



D021

Door

**Uniform
Procedures For
Collision Repair
UPCR**

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v.4.0



1. Description

This procedure describes the repair or replacement of a vehicle door. Inspection and evaluation requirements are also included.



2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality repair of vehicle doors. This procedure is intended for use by professionals who are qualified through training and experience.



3. Referenced Documents

The following documents are considered part of this procedure by reference.

3.1 Procedures

- CP01A Corrosion Protection
- CP01S Corrosion Protection
- DO01 Hinge
- DO31P Skin
- DO31S Skin
- MG01 Movable Glass
- PR01 Plastic Repair, Welding
- PR11 Plastic Repair, Adhesive
- PS01 Personnel Safety
- RE22 Airbag Systems, Side
- RF01P Surface Preparation
- RF01S Surface Preparation
- RF41 Finish Application
- ST21A Metal Repair
- ST21S Metal Repair
- ST31 Body Fillers
- WE01A GMA (MIG) Plug Weld
- WE01S GMA (MIG) Plug Weld
- WE11A GMA (MIG) Fillet Weld
- WE11S GMA (MIG) Fillet Weld

3.2 Other Information

- Product-specific information
- Recycled parts information
- Vehicle-specific repair information



4. Equipment And Material Requirements

4.1 GMA (MIG) Welding Equipment

Use GMA (MIG) welding equipment as described in **WE01A**, **WE01S**, **WE11A**, or **WE11S**.

4.2 Plastic Repair Equipment And Materials

Use plastic repair equipment and materials as described in **PR01** or **PR11**.

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4. Equipment And Material Requirements (cont'd)

4.3 Door Repair Materials

The use of these materials is included in this procedure:

- seam sealers
- anti-corrosion materials



5. Damage Analysis

5.1 General Damage

Inspect a door for these conditions or types of damage:

- visible damage
- corrosion
- signs of water leakage
- misalignment or damage to the intrusion beam
- damage to the energy-absorbing foam panels
- damage to the vertical glass run or mounting parts (see **MG01**)
- damage to the glass regulator
- improper previous repairs
- damaged or stressed spot welds or fasteners
- stress cracks around the hinges or latch
- damaged or missing trim, labels, seals, etc.
- excessive filler or paint film thickness
- separation of the skin from the inner structure
- splitting of the side airbag module trim cover, or a deployed side airbag module (see **RE22**)

Determine whether the door should be repaired or replaced. If the door skin cannot be repaired, plan to replace it. See **DO31P** or **DO31S**.

Some vehicle makers require replacement of the inner door panel after a side airbag deployment.

If the door intrusion beam is damaged, determine if a replacement part is available. Some vehicle makers do not recommend repairing door intrusion beams. If the vehicle maker does not recommend repairs, or does not provide a replacement intrusion beam, plan to replace the door.

If the glass regulator is damaged, determine whether it will be repaired or replaced. Plan to replace the water shield if there are signs of water leakage.

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5. Damage Analysis (cont'd)

If the energy-absorbing foam panel is removed or damaged, plan to replace it. Verify the availability of replacement parts.

For hinge replacement procedures, see **DO01**.



6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

Make sure the door is properly supported, and use proper lifting techniques during removal and installation.

6.2 Metal Repair Safety

Metal repair safety information is in **ST21A** or **ST21S**.

6.3 Hinge Safety

Door hinge safety information is in **DO01**.

6.4 Welding Safety

Welding safety information is in **WE01A**, **WE01S**, **WE11A**, or **WE11S**.

6.5 Plastic Repair Safety

Plastic repair safety information is in **PR01** or **PR11**.

6.6 Side Airbag Safety

Side airbag safety information is in **RE22**.



7. Environmental Safety

Does not apply.



8. Vehicle Protection

8.1 Electronic Parts

To protect computers and other sensitive parts from damage:

- Follow the vehicle maker's recommendations for recording and resetting electronic memories.
- Ensure that the ignition switch is in the LOCK position, and the key is removed.
- Disconnect and isolate the negative battery cable, and disarm the passive restraint system. Follow the vehicle maker's recommendations.
- Carefully remove computer modules when welding or heating within 300 mm (12"), or a greater distance when recommended by the vehicle maker.
- Protect modules, connectors, and wiring from dirt, heat, static electricity, and moisture.
- Loosen or remove any wiring harnesses or electrical parts that could be damaged during the repair process.

8.2 Side Airbag System Parts

Follow the vehicle-specific information for disarming an undeployed side airbag system. For general information, and for information on handling an undeployed side airbag module, see **RE22**.

To protect diagnostic or resistor modules:

- Avoid touching electrical terminals.
- Use an ESD strap when handling the module.
- Do not store modules near electric welders or other high-energy electrical equipment.
- Do not perform electrical tests unless directed by a service manual.
- Do not open the package of the replacement module until it is to be installed on the vehicle.
- Inspect replacement modules for the proper part number and absence of damage before installation.

8.3 Door And Adjacent Areas

When removing or replacing a door:

- Protect the door from damage during removal, storage, and installation.
- Protect adjacent areas from damage.
- Avoid cutting into the finish when marking hinge locations.
- Protect glass, upholstery, and other cosmetic areas from damage caused by welding or cutting sparks. Remove interior and exterior trim and adjacent panels that cannot be protected.



9. Repair Procedure

For minor repairs, see **9.1**. For replacing a door with mechanically fastened hinges, see **9.2** and **9.3**. For replacing a door with welded-on door hinges, see **9.4** and **9.5**. For replacing a welded-on door intrusion beam, see **9.6**. For replacing a mechanically fastened door intrusion beam, see **9.7**.

9.1 Minor Repairs

To perform minor repairs on a door:

- 1. Perform repairs using metal repair, heat shrinking, and plastic repair procedures, as appropriate. Repairs to damaged intrusion beams may not be recommended, or may be limited to minor damage and cold straightening methods. Follow the vehicle maker's recommendations.
- 2. Replace damaged welded-on trim-mounting studs, as required.
- 3. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision or repairs.
- 4. Refinish the door as required to restore appearance, including edges damaged by the collision or repairs. Refinish cosmetic surfaces after all body repairs are complete.
- 5. Replace or restore sound deadeners, energy-absorbing foam panels, undercoatings, etc., that were damaged by the collision or during repairs.
- 6. Check the door alignment. Adjust as necessary.
- 7. Replace all trim, labels, weatherstrips, etc., as necessary.
- 8. Continue vehicle reassembly.

9.2 Door Removal—Mechanically Fastened Hinges

To remove a door mounted with mechanically fastened hinges:

- 1. Protect the interior and adjacent panels.
- 2. Open and support the door.
- 3. Remove interior trim, as necessary for access.
- 4. Disconnect, remove, and protect electrical connectors, wiring, and mirror cables, as necessary.
- 5. Straighten the door, if necessary to ensure alignment to the door opening.
- 6. Remove the hinge springs and pins, if required. Discard any damaged springs, pins, or bushings.
- 7. Mark the hinge locations on the door and pillar.
- 8. If not removing the hinge pins, remove the hinge mounting fasteners from the pillar. Discard any damaged fasteners. Note the locations of any shims.
- 9. Remove and carefully store the door.
- 10. Remove the striker pin.

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9. Repair Procedure (cont'd)

9.3 Door Installation—Mechanically Fastened Hinges

To install a door mounted with mechanically fastened hinges:

- 1. Apply corrosion-resistant primer to all areas damaged by the collision or repairs.
- 2. Apply seam sealers, as necessary. Reprime if required by the product maker.
- 3. Refinish the underside, edges, body opening, and any areas where hardware will be installed, as required to restore the appearance. Refinish cosmetic surfaces after all body repairs are complete.
- 4. Protect the adjacent parts.
- 5. Support the door while aligning the hinges.
- 6. Install the mounting fasteners loosely.
- 7. Install all removed shims in their original locations.
- 8. Reinstall the hinge springs, pins and bushings, if required.
- 9. Reroute any electrical wiring and mirror cables to their original locations.
- 10. Close the door enough to check the alignment of the door to the adjacent panels. Adjust as necessary.
- 11. Torque the fasteners to the vehicle maker's recommendations.
- 12. Recheck the alignment of the door to the adjacent panels. Adjust as necessary.
- 13. Verify the proper operation of the door checks or brakes.
- 14. Install the striker pin.
- 15. Check the door for proper latching. Align the striker and latch assembly, as necessary.
- 16. Reconnect all electrical connectors, as necessary.
- 17. Apply sound-deadening pads and energy-absorbing foam panels, as necessary.
- 18. Transfer or install replacement parts such as door handles, locks, window regulators and tracks, latch assemblies, etc.
- 19. Install all removed interior trim.
- 20. Install all exterior trim, labels, weatherstripping, etc., as necessary.
- 21. Lubricate the hinges and latch, as necessary. Follow the vehicle maker's recommendations.
- 22. Test the operation of the door glass and all electrical accessories. Correct any defects.
- 23. Perform air and water leak tests to ensure proper door-to-body and glass-to-door seals.
- 24. Continue vehicle reassembly.

9.4 Door Removal—Welded-On Hinges

To remove a door mounted with welded-on hinges:

- 1. Protect the interior and adjacent panels.
- 2. Open and support the door.
- 3. Remove interior trim, as necessary for access.
- 4. Disconnect and protect electrical connectors, wiring, and mirror cables, as necessary.
- 5. Straighten the door, if necessary to ensure alignment to the door opening.

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9. Repair Procedure (cont'd)

- 6. Remove the hinge springs and pins, if required. Discard any damaged springs, pins, or bushings.
- 7. Mark the hinge locations on the door and pillar.
- 8. Remove any remaining fasteners. Discard any damaged fasteners.
- 9. Remove and carefully store the door.
- 10. Remove the spot welds. If the hinge is fillet welded, cut the hinge off. Avoid damaging adjacent parts.
- 11. Remove any burrs or spot weld nuggets. Avoid removing any zinc coating.
- 12. Remove the striker pin.

9.5 Door Installation—Welded-On Hinges

To install a door mounted with welded-on door hinges:

- 1. Protect the adjacent parts.
- 2. Apply weld-through primer to the steel hinge and pillar mating surfaces that do not have zinc coating or where the zinc coating was removed. Follow the vehicle maker's recommendations. Due to the poor adhesion property of some weld-through primers, it may have to be removed from all exposed surfaces after welding, before applying other coatings and sealants.
- 3. Install the hinges to the pillar with temporary fasteners.
- 4. Support the door while aligning the hinges, and loosely install the hinge fasteners to the door. Reinstall any removed shims. Adjust the hinges as necessary.
- 5. Mark the hinge locations.
- 6. Remove the door.
- 7. Remove the hinges.
- 8. Make test welds, before welding on the vehicle, using the same type and thickness metal that will be welded on the vehicle. Make the test welds in the same position as the welds on the vehicle, using weld-through primer if applicable. Visually inspect and destructively test the welds before welding on the vehicle.
- 9. Weld the hinges in position.
- 10. Dress the welds as necessary to restore the appearance.
- 11. Apply corrosion-resistant primer to all areas damaged by the collision or repairs.
- 12. Apply seam sealer as necessary. Reprime if required by the product maker.
- 13. Refinish the underside, edges, body opening, and any areas where hardware will be installed, as required to restore the appearance. Refinish cosmetic surfaces after all body repairs are complete.
- 14. Install the door.
- 15. Reroute any electrical wiring and mirror cables to their original locations.
- 16. Close the door enough to check the alignment of the door to the adjacent panels. Adjust as necessary.
- 17. Verify the proper operation of the door checks or brakes.
- 18. Install the striker pin.

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9. Repair Procedure (cont'd)

- 19. Check the door for proper latching. Align the striker and latch assembly, as necessary.
- 20. Reconnect all electrical connectors, as necessary.
- 21. Apply sound-deadening pads and energy-absorbing foam panels, as necessary.
- 22. Transfer or install replacement parts such as door handles, locks, window regulators and tracks, latch assemblies, etc.
- 23. Install all removed interior trim.
- 24. Install all exterior trim, labels, weatherstripping, etc., as necessary.
- 25. Lubricate the hinges and latch, as necessary. Follow the vehicle maker's recommendations.
- 26. Test the operation of the door glass and all electrical accessories. Correct any defects.
- 27. Perform air and water leak tests to ensure proper door-to-body and glass-to-door seals.
- 28. Continue vehicle reassembly.

9.6 Welded-On Intrusion Beam Replacement

To replace a welded-on intrusion beam:

- 1. Remove all parts necessary to access the intrusion beam, and to prevent damage.
- 2. Straighten the door frame to the proper dimensions. Verify the alignment of the door frame to the door opening.
- 3. Identify and mark all spot weld locations.
- 4. Remove the spot welds. Do not damage any parts which are not to be replaced. Do not drill completely through the inner panel where the new beam will mount.
- 5. Remove the damaged intrusion beam.
- 6. Remove any burrs or spot weld nuggets from the weld mating locations. Avoid removing any zinc coating.
- 7. Verify that the proper part is being installed by checking the part number and performing a trial fit.
- 8. Clean the weld mating surfaces. Avoid removing any zinc coating.
- 9. Refer to the vehicle maker's recommendation for the location, number, and size of plug weld holes. If no recommendations are available, punch or drill holes that duplicate the diameter of the original spot welds in the replacement beam at the same locations used originally by the vehicle maker.
- 10. Apply weld-through primer to all mating weld surfaces that do not have zinc coating, or where the zinc coating was removed. Follow the vehicle maker's recommendations. Due to the poor adhesion property of some weld-through primers, it may have to be removed from all exposed surfaces after welding, before applying other coatings and sealants.
- 11. Position the beam on the door and tack weld or clamp it in place. Protect glass or other sensitive parts that cannot be removed.
- 12. Make test welds, before welding on the door, using the same type and thickness metal that will be welded on the vehicle. Make the test welds in the same position as the welds on the vehicle, using weld-through primer if applicable. Visually inspect and destructively test the welds before welding on the vehicle.

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9. Repair Procedure (cont'd)

- 13. Make the required welds.
- 14. Dress the welds, if necessary.
- 15. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision or repairs.
- 16. Install all parts that were removed for access.
- 17. Continue door repair.

9.7 Mechanically Fastened Intrusion Beam Replacement

To replace a mechanically fastened intrusion beam:

- 1. Remove all parts necessary to access the intrusion beam, and to prevent damage.
- 2. Straighten the door frame to the proper dimensions. Verify alignment of the door frame to the door opening.
- 3. Locate and remove all mounting fasteners. Discard any one-time or damaged fasteners.
- 4. Remove the damaged intrusion beam.
- 5. Verify that the proper part is being installed by checking the part number and performing a trial fit.
- 6. Align the replacement part with the mounting locations.
- 7. Loosely install the fasteners. Use replacement fasteners that are the same grade, size, and type as the original fasteners.
- 8. Torque the fasteners to the vehicle maker's recommendations.
- 9. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision or repairs.
- 10. Install all parts that were removed for access.
- 11. Continue door repair.



10. Use Of Recycled (Salvage) Parts

10.1 Condition Of Salvage Parts

Do not install a salvage door having any of these defects:

- unrepairable damage
- corrosion that has caused pitting
- improper previous repairs
- stress cracks around the hinges or latch
- damage caused by fire
- excessive filler or paint film thickness

Plan to transfer or replace any of the following:

- mirrors, door locks, and keyless entry systems
- window parts required to duplicate vehicle options
- damaged, missing, or mis-matched moldings, labels, or other required trim

10.2 Preparation Of Salvage Parts

To prepare a salvage door for installation:

- Make any necessary repairs.
- Remove any trim or moldings that are to be reused or replaced.
- Clean the part to remove dirt, wax, grease, etc.
- Remove excessive paint film thickness.
- Remove or install trim-attachment studs and drill or fill trim-attachment holes, as required.
- Apply corrosion protection as necessary.
- Refinish the hinges and door frame before installation, to restore corrosion protection and appearance.



11. Inspection And Testing

11.1 Inspection Of A Repaired Or Replaced Door

After installation or repair, inspect a door for these conditions:

- proper lubrication
- proper application of seam sealers and corrosion protection
- proper finish appearance and film thickness
- proper alignment with adjacent panels
- proper latching and release
- proper operation of the door checks or brakes
- proper installation of all interior trim, labels, weatherstripping, and fasteners
- proper installation of wiring harnesses and electrical connectors
- proper operation of the electrical accessories, such as interior lighting, key chime, door ajar warning lamp, and security system, if applicable
- proper operation of mirrors, door glass, and door locks
- ease of operation
- proper lubrication
- proper weatherstrip sealing

Correct any defects.