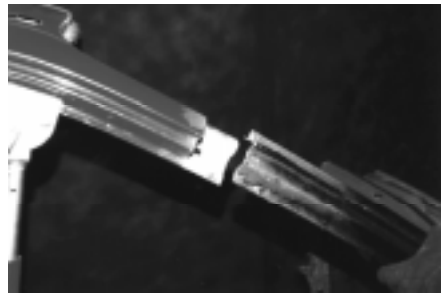
Uniform Procedures For Collision Repair

SP31S—A-Pillar

 v.2.3

1. Description

This procedure describes the repair and complete or partial replacement of a steel A-pillar assembly. 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 A-pillar assemblies. 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

CP01S Corrosion Protection
ME01 Three-Dimensional Measuring
PS01 Personnel Safety
RF01S Surface Preparation
RF41 Finish Application
ST01S Stress-Relieving Heat Limitations
ST11 Structural Straightening
ST21S Metal Repair
WE01S GMA (MIG) Plug Weld
WE11S GMA (MIG) Fillet Weld
WE21S GMA (MIG) Butt Joint With Backing
WE51S Squeeze-Type Resistance Spot Weld

3.2 Other Information

Vehicle-specific dimension specifications
Vehicle-specific repair information

4. Equipment And Material Requirements

4.1 Straightening And Measuring Equipment

Use straightening equipment as described in **ST11**.

Use measuring equipment as described in **ME01**.

4.2 Welding Equipment

Use GMA (MIG) welding equipment as described in **WE01S**, **WE11S**, or **WE21S**.

Use squeeze-type resistance spot welding (STRSW) equipment as described in **WE51S**.

Note: Some vehicle makers recommend against the use of STRSW for replacing spot welds.

5. Damage Analysis

5.1 General Damage

Inspect an A-pillar for these types of damage:

- ❏ visible damage
- ❏ corrosion
- ❏ improper previous repairs
- ❏ dimensional misalignment
- ❏ damaged finish

Determine how much of the A-pillar can be straightened, and the portion that must be replaced. Verify the availability of replacement parts. Refer to the vehicle maker's body repair manual for recommended joint locations.

6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

6.2 Straightening Safety

Straightening safety information is in **ST11**.

6.3 Welding Safety

Welding safety information is in **WE01S**, **WE11S**, **WE21S**, or **WE51S**.

7. Environmental Safety

Does not apply.

8. Vehicle Protection

8.1 Stress-Relieving

If heat is used for stress-relieving, use temperature-measuring methods as described in **ST01S**.

Note: Some vehicle makers recommend against the use of heat for stress-relieving.

8.2 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.

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8. Vehicle Protection (cont'd)

- ❑ Protect computer 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.

Remove the battery if it is in an area to be welded or heated.

8.3 Adjacent Areas

Protect glass, upholstery, and other cosmetic surfaces from welding, grinding, or cutting sparks. Remove glass, interior trim, and adjacent parts that cannot be protected.

Remove or relocate any wiring, roof drains, or antenna leads that may be attached to or routed through the pillar, before starting repairs.

8.4 Sectioning Guidelines

Do not section in or near these areas:

- ❑ holes larger than 3 mm (⅛")
- ❑ compound shapes or structures
- ❑ areas where proper welding cannot be performed
- ❑ mechanical part-mounting locations

Note: Do not section inner reinforcements unless recommended by the vehicle maker.

9. Repair Procedure

9.1 Straightening

To straighten an A-pillar:

- ❑ 1. Make sure the vehicle is properly anchored to the straightening system.
- ❑ 2. Make upperbody measurements to determine the location of the A-pillar, door opening, and surrounding structure.
- ❑ 3. Make windshield opening diagonal measurements to determine the location of the A-pillar.

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❑ 4. Use multiple pulls and stress-relieving to return the A-pillar to proper dimensions. Follow the tolerance recommendations of the vehicle maker. If no recommendations are given, use a tolerance of ±3 mm (⅛"). Use a three-dimensional measuring system and adjacent panels to verify that the part is properly aligned.

❑ 5. If heat is used for relieving stress, follow the vehicle maker's temperature and time recommendations. If the part cannot be identified as mild steel, treat it like high-strength steel (HSS). Refer to the vehicle maker's repair information to locate any internal parts such as drain tubes or wiring before applying heat.
Note: Some vehicle makers recommend against the use of heat for stress-relieving.

❑ 6. Plan to replace any part that is kinked, has stress cracks, or develops cracks during straightening. If replacement is required, see **9.2** and **9.3**. For sectioning, see **9.4** and **9.5**.

❑ 7. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.

❑ 8. Apply seam sealers, as necessary, to seal the joints and restore the appearance. Reprime if required by the product maker.

❑ 9. Replace foam fillers, if necessary. Follow the vehicle maker's recommendations.

❑ 10. Apply anti-corrosion compounds to all enclosed areas.

❑ 11. Refinish areas damaged by the collision, repairs, or anchoring, as required to restore the appearance. Refinish cosmetic surfaces after all body repairs are complete.

❑ 12. Continue vehicle reassembly.

9.2 Complete A-Pillar Removal

To remove a complete A-pillar assembly:

❑ 1. Perform upperbody measurements and adjacent panel alignment and straightening. See **9.1**.

❑ 2. Remove necessary trim, glass, adhesives, drain tubes, and wiring.

❑ 3. Identify and mark all spot weld locations.

❑ 4. Install a holding device to support and align the roof panel.

❑ 5. Remove the spot welds. Do not damage the parts attached to the A-pillar assembly which are not to be replaced.

❑ 6. Locate the roof to A-pillar seam, if equipped. Remove the paint and primers from this area.

❑ 7. Remove the filler material from the roof to A-pillar seam.

❑ 8. Cut the weld at the roof to A-pillar seam.

❑ 9. Remove the damaged A-pillar. Do not discard any labels until replacements are obtained.

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❑ 10. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage. Avoid removing any zinc coating.
❑ 11. Remove any foam fillers from the weld joint areas, if necessary. Follow the vehicle maker's recommendations.
❑ 12. Straighten the mating panel edges, if necessary to ensure a proper fit-up with the replacement pillar.

9.3 Complete A-Pillar Installation

To install a complete A-pillar assembly:

❑ 1. Perform a trial fit of the replacement parts.
❑ 2. Clean the mating surfaces. Avoid removing any zinc coating.
❑ 3. Refer to the vehicle maker's body repair manual for the recommended welding method. STRSW should only be used when recommended by the vehicle maker.
❑ 4. 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 8 mm (5/16") holes in the outer panel at the same locations used originally by the vehicle maker. If using a lap joint, allow for a minimum 6 mm (1/4") overlap. If STRSW is used, refer to the vehicle maker's recommendations for the electrode diameter, weld locations and spacing, etc.
❑ 5. Follow the vehicle maker's recommendation for the types and locations of the welds required at the roof to A-pillar seam.
❑ 6. Test-fit the replacement A-pillar, and clamp it in place.
❑ 7. Remove the replacement A-pillar assembly from the vehicle.
❑ 8. Apply weld-through primer to all weld 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.
❑ 9. Apply weld-bond adhesive when recommended by the vehicle maker.
❑ 10. Position the part on the vehicle and clamp it in place.
❑ 11. Use a three-dimensional measuring system and adjacent panels to verify that the part is properly aligned.
❑ 12. Tack weld, or securely hold, the part in position.
❑ 13. Recheck the alignment using the measuring system and the adjacent panels.

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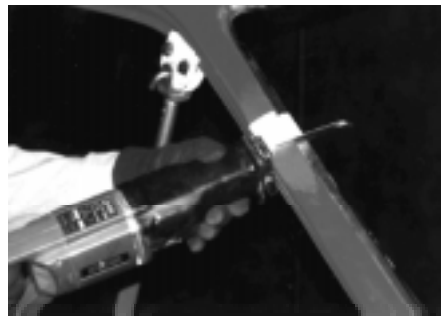
- ❑ 14. Make test welds, before welding on the vehicle, using the same type and thickness metal that will be welded on the vehicle. Make the test welds in the same position as the welds on the vehicle, using weld-through primer if applicable. Visually inspect and destructively test the welds before welding on the vehicle.
- ❑ 15. Make the required welds.
- ❑ 16. Use the measuring system and adjacent panels to verify that the A-pillar assembly is still properly aligned.
- ❑ 17. Dress the welds, if necessary.
- ❑ 18. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- ❑ 19. Apply seam sealers, as necessary, to seal the joints and restore the appearance. Reprime if required by the product maker.
- ❑ 20. Reinstall the drain tubes and wiring, if required.
- ❑ 21. Replace foam fillers, if necessary. Follow the vehicle maker's recommendations.
- ❑ 22. Apply anti-corrosion compounds to all enclosed areas.
- ❑ 23. Refinish areas damaged by the collision, repairs, or anchoring, as required to restore the appearance. Refinish cosmetic surfaces after all body repairs are complete.
- ❑ 24. Install any labels previously removed.
- ❑ 25. Continue vehicle reassembly.

9.4 Partial A-Pillar Removal

To remove the damaged portion of an A-pillar for partial replacement:

- ❑ 1. Perform upperbody measurements and adjacent panel alignment and straightening. See **9.1**.
- ❑ 2. Remove necessary trim, glass, adhesives, drain tubes, and wiring.
- ❑ 3. Select the cut locations based on the damage and construction of the A-pillar. Follow the vehicle maker's recommendations and the sectioning location guidelines described in **8.4**. If the inner panel is to be replaced along with the outer panel, plan to use a butt joint with insert or an offset cut with any combination of sectioning joints.
- ❑ 4. Measure and mark the cut locations.
- ❑ 5. Cut the undamaged portion of the A-pillar slightly longer than the final cut locations. Avoid creating a large heat-affected zone.
- ❑ 6. Remove any foam fillers from the weld joint areas, if equipped. Follow the vehicle maker's recommendations.



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❑ 7. Identify and mark the spot weld locations of the portion to be removed.
❑ 8. Remove the spot welds. Do not damage the parts that are attached to the A-pillar which are not to be replaced.
❑ 9. Remove the cutout portion of the A-pillar from the vehicle. Do not discard any labels until replacements can be obtained.
❑ 10. Trim the remaining edges of the A-pillar to the exact cut locations.
❑ 11. Remove all burrs or spot weld nuggets from the mating surfaces, and repair all damage. Avoid removing any zinc coating.
❑ 12. Straighten the mating panel edges, if needed to ensure a proper fit-up with the replacement portion.

9.5 Partial A-Pillar Installation

To install a replacement A-pillar section:

❑ 1. Compare the replacement part to the original part by visual inspection and measuring. Measure across the area to be sectioned using three or more reference points, such as holes, notches, weld seams, or feature lines. If no reference points exist on the replacement part, make reference points on both parts.
❑ 2. Cut the replacement A-pillar to the proper length and shape for the type of joints recommended by the vehicle maker.
❑ 3. Clean the mating surfaces. Avoid removing any zinc coating.
❑ 4. Refer to the vehicle maker's body repair manual for the recommended welding method. STRSW should be used only when recommended by the vehicle maker.
❑ 5. 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 8 mm (5⁄16") holes in the outer panel at the same locations used originally by the vehicle maker. If using a lap joint, allow for a minimum of 6 mm (¼") overlap. If STRSW is used, refer to the vehicle maker's recommendations for the electrode diameter, weld locations and spacing, etc.
❑ 6. Test-fit the partial A-pillar, and clamp it in place.
❑ 7. Remove the partial A-pillar from the
❑ vehicle.
❑ 8. Apply weld-through primer to all weld mating surfaces that do not have a 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.

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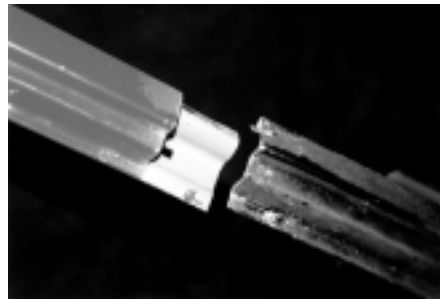
9. Repair Procedure (cont'd)



- ❏ 9. Apply weld-bond adhesive when recommended by the vehicle maker.
- ❏ 10. Position the replacement part on the vehicle and clamp it in place.
- ❏ 11. Use a three-dimensional measuring system and adjacent panels to verify that the part is properly aligned.
- ❏ 12. Tack weld, or securely hold, the part in position.
- ❏ 13. Recheck the alignment using the measuring system and the adjacent panels.
- ❏ 14. 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.
- ❏ 15. Make the required welds.
- ❏ 16. Use the measuring system and adjacent panels to verify that the part is still properly aligned.
- ❏ 17. Dress the welds, if necessary.
- ❏ 18. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- ❏ 19. Apply seam sealers, as necessary, to seal the joints and restore the appearance. Reprime if required by the product maker.
- ❏ 20. Reinstall the drain tubes, wiring, and other necessary parts.
- ❏ 21. Replace foam fillers, if necessary. Follow the vehicle maker's recommendations.
- ❏ 22. Apply anti-corrosion compounds to all enclosed areas.
- ❏ 23. Refinish areas damaged by the collision, repairs, or anchoring, as required to restore the appearance. Refinish cosmetic surfaces after all body repairs are complete.
- ❏ 24. Install any labels previously removed.
- ❏ 25. Continue vehicle reassembly.

10. Use Of Recycled (Salvage) Parts

10.1 Inspection Of Salvage Parts

Do not install a salvage A-pillar having any of these defects:

- ❏ unrepairable damage
- ❏ corrosion that has caused pitting
- ❏ improper previous repairs
- ❏ missing mounting locations

10.2 Preparation Of Salvage Parts

To prepare a salvage A-pillar for installation:

- ❏ Clean the part to remove dirt, wax, grease, undercoating, corrosion, etc.
- ❏ Remove all heat-affected zones.
- ❏ Trim the part to fit.
- ❏ Make sure the part is not deformed along the weld joints.

11. Inspection And Testing

11.1 Inspection Of A Repaired Or Replaced A-Pillar

Inspect a repaired A-pillar for these conditions:

- ❏ dimensional alignment
- ❏ proper alignment to adjacent panels
- ❏ weld quality
- ❏ proper finish appearance and film thickness
- ❏ proper application of corrosion protection
- ❏ proper operation of the restraint system
- ❏ proper alignment and operation of the windshield, door mechanisms, hinges, latches, and locks
- ❏ proper installation of all labels

Correct any defects.