

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

Reverse the preceding operation.

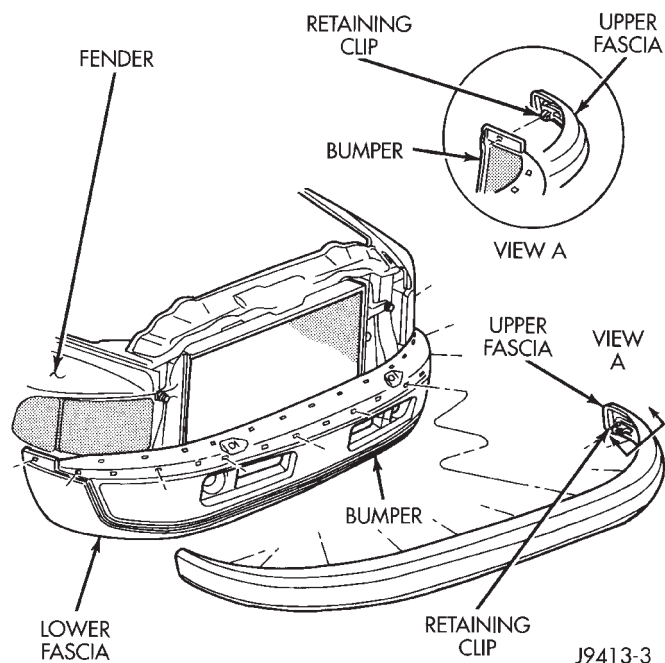


Fig. 2 Front Bumper Upper Fascia

FRONT BUMPER LOWER FASCIA

REMOVAL

- (1) Open hood.
- (2) Remove fasteners at side fender openings.
- (3) Remove lower air dam.
- (4) Disengage clips holding end of upper fascia to bumper face bar (Fig. 3).
- (5) Disengage clips holding lower fascia to bumper face bar.
- (6) Separate lower fascia from bumper.

INSTALLATION

Reverse the preceding operation.

FRONT BUMPER AIR DAM

REMOVAL

- (1) Remove Pin-type fasteners holding air dam to bottom of front bumper (Fig. 4).
- (2) Remove screws holding air dam to bottom of front bumper.
- (3) Separate air dam from vehicle.

INSTALLATION

Reverse the preceding operation.

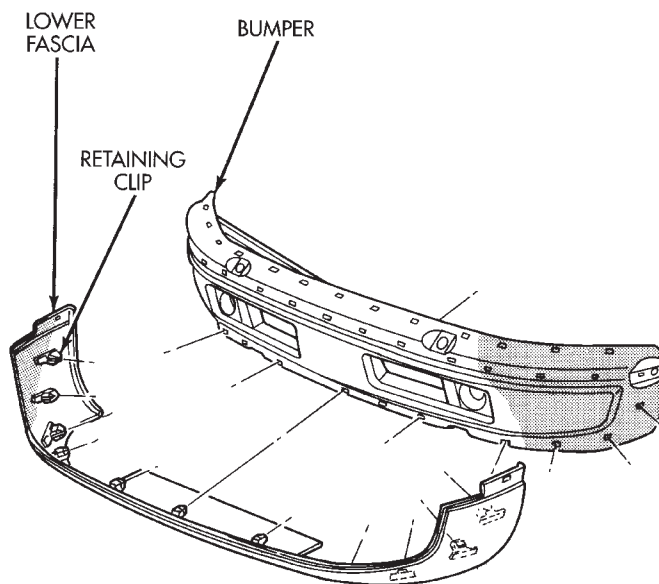


Fig. 3 Front Bumper Lower Fascia

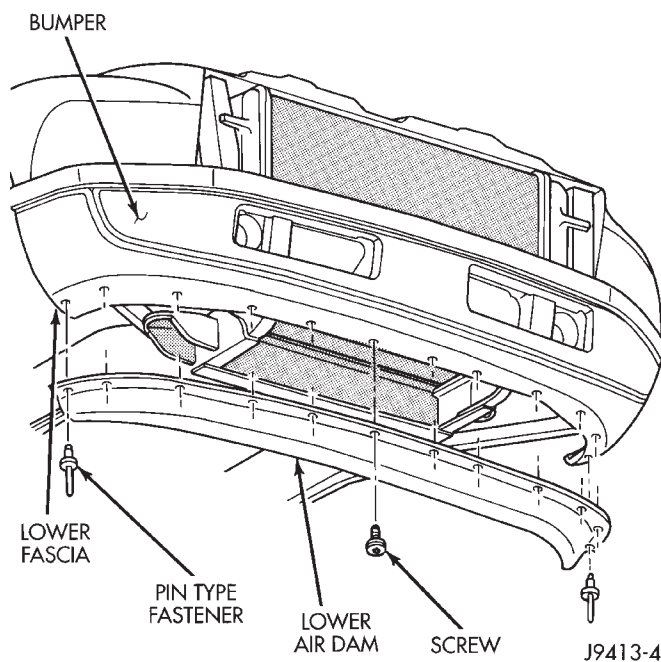


Fig. 4 Front Bumper Air Dam

REMOVAL AND INSTALLATION (Continued)

REAR BUMPER**REMOVAL**

- (1) Support rear bumper on a suitable lifting device.
- (2) Remove bolts holding rear bumper braces to frame rails (Fig. 5).
- (3) Disengage license plate lamp wire connector from body wire harness, if equipped.
- (4) Separate rear bumper from vehicle.

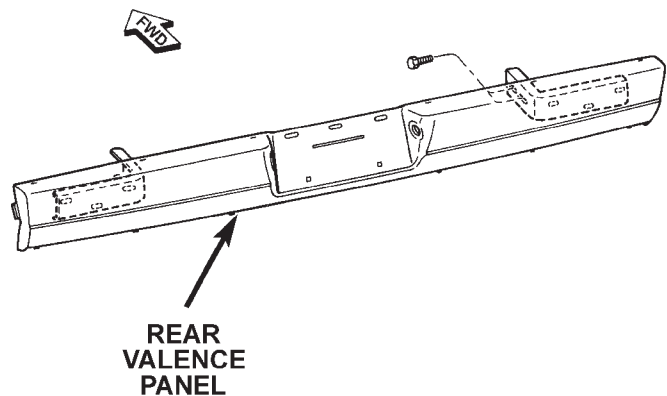
INSTALLATION

Reverse the preceding operation.

REAR VALENCE PANEL**REMOVAL**

- (1) Support rear valence panel on a suitable lifting device.
- (2) Remove bolts attaching rear valence to frame rails (Fig. 6).
- (3) Disengage license plate lamp wire connector from body wire harness, if equipped.

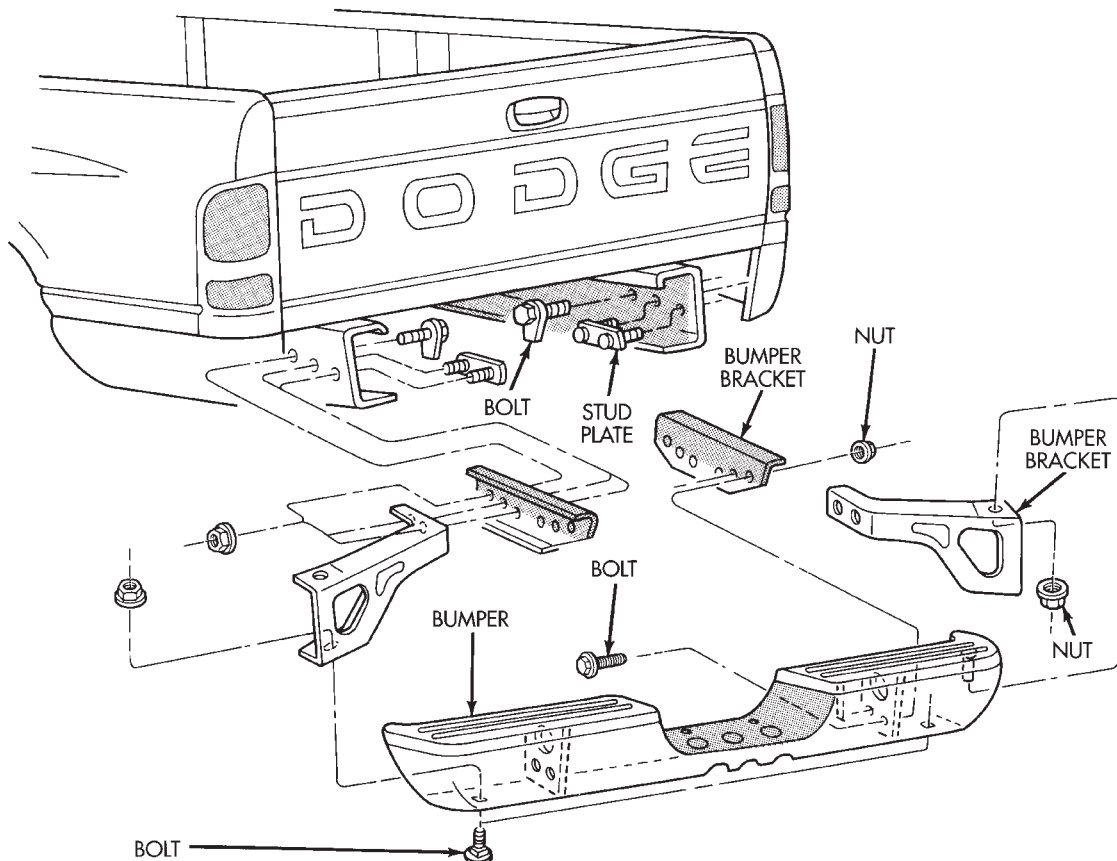
- (4) Separate rear valence from vehicle.



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Fig. 6 Rear Valence Panel**INSTALLATION**

Reverse the preceding operation.



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Fig. 5 Rear Bumper

FRAME

INDEX

	page		page
GENERAL INFORMATION		SPARE TIRE WINCH	6
GENERAL INFORMATION	4	TRAILER HITCH	7
SERVICE PROCEDURES		TRANSFER CASE SKID PLATE	6
FRAME SERVICE	5	SPECIFICATIONS	
REMOVAL AND INSTALLATION		TORQUE SPECIFICATIONS	10
CAB CHASSIS ADAPTER BRACKET	6	VEHICLE DIMENSIONS	7

GENERAL INFORMATION

GENERAL INFORMATION

BR trucks have a ladder-type frame (Fig. 1) with Box-section front rails, dropped center section and open-channel side rails in the rear.

Cross members attached to the frame side rails with rivets, welds or bolts form a ladder-type construction (Fig. 1). The cab is isolated from the frame with rubber load cushions (Fig. 2) with through-bolts. The cargo box or bed is attached to the frame with bolts. Refer to Group 23, Body for cargo box service procedures.

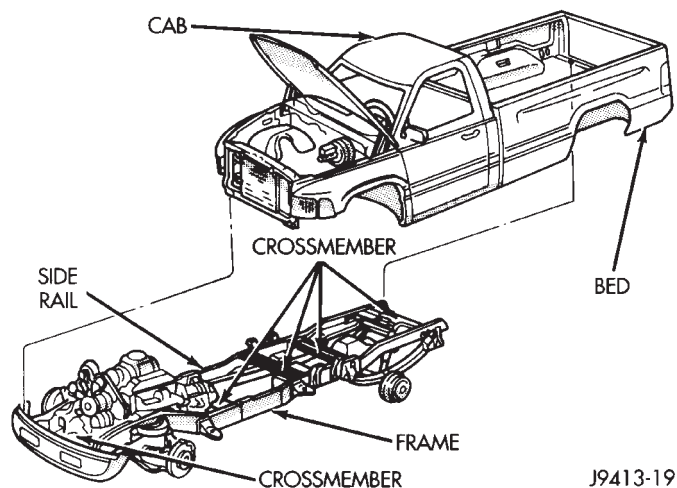


Fig. 1 Frame

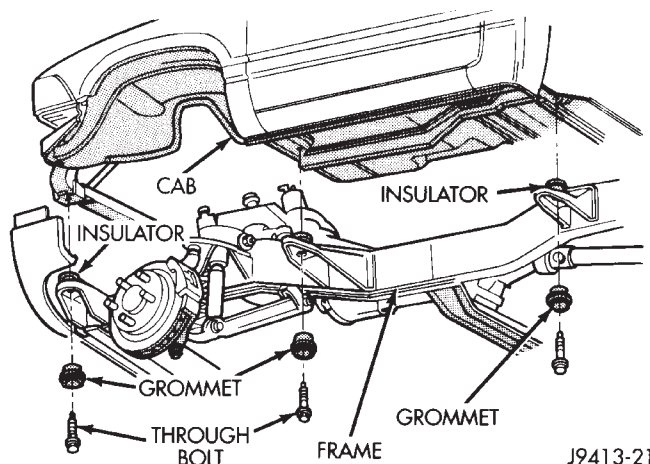


Fig. 2 Cab Mounts

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. The frame is the mounting platform for the following systems and components:

- Front and rear suspension systems.
- Engine, transmission, and transfer case.
- Steering gear and linkage.
- Exhaust system and heat shields.
- Fuel cell and fuel line tubing.
- Front end sheet metal and radiator closure panel.
- Skid plate.
- Passenger cab.
- Cargo box or bed.
- Spare tire winch.
- Front and rear bumper systems.

SERVICE PROCEDURES

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. 3) 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. 3).

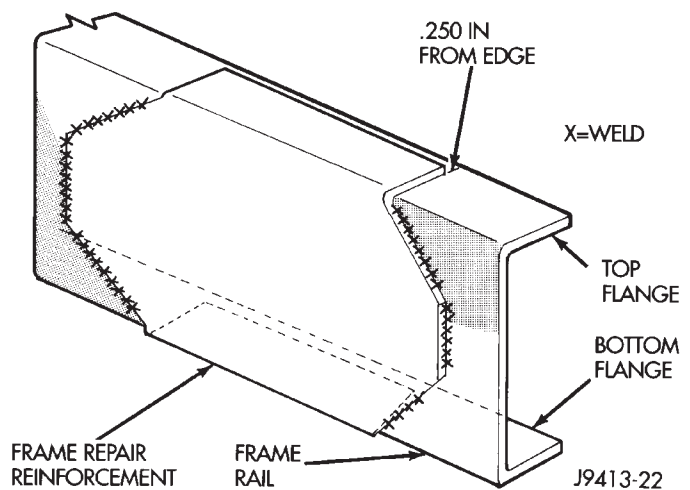


Fig. 3 Frame Reinforcement

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

SERVICE PROCEDURES (Continued)

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 splitting 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.

REMOVAL AND INSTALLATION

CAB CHASSIS ADAPTER BRACKET

REMOVAL

- (1) Remove bolts attaching cab chassis adapter brackets to frame rail (Fig. 4)
- (2) Separate cab chassis adapter brackets from frame rail

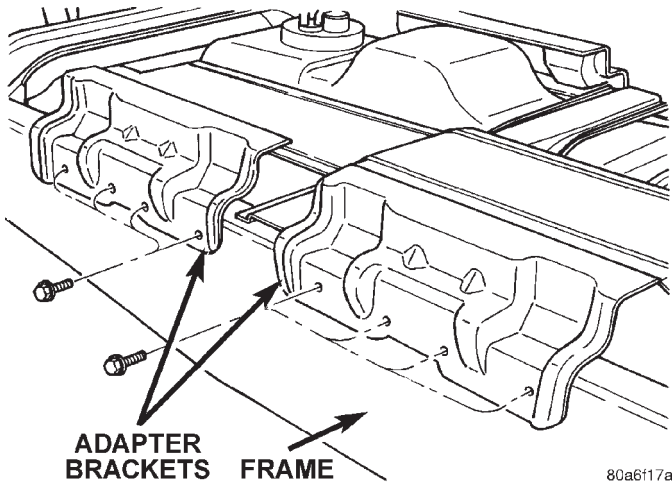


Fig. 4 Cab Chassis Adapter Brackets

INSTALLATION

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

TRANSFER CASE SKID PLATE

REMOVAL

- (1) Hoist and support vehicle on safety stands.
- (2) Remove bolts holding skid plate to frame rails (Fig. 5).
- (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.

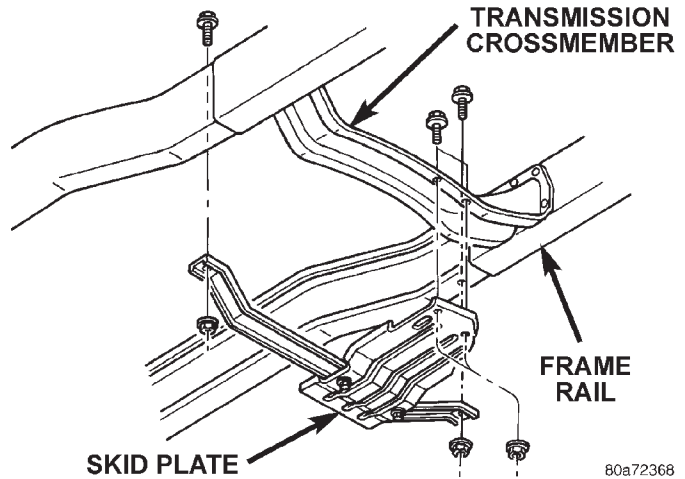


Fig. 5 Skid Plate

SPARE TIRE WINCH

REMOVAL

- (1) Remove spare tire from under vehicle.
- (2) Remove bolts holding spare tire winch to spare tire bracket (Fig. 6).
- (3) Separate spare tire winch from vehicle.

INSTALLATION

- (1) Position spare tire winch on vehicle.
- (2) Install bolts holding spare tire winch to spare tire bracket.
- (3) Install spare tire.

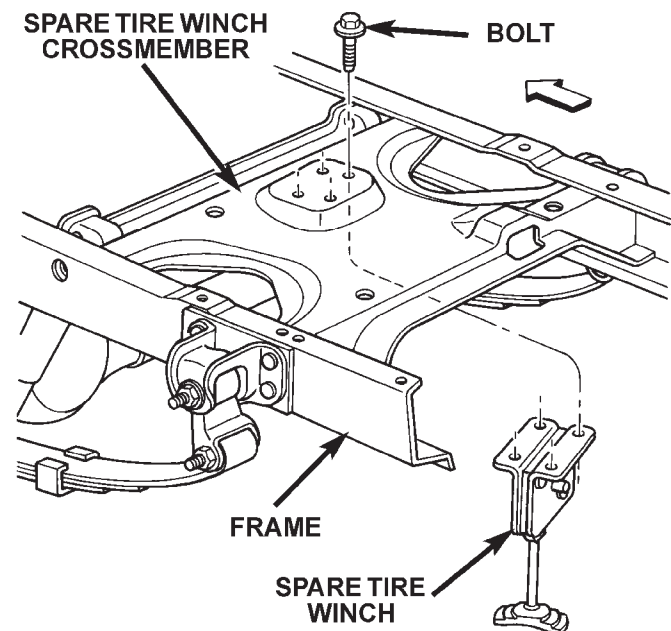


Fig. 6 Spare Tire Winch

REMOVAL AND INSTALLATION (Continued)

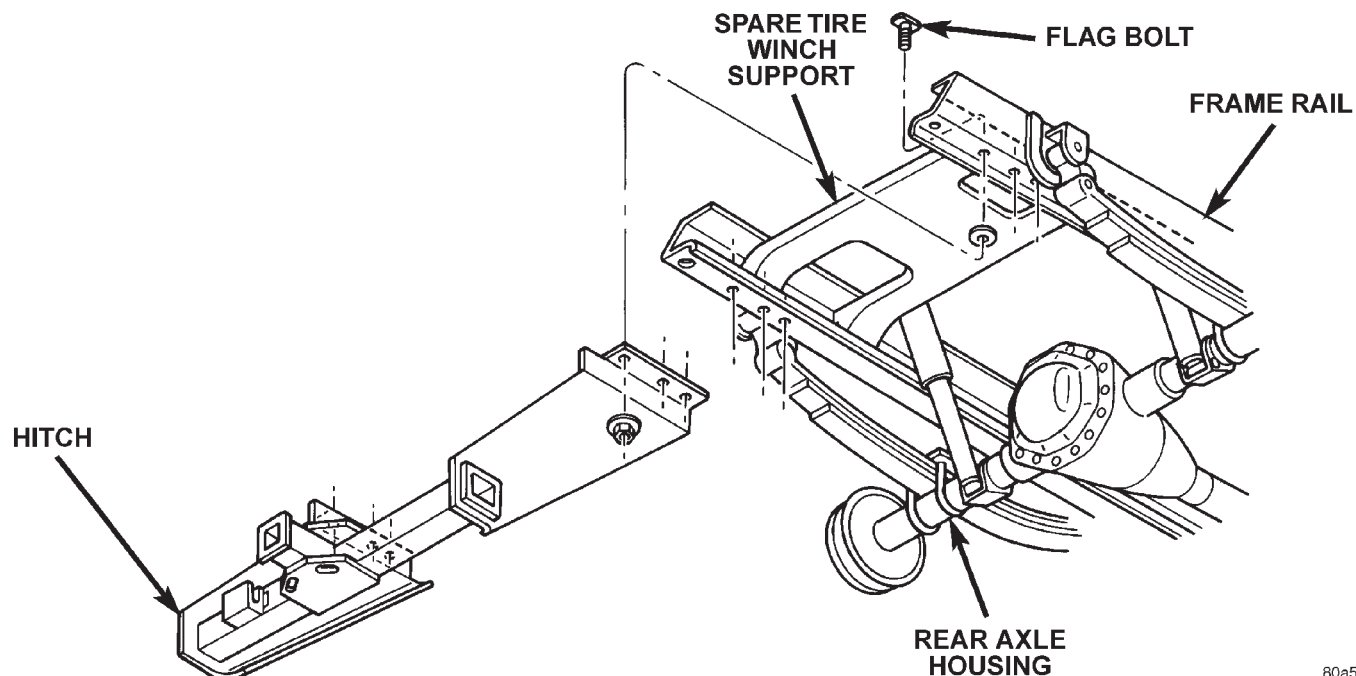
TRAILER HITCH

REMOVAL

- (1) Support trailer hitch on a suitable lifting device.
- (2) Remove fasteners holding trailer wiring connector to trailer hitch, if equipped.
- (3) Remove bolts holding trailer hitch to frame rails (Fig. 7).
- (4) Separate trailer hitch from vehicle.

INSTALLATION

- (1) Position trailer hitch on vehicle.
- (2) Install the bolts holding trailer hitch to frame rails and remove lifting device.
- (3) Install fasteners holding trailer wiring connector to trailer hitch, if equipped.



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Fig. 7 Trailer Hitch

SPECIFICATIONS

VEHICLE DIMENSIONS

Frame dimensions are listed in inch scale. All dimensions are from center to center of Principal Locating Point (PLP), or from center to center of PLP and fastener location (Fig. 8), (Fig. 9), (Fig. 10), (Fig. 11) and (Fig. 12).

SPECIFICATIONS (Continued)

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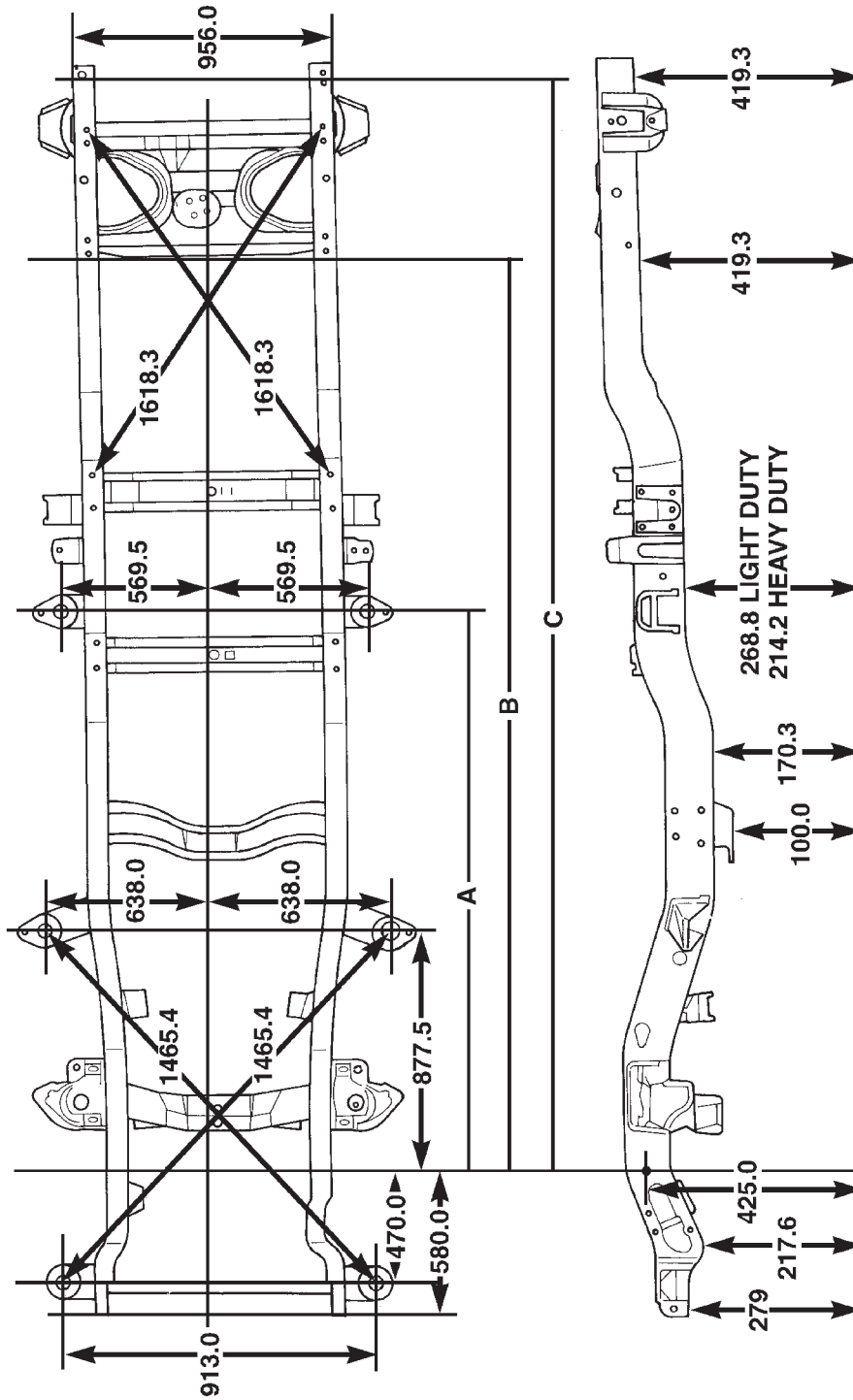


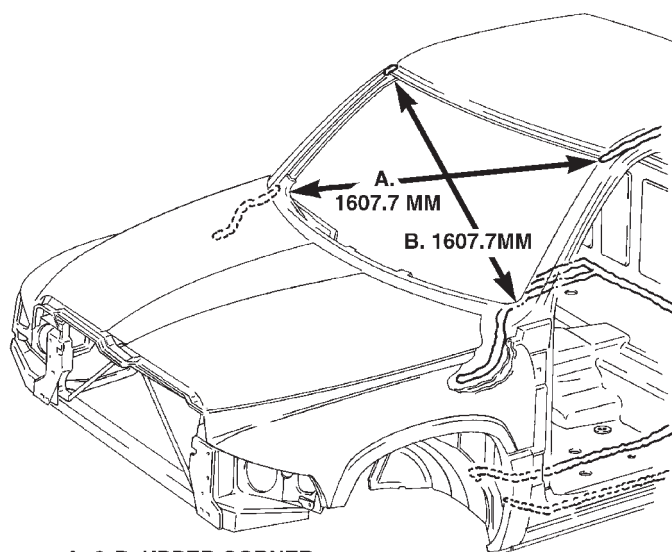
Fig. 8 Frame Dimensions

SPECIFICATIONS (Continued)

LENGTH 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

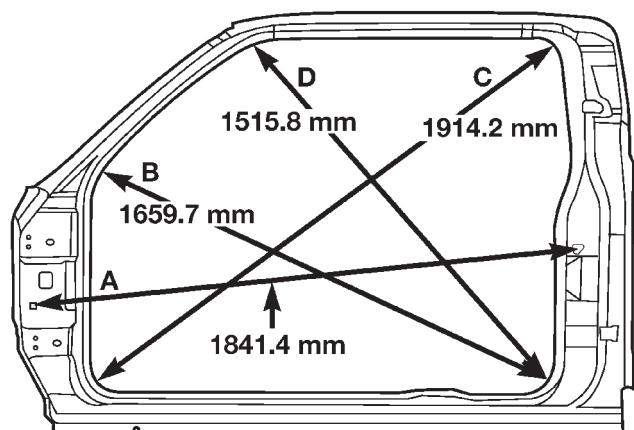
*Measurements are in Millimeters (mm).



A. & B. UPPER CORNER
OF WINDSHIELD OPENING
TO TOP OF RADIUS AT LOWER
CORNER OF OPENING.

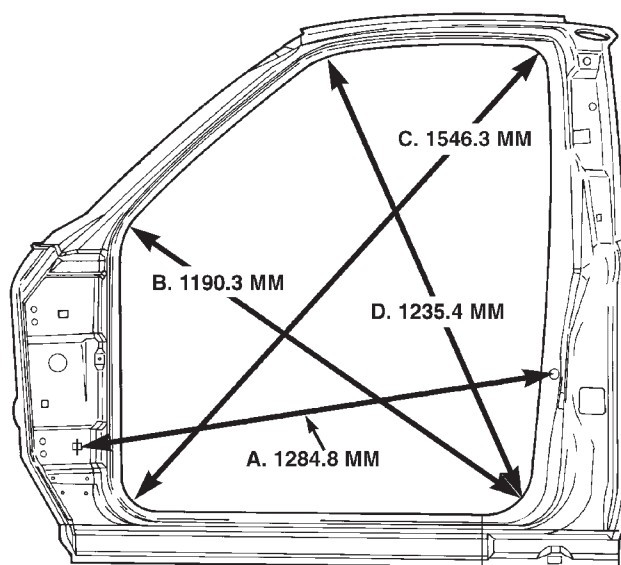
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Fig. 9 Body Dimensions—Front View



Body Dimensions—Quad Cab

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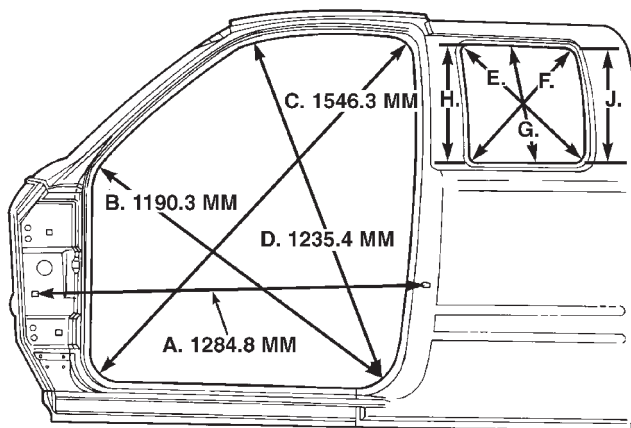
LH SIDE VIEW

- A. Centerline of A-Pillar gaging hole to centerline of seat belt retractor hole at B-Pillar.
- B. Centerline of radius at rear lower door opening flange inner edge to center of radius at cowl flange edge.
- C. Centerline of radius at front lower door opening flange inner edge to center of radius at upper opening rear flange inner edge.
- D. Centerline of radius at rear lower door opening flange inner edge to center of radius at upper front flange inner edge.

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Fig. 10 Body Dimensions—Conventional Cab

SPECIFICATIONS (Continued)

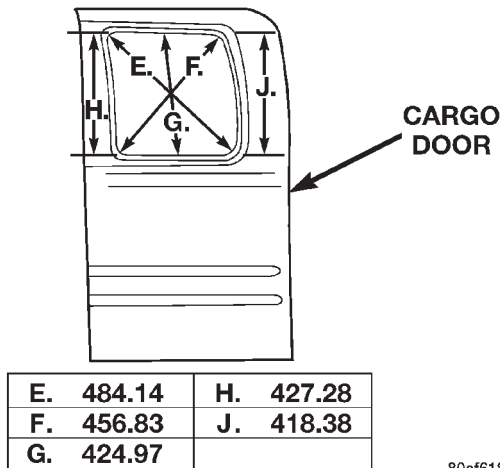


A. 1284.8 MM	D. 1235.4 MM	G. 436.2 MM
B. 1190.3 MM	E. 582.6 MM	H. 440.5 MM
C. 1546.3 MM	F. 538.8 MM	J. 426.8 MM

LH SIDE VIEW

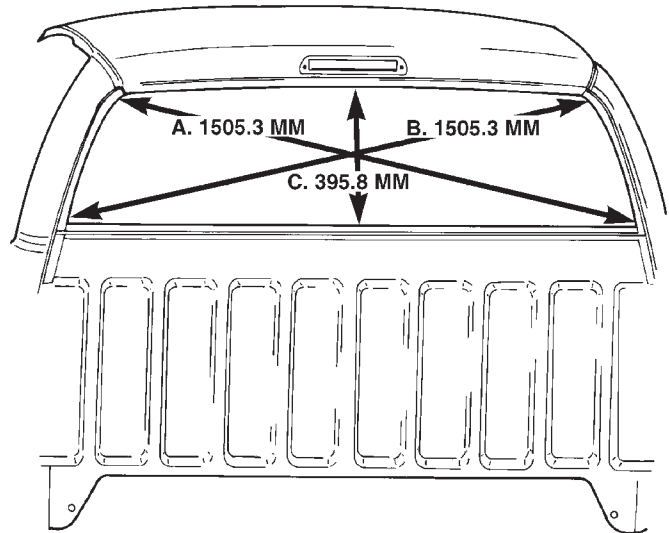
- A. Centerline of A-Pillar gaging hole to centerline of seat belt retractor hole at B-Pillar.
 B. Center of radius at rear lower door opening flange inner edge to center of radius at cowl flange edge.
 C. Center of radius at front lower door opening flange inner edge to center of radius at upper opening rear flange inner edge.
 D. Center of radius at rear lower door opening flange inner edge to center of radius at upper front flange inner edge.
 E. Lower rear corner inner flange edge to upper front corner inner flange edge of quarter glass opening.
 F. Lower front corner inner flange edge to upper rear corner inner flange edge of quarter glass opening.
 G. Upper inner flange lower edge to lower flange upper edge of quarter glass opening.

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Fig. 11 Body Dimensions—Club Cab

E. 484.14	H. 427.28
F. 456.83	J. 418.38
G. 424.97	

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Cargo Door Quarter Glass Opening Dimensions**REAR VIEW**

- A. & B. Center of radius at top corner to center of radius at lower corner of glass mounting flange.
 C. Lower edge of upper back glass mounting flange to upper edge of lower back glass mounting flange measurement taken at centerline of rear glass opening.

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Fig. 12 Body Dimensions—Rear View**TORQUE SPECIFICATIONS**

DESCRIPTION	TORQUE
Cab Chassis adapter nut.	108 N·m (80 ft. lbs.)
Front bumper	
brkt-to-frame nut68 N·m (50 ft. lbs.)
Front bumper outer brace bolt68 N·m (50 ft. lbs.)
Rear bumper-to-brace nut.40 N·m (30 ft. lbs.)
Rear bumper	
brace-to-brkt nut.101 N·m (75 ft. lbs.)
Rear bumper	
brkt-to-frame nut101 N·m (75 ft. lbs.)
Skid plate	
crossmember-to-frame bolt54 N·m (40 ft. lbs.)
Skid plate-to-crossmember bolt. . .	.40 N·m (30 ft. lbs.)
Skid plate-to-trans	
crossmember bolt54 N·m (40 ft. lbs.)
Spare tire winch bolt27 N·m (20 ft. lbs.)
Trailer hitch nut108 N·m (80 ft. lbs.)