

FRAME AND BUMPERS

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BUMPERS

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DESCRIPTION AND OPERATION

BUMPERS

DESCRIPTION

Bumpers are used at the front and rear of the vehicle. Bumpers are incorporated into the design of the front and rear fascias. They are mounted to the frame with brackets and may contain some lamp elements.

OPERATION

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.

REMOVAL AND INSTALLATION

FRONT BUMPER

REMOVAL

- (1) Open hood.
- (2) Support front bumper on a suitable lifting device.
- (3) Disengage wire connectors from fog lamps, if equipped.
- (4) Disengage push-in fasteners attaching air deflector to bottom of bumper fascia.

(5) Pull the front wheelhouse liner back at the bumper and remove bolts attaching outer bumper brackets to frame rail (Fig. 1).

(6) Remove the bolts attaching the bumper to the inner bumper bracket.

(7) Separate front bumper with outer bracket attached from vehicle.

INSTALLATION

When the front bumper is installed, there should be a 19 mm gap between the bumper and front fender.

(1) Place the bumper on a suitable lifting device and position the bumper at the vehicle.

(2) Install the bolts attaching front bumper to inner bumper bracket. Tighten to 94 N·m (70 ft. lbs.) torque.

(3) Install the bolts attaching outer bumper brackets to the frame rail. Tighten to 94 N·m (70 ft. lbs.) torque. Ensure front wheelhouse liners are positioned correctly behind bumper.

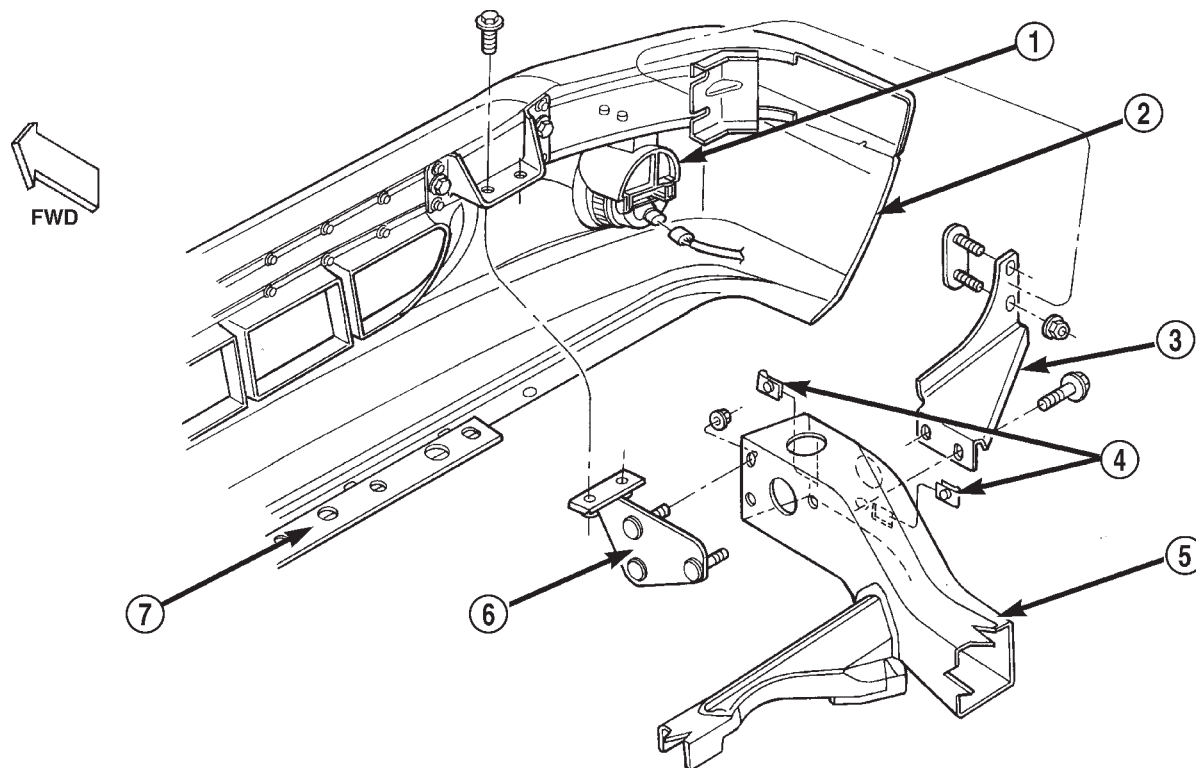
(4) Engage wire connectors to fog lamps, if equipped.

(5) Install push-in fasteners attaching air deflector to front bumper fascia.

(6) Remove lifting device.

(7) Close hood.

REMOVAL AND INSTALLATION (Continued)



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Fig. 1 Front Bumper

1 - FOG LAMP

2 - FRONT BUMPER

3 - OUTER BUMPER BRACKET

4 - U-NUT

5 - FRAME

6 - INNER BUMPER BRACKET

7 - FASCIA BRACKET

FRONT BUMPER INNER BRACKET**REMOVAL**

(1) Remove bolts attaching top of bumper to bumper bracket.

(2) Remove nuts attaching inner bumper bracket to frame (Fig. 1).

(3) Using a shallow socket and extension or equivalent, tap with a hammer to drive inner bumper bracket studs out of frame.

(4) Separate inner bumper bracket from frame.

INSTALLATION

(1) Position inner bumper bracket studs into frame.

(2) Install nuts attaching inner bumper bracket to frame. Tighten nuts to 94 N·m (70 ft. lbs.) torque.

(3) Install bolts attaching top of bumper to bumper bracket.

FRONT BUMPER FASCIA**REMOVAL**

(1) Remove the front bumper.

(2) Remove the bolts attaching the fascia to the bumper.

(3) Separate fascia from bumper.

INSTALLATION

(1) Position fascia on bumper.

(2) Install the bolts attaching the fascia to the bumper.

(3) Install the front bumper.

REAR BUMPER**REMOVAL**

(1) Remove trailer hitch, if equipped.

(2) Raise and support the rear of the vehicle.

(3) Support the bumper.

(4) Remove rivets at each side rear wheel well.

(5) Disconnect license plate lamp wiring harness.

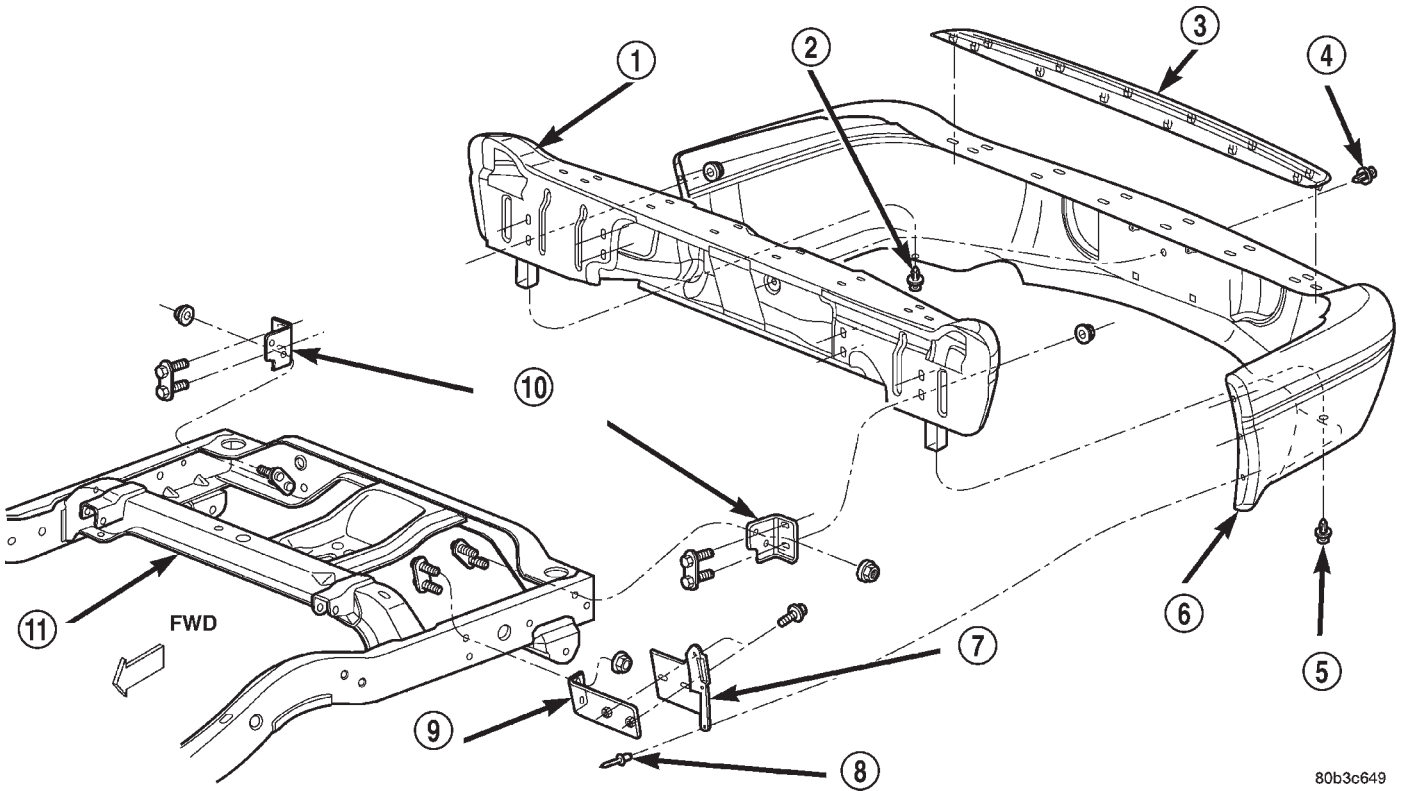
(6) Remove nuts attaching bumper support brackets to rear rails and crossmember (Fig. 2).

(7) Remove the bumper/fascia from the vehicle.

INSTALLATION

(1) Position the bumper/fascia on the vehicle.

REMOVAL AND INSTALLATION (Continued)



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Fig. 2 Rear Bumper

- | | |
|-----------------|---------------------|
| 1 - BUMPER BEAM | 7 - SHIELD |
| 2 - PUSH-PIN | 8 - BLIND RIVET |
| 3 - STEP PAD | 9 - FASCIA BRACKET |
| 4 - PUSH-PIN | 10 - BUMPER BRACKET |
| 5 - PUSH-PIN | 11 - FRAME |
| 6 - FASCIA | |

(2) Install nuts attaching bumper support brackets to crossmember and rear rails (Fig. 2).

(3) Check gaps and fit. Adjust as necessary. Tighten nuts to 54 N·m (40 ft. lbs.) torque.

(4) Connect license plate lamp wiring harness.

(5) If equipped, install the trailer hitch.

REAR BUMPER FASCIA

REMOVAL

(1) Remove rivets at each side rear wheel well.

NOTE: Removing the step pad will damage the step pad retainers, verify availability of step pad from parts supplier.

(2) Using a trim stick, carefully pry step pad from fascia.

(3) Disconnect license plate lamp connector.

(4) Remove upper push pin from the bumper fascia (Fig. 3).

(5) Remove the lower push pins from the bumper fascia.

REMOVAL AND INSTALLATION (Continued)

(6) Remove the bumper fascia from the bumper (Fig. 2).

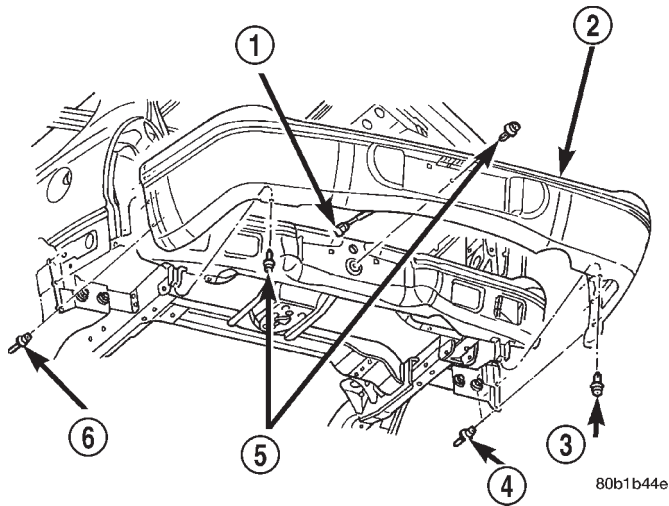


Fig. 3 Rear Fascia

- 1 - LICENSE PLATE LAMP CONNECTOR
- 2 - FASCIA
- 3 - PUSH PIN
- 4 - RIVET
- 5 - PUSH PIN
- 6 - RIVET

INSTALLATION

- (1) Position the bumper fascia on the bumper (Fig. 2).
- (2) Install upper push pin.
- (3) Align all holes and install the lower push pins.
- (4) Position step pad on fascia and press into place.
- (5) Connect license plate lamp connector.
- (6) Align fascia bracket, wheel house liner shield and fascia holes and install rivets.

FRAME

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DESCRIPTION AND OPERATION

FRAME

DESCRIPTION

The DN uses a three section frame design. The ends of the center section are swaged to fit into the front and rear sections. The front, center, and rear sections are welded together. The frame is serviced as a complete unit only.

OPERATION

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:

- Engine, transmission, and transfer case.
- Exhaust system and heat shields.
- Front and rear bumper systems.
- Front and rear suspension systems.
- Front end sheet metal and radiator closure panel.
- Fuel cell and fuel line tubing.
- Parking brake.
- Steering gear and linkage.
- Skid plate.
- Spare tire winch.
- Trailer hitch.
- Vehicle body.

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.

A straightening repair process should be limited to frame members that are not severely damaged. The

SERVICE PROCEDURES (Continued)

replacement bolts that are used to join the frame members should conform to the same specifications as the original bolts.

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. 1) 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. 1).

FRAME FASTENERS

Bolts, nuts and rivets can be used to repair frames or to install a reinforcement section on the frame.

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

FRONT AXLE SKID PLATE

REMOVAL

- (1) Position a support under skid plate.
- (2) Remove bolts attaching skid plate to front crossmember (Fig. 2).

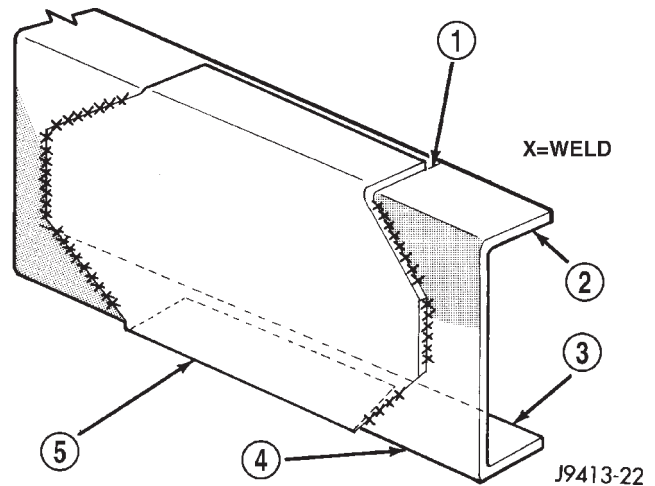


Fig. 1 Frame Reinforcement

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

(3) Remove bolts attaching skid plate to skid plate crossmember (Fig. 3).

(4) Separate skid plate from the vehicle.

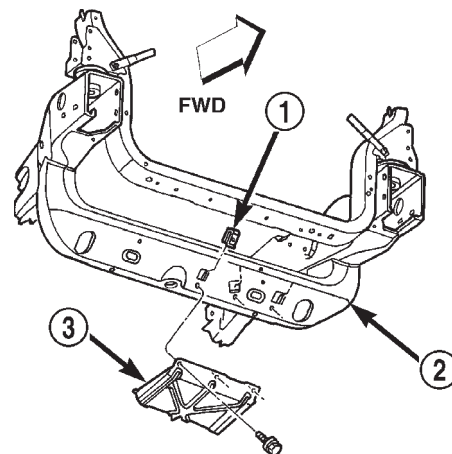


Fig. 2 Front Axle Skid Plate

- 1 - U-NUT
- 2 - FRAME
- 3 - SKID PLATE

INSTALLATION

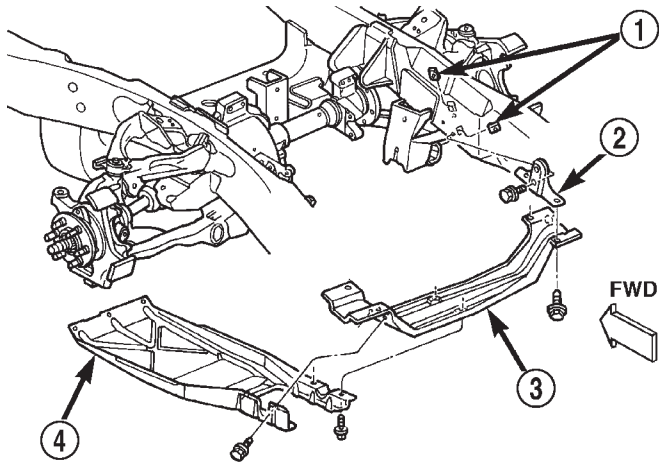
(1) Position and support skid plate at front crossmember.

(2) Install bolts attaching skid plate to transmission crossmember. Tighten to 23 N·m (17 ft. lbs.) torque.

(3) Install bolts attaching skid plate to front crossmember. Tighten to 23 N·m (17 ft. lbs.) torque.

(4) Remove support from under skid plate.

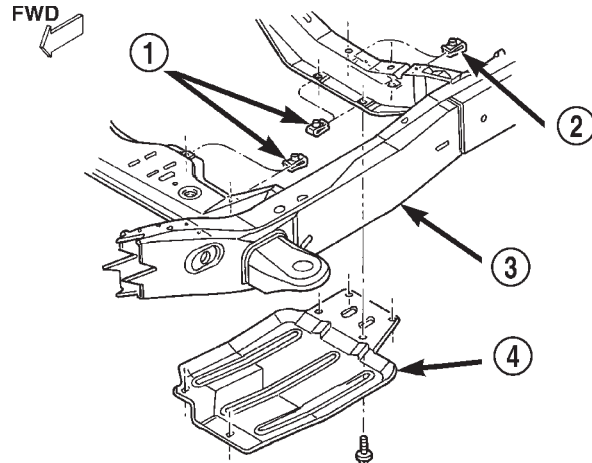
REMOVAL AND INSTALLATION (Continued)



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Fig. 3 Front Axle Skid Plate

- 1 - U-NUT
- 2 - BRACKET
- 3 - SKID PLATE CROSSMEMBER
- 4 - SKID PLATE



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Fig. 4 Transfer Case Skid Plate

- 1 - U-NUT
- 2 - U-NUT
- 3 - FRAME
- 4 - SKID PLATE

TRANSFER CASE SKID PLATE

REMOVAL

- (1) Hoist and support vehicle on safety stands.
- (2) Remove bolts attaching skid plate to crossmembers (Fig. 4).
- (3) Separate skid plate from vehicle.

INSTALLATION

- (1) Position skid plate on vehicle.
- (2) Install bolts attaching skid plate to crossmembers. Tighten to 23 N·m (17 ft. lbs.) torque.
- (3) Remove safety stands and lower vehicle.

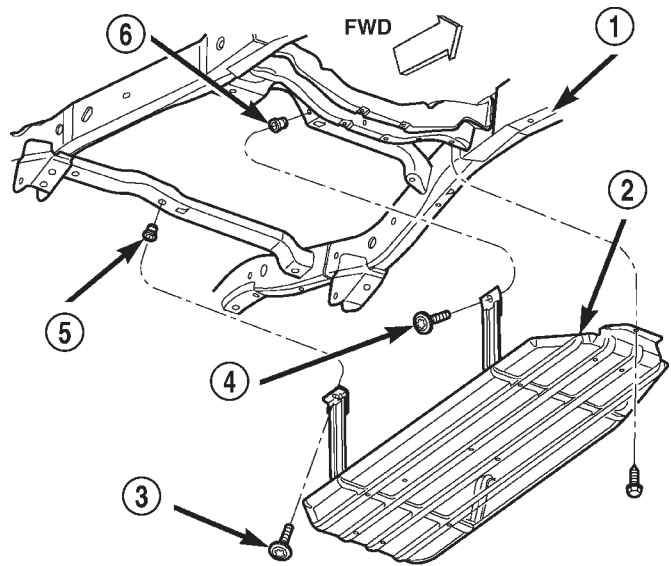
FUEL TANK SKID PLATE—4WD VEHICLES

REMOVAL

- (1) Position a support under skid plate.
- (2) Remove inboard screws that attach skid plate to crossmember.
- (3) Remove bolts that attach skid plate to frame side rail (Fig. 5).
- (4) Remove support and skid plate from vehicle.

INSTALLATION

- (1) Position and support skid plate under fuel tank.
- (2) Install inboard screws attaching skid plate to crossmember. Tighten screws to 41 N·m (30 ft. lbs.) torque.
- (3) Install bolts attaching skid plate to frame side rail. Tighten bolts to 23 N·m (17 ft. lbs.) torque.
- (4) Remove support from under skid plate.



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Fig. 5 Fuel Tank Skid Plate—4WD Vehicles

- 1 - FRAME
- 2 - SKID PLATE
- 3 - SCREW
- 4 - SCREW
- 5 - RIV-NUT
- 6 - RIV-NUT

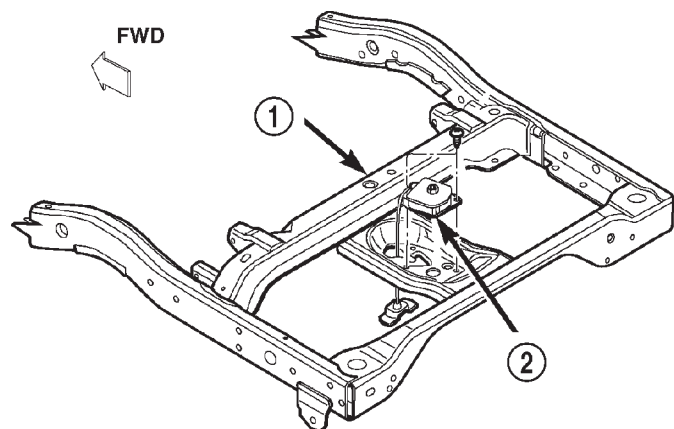
SPARE TIRE WINCH

CAUTION: Do not use impact wrench when winching spare tire.

REMOVAL AND INSTALLATION (Continued)

REMOVAL

- (1) Remove spare tire.
- (2) Raise and support vehicle on hoist.
- (3) Remove bolts attaching spare tire winch to frame.

**Fig. 6 Spare Tire Winch**

- 1 - FRAME
2 - SPARE TIRE WINCH

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INSTALLATION

- (1) Position spare tire winch on frame and install bolts. Tighten bolts to 18 N·m (13 ft. lbs.) torque.
- (2) Remove support and lower vehicle.
- (3) Install spare tire.

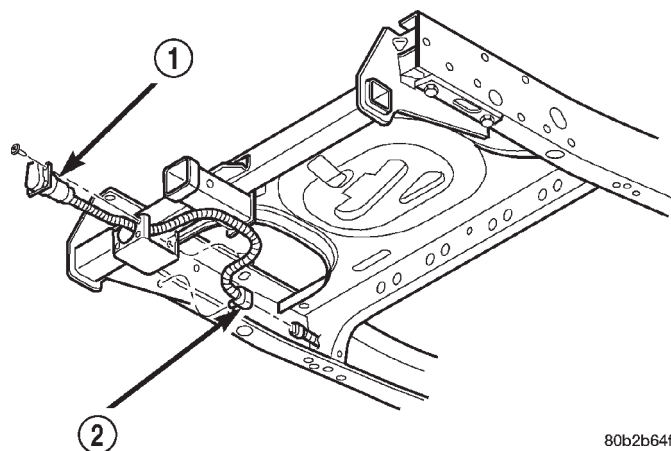
TRAILER HITCH

REMOVAL

- (1) Remove spare tire.
- (2) Support trailer hitch on a suitable lifting device.
- (3) Remove fasteners attaching trailer wiring connector to trailer hitch, if equipped (Fig. 7).
- (4) Remove bolts attaching trailer hitch to frame rails and rear crossmember (Fig. 8).
- (5) Separate trailer hitch from vehicle.

INSTALLATION

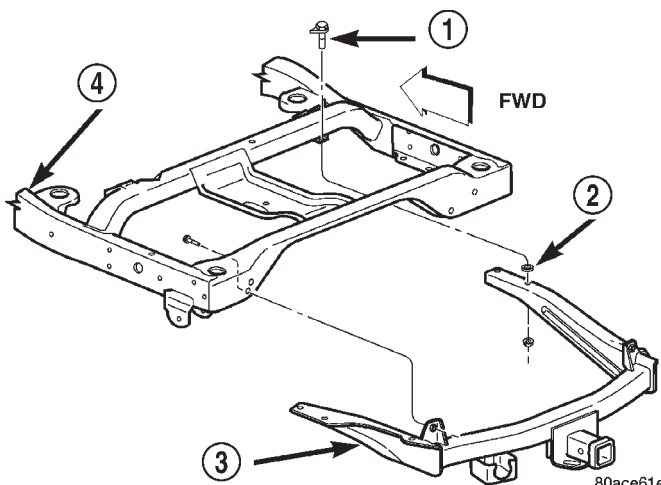
- (1) Position trailer hitch on vehicle.
- (2) Install the bolts attaching trailer hitch to frame rail and rear crossmember. Tighten bolts to 108 N·m (80 ft. lbs.) torque.
- (3) Install fasteners attaching trailer wiring connector to trailer hitch, if equipped.



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Fig. 7 Trailer Hitch Harness Connector

- 1 - TRAILER HARNESS CONNECTOR
2 - HARNESS CONNECTOR



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Fig. 8 Trailer Hitch

- 1 - FLAG BOLT
2 - SPRING WASHER
3 - TRAILER HITCH
4 - FRAME

- (4) Install spare tire.

SPECIFICATIONS

FRAME DIMENSIONS

FRAME

All dimensions are listed in millimeters.

SPECIFICATIONS (Continued)

TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
Front axle skid plate-to-front x-member bolt	23 N·m (17 ft. lbs.)
Front axle skid plate-to-trans x-member bolt	23 N·m (17 ft. lbs.)
Front bumper brkt-to-frame nut	94 N·m (70 ft. lbs.)
Front bumper outer brace bolt	94 N·m (70 ft. lbs.)
Fuel tank skid plate-to-frame rail bolt	23 N·m (17 ft. lbs.)
Fuel tank skid plate-to-x-member screw	41 N·m (30 ft. lbs.)
Rear bumper bracket-to-frame nut	54 N·m (40 ft. lbs.)
Spare tire winch bolt	18 N·m (13 ft. lbs.)
Transfer case skid plate-to-x-member bolt	23 N·m (17 ft. lbs.)
Trailer hitch nut	108 N·m (80 ft. lbs.)