisture from entering enclosed panels and causing them to rust and work improperly. Some grommets must be replaced with new ones after they have been removed.
- cushioning to prevent noise and vibration. Rubber bumpers are used all over the vehicle to cushion a door, handle, or glove box door from slamming shut or creating a noise after it has been closed.



This stopper can be adjusted to align the hood to the fenders.



This grille assembly is attached to the bumper cover.



Bumpers, stoppers, and grommets are located throughout the vehicle enclosed locations, such as under the hood and in the door frame.

Grille attachment methods include:

- studs on the grille where nuts are threaded through brackets onto the studs.
- molded in with other trim pieces, such as the fascia.



This tail lamp assembly is attached with hex nuts.

Tail lamps may be attached with wing nuts or hex nuts. Tail lamp locations include being:

- part of an appliqué.
- one panel stretching the width of the vehicle.



License plate screws fasten through the license plate and into these nylon retainers.

License plates can be attached using nylon fastener retainers. Locations of license plates include being within:

- an appliqué, with or without a lock cylinder.
- the bumper assembly.



A rear windshield wiper is attached to this liftgate glass.

Rear wiper arm and rests are located above, below, or on the backglass.

Removing the rest:

- is similar to removing and installing windshield wiper arms.
- may require interior trim panel removal.

Module Wrap-Up

Topics discussed in this module included attachment methods used for trim on the:

- front of the vehicle.
- rear of the vehicle.
- underbody of the vehicle.

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Module 3 - Exterior Accessories



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Exterior Accessories

Learning objectives for this module include:

- identifying the difference between OEM and aftermarket bolt-on and adhered accessories.
- identifying general attachment methods for exterior trim.



The running boards on this vehicle are OEM.

Bolt-on and adhered accessories include, but are not limited to:

- running boards.
- carriers.
- tonneau covers.
- brush guards.
- air deflectors.
- wheel flares.
- off-road accessories.
- spoilers.



The rear spoiler on this vehicle is OEM (left). The brand name of the aftermarket tonneau cover is shown (right).

Methods of identifying OEM and aftermarket accessories include:

- looking for part numbers that would identify the manufacturer or ID numbers that would identify a conversion package and list accessories. ID numbers may be located in the doorjamb.
- looking for decorative logos that indicate the manufacturer. Logos may be emblems or decals.
- asking the customer where the accessory was installed on the vehicle. Ask if it was purchased that way, dealer installed, or an aftermarket installation.
- looking in an estimating guide to identify if the accessory could be original equipment.

Replacement Specifications

Before replacing adhered or bolt-on accessories, check:

- part warranty. The part may be warrantied by the vehicle maker from the date of vehicle purchase.

- conversion package requirements. Replacement parts, paint codes, and graphic packages may only be available through the conversion company.
- part availability. Some accessories may only be available as a kit or for both sides.

Vehicle Protection

Use caution when drilling holes. Some vehicle makers do not recommend drilling holes in the frame side rail top and bottom flanges. This can cause metal fatigue resulting in frame failure. Other hole drilling requirements may include staying a certain distance away from the edge of the nearest hole, flange, frame centerline, or existing bracket or parts of the frame.



Various parts of the exterior are shown.

Other parts of the exterior include:

- antennas.
- washer nozzles.
- mirrors.
- a high-mount stop lamp.
- door handles.
- lock cylinders.

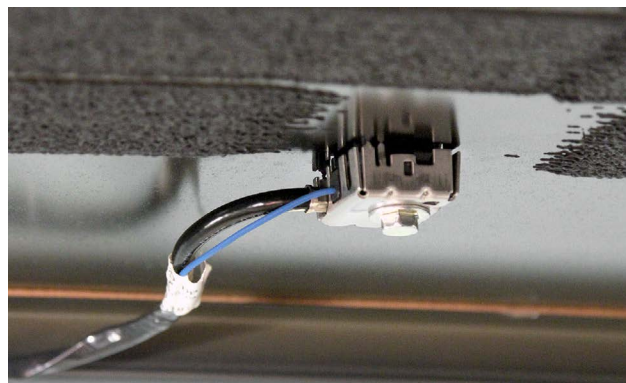


A radio antenna is mounted to the fender (left). This antenna is attached to the roof (right).

Antennas may be located on a fender, the roof, or imbedded into stationary glass. Antennas are used for various devices located inside the vehicle, such as for:

- AM/FM radio.
- television.
- satellite radio.
- cellular transmission.
- a navigation system.

There may be multiple antennas located on the vehicle, such as one antenna for the AM/FM radio, and one for satellite and/or navigation systems.



This bolt will require removal to disconnect the antenna wire.

Antenna removal requires accessing the backside of the panel it is mounted to. Antennas located on the roof typically require removing or repositioning the headliner to access the antenna mounting fastener, and antenna wiring.



This windshield washer nozzle is located on the rear portion of a hood.

Washer nozzles are used to distribute washer solution onto the windshield, headlamps, or backglass. These nozzles can be located at the rear of the hood, on the bumper, or on the rear liftgate.

Washer Nozzle Removal

Typical removal of the hood-mounted nozzle includes removing the underhood insulation pad, disconnecting the washer solution hose, squeezing from the underside, and popping it through the top of the panel.

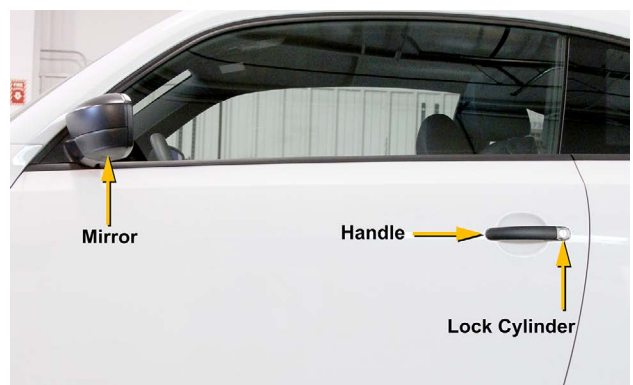


Screws and a moisture seal are used to attach this high-mount stop lamp to the roof panel.

High-mount stop lamps may be attached to the exterior on the liftgate, above the liftgate, or above the rear window on a truck.

High-Mount Stop Lamp Removal/Installation

When removing and installing high-mount stop lamps, use caution not to damage the surrounding painted surface, gasket, or screw. Typically these lamps are attached with visible screws that should not be damaged during removal and installation.



Exterior parts of the door are identified.

Exterior door parts and trim that may require removal during the repair process include door:

- mirrors.
- handles.
- lock cylinders.

Removal of these parts may require removal of the interior door trim panel.

General parts to an interior door trim panel include:

- hardware, such as visible and hidden screws and nylon retainers.
- accessories, such as the handle bezel, window regulator handle, and power accessory switch panel.

Before removing the interior door trim panel, locate and identify:

- clips. Some vehicle makers may require the replacement of specific clips to ensure that the trim panel is properly secured to the door frame.
- hidden fasteners. If all hidden fasteners are not identified and removed, the panel will not be able to be removed without damage to the panel or some other part.
- removal procedures for each part or option. These procedures can be found in the vehicle-specific service information.



A plastic cover in the door handle trim is being removed.



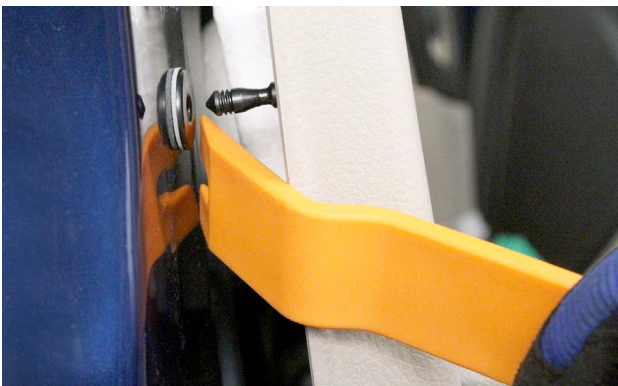
A screw for removing the door handle trim is shown.



The power accessory switch panel is being removed.



Various connectors for the power accessory switch panel will have to be removed.



A plastic pry tool is being used to release the fastener from the door shell.



This fastener remains attached to the door trim panel.

Personal Safety

Use caution when operating power windows during repairs, especially around the regulator assembly. Most power windows have an express down mode,

which causes the window to continue lowering even after the switch is released. To prevent injury, disconnect the power window switch when it is not being used.

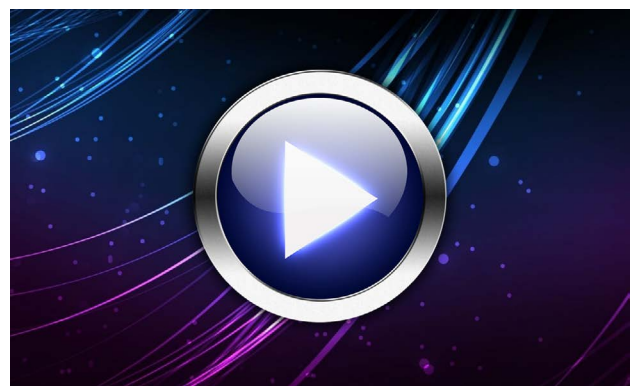
Make sure the ignition is in the OFF position and the key is removed when removing the door trim panel switches. This will prevent the flat-bladed tool, awl, or another metal object from shorting out the switch.

It is also important to apply tape to sharp metal tools before inserting them. This will help protect the inner door trim panel from damage.

Vehicle Protection

Make sure the ignition is in the OFF position and the key is removed when removing the door trim panel switches. This will prevent the flat-bladed tool, awl, or another metal object from shorting out the switch.

It is also important to apply tape to sharp metal tools before inserting them. This will help protect the inner door trim panel from damage.



Refer to "Video: Removing Interior Door Trim Panels" in the presentation. This video discusses common steps when removing door trim panels.



The door moisture barrier must be handled carefully to prevent tearing (left). This door cassette serves as a barrier (right).

The dust and moisture barrier protects the parts located between the door shell and interior door panel. This barrier:

- is located between the interior trim panel and the door frame.
- is adhered to the door frame. Adhesion must be restored during reinstallation.
- is made of clear or black plastic or a foam-type material.
- if plastic, may be repaired with waterproof tape.
- must be reinstalled or replaced.

Some door assemblies have a cassette that houses mechanical parts, and may be sealed to serve as a barrier.



This door mirror assembly includes a turn signal.

Door mirrors may be equipped with a variety of features. Door mirror assemblies may:

- be heated.
- include turn signals.
- include lamps for a blind spot detection system.
- include a camera.

During damage analysis, it should be determined if the parts of the mirror can be replaced or if the complete assembly will require replacement. Use caution while handling electronic parts of the mirror assembly and make note of them on damage reports.



A trim panel is being removed to access the door mirror fasteners (left). The mirror is fastened to the door with nuts (right).

Exterior mirrors that mount to the interior of the vehicle typically:

- use studs located on the mirror and nuts fastening it to the door frame.
- require removal of the interior door trim panel and/or belt-line moldings and appliqué.

A special tool may be required. Breakaway mirror assemblies are typically friction-fitted.

Door handles have many different designs and can be attached to the door panel with studs and nuts, rivets, bolts, and retaining clips.

Typically, interior door trim panels and dust and moisture barriers must be removed to remove the door handle. Door handle removal may also require repositioning or removal of the door glass.



The door handle is being removed.



This grommet is being removed from the door shell to access a door handle fastener.



A fastener for the door handle is shown.



A door handle fastener is being removed.

Lock cylinders may be located in the handle assembly, an appliqué, or an individual hole in the panel. Ignition, door, deck lid, and rear hatch lock cylinders may be coded to the key with replacement lock barrels, tumblers, and tumbler springs.

Many door locks are electrical and primarily function with a key fob. The lock cylinder may be concealed behind a cover that can be removed in case of power failure.



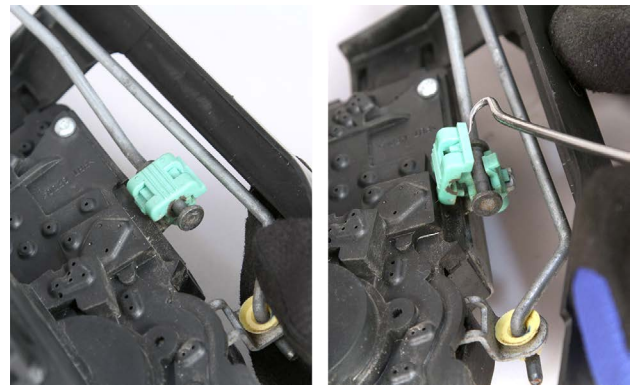
The button on this door handle is used to lock the doors when the key fob is nearby. A lock cylinder for a standard key is also provided.



This lock cylinder is located in an individual hole on the door panel.



This lock cylinder is concealed behind a plastic cover.



Rod retainers are plastic pieces of hardware typically used to lock rods to an assembly (left). The retainer is being detached from the rod (right).

Rod retainers are used to connect rods to the linkages they operate. Rod retainers come in a variety of designs and are used in several door locations including:

- interior door handles to the opening mechanism.
- exterior door handles to the opening mechanism.
- interior lock knob to the lock actuator.
- exterior lock cylinder to the lock actuator.

Avoid repairing a damaged lock cylinder or attaching lock parts. Removing door lock cylinders may require removal of:

- the handle assembly.
- interior door parts, such as the window glass.
- a retaining clip.



A retaining clip is being removed from this door lock cylinder.



This door lock cylinder is being removed from the assembly.



This door lock cylinder has been removed from the door handle assembly.



This door lock cylinder assembly is attached to the decklid with rivets.

Removing deck lid lock cylinders may require removal of: the tail lamp assembly.

- a retaining ring.
- a plastic clip.
- rivets.

Module Wrap-Up

Topics discussed in this module included:

- OEM and aftermarket bolt-on and adhered accessories.

- exterior trim attachment methods.

Module 4 - Pinstripes And Decals



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Pinstripes and Decals

Learning objectives for this module include:

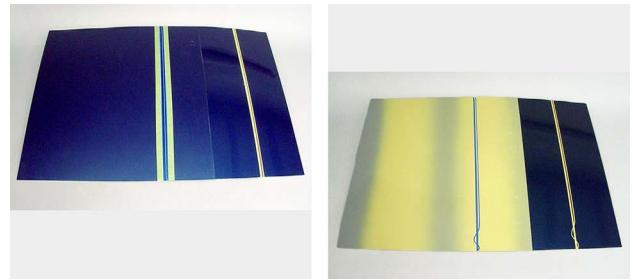
- identifying different methods of applying painted pinstriping.
- identifying different methods for removing pinstriping and decals.
- applying taped pinstriping.
- performing wet applications of an adhesively bonded decal.
- identifying different methods of pinstriping application.



A dual-action sander can be used to remove painted pinstripes.

Painted pinstripes can be OEM or aftermarket applications. In areas requiring refinishing, to remove painted pinstripes:

- use a dual-action (DA) sander.
- feather out the area to create a smooth area. While keeping the repair area as small as possible, if areas are not feathered out properly the edges of the pinstripe will show through.



The method of applying the tape may depend on how and where the vehicle is being refinished.

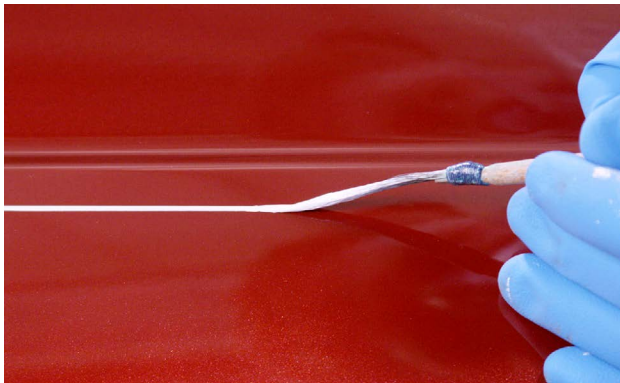
Paint striping tape is available in different widths. There are two different methods for applying painted pinstripes using tape. When refinishing the pinstriped area, the paint can be applied so that the first color applied is the:

- pinstripe color. Then, the exact location of the pinstripe is taped off with paint striping tape or fine line tape and the basecoat color of the vehicle is applied. Finally, the paint striping tape is removed revealing the pinstripe. Highly complex pinstripes, with multiple colors, may be more easily replaced by applying the pinstripe color one step at a time, masking off, then applying the basecoat color to the panel. Pre-positioned paint striping tape is available. Generally, plastic paint striping tape is used to create a clean, straight line.
- basecoat color of the vehicle. Then, all areas except the pinstripe lines are masked off and the pinstripe color is applied. Finally, the masked area is removed and the pinstripe color appears on the surface of the basecoat color.

Painted pinstripes can also be applied by hand with a brush. There are two methods that can be used: freehand or stenciled. When stenciling, paint striping tape or fine line tape is used as a guide and is removed after the finish has partially dried. Removing the tape reveals a clean stripe. Using the freehand method requires:

- practice.
- a steady hand.
- specialized brushes. Special care and maintenance of brushes is important to apply a straight line.

Sikkens Autoclear HS + LV suggests painted pinstripes and lettering be applied within 48 hours of finish application for good adhesion.



Pinstriping is being applied using a special brush.



There are a variety of pinstriping brushes available, the type used depends on technician skill level and how the brush is to be used.



Pinstriping may be done using fine-line tape as a guide.



This striping tool can be used to apply a variety of different widths and configurations of pinstriping.

A wheel striping tool can be used to apply painted pinstripes. The striping tool:

- uses an application method similar to a rubber stamp.

- includes various attachments for width and number of stripes.



Heat is applied to the taped pinstripe as it is being removed.

Methods of removing taped pinstriping include:

- applying heat with a heat gun or heat lamp to loosen the adhesive. Heat may be required to bring the surface to a recommended temperature or to loosen the adhesive. When using a heat gun, use a circular motion, and pull the taped pinstripe away from the panel while applying tension near the panel.
- using a chemical remover, such as a general-purpose adhesive remover or similar material. Chemical removers, such as a general-purpose adhesive remover or an adhesive release agent, can be used to remove taped pinstripes. Test the chemical remover on a small, hidden area or on damaged panels that have been removed before applying

chemical removers to the repaired panel.

- cleaning with an eraser disc chucked into the correct size drill. An eraser disc can be used to remove the pinstripe and the adhesive residue. Use similar techniques with the eraser disc to remove pinstripes as when removing emblem adhesive. This should be done by applying light pressure, and using horizontal and vertical movements. Residue should be removed from the eraser disc by lightly rubbing the area with general-purpose adhesive remover or isopropyl alcohol.

Personal Safety

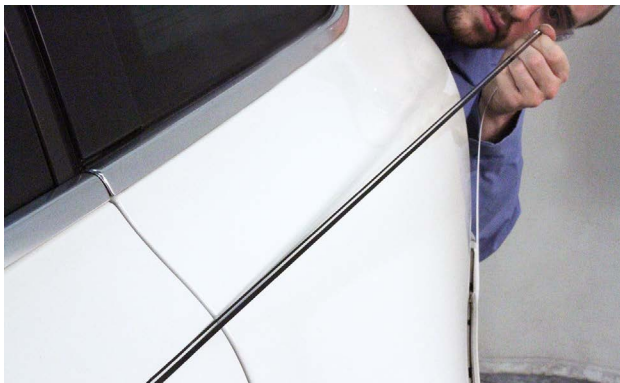
Do not use chemical removers and a heat gun or heat lamp simultaneously.

To apply taped pinstripes:

- verify that the surface temperature is 16 - 27°C (60 - 80°F). Pinstripes should not be applied when temperatures are below 16°C (60°F).
- clean the surface properly. This can include a chemical to remove water-soluble contaminants and a chemical to remove oil-based contaminants. This may not be required on newly refinished panels.
- verify that the surface is smooth. Wet sanding may be required to remove dirt imbedded into the finish. Following wet sanding,

the surface should be cleaned properly.

- cut a length longer than needed as a precautionary measure, and use as an alignment reference when extended onto adjacent panels.
- remove the backing, if required.
- do not overstretch the pinstripe tape.
- align and temporarily apply.
- use a squeegee to apply firm pressure to adhere the pinstripe to the panel.
- remove the protective film at 180° angle to the panel, if required. Some taped pinstripes may not contain a protective film.
- use a pin to pop the air bubbles. This will prevent breaking through the paint film, which can cause future problems. Do not use a metal razor blade.



Replacement pinstriping is being applied to the quarter panel.



Tools and products needed to apply a taped pinstripe include water-based and oil-based cleaners, a squeegee, a pin, and the pinstriping tape.



To help with alignment, the replacement pinstripe is temporarily applied to overlap the original pinstripe on an adjacent panel.



Racing stripe decals are shown on this vehicle (left). This decal is attached to the lower portion of the quarter panel (right).

Decals are most commonly called graphics, transfers, or overlays. Decals are applied to the exterior of the vehicle and come in:

- various sizes, shapes, and colors.
- kits. Some graphics packages may only be available as a kit that includes both sides and additional pieces that may not require replacement on the damaged vehicle.

Decals can also be designed and created by aftermarket suppliers. The supplier should be referenced for specific application of these types of decals. Aftermarket suppliers can also be valuable if they can duplicate a graphic that has been discontinued or is only available in a kit.



This vehicle wrap serves as an advertisement.

A vehicle wrap:

- is typically a printed vinyl film that adheres to exterior body panels, and glass.
- is an alternative to custom painting.
- is commonly used for advertising on company vehicles.
- covers a large area or the entire exterior of the vehicle.



This decal is being removed with a heat gun and plastic razor blade.

Decals can be removed similar to how pinstriping is removed. These methods include:

- applying heat with a heat gun or heat lamp to loosen the adhesive. Be careful not to overheat the area.
- cleaning with an eraser disc chucked into the correct size drill motor.
- using a chemical remover, such as a general-purpose adhesive remover or similar product. Test the chemical remover on a small, hidden area or on a damaged panel before applying chemical removers to the repaired panel.

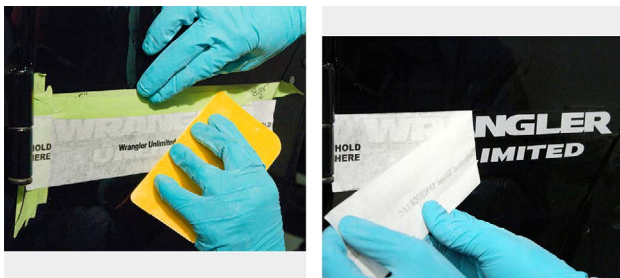
Vehicle Wrap Removal

Vehicle wraps should be removed from damaged panels and panels where blending may be necessary. Vehicle wraps are removed by applying heat and peeling the wrap from the panel.

Vehicle Wrap Replacement

Following repairs, vehicle wraps:

- are typically replaced at the facility where it was originally installed. This may be handled by the collision repair facility as a sublet, or returned to the vehicle owner to have the wrap replaced.
- should not be applied until the refinish has fully cured. Refer to paint maker recommendations to determine the proper amount of time before the vehicle wrap can be replaced. This may require communication with the facility that originally installed the vehicle wrap, or the vehicle owner.
- can be replaced for individual panels. The graphics are generally digitally stored by the installation facility or supplier, and can be replaced as necessary.



Lubricant is being squeegeed out from the inside to the outside of the decal (left). The protective film is being removed, leaving the decal attached to the panel (right).

Before application, align and measure the desired location of the decal. To apply decals:

- maintain a temperature between 16 - 27°C (60 - 80°F). Decals should not be applied when the surface is below 16°C (60°F).
- clean the surface properly. This can include a chemical to remove water-soluble contaminants and a chemical to remove oil-based contaminants. This may not be required on newly refinished panels.
- apply wet or dry.
- squeegee from the inside to the outside of the decal or into recessed areas.
- remove the protective film that covers the decal and keeps the pieces in alignment.
- use a pin to prick bubbles. This will prevent breaking through the paint film, which can cause future problems. Do not use a metal razor blade.
- apply heat to contour the decal into recessed areas or to evaporate residual moisture during wet application.
- allow freshly refinished surfaces to dry before installation. Residual solvents can cause blistering after decal application. The recommended cure time before applying decals may vary depending on the width and thickness of the decal. For example, Glasurit recommends waiting at least 48 hours before applying taped pinstripes, and one week before applying large or thick decals.

Factory decals or graphics are typically adhered to painted surfaces by a pressure-sensitive adhesive. The use of a wetting solution aids in the lifting and the positioning of the decal during installation and is particularly helpful when applying large decals.

A wetting solution can also be used to apply stripes or decals that are applied to flexible surfaces. The solution helps prevent the forming of air bubbles under the decal due to outgassing of the flexible material. It may not be recommended to use a wetting solution on color-impregnated TPO plastic.

Follow the paint maker recommendations for proper cure time before applying decals. This may require the customer to return at a later date to have the decals installed.



Refer to "Video: Decal Removal And Installation" in the presentation. This video shows one product maker's procedures for applying a decal using a wetting solution to assist in the application.

Module Wrap-Up

Topics discussed in this module included different methods:

- of applying paint pinstriping.
- for removing pinstriping, and decals.
- for applying taped pinstriping.
- for applying wet applications of an adhesively bonded decal.

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