

FRAME & BUMPERS

TABLE OF CONTENTS

	page		page
BUMPERS		INSTALLATION	5
DESCRIPTION	1	REAR BUMPER	
SPECIFICATIONS - TORQUE	1	REMOVAL	6
FRONT AIR DAM		INSTALLATION	6
REMOVAL	2	FRAME	
INSTALLATION	2	DESCRIPTION	
FRONT FASCIA		DESCRIPTION	6
REMOVAL	2	FRAME SERVICE	7
INSTALLATION	2	SPECIFICATIONS	
ADJUSTMENTS		FRAME DIMENSION	8
ADJUSTMENT	2	CAB CHASSIS ADAPTER BRACKET	
FRONT LOWER FASCIA		REMOVAL	10
REMOVAL	3	INSTALLATION	10
INSTALLATION	3	FRONT TOW HOOK	
FRONT FASCIA - SPORT		REMOVAL	10
REMOVAL	3	INSTALLATION	10
INSTALLATION	3	TRAILER HITCH	
FRONT BUMPER		REMOVAL	11
REMOVAL	4	INSTALLATION	11
INSTALLATION	4	TRANSFER CASE SKID PLATE	
FRONT BUMPER - SPORT		REMOVAL	11
REMOVAL	5	INSTALLATION	11

BUMPERS

DESCRIPTION

Bumpers are used at the front and rear of the vehicle. Bumpers may be chrome or painted.

Bumpers are designed to protect the exterior sheet-metal in low impact situations. The bumpers are attached to the frame and provide mounting points for some optional accessories such as fog lights and tow hooks.

SPECIFICATIONS - TORQUE

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Cab chassis adapter nut	108	80	—
Front bumper bracket to frame nut	68	50	—
Front bumper outer brace bolt	68	50	—
Rear bumper to brace nut	40	30	—
Rear bumper brace to bracket nut	101	75	—
Rear bumper bracket to frame nut	101	75	—
Skid plate crossmember to frame bolt	54	40	—
Skid plate to crossmember bolt	40	30	—
Skid plate to transmission crossmember bolt	54	40	—
Spare tire winch bolt	27	20	—
Trailer hitch nut	108	80	—

FRONT AIR DAM

REMOVAL

- (1) Remove Pin-type fasteners attaching air dam to bottom of front bumper (Fig. 1).
- (2) Remove screws attaching air dam to bottom of front bumper.
- (3) Separate air dam from bumper.

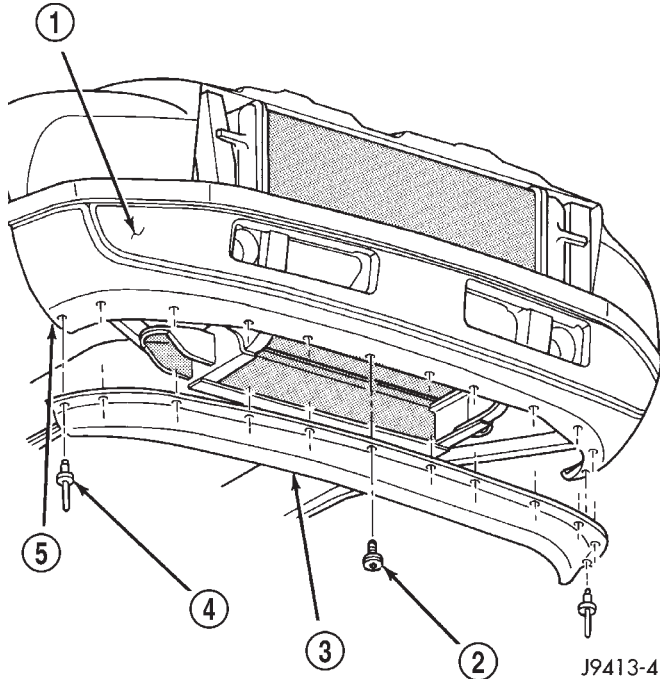


Fig. 1 Front Bumper Air Dam

- 1 - BUMPER
- 2 - SCREW
- 3 - LOWER AIR DAM
- 4 - PIN TYPE FASTENER
- 5 - LOWER FASCIA

INSTALLATION

- (1) Position air dam on bumper.
- (2) Install screws attaching air dam to bottom of front bumper.
- (3) Install Pin-type fasteners attaching air dam to bottom of front bumper.

FRONT FASCIA

REMOVAL

- (1) Open hood.
- (2) Remove fasteners at fender side openings.
- (3) Separate fascia from bumper.

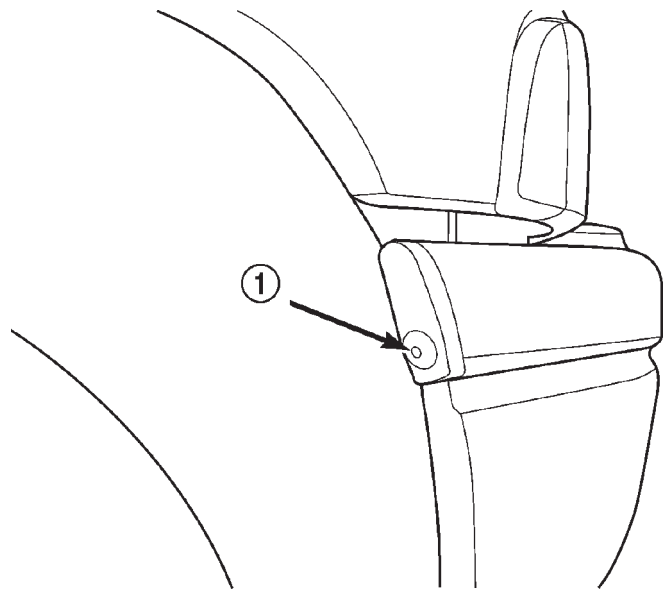
INSTALLATION

- (1) Position fascia on bumper.
- (2) Install front fascia. See fascia adjustment procedure in this section.
- (3) Install fasteners at fender side openings.

ADJUSTMENTS

ADJUSTMENT

- (1) Remove the plastic rivet that secures the front upper fascia to the front lower fascia (Fig. 2).
- (2) Position the upper front fascia so that there is approximately a 19 mm (3/4 in.) gap between the lower portion of the front fender and the upper portion of the front upper fascia (Fig. 3). The gap should ideally be 19 mm (3/4 in.), but it is more important to avoid a V-Gap between the lower portion of the front fender and the upper portion of the front upper fascia than maintaining the gap. There are ribs in the front upper fascia and lower fascia that will hold the front upper fascia in position (Fig. 4).
- (3) Attach the front upper fascia to the front lower fascia using a new plastic rivet.

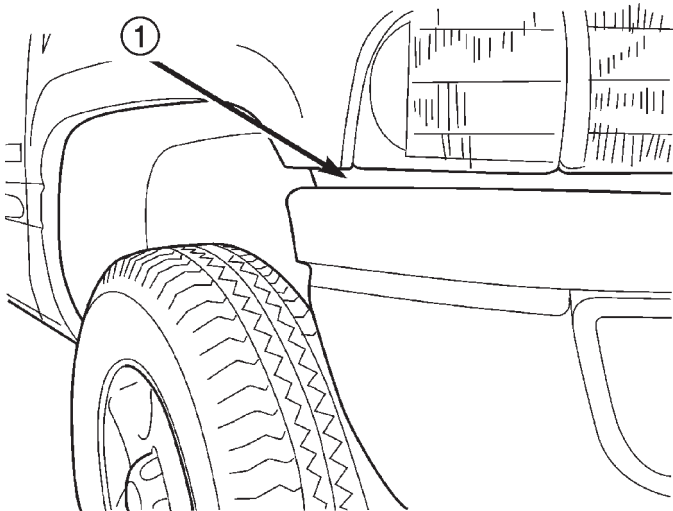


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Fig. 2 Fascia Rivet

1 - RIVET MUST BE REPLACED AFTER EACH ADJUSTMENT

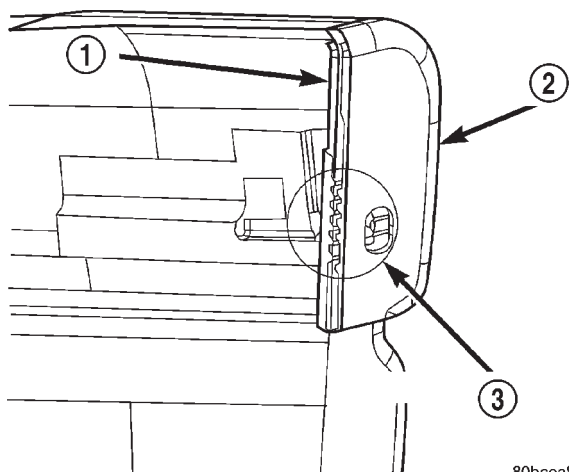
FRONT FASCIA (Continued)



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Fig. 3 Fascia Gap

1 - GAP — 19 mm PARALLELISM MOST IMPORTANT



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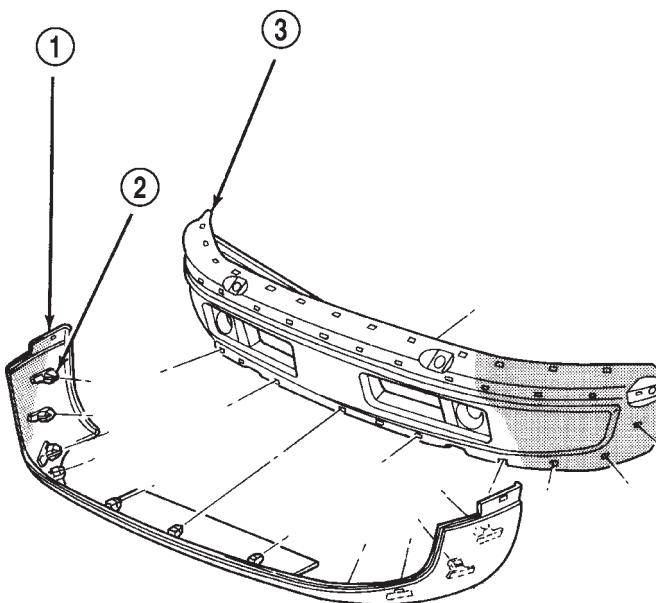
Fig. 4 Fascia Adjustment Ribs

1 - FRONT UPPER FASCIA
 2 - ADJUSTMENT RIBS
 3 - FRONT LOWER FASCIA

FRONT LOWER FASCIA

REMOVAL

- (1) Open hood.
- (2) Remove fasteners at side fender openings.
- (3) Remove lower air dam.(Refer to 13 - FRAMES & BUMPERS/BUMPERS/FRONT AIR DAM - REMOVAL)
- (4) Disengage clips attaching end of upper fascia to bumper face bar (Fig. 5).
- (5) Disengage clips attaching lower fascia to bumper face bar.
- (6) Separate lower fascia from bumper.



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Fig. 5 Front Bumper Lower Fascia

1 - LOWER FASCIA
 2 - RETAINING CLIP
 3 - BUMPER

INSTALLATION

- (1) Position lower fascia on bumper.
- (2) Engage clips attaching lower fascia to bumper face bar.
- (3) Install lower air dam.(Refer to 13 - FRAMES & BUMPERS/BUMPERS/FRONT AIR DAM - INSTALLATION)
- (4) Install fasteners at side fender openings.

FRONT FASCIA - SPORT

REMOVAL

The fascia can be removed from the vehicle without removing the bumper.

- (1) Disconnect wire connectors from fog lamps.
- (2) Remove screws attaching rearward edges of fascia to outer bumper brackets (Fig. 7) .
- (3) Remove screws attaching bottom of air deflector.
- (4) Lift top of fascia upward to disengage from retaining clips on front bumper.
- (5) Pull fascia from front bumper and separate from vehicle.

INSTALLATION

- (1) Position fascia on front bumper.
- (2) Engage fascia with retaining clips on front bumper.

FRONT FASCIA - SPORT (Continued)

- (3) Install screws attaching bottom of fascia to air deflector.
- (4) Align fascia and wheelhouse liners with outer bumper brackets and install screws.
- (5) Connect harness connectors to fog lamps.

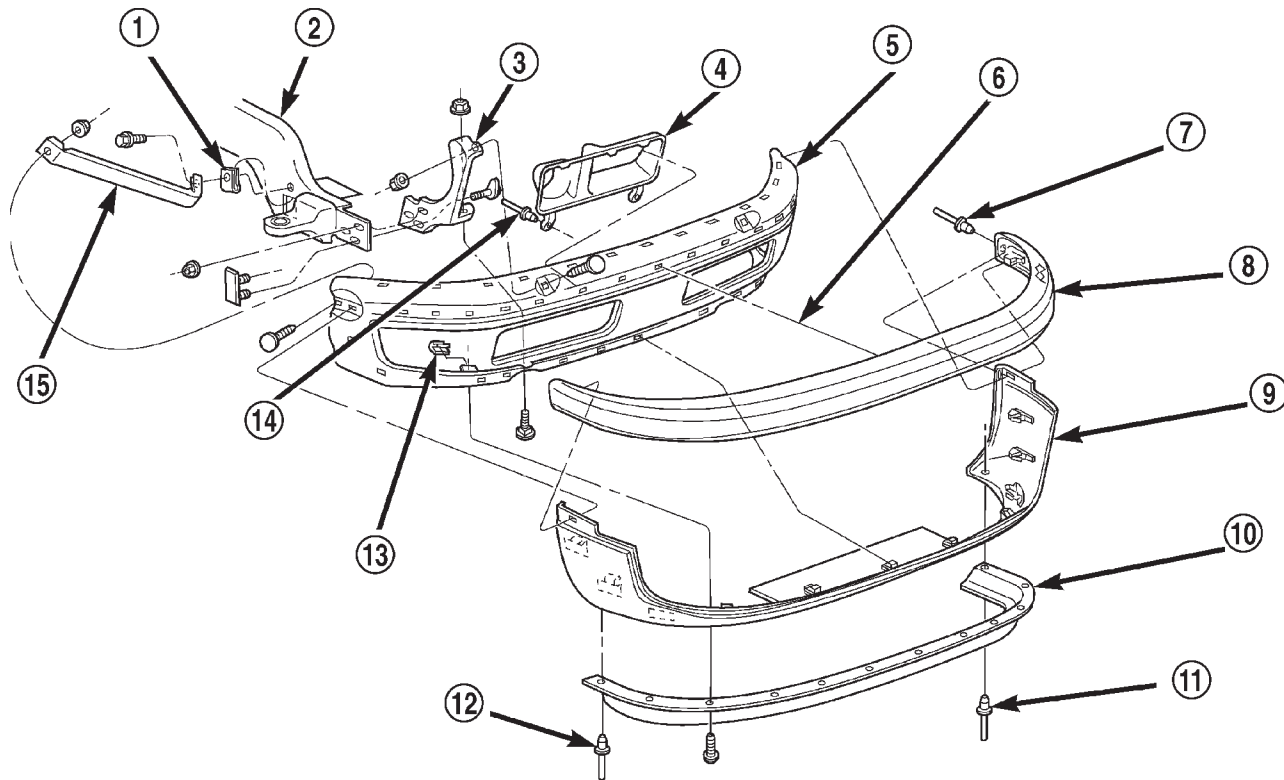
FRONT BUMPER

REMOVAL

- (1) Support front bumper on a suitable lifting device.
- (2) Remove bolts attaching front bumper outer bracket to frame rail (Fig. 6).
- (3) Remove nuts and stud plates attaching front bumper to end of frame rail.
- (4) Disengage wire connectors from fog lamps, if equipped.
- (5) Separate front bumper from vehicle.

INSTALLATION

- (1) Support front bumper on a suitable lifting device.
- (2) Position front bumper on vehicle.
- (3) Engage fog lamp wire connectors, if equipped.
- (4) Install nuts and stud plates attaching front bumper to end of frame rail. Tighten nuts to 94 N·m (70 ft. lbs.) torque.
- (5) Install bolts attaching front bumper outer bracket to frame rail. Tighten bolts to 94 N·m (70 ft. lbs.) torque.



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Fig. 6 Front Bumper

- | | |
|---------------------------|---------------------------|
| 1 - U-NUT | 9 - LOWER FASCIA |
| 2 - FRAME | 10 - AIR DAM |
| 3 - INNER BUMPER BRACKET | 11 - BLIND PLASTIC RIVET |
| 4 - FOG LAMP SIGHT SHIELD | 12 - BLIND PLASTIC RIVET |
| 5 - BUMPER | 13 - U-NUT |
| 6 - 4-WAY CENTER LOCATOR | 14 - BLIND RIVET |
| 7 - BLIND PLASTIC RIVET | 15 - OUTER BUMPER BRACKET |
| 8 - UPPER FASCIA | |

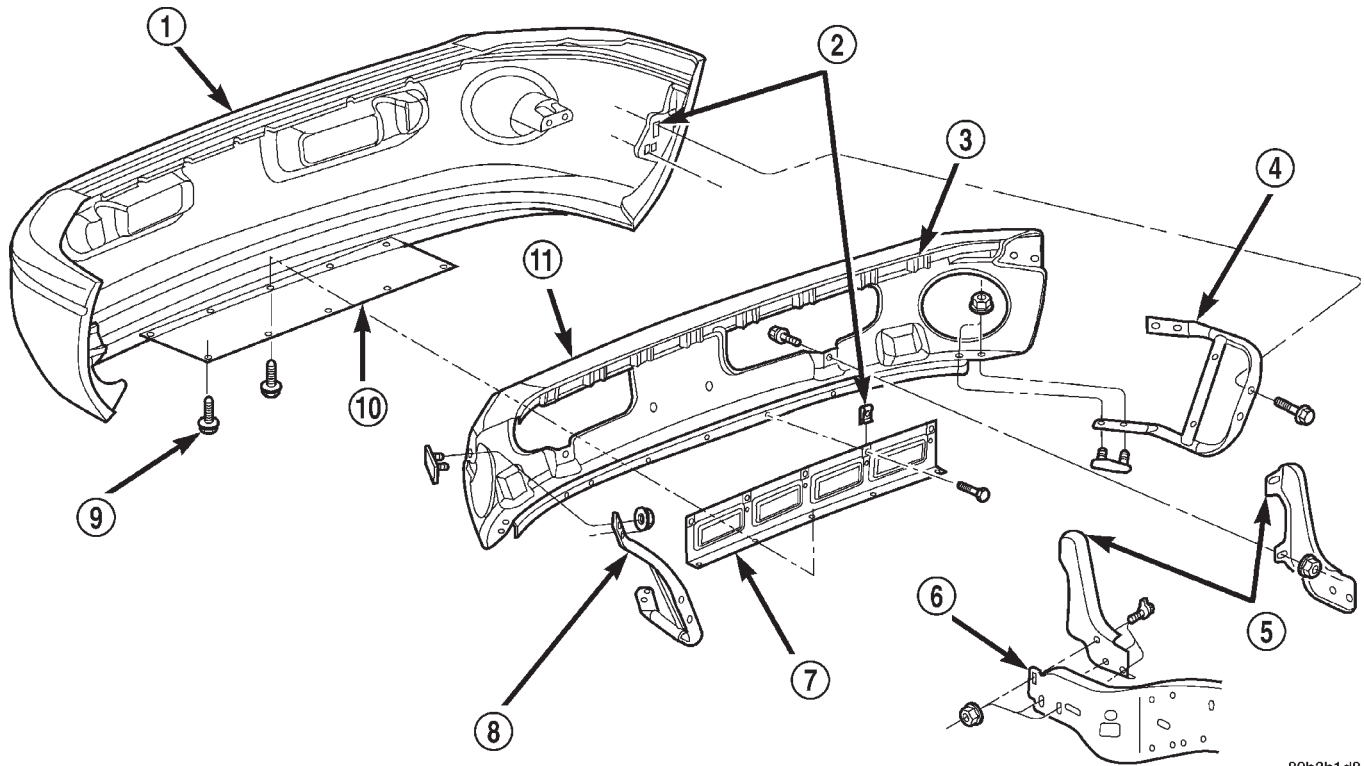
FRONT BUMPER - SPORT

REMOVAL

- (1) Disconnect wire connectors from fog lamps.
- (2) Remove screws attaching fascia and outer bumper brackets to wheelhouse liners.
- (3) Remove screws and push-in fasteners attaching bottom of fascia to air deflector.
- (4) Support bumper on a suitable lifting device.
- (5) Remove nuts attaching bumper to inner bumper brackets (Fig. 7).
- (6) Separate bumper from vehicle.

INSTALLATION

- (1) Support bumper on a suitable lifting device.
- (2) Position bumper on vehicle.
- (3) Install nuts attaching bumper to inner bumper brackets. Tighten nuts to 94 N·m (70 ft. lbs.) torque.
- (4) Install screws and push-in fasteners attaching bottom of fascia to air deflector.
- (5) Align fascia and wheelhouse liners with outer bumper brackets and install screws. See fascia adjustment in this section.
- (6) Connect wire connectors to fog lamps.



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Fig. 7 Front Bumper & Fascia — Sport

- | | |
|--------------------|----------------------|
| 1 - FASCIA | 7 - FASCIA SUPPORT |
| 2 - U-NUT | 8 - OUTER BRACKET |
| 3 - RETAINING CLIP | 9 - PUSH-IN FASTENER |
| 4 - OUTER BRACKET | 10 - AIR DEFLECTOR |
| 5 - INNER BRACKET | 11 - BUMPER |
| 6 - FRAME | |

REAR BUMPER

REMOVAL

- (1) Support rear bumper on a suitable lifting device.
- (2) Remove nuts attaching rear bumper to inner and outer brackets (Fig. 8).
- (3) Disengage license plate lamp wire connector from body wire harness, if equipped.
- (4) Separate rear bumper from vehicle.

INSTALLATION

- (1) Support rear bumper on a suitable lifting device.
- (2) Position rear bumper on vehicle.
- (3) Engage license plate lamp wire connector to body wire harness, if equipped.
- (4) Install nuts attaching rear bumper to inner and outer brackets. Tighten nuts to 94 N·m (70 ft. lbs.) torque.

FRAME

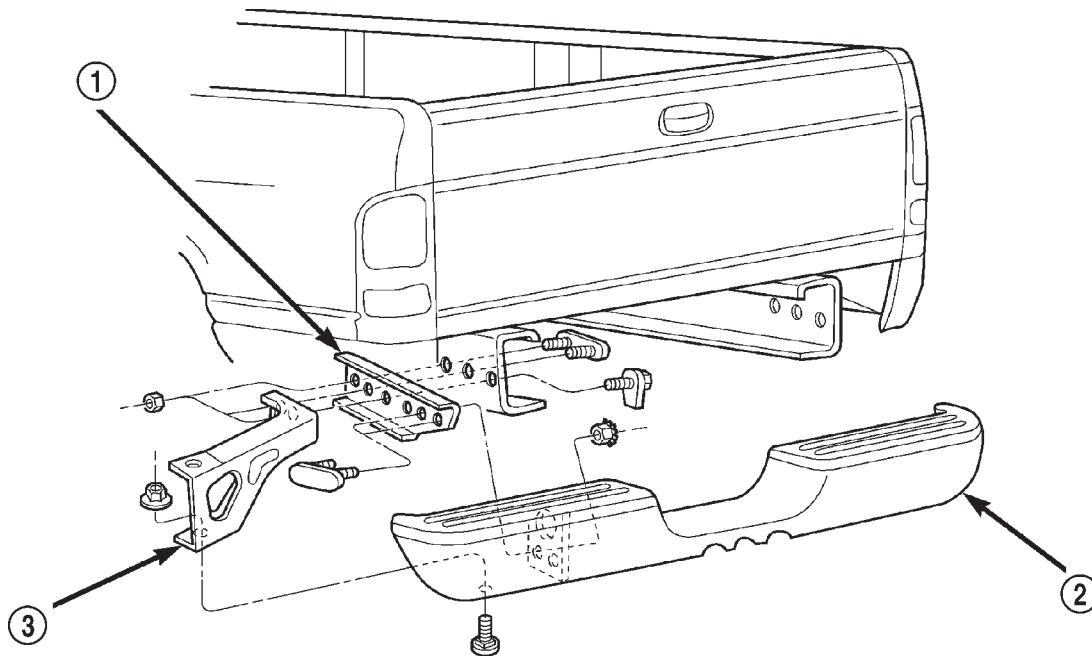
DESCRIPTION

DESCRIPTION

The BR/BE frame is the structural center of the vehicle. In addition to supporting the body and payload, the frame provides a station for the engine and drivetrain. BR/BE trucks have a ladder type frame with Box-section front rails, dropped center section, and open-channel side rails in the rear.

Cross members attach to the side rails with rivets, welds, or bolts. The cab is isolated from the frame with rubber load cushions with through bolts. The cargo box or bed is attached to the frame with bolts.

The frame is designed to absorb and dissipate flexing and twisting due to acceleration, braking, cornering, and road surface variances without bending when subjected to normal driving conditions.



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Fig. 8 Rear Bumper

1 - INNER BRACKET
2 - BUMPER

3 - OUTER BRACKET

FRAME (Continued)

FRAME SERVICE

SAFETY PRECAUTIONS AND WARNINGS

WARNING: USE EYE PROTECTION WHEN GRINDING OR WELDING METAL, SERIOUS EYE INJURY CAN RESULT. BEFORE PROCEEDING WITH FRAME REPAIR INVOLVING GRINDING OR WELDING, VERIFY THAT VEHICLE FUEL SYSTEM IS NOT LEAKING OR IN CONTACT WITH REPAIR AREA, PERSONAL INJURY CAN RESULT. DO NOT ALLOW OPEN FLAME TO CONTACT PLASTIC BODY PANELS. FIRE OR EXPLOSION CAN RESULT. WHEN WELDED FRAME COMPONENTS ARE REPLACED, 100% PENETRATION WELD MUST BE 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. DO NOT VENTURE UNDER A HOISTED VEHICLE THAT IS NOT SUPPORTED ON SAFETY STANDS, PERSONAL INJURY CAN RESULT.

CAUTION: Do not reuse damaged fasteners, quality of repair would be suspect. Do not drill holes in top or bottom frame rail flanges, frame rail failure can result. Do Not use softer than Grade 5 bolts to replace production fasteners, loosening or failure can result. When using heat to straighten frame components do not exceed 566°C (1050°F), metal fatigue can result. Welding the joints around riveted cross members and frame side rails can weaken frame.

FRAME STRAIGHTENING

When necessary, a conventional frame that is bent or twisted can be straightened by application of heat. The temperature must not exceed 566°C (1050°F). The metal will have a dull red glow at the desired temperature. Excessive heat will decrease the strength of the metal and result in a weakened frame.

Welding the joints around riveted cross members and frame side rails is not recommended.

A straightening repair process should be limited to frame members that are not severely damaged. The replacement bolts, nuts and rivets that are used to join the frame members should conform to the same specifications as the original bolts, nuts and rivets.

FRAME REPAIRS

DRILLING HOLES

Do not drill holes in frame side rail top and bottom flanges, metal fatigue can result causing frame failure. Holes drilled in the side of the frame rail must be at least 38 mm (1.5 in.) from the top and bottom flanges.

Additional drill holes should be located away from existing holes.

WELDING

Use MIG, TIG or arc welding equipment to repair welded frame components.

Frame components that have been damaged should be inspected for cracks before returning the vehicle to use. If cracks are found in accessible frame components perform the following procedures.

- (1) Drill a hole at each end of the crack with a 3 mm (0.125 in.) diameter drill bit.
- (2) Using a suitable die grinder with 3 inch cut off wheel, V-groove the crack to allow 100% weld penetration.
- (3) Weld the crack.
- (4) If necessary when a side rail is repaired, grind the weld smooth and install a reinforcement channel (Fig. 9) over the repaired area.

NOTE: If a reinforcement channel is required, the top and bottom flanges should be 0.250 inches narrower than the side rail flanges. Weld only in the areas indicated (Fig. 9).

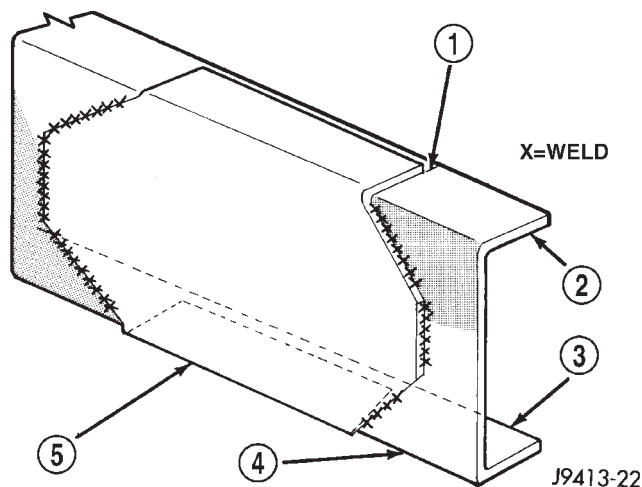


Fig. 9 Frame Reinforcement

- 1 - .250 IN FROM EDGE
- 2 - TOP FLANGE
- 3 - BOTTOM FLANGE
- 4 - FRAME RAIL
- 5 - FRAME REPAIR REINFORCEMENT

FRAME (Continued)

FRAME FASTENERS

Bolts, nuts and rivets can be used to repair frames or to install a reinforcement section on the frame. Bolts can be used in place of rivets. When replacing rivets with bolts, install the next larger size diameter bolt to assure proper fit. If necessary, ream the hole out just enough to sufficiently receive the bolt.

Conical-type washers are preferred over the split-ring type lock washers. Normally, grade-5 bolts are adequate for frame repair. **Grade-3 bolts or softer should not be used.** Tightening bolts/nuts with the

correct torque, refer to the Introduction Group at the front of this manual for tightening information.

SPECIFICATIONS**FRAME DIMENSION**

Frame dimensions are listed in Millimeters (mm) scale. All dimensions are from center to center of Principal Locating Point (PLP), or from center to center of PLP and fastener location (Fig. 10) .

*DIMENSIONS FOR DIFFERING WHEELBASES**

WHEELBASE	LENGTH A	LENGTH B	LENGTH C
118	2118.0	3663.6	4185.4
134	2118.0	3994.5	4693.4
138	2626.0	4096.1	4693.4
154	2626.0	4502.5	5201.4
162	2118.0	4705.0	5042.5

*Measurements are in Millimeters (mm).

FRAME (Continued)

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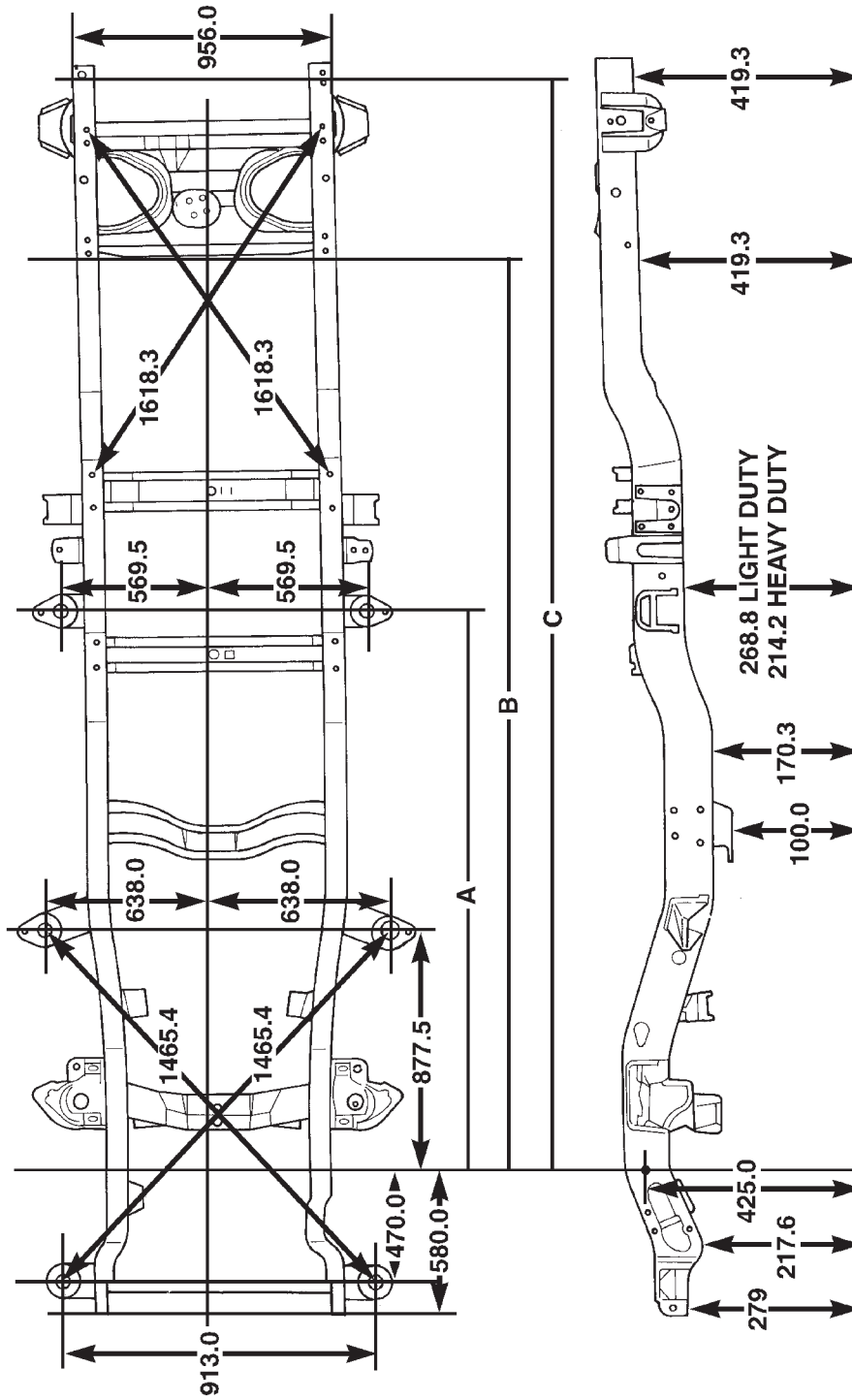


Fig. 10 Frame Dimensions

CAB CHASSIS ADAPTER BRACKET

REMOVAL

- (1) Remove bolts attaching cab chassis adapter brackets to frame rail (Fig. 11)
- (2) Separate cab chassis adapter brackets from frame rail

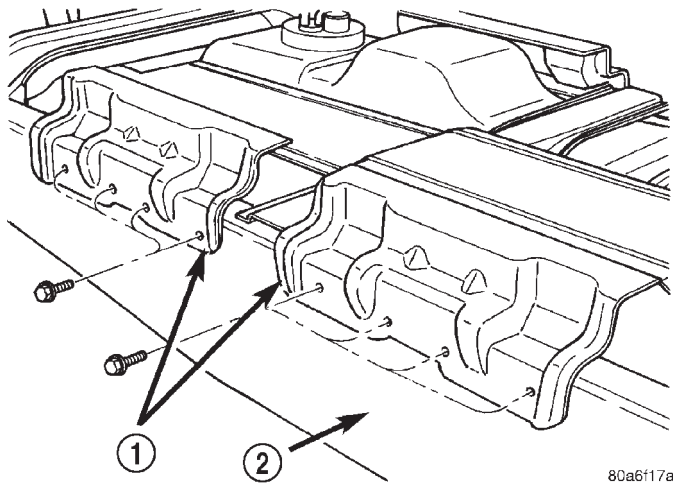


Fig. 11 Cab Chassis Adapter Brackets

- 1 - ADAPTER BRACKETS
2 - FRAME

INSTALLATION

- (1) Position cab chassis adapter brackets on frame rail
- (2) Install bolts attaching cab chassis adapter brackets to frame rail.

FRONT TOW HOOK

REMOVAL

Some vehicles are equipped with front tow hooks. The tow hooks are to be used for **EMERGENCY** purposes only.

- (1) Remove the fasteners that attach the tow hooks to the frame (Fig. 12).
- (2) Separate the tow hooks from the frame.

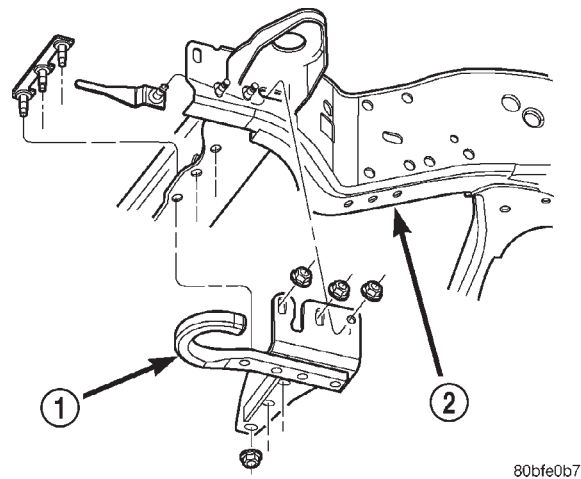


Fig. 12 Front Tow Hooks

- 1 - TOW HOOK
2 - FRAME

INSTALLATION

Some vehicles are equipped with front tow hooks. The tow hooks are to be used for **EMERGENCY** purposes only.

- (1) Position the tow hooks on the frame.
- (2) Install the fasteners that attach the tow hooks to the frame.
- (3) Tighten the nuts to 108 N·m (80 ft. lbs.) torque.

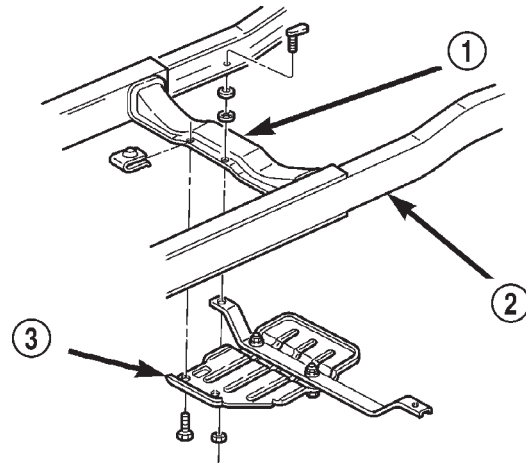
TRAILER HITCH

REMOVAL

- (1) Support trailer hitch on a suitable lifting device.
- (2) Remove fasteners attaching trailer wiring connector to trailer hitch, if equipped.
- (3) Remove bolts attaching trailer hitch to frame rails (Fig. 13) .
- (4) Separate trailer hitch from vehicle.

INSTALLATION

- (1) Position trailer hitch on vehicle.
- (2) Install nuts attaching trailer hitch to frame rails. Tighten nuts to 108 N·m (80 ft. lbs.) torque.
- (3) Install fasteners attaching trailer wiring connector to trailer hitch, if equipped.



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Fig. 14 Skid Plate

- 1 - TRANSMISSION CROSS MEMBER
 2 - FRAME RAIL
 3 - SKID PLATE

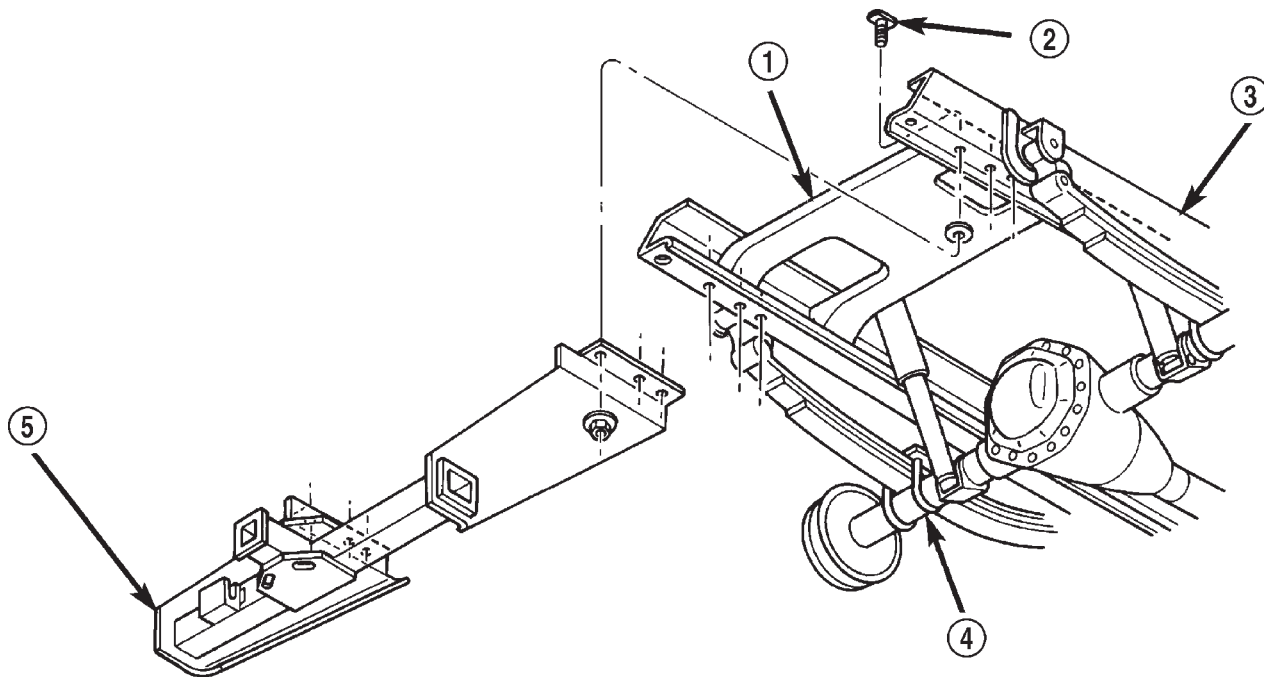
TRANSFER CASE SKID PLATE

REMOVAL

- (1) Hoist and support vehicle on safety stands.
- (2) Remove bolts holding skid plate to frame rails (Fig. 14) .
- (3) Separate skid plate from vehicle.

INSTALLATION

- (1) Position skid plate on vehicle.
- (2) Install bolts holding skid plate to frame rails.
- (3) Remove safety stands and lower vehicle.



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Fig. 13 Trailer Hitch

- 1 - SPARE TIRE WINCH SUPPORT
 2 - FLAG BOLT
 3 - FRAME RAIL

- 4 - REAR AXLE HOUSING
 5 - HITCH

