







# **DURANGO BODY REPAIR MANUAL**



### SAFETY NOTICE

#### CAUTION

All SERVICE AND REBUILDING INSTRUCTIONS CONTAINED HEREIN ARE APPLICABLE TO, AND FOR THE CONVENIENCE OF, THE AUTOMOTIVE TRADE ONLY. All test and repair procedures on components or assemblies in non-automotive applications should be repaired in accordance with instructions supplied by the manufacturer of the total product.

Proper service and repair is important to the safe, reliable operation of all motor vehicles. The service produces recommended and described in this publication were developed for professional service personnel, and are effective methods for performing vehicle repair. Following these procedures will help ensure efficient economical vehicle performance and service reliability. Some service procedures require the use of special tools designed for specific procedures. These special tools should be used as recommended throughout this publication.

Special attention should be exercised when working with spring-or tension-loaded fasteners and devices such as E-Clips, Circlips, Snap rings, etc., since careless removal may cause personal injury. Always wear safety goggles when working on vehicles or vehicle components.

It is important to note that this publication contains various Cautions and Warnings. These should be read carefully in order to minimize risk of personal injury or the possibility that improper service methods may damage the vehicle or render it unsafe. It is important to note that these Cautions and Warnings cover only the situations and procedures DaimlerChrysler Corporation has encountered and recommended. DaimlerChrysler Corporation cannot possibly know, evaluate, and advise the service trade of all conceivable ways in which service may be performed, or of the possible hazards of each. Consequently, DaimlerChrysler has not undertaken any such broad service review. Accordingly, anyone uses a service procedure or tool that is not recommended in this publication must be certain that neither personal safety, nor vehicle safety, will be jeopardized by the service methods they select.







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# **INTRODUCTION** Dodge Durango



This manual has been prepared for use by all body technicians involved in the repair of the Dodge Durango.

This manual shows:

- Typical unibody panels contained in these vehicles
- The weld locations for these panels

- The types of welds for the panel
- Proper sealer types and correct locations
- Manufacturer Advertisments.... Body Construction Characteristics... History of Collision Repair... Body Code Plate Information... Corrosion Protection... Vehicle Identification Number Information... Vehicle Identification Number Information... Welded Panel Replacement. Sealer Locations... Sound Deadner Locations... Structural Adhesive Locations... Frame/Body Dimensions... Frame Tip Replacement.

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## **BODY CONSTRUCTION CHARACTERISTICS**

Definitions of Steels used in the Dodge Durango:

- MS 66 Represents an uncoated Hot Rolled Steel Sheet used mainly for interior braces and reinforcements.
- MS 67 Represents an uncoated Cold Rolled Sheet structural steel used in areas where structural integrity is critical. EG., the type of steel used for the "A" pillar.
- MS 264 Represents an uncoated high strength low alloy (HSLA) steel used in applications where structural integrity is critical.
- MS 6000-44A Low carbon, hot dipped galvanneal (or EGA) with 45 g/m<sup>2</sup> minimun coating weight on both sides. - Most common Sheet Steel product used by Chrysler
- MS 6000-44VA 50 ksi min. yield strength, HSLA, killed steel, with 44 g/m<sup>2</sup> minimun coating weight on both sides. -- Most common high strength coated steel product used by Chrysler

# PARTIAL LIST OF STEEL APPLICATIONS Galvannealed Steel

Body Side Aperture Cowl Plenum Panel Cowl Side Panel Dash Panel Front Door - Inner Panel Front Door - Outer Panel Front Fender Front Floor Pan Front Floor Pan Front Hinge Pillar Front Rail Front Strut Mounting Tower Front Wheelhouse (Front and Rear) Lower Radiator Crossmember Rear Door - Inner Panel Rear Door - Outer Panel Rear Floor Pan Rear Floor Pan Front Crossmember Rear Floor Pan Side Rail Rear Suspension Crossmember Rear Quarter Panel - Inner Rear Quarter Panel - Outer Rear Wheelhouse - Inner Roof Panel UpperLoad Path beem Upper Radiator Crossmember

### **BODY CONSTRUCTION CHARACTERISTICS**

The following measures have been implemented in order to provide maximum corrosion prevention and protection.

- 1. The use of galvannealed coatings throughout the body structure.
- 2. Ecoat is used on the complete body in all instances.
- 3. Body sealing.
- 4. Stone-chipping resistant primer application.
- 5. Underbody corrosion prevention.

## **HISTORY OF COLLISION REPAIR**

Time was, if you had an accident, the call went out to the insurance company - to the collision shop - or several shops - get the lowest bid and in no time at all, the vehicle was repaired.

The facilities, training, and equipment were simple. Use a torch to cut, shape, and bend. Use something substantial as an anchoring point - maybe a tree and then just pull.

Use plenty of solder or body putty to make it look good. With the frame and body vehicle, the job was easy; first straighten the frame - then fix the mechanical components and the body work was cosmetic. This was all well and good until the mid - '70s.

Then, the designers, engineers, and manufacturers had to find ways to make the vehicles energy efficient - and that meant unibody cars. The unibody concept wasn't new - back in the '30s the Chrysler Air Flow had it - race cars have it - and now the driving public worldwide has it.

The change came quickly. Manufacturers devoted time, money, and talent to delvelop the unibody car.

The public was ready to buy and did!

But then came the problem! The collision repair industry wasn't given the luxury of taking their time to train people in the new technology - or take time to plan for new equipment.

The collision happened and the vehicle had to be fixed. Cars that were repairable were being totalled.

Cars that were repaired were not repaired correctly. Everybody was in a quandary- auto manufacturer - insurance company - repair equipment people - body shops - and repair technicians.

The problem started in the early '70s and body shops are still catching up today. Yesterday's "ding" is today's "crash". It takes trained technicians and sophisticated equipment to do the repair today.

That's why DaimlerChrysler is taking the time and effort to get the right information into the hands of the people that handle the repair job.

#### **BODY CODE PLATE DESCRIPTION**

The Body Code Plate is located in the passenger side front wheel well. There are seven lines of information on the body code plate. Lines 4, 5, 6, and 7 are not used to define service information. Information reads from left to right, starting with line 3 in the center of the plate to line 1 at the bottom of the plate.





#### **Factory Applied Corrosion Protection**

During the manufacturing of the unibody car, the manufacturer applies "corrosion protection" using specialized manufacturing processes. This system is not duplicated in the collision repair body shop. However, the body shop still has a responsibility to apply corrosion protection to the unibody vehicle. So, the collision repair shop must use alternative materials to do the corrosion protection job after the repair.

This corrosion protection is required regardless of the environment and weather conditions the vehicle will be operated in. Corrosion protection is as important in the desert as it is at the seaside. Corrosion damage can literally destroy the structural integrity of a unibody vehicle from within. Many corrosion protection systems are destroyed during collision repair operations. Metal finishing, metal working and fatigue can cause the breakdown of many of the corrosion barriers installed at the factory. The use of heat for stress relief and welding also destroys factory installed corrosion barriers. These corrosion barriers and corrosion protection systems must be replaced after collision repair to ensure that the structural integrity of the unibody will remain intact throughout its life. In the past, only vehicles with aftermarket or afterdelivery corrosion protection systems installed were serviced after collision repair to restore the corrosion protection system.

An understanding of the types of corrosion which affect the unibody vehicles will assist in understanding why the factory protection systems are important, how the factory protection systems consist of and how the systems' protection is replaced after collision and electrolytic corrosion. Some of the more common types of corrosion are **crevice corrosion**, **pitting**, **galvanic corrosion**, **stress corrosion**, **cracking**, **fretting**, and **erosion corrosion**.



The penetration of corrosive solutions into these small areas, with widths that are typically a few thousandths of an inch, can result in various types of failures: the metal surface may become rusty in appearance, operating components may seize when protective coatings may have been removed from the metal surface. The coating of zinc on steel, known as galvanized, is an example of sacrificial cathodic protection.

An example of galvanic corrosion on the automobile is a stainless steel trim molding on a painted mild steel. When the paint becomes damaged, a galvanic corrosion cell is formed between the passive stainless steel (cathode) and the steel (anode). The corrosion leads to what would look like a rust stain. Methods of reducing galvanic corrosion include the use of compatible materials, minimizing of cathode-to-anode areas, the insulation of dissimilar metal contacts and the use of thick, replaceable sections.

#### Stress corrosion, cracking, fretting, and erosion corrosion.

Corrosion cracking is the early cracking of metals produced by the combined action of tensile stress and a corrosive atmosphere.

Corrosion fatigue is cracking due to the action of stresses and corrosion. Methods of reducing corrosion fatigue include the reduction in stress and the use of coatings.

Fretting is the deterioration of a metal at contact surfaces due to the presence of a corrosive and relative motion between the surfaces. The two metal surfaces initially are covered with an oxide film that becomes abraded during vibration. The results are oxide particles that become corroded. During the collision repair process, the factory protection materials become damaged from working the metals, or from the use of heat in the repair operations. If these factory protection materials are not replaced with some similar protection material after repair, a corrosion hot spot is formed. A corrosion hot spot is a small unprotected area surrounded by a protected area throughout the rest of the vehicle. the hot spot effect causes rapid deterioration of the unprotected area. This deterioration takes place at a much faster rate, sometimes 10-12 times faster than if the entire car were unprotected. The hot spot effect is created because all the corrosive factors are channeled to the unprotected area much the same way all material flowing through a funnel is concentrated in a small area. This hot spot effect means that corrosion failures to the unibody structure could occur in a short period of time even in an atmosphere normally not subject to corrosion. The hot spot effect can cause rapid deterioration damage in a desert as well as seaside.

The types of materials used in rustproofing application include oil based materials, wax base materials, primers and color coats. The most important properties of rustproofing materials are adhesion, toughness, and the resistance to the environment. The best coating in the world is not effective unless it is present in the right place at the right time.

#### **Corrosion Protection Information**

When making the collision repair, refer to the manufacturer's information on where corrosion protection and sealants are applied. Be sure to follow the recommendations. The application process is usually included with the material manufacturer's information so be sure to read and understand it before proceeding with the repair.

#### **Collision Repair Corrosion Protection Materials**

The materials must provide good **electrolyte barriers**. The material must also be able to penetrate **tiny crevices** and prevent **abrasive corrosion**. The material must be **compatible** with **paint systems** as many areas of the car must be treated before paint is applied.

Materials containing silicones will cause paint conditions such as fish eyes if they are applied before the repaired vehicle is painted. So no silicone containing material is to be used. As many of the repair areas are more accessible before final assembly and painting, the non-silicone type materials are a must for this type of application.

When protecting an enclosed area, fog type properties for the corrosion protection material are a plus. The fog properties make the material much less susceptible to operator error or misapplication. With a fog type material, once the material is introduced inside of an enclosure, the fog spreads rapidly and evenly into all areas including tiny crevices. The fog type materials do not require direct spray application to be effective. Fog type materials are also very effective in coating over any existing rusted or corrosion damaged areas and preventing further corrosion of these areas. This is especially important on repairs of older vehicles.

#### Spray Accessibility to the Repair



Being able to achieve fog spray penetration into enclosed cavities as well as open areas requires application equipment, which includes an assortment of wands of various lengths and design.



Some areas are more effectively treated by brush application of corrosion protection material before they are assembled. A good example of this is an inner and outer engine compartment side rail area. Brush application to the inside of these areas as individual pieces is easy before assembly and can be followed by a light fog application to the weld areas and the crevices formed during assembly after the rails are assembled. Brush application keeps the foreign material from getting between welded joints during assembly yet gives good coverage to general areas with easy application. The material selected in addition to paint compatibility features and fog application features is also an excellent brush application material. Repaired areas, boxed in or closed in are more easily treated during assembly using fog and brush on techniques. Care must be taken to keep the corrosion materials away from the welding areas as welding contamination might take place. Brush-on applications are used before welding and fog in applications are used after welding assemblies together.

#### **Desired Characteristics of Corrosion Protection Material**

**1. Corrosion prevention material-** The material must displace water to prevent corrosion. This can be tested by spraying water on an open panel on the floor, then spraying the corrosion preventative material over the watered panel and observing if the material displaces the water.

**2. Creepage of material-** To insure thorough and complete protection coverage, the material should have a "creep" capability, approximately 1/4 inch per minute while drying. This assures protective penetration of pinch welds, cracks, etc.

3. Safe material- Material should be non-combustible when dried and when wet unable to support a fire after ignition.

**4. Clean-up-** The material should be of a viscosity which inhibits runs or drips. Overspray on a vehicle's painted surface should wipe off easily without solvent when wet, with solvent when dry. The material should also dry clean off clothing.

**5. Guarantee/Warranty-** The corrosion protection has to be done to maintain factory corrosion warranty. Manufacturer's recommendations must be followed.

Glossary:

Abrasion Corrosion - Rubbing or hitting of one material by another
Corrosion Protection - Material applied to deter corrosion (oxidation)
Crevice Corrosion - Oxidation when two metals are joined
Electrolytic Corrosion - Electrical action taking place between two materials in the presence of an electrolyte (liquid)
Fogging - Applying material in a mist form
Fretting - Deterioration of metal at contact surfaces due to motion and corrosive elements
Galvanic Corrosion - Electrical action (electrolysis) between two dissimilar metals in the presence of electrolyte (liquid)
Hot Spot - An unprotected area subject to corrosion
Pitting Corrosion - Corrosion on a surface the results in a small "specks" or "pinholes"
Stress of Fatigue, Cracking Corrosion - Cracking due to stress and atmospheric elements

#### DURANGO VEHICLE IDENTIFICATION NUMBER DESCRIPTION

The Vehicle Identification Number (VIN) can be viewed through the windshield at the upper left corner of the in-strument panel, near the left windshield pillar. The VIN consists of 17 characters in a combination of letters and numbers that provide specific information about the vehicle. Refer to VIN Code Breakdown Chart for decoding information. To protect the consumer from theft and possible fraud the manufacturer is required to include a Check Digit at the ninth position of the vehicle identification number. The check digit is used by the manufacturer and government agencies to verify the authenticity of the vehicle and official documentation. The formula to use the check digit is not released to the general public.

#### **VEHICLE IDENTIFICATION NUMBER (VIN)**



	VIN CODE BRE	AKDOWN CHART
POSITION	INTERPRETATION	CODE = DESCRIPTION
1	Country of Origin	1 = Manufactured by DaimlerChrysler Corporation
		2 = Manufactured by DaimlerChrysler Canada Inc.
2	Make	D = Dodge
3	Vehicle Type	4 = Multipurpose Passenger Vehicle Less Side Airbags
		8 = Multipurpose Passenger Vehicle With Side Airbags
4	Gross Vehicle Weight Rating	H = 6001 - 7000  lbs.
5	Car Line	D = Durango 4x2
		B = Durango 4x4
6	Series	3 = Durango ST
		4 = Durango SLT
		5 = Durango Limited
7	Body Style	8 = Sport Utility 4 Door
8	Engine	K = 3.7L 6 cyl. MPI Gasoline
		N = 4.7L 8 cyl. MPI Gasoline
		D = 5.7L 8 cyl. SMPI Gasoline
9	Check Digit	See explanation in this section.
10	Model Year	4 = 2004
11	Assembly Plant	F = Newark Assembly
12 through 17	Sequence Number	A six digit number assigned by assembly plant.

# WELDED PANEL REPLACEMENT Dodge Durango



The basic parts of the body structure are the welded panels. This section contains a brief description of the placement of some of the panels and their weld locations.

Note: To ensure the strongest, most durable and cleanest welds possible, perform testing before and during all weld procedures. Always follow American Weld Society specifications and procedures.

Note: Diagrams do not show all of the parts.

Explanation of Manual Contents
Engine Box
Underbody
Hood
Front Door Assembly
RR Door Assembly
Lift Gate Assembly
Misc. Welds
Front Assembly
Front Floor Assembly

Ladder Assembly
Dash To Floor Assembly
RR Floor Assembly
Underbody Complete
B/S/A Inner Complete
B/S/A Outer Complete
B/S/A Complete
Body Complete W/ Sun Roof
Body Complete W/Out Roof

#### **Explanation of Welding/Sealer Information**

The major construction of a unibody vehicle consists of welded panels that create the supporting structure for all componets and assemblies of the vehicle. Here are some examples for replacement of these parts.

Certain body components must use sealers to ensure proper assembly. Be sure to check the **Body Sealing Locations** and **Structural Adhesive Sections** for location and sealer type.





PARTS IDENTIFICATION LEGEND, OVERVIEW 2

AA TUBE - RADIATOR & FRT FENDER RT -

AA TUBE - RADIATOR & FRT FENDER LT -

AB BRACKET ASSY - RADIATOR CLOSURE FRAME MOUNTING RT -

AB BRACKET ASSY - RADIATOR CLOSURE FRAME MOUNTING LT -

AC TUBE - FRT FENDER SUPPORT RT -

AC TUBE - FRT FENDER SUPPORT LT -

AD TUBE - VERTICAL RADIATOR CLOSURE RT -

AD TUBE - VERTICAL RADIATOR CLOSURE RT -




























































- AA PANEL LIFTGATE INR -
- AB PANEL LIFTGATE OTR -
- AC REINF LATCH MOUNT LIFT GATE -
- AD TAPPING PLATE LIFTGATE HINGE MOUNTING -
- AE TAPPING PLATE LIFTGATE INR PANEL & TROUGH PROP -



EW










































PARTS IDENTIFICATION LEGEND, OVERVIEW 13

AA PAN - FLOOR FRT -

- AB CROSSMEMBER FRT SEAT MOUNTING -
- AC REINF STEERING COLUMN -
- AD BRACKET DASH -
- AE STUD.WELD/EXTERNAL HEADER.PT.SPECIAL SILENCER TO FLOOR











PARTS IDENTIFICATION LEGEND, OVERVIEW 14

AA SILL - INR RT -AA SILL - INR LT -AB SUPPORT - UNDERBODY HOLD-DOWN FRT RT -AB SUPPORT - UNDERBODY HOLD-DOWN FRT LT -AC CROSSMEMBER - C-PILLAR RT -AC CROSSMEMBER - C-PILLAR LT -AD CROSSMEMBER - SEAT MTG 2ND ROW FRT I/B RT -AE CROSSMEMBER - B-PILLAR RT -AF CROSSMEMBER - B-PILLAR LT -AG CROSSMEMBER - SEAT MTG 2ND ROW FRT I/B LT -AH CROSSMEMBER - C-PILLAR LT -


























































































































































































































## Sealer/Sound Deadner/ Structural Adhesive Locations Dodge Durango



This section shows the different locations for Sealers, Sound Deadners and Strutural Adhesives and has been prepared for use by all body technicians involved in the repair of the Dodge Durango.

Sealer Locations
Sound Deadner Locations
Structural Adhesive Locations

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## DURANGO BODY SOUND DEADNER LOCATIONS

































## DURANGO FRAME/BODY DIMENSIONS

### GAP AND FLUSH DIMENSIONS



DIMENSION	LOCATION	GAP	FLUSH
1	HEADLAMP TO FENDER	3.0±2.5	HEADLAMP OVERFLUSH $0.9 \pm 2.25$
2	GRILLE TO HOOD	$8.0 \pm 2.75$ PARALLEL WITHIN 4.0	-
3	HOOD TO FENDER	$4.5 \pm 1.25$ PARALLEL WITHIN 2.0	$0.0 \pm 1.25$ (REAR) OVERFLUSH 2.0 $\pm 1.25$ (FRONT/MIDDLE)
4	FRONT DOOR TO ROOF	-	OVERFLUSH 0.25 ± 1.25
5	REAR DOOR TO ROOF	-	$0.0 \pm 1.25$
6	FUEL FILLER DOOR TO QUARTER PANEL	$3.2 \pm 1.25$	0.0±1.25
7	FRONT DOOR TO REAR DOOR	$4.5 \pm 1.25$ PARALLEL WITHIN 1.0	0.0±2.5
8	FRONT DOOR TO FENDER	$4.5 \pm 1.25$ PARALLEL WITHIN 1.0	0.0±1.25
9	FRONT FASCIA TO FENDER	$12.8 \pm 3.0$ PARALLEL WITHIN 2.5	0.0±2.5
10	HEADLAMP TO FASCIA	$13.0 \pm 3.0$ PARALLEL WITHIN 2.5	-
11	HEADLAMP TO GRILLE	$6.3 \pm 3.0$	-
12	GRILLE TO FENDER	$6.4 \pm 3.0$	-
13	FRONT FASCIA TO GRILLE	$13.0 \pm 3.0$ PARALLEL WITHIN 2.5	-
14	TAILLAMP TO LIFTGATE	$4.5 \pm 2.0$	OVERFLUSH 1.4 ± 2.5
15	LIFTGATE TO ROOF	$8.0 \pm 1.5$ PARALLEL WITHIN 1.0	$0.0 \pm 1.5$
16	LIFIGATE TO APERTURE	$4.5 \pm 1.25$ PARALLEL WITHIN 1.0	0.0±1.25
17	TAILLAMP TO APERTURE- TOP	$2.0 \pm 1.5$	0.0±1.5
18	REAR DOOR TO QUARTER PANEL	$4.5 \pm 1.25$ PARALLEL WITHIN 1.0	0.0±1.25
19	TAILLAMP TO APERTURE- MIDDLE	$1.5 \pm 1.5$	0.0±1.5
20	REAR FASCIA TO APERTURE	$13.5 \pm 3.0$ PARALLEL WITHIN 2.5	-
21	REAR FASCIA TOTAILLAMP	$13.5 \pm 3.0$ PARALLEL WITHIN 2.5	-
22	REAR FASCIA TO LIFTGATE	$13.5 \pm 3.0$ PARALLEL WITHIN 2.5	-















# DURANGO FRONT FRAME TIP REPAIR

### INSTRUCTION SHEET K6855432 FRONT FRAME RAIL TIP REPLACEMENT

Each repair package contains the following components:

<b>Quantity</b>	Descriptio
1	HB Collis

Description HB Collision Repair Tip Assembly

### SAFETY PRECAUTIONS AND WARNINGS

WARNING: BEFORE PERFORMING ANY WELDING OPERATINS, DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE AND DISCONNECT ALL WIRE HARNESS CONNECTORS FROM THE AIRBAG CONTROL MODULE (ACM). FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND OTHER POSSIBLE DAMAGE TO THE SUPPLEMENTAL RESTRAINT SYSTEM CIRCUITS AND COMPONENTS.

- USE EYE PROTECTION WHEN GRINDING OR WELDING METAL, SERIOUS EYE INJURY CAN RESULT.
- BEFORE PROCEEDING WITH FRAME REPAIR INVOLVING GRINDING OR WELDING, VERIFY THAT THE VEHICLE FUEL SYSTEM IS NOT LEAKING OR IN CONTACT WITH REPAIR AREA, PERSONAL INJURY CAN RESULT.
- DO NOT ALLOW OPEN FLAME OR HEAT AND METAL SPATTER FROM ARC WELDING, TO CONTACT PLASTIC BODY PANELS. FIRE OR EXPLOSION CAN RESULT.
- WHEN WELDED FRAME COMPONENTS ARE REPLACED, ENSURE COMPLETE PENETRATION WELD IS ACHIEVED DURING INSTALLATION. IF NOT, DANGEROUS OPERATING CONDITIONS CAN RESULT.
- STAND CLEAR OF CABLES OR CHAINS ON PULLING EQUIPMENT DURING FRAME STRAIGHTENING OPERATIONS, PERSONAL INJURY CAN RESULT.
- NO HEAT MAY BE USED IF FRAME STARIGHTENING IS REQUIRED. THE USE OF HEAT IS ACCEPTABLE IN THOSE SITUATIONS WHERE THE PART BEING HEATED WILL BE REPLACED. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

<u>CAUTION</u>: This procedure is designed to replace the front frame rail tips that have been damaged in the crush initiator zones. Prior to any cutting, the vehicle must be mounted on the appropriate frame repair equipment ("frame rack"), checked with three dimensional measuring equipment, and the necessary pull corrections made without the use of heat

- If the damage remains in the frame beyond the area covered by this service part after the pull, the frame must be replaced in its entirety.
- If damage to the front body structure is evident, repair the Front End Sheet Metal (FESM) fender rails as necessary Inspect all body mount bolts for damage and repair if necessary. Do not reuse damaged fasteners; quality of repair would be suspect. Failure to use only production fasteners or fasteners of equivalent hardness can result in loosening or failure. Do not drill any holes in the frame that are not specifically outlined in this, or other, DaimlerChrysler procedure as frame rail failure can result.

## <u>CAUTION</u>: Inspect the tire winch assembly for damage. If any one or more of the following are evident, replace the winch assembly.

- Indications of cracked or bulging plastic.
- Housing flanges are bent or cracked.
- If winch was loose before repair.
- If the rivet heads are separated from the housing in any way.
- 1. Before proceeding with this repair procedure review the required service warnings and precautions.
- 2. Disconnect and isolate the battery negative cable.
- 3. Remove the front wheelhouse splash shield.
- 4. Remove the front bumper if required.
- 5. Remove the washer bottle, if required.
- 6. Remove the front cab mount bolt (1) to the Front End Sheet Metal (FESM) bracket and the lower bumper support nuts (3) attaching the tow hook (2), if equipped.



7. Using a reciprocating saw (2) or equivalent, carefully cut and remove the damaged frame rail tip behind the stop bracket (1).

<u>CAUTION</u>: Do not use any flame or plasma cutting equipment to cut the frame in step 7. This is due to the inaccurate nature of the cut-line and the fact that the high temperatures achieved during the flame or plasma cutting will change the metal characteristics and may weaken the frame and/or repair location.


- 8. Remove the brake lines as necessary, to gain access to the upper fillet welds.
- 9. For the right side rail tip, remove the oil filter to gain access to the inner fillet weld.
- 10. Remove the four puddle welds attaching the remaining frame tip section (2) to the frame (1) at the locations indicated. (Right side shown, left side similar.)

11. Using a plasma cutter, remove the welds (4) by cutting along the outside edge of the weld (1) approximately 1/8 in. (2).

- 12. With the puddle welds (1) removed, remove the remaining piece of the frame tip (2) from within the frame rail and discard.
- 13. Smooth and square the cut edges of the original frame.
- 14. Remove any burrs at the holes (1) and frame edges.







15. Dry fit the new rail (2) to verify alignment, fit and make any adjustments as necessary.

16. Remove all internal and external OEM e-coat within 51 MM (2.0 in.) of the weld joint on the replacement tip and the existing frame rail.

NOTE: Any burned surface coatings will need to be removed prior to application of corrosion preventative coatings.

<u>CAUTION</u>: Shield the surrounding area and components from exposure to the welding spatter and heat.



17. Loosely install the lower FESM insulator and cab mounting bolt.

18. Position the stop bracket (2) against the frame rail (1).

NOTE: If replacing the driver's side tip, the stop bracket mounting tab will not be utilized. The stop bracket may be rotated about the narrow end of the tip and repositioned so interference of tab with other parts is avoided. The mounting tab my also be cut off.

If replacing the passenger's side tip, the stop bracket mounting tab may be utilized if the vehicle is equipped with optional rear AC system.

<u>CAUTION</u>: Shield the surrounding area and components from exposure to the welding spatter and heat.



19. Using the appropriate measuring equipment, verify the front end sheet metal bracket's location in all three (X,Y, and Z) planes of space, and adjust if required (?Chart supplied at end of instruction sheet).



20. When correctly fitted, tack the three upper ring fillet welds (1) to hold the tip (3) in position, and then complete the ring fillet welds (1).

NOTE: Ring-fillet welds may be filled in with weld material if an improved cosmetic appearance is desired. (\*Welding process standard "ps 9472" chart included at end)

21. Confirm alignment of the replacement frame rail tip.

22. Final welding should be performed in a skip (stitch) type method to minimize the heat buildup and frame distortion, utilizing the Weld Process Specifications at the end of this section. The preferred method is

GMAW (MIG).

- (a) Apply root pass welds to the root joint (5) behind the stop bracket (2), one quadrant at a time, switching to the opposite side of the frame for each quadrant.
- (b) Apply root pass welds to the root joint in front (4) of the stop bracket (2), one quadrant at a time, switching to the opposite side of the frame for each quadrant.
- (c) Clean the welds of any flux and other impurities before proceeding with the cover pass welds.
- (d) Apply the cover pass welds in the same manner as described above.

23. Confirm alignment of the replacement frame rail tip.

## **NOTE:** Any burned surface coatings will need to be removed prior to application of corrosion preventative coatings.

24. Dress the welded area and apply corrosion resistant coatings inside and out.

- (a) Apply etch-primer to the inside of the frame rail repair area.
- (b) Inside the rail, inject a creeping wax based rust inhibitor compound through the existing holes in the frame ensuring 100% coverage including the space between the original frame rail and the reinforcing sleeve.
- (c) Apply a durable top coat to the outside of the repair area.

25. Install the tow hook assembly (2), if equipped, and install the two lower bumper support nuts (3).

26. Tighten the nuts (3) to  $108 \text{ N} \cdot \text{m}$  (80 ft. lbs.).

27. Install the front body mount bolt (1) and tighten to 81 N·m (60 ft. lbs.).



 28. Install the front bumper.

29. Install the front wheelhouse splash shield.

*			
WELDING PROCESS	FLUX CORED ARC	GAS METAL ARC (MIG)*	SHIELDED METAL ARC (STICK)
Material Thickness	3.7 mm to 4.2 mm	3.7 mm to 4.2 mm	3.7 mm to 4.2 mm
Electrode Type	Lincoln Electrical Co.	AWS ER70S-3	**AWS E 7018
	Product #: NR-211 MP	(Do Not Substitute)	
	(Do Not Substitute)		
<b>Electrode Size Inches</b>	0.045 Tubular	0.035 Solid	3/32"
Electrode Stick Out	3/8" – 1/2"	<sup>1</sup> /2" - 5/8"	N/A
Polarity	Electrode "-"	Electrode "+"	Electrode "+"
-	Work Piece "+"	Work Piece "-"	Work Piece "-"
Shielding Gas	Self Shielded	75% Ar	Self Shielded
		25% CO <sub>2</sub>	
Gas Flow Rate	N/A	25-35 CFM	N/A
Wire Feed Speed	110-130 Vertical Down	245-250 Vertical Down	N/A
(inches per minute)	70-90 Flat & Overhead	210-225 Flat & Overhead	
Approximate Amperage			
Vertical	110-130	175	85 (3/32" Diameter)
Flat & Overhead	70-90	155	90 (3/32" Diameter)
Voltage	15-18	19-20	N/A
Direction of Welding			
Vertical	Vertical Down Hill (only)	Vertical Down Hill (only)	Vertical Up Hill (only)
Flat & Overhead	Flat – Push or Drag	Flat – Push or Drag	Flat – Drag

CAUTION: All welds should conform to DaimlerChrysler vehicle engineering process standard "PS 9472".

\* **First choice – Gas Metal Arc Welding Process:** Butt joints – apply two layers (passes) of weld metal. First pass should only fill approximately ½ the thickness. Vertical position welds – maintain electrode wire at leading edge of weld puddle while traveling down hill to produce maximum penetration into the sleeve. These techniques work for FCAW as well.

**\*\* E7018** new electrodes may be exposed to the atmosphere for up to ten hours with no harmful effect. Reconditioning schedules should come from the manufacturer.







NOTE: ALL DIMENSIONS ARE IN MILLIMETERS

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