

BODY-PANELS-FENDERS-HOOD-BUMPERS

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BODY

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BODY CONSTRUCTION

General

Jeep vehicles are of all-steel construction, with insulated body mounting points that provide a secure attachment to the chassis frame.

All major body panels are of heavy gauge steel, reinforced, flanged, and welded. The bodies are completely detachable from the chassis unit and are insulated from the frame by body spacers placed between the body and frame and held in position with body bolts.

Primed skeleton bodies are available in all models as replacements when the body is damaged beyond repair. Doors, trim material, hardware, and other parts may be repaired and reused.

Spacers are located between the body and chassis mounting points to insulate against vibrations and road noises.

Periodic inspection is necessary to determine the condition of body spacers and holddown bolts. Worn, loose or fatigued spacers permit the body to settle causing possible interference between the floorpan and various chassis components.

Water Test Procedure

Water testing can be performed without the need of a helper, by utilizing a suitable stand to which a water hose can be attached. The hose attachment should be adjustable to permit changing the spray direction as needed. This method will make it possible for one man to observe and detect the point of water entry while the water is being applied.

Always begin the water spray at the lowest point and allow sufficient saturation before moving the water spray upward.

To best simulate normal conditions that cause water leaks, i.e., rain or car wash, it is advisable to water test

with a spray pattern rather than a heavy, solid stream of water which can create misleading symptoms.

This procedure can be used on any area suspected of having a water leak.

Correction of Leaks

The following is a list of sealing compounds best suited to correct water or dust leaks in the respective areas as described. Comply with specific instructions recommended by the manufacturer and noted on the container.

Body Joint Sealer - A heavy-bodied asphalt base compound with properties very similar to undercoating material. Used to seal body joints. Do not use where scuffing of sealer may occur. Ideal for use in wheel splash area after adequate cleaning of surface.

Undercoat spray - Undercoating material in a pressurized spray container is ideal for quick sealing of body seams and joints. A four-inch plastic tube as a nozzle extension allows access to hard-to-seal areas.

Body Caulk-String Caulk - A heavy bodied material which can easily be molded and pressed into place and remain pliable. Adjoining surfaces must be clean for good adhesion. Caulk is best suited as a gasketing material and not to be substituted for sealing which requires an adhering bond.

Plastisol or Hard-Setting Sealers - Fast curing sealers which can be used on an exposed painted surface. Surface of sealer will harden smoothly and quickly for repaint or touch-up. Use for sealing coach joints of exposed surface requiring a hard, smooth finish.

Flowable Black Sealers - Black, thin-bodied sealers with a butyl or rubber base, remain soft and tacky to

fill voids which may occur due to flexing. When sealing the windshield or rear window area make certain the sealer being used is recommended by the manufacturer for use next to butyl tape. Some types of flowable black sealers will deteriorate the butyl tape.

FRAME CONSTRUCTION

The frame is the foundation and structural center of the vehicle. In addition to carrying the load, it mounts and supports the power unit while maintaining correct relationship and alignment of the power train. This relationship assures normal functioning of the units and freedom from excessive wear, stress and strain. The frame is constructed of heavy channel steel side rails and crossmembers. The crossmembers maintain the proper positions of the side rails in direct relationship to each other, providing maximum resistance to torsional twist and strains.

In the event of collision damage, it is important that the frame alignment be checked and realigned to frame dimensions shown on the individual dimension charts (fig. 14-1 through 14-4).

Wheel geometry and axle alignment should be checked.

FRAME ALIGNMENT

The most efficient method of checking frame alignment is with a frame alignment machine.

If a frame straightening machine is not available, frame alignment may be determined by using the "x", or diagonal method (fig. 14-5). Figures 14-1 through 14-4 provide all frame dimensions.

The most convenient method of checking frame dimensions is to mark on a level floor all dimensional points from which measurements are taken. This is known as "plumb-bobbing" the frame. If working on a cement floor, clean it so that the chalk marks will be visible underneath the frame. If working on a wooden floor, lay sheets of paper underneath the vehicle. Drop a plumb-bob from each point indicated in figure 14-5, marking the floor directly underneath the point. Satisfactory checking depends on the accuracy of the marks in relation to the frame.

To check points that have been marked, carefully move the vehicle away from the layout on the floor, and proceed as follows:

Check the frame at front and rear end using corresponding marks on the floor. If widths correspond to frame specifications, draw a centerline the full length of the vehicle, halfway between the marks indicating front and rear widths. If frame width is not correct and the centerline cannot be laid out from checking points

at the end of frame, it can be drawn through intersections of any two pair of equal diagonals.

With the centerline correctly laid out, measure the distance to several opposite points over the entire length of the frame. If the frame is in proper alignment, opposite measurement should be the same.

To locate the points at which the frame is sprung, measure the diagonals marked AB, BC, and CD (fig. 14-5).

If the diagonals in each pair are within 1/8-inch, that part of the frame included between points of measurement may be considered as satisfactorily aligned. These diagonals should also intersect at the centerline. If the measurements do not agree within the above limits, it means that a frame alignment correction is necessary and will have to be made between those points that are not equal.

NOTE: *During the process of straightening the frame, be extremely careful not to overstretch the frame. This could cause the already aligned sections of the frame to become misaligned or weakened.*

FRAME STRAIGHTENING

A bent or twisted frame may be straightened, provided the extent of misalignment is not excessive. To avoid weakening the frame, straightening should be performed without the application of heat. Severely damaged frame parts should be replaced.

NOTE: *The controlled-heat technique can be utilized where a frame section is squashed and must be brought out without tearing or excessive stretch to the metal.*

AXLE ALIGNMENT

When the frame is properly aligned, the front axle alignment to the frame should also be checked. The front axle is square with the frame if the distance between the front and rear axles is the same on both sides.

The distance from the spring upper bushings to the axle on both sides should be equal. Check both axles.

NOTE: *Always inspect the springs for broken spring center-bolts when checking the frame and axle alignment.*

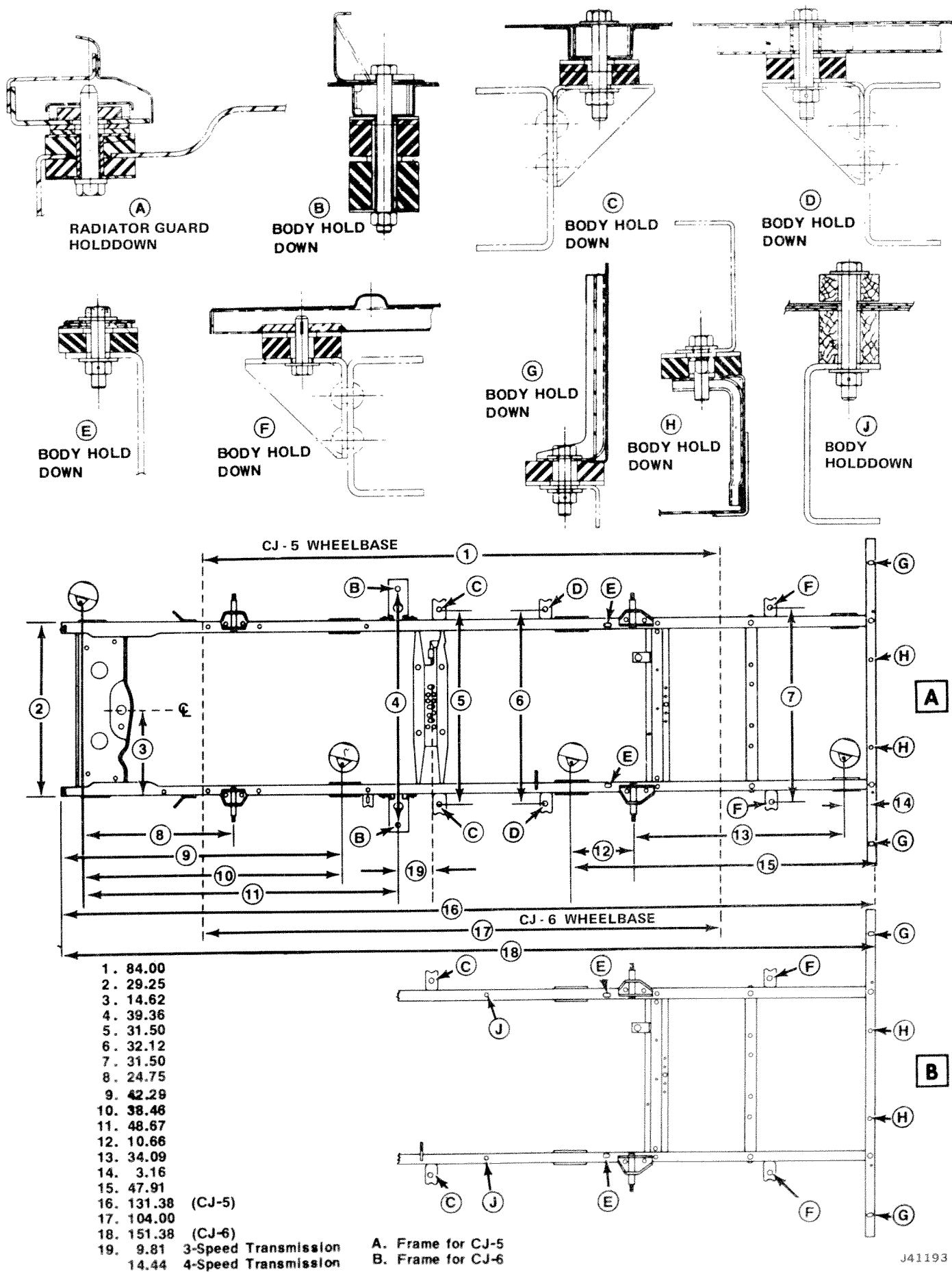
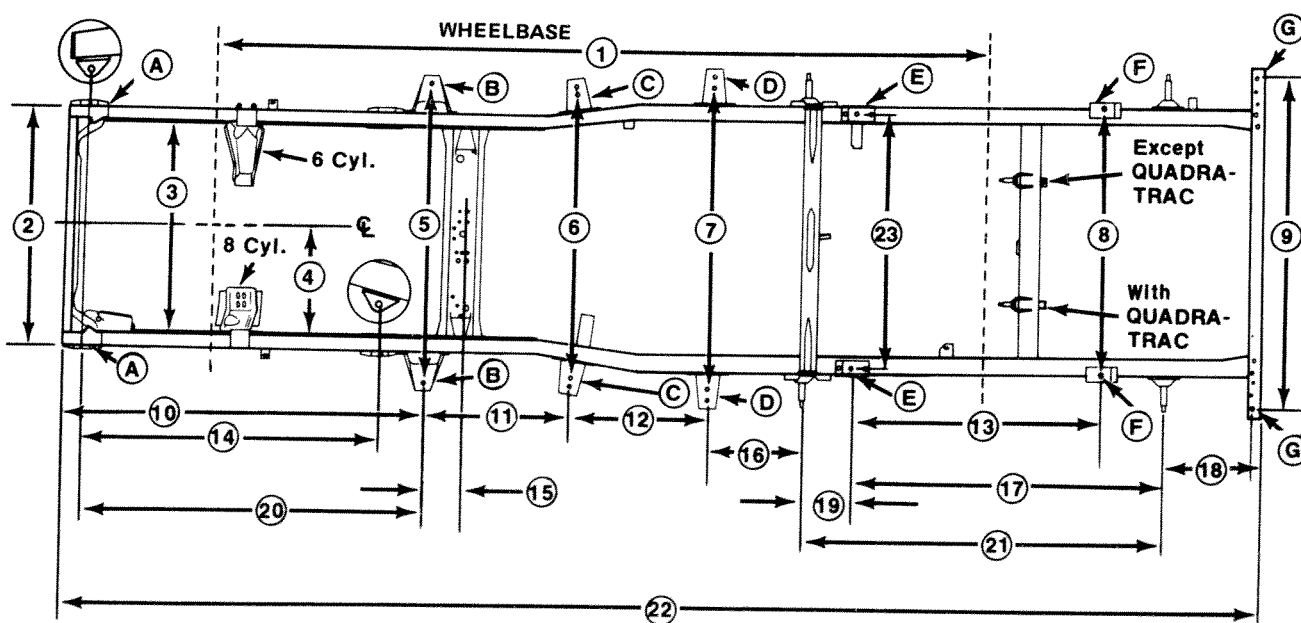
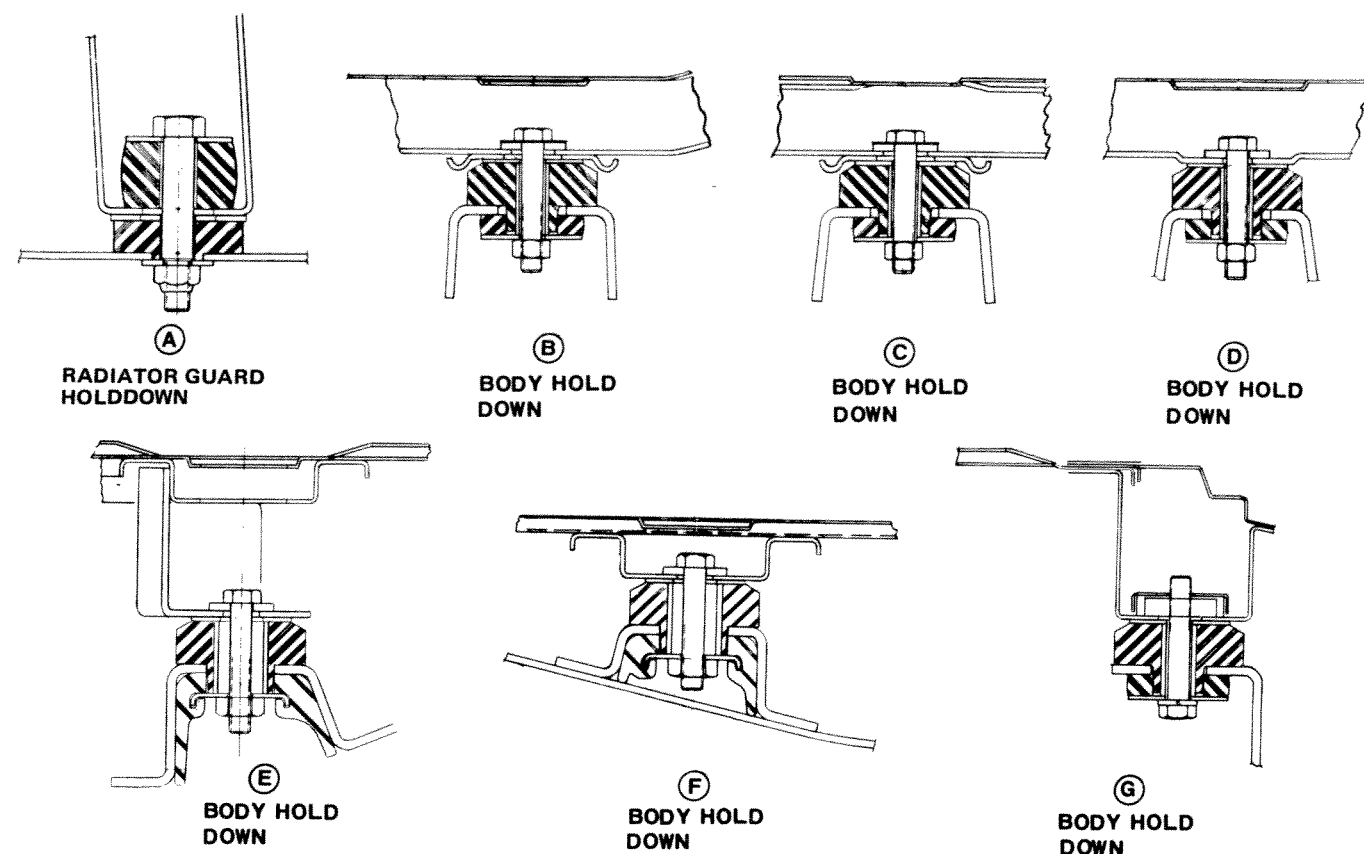


Fig. 14-1 CJ Model Frame Dimensions



1. 108.75	13. 36.31
2. 34.25	14. 45.75
3. 30.00	15. 5.13
4. 15.00	16. 13.69
5. 42.50	17. 45.31
6. 42.50	18. 12.71
7. 45.88	19. 7.00
8. 37.30	20. 50.00
9. 46.75	21. 52.36
10. 52.60	22. 173.99
11. 21.12	23. 36.08
12. 20.00	

Fig. 14-2 Cherokee and Wagoneer Frame Dimensions (Inches)

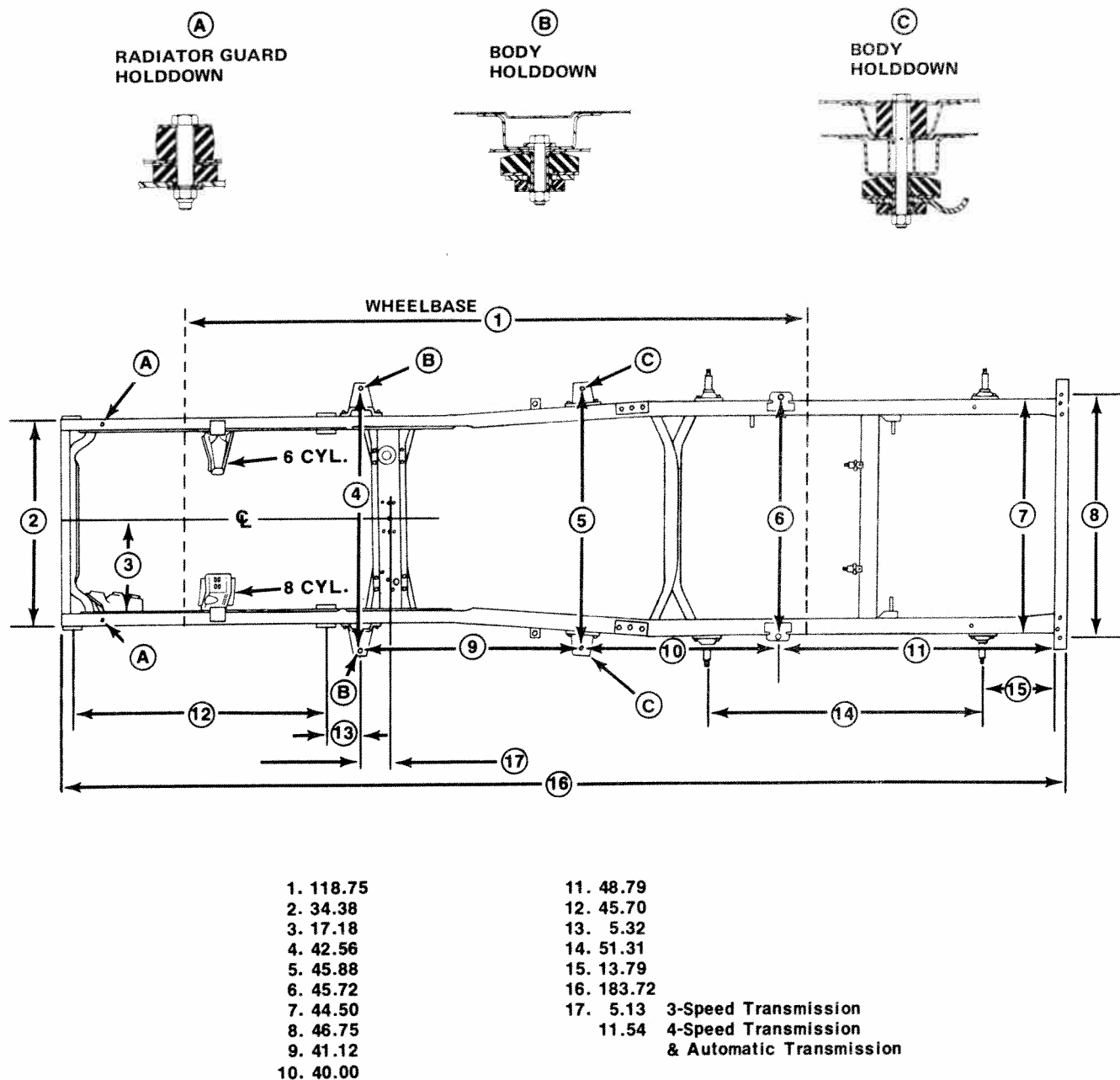


Fig. 14-3 J-10 Truck Frame Dimensions (Inches)

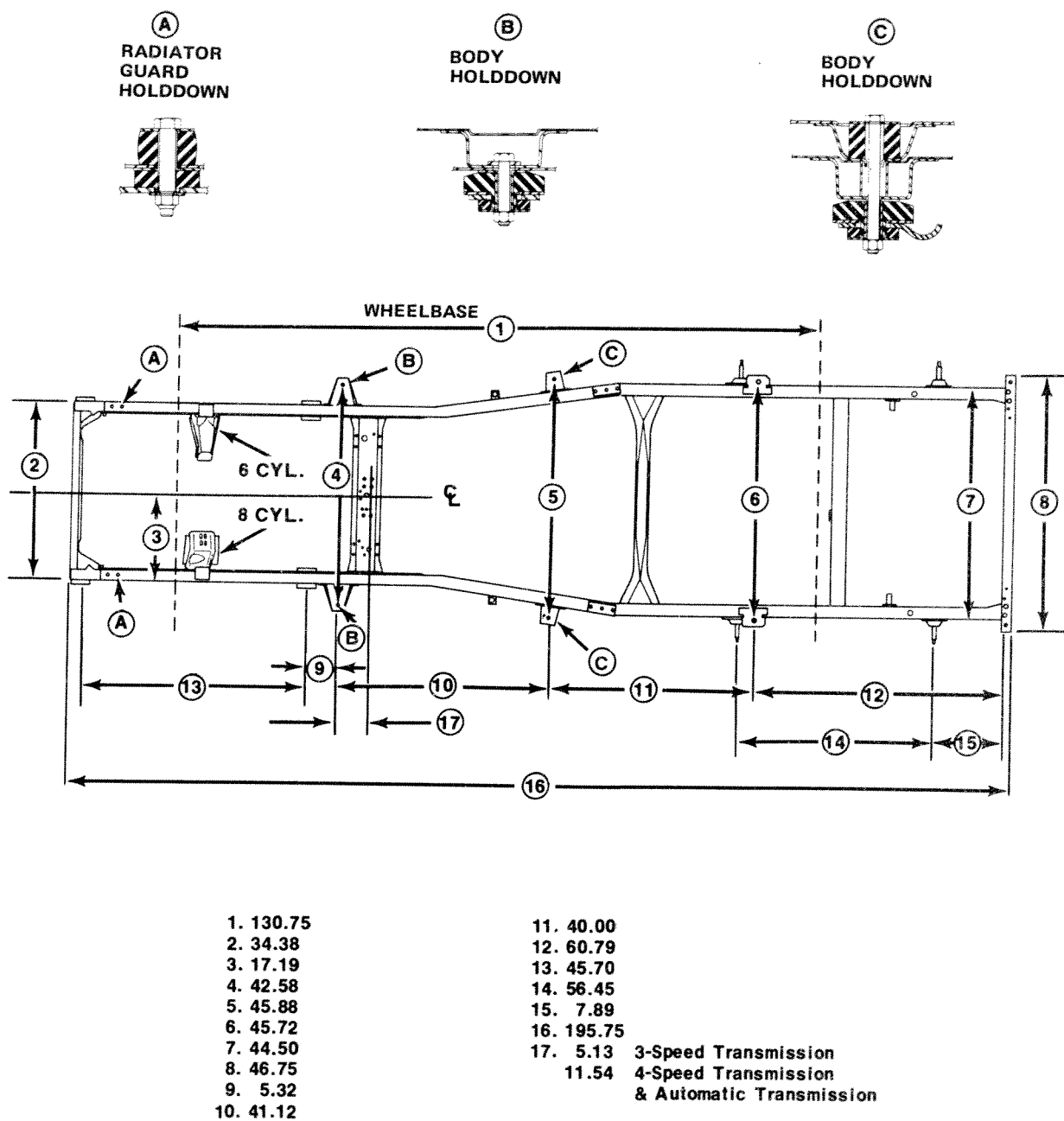
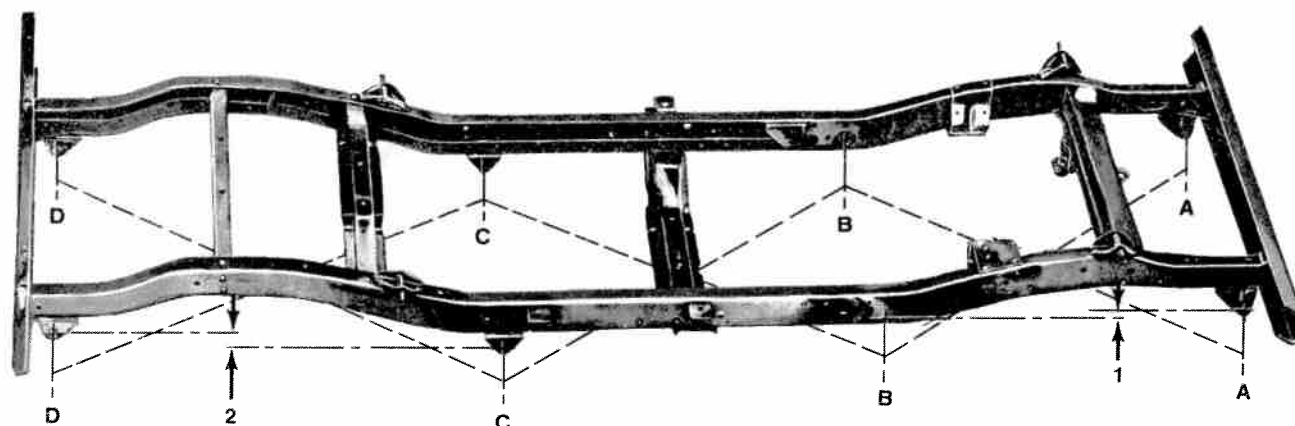


Fig. 14-4 J-20 Truck Frame Dimensions (Inches)



Vehicle	Spring Hanger Step Dimensions (Inches)	
	1 - Front Set	2 - Rear Set
CJ-5	4.15	3.22
CJ-6	4.27	3.34
Wagoneer & Cherokee	6.28	2.37
Truck, J-10	6.34	2.49
Truck, J-20	6.34	1.27

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Fig. 14-5 Typical Frame Assembly

PANELS

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GENERAL

Replacing damaged panels with new parts is less expensive than repairing the damaged section.

Assembled sections or any of the individual panels available for replacement are complete and may be installed as a unit. When only a portion of the unit is damaged, the damaged unit may be cut from the body at the location best suited for welding, and the new unit cut to the desired size and welded in place.

Galvanized Panels

For protection against rust, all panels vulnerable to corrosion on Cherokee, Wagoneer, and Truck vehicles are galvanized. A neutralizer must be applied to these panels prior to painting to ensure good adhesion of the paint.

Replacement

Where replacement is required, careful examination should be made as to the extent of the damage to determine which panels required for replacement.

In most cases, the weld joints of one panel to another are visible and can be separated for installation of a new panel.

DOORS

The complete door, with outer and inner door panels flanged and welded together and primed, is available as well as the outer panel only.

These may be used in cases where the inner panel and pillar assemblies are not damaged, saving the extra expense of using a complete door.

REAR QUARTER PANELS

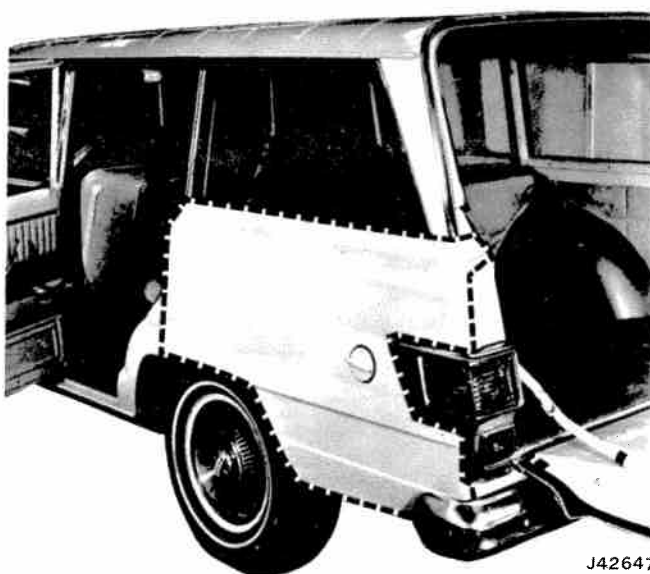
The rear quarter panels are welded to the body as indicated by dotted lines in fig. 14-6 through 14-8.

Whenever a rear quarter panel is replaced, it is very important to apply a suitable rust preventative such as a weld primer to all mating surfaces prior to welding. It is also very necessary to seal all welded joints with Jeep Metal Joint Sealer or equivalent.



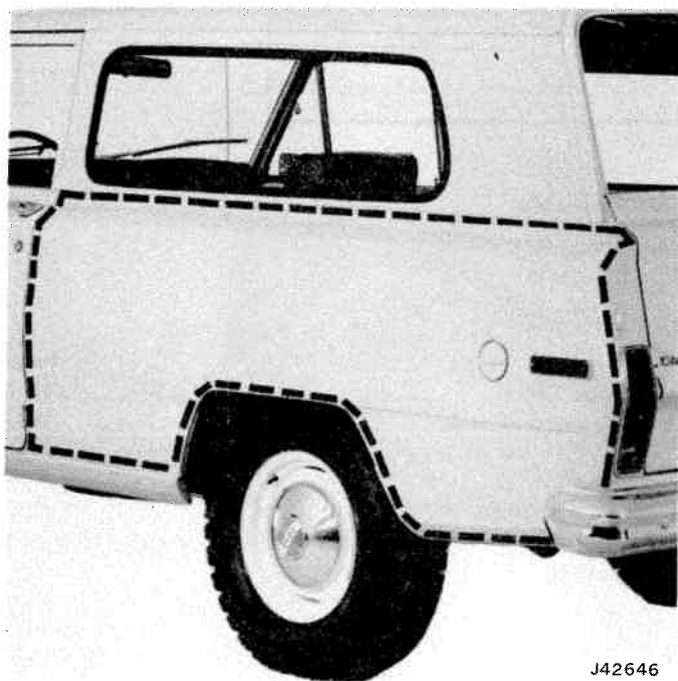
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Fig. 14-6 Rear Quarter Panel - CJ



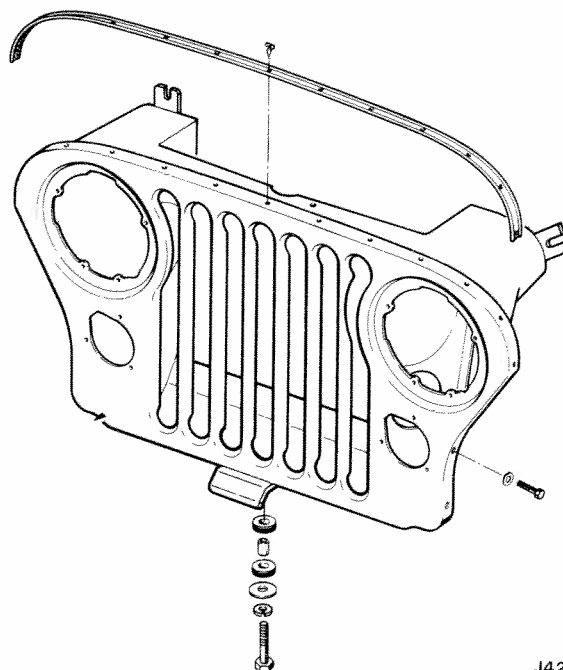
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Fig. 14-8 Rear Quarter Panel- Wagoneer



J42646

Fig. 14-7 Rear Quarter Panel - Cherokee



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Fig. 14-9 Grille Panel - CJ Models

RADIATOR GRILLES

CJ Models

The CJ grille and the support and baffle are welded together to form a maximum-strength radiator guard (fig. 14-9).

Cherokee - Wagoneer - Truck

Wagoneers feature a new molded radiator grille insert which can be quickly replaced when damaged (fig. 14-10). The grille insert is secured to the grille panel with disposable plastic fasteners to facilitate servicing.

Cherokee and truck grilles are one-piece metal construction, a separate grille face panel and support and baffle are used for rigidity and service economy.

GRILLE REMOVAL

CJ Models

- (1) Remove screws and washers securing radiator to radiator guard panel.
- (2) Remove bolts and washers securing guard panel to fenders.
- (3) Remove radiator grille to frame crossmember holddown assembly. Note sequence of parts.

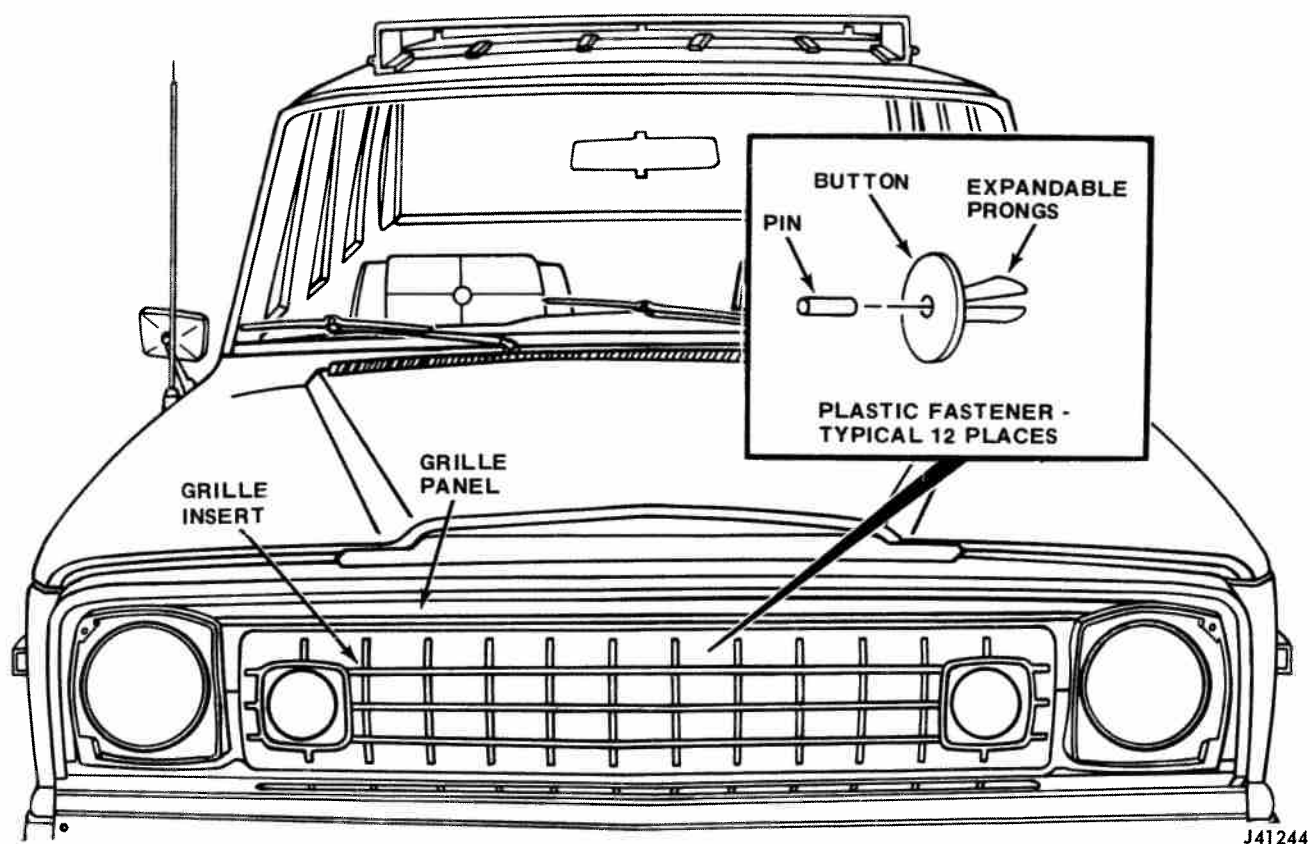


Fig. 14-10 Grille Insert and Fasteners - Wagoneer

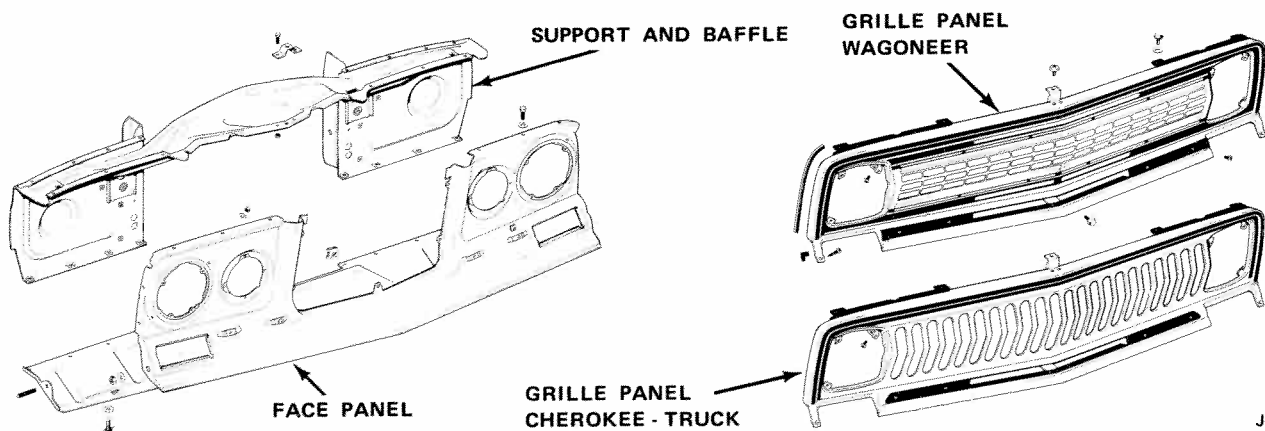


Fig. 14-11 Grille Panel - Cherokee - Wagoneer - Truck

- (4) Loosen nuts securing the two radiator support rods to the radiator grille guard support brackets.
- (5) Remove rods from brackets.
- (6) Tilt guard panel forward and disconnect electrical wiring at head lamp sealed beam unit, and parking lamp assembly wire harness at connectors.
- (7) Lift radiator guard panel from vehicle.

Cherokee - Wagoneer - Truck

- (1) Remove headlamp doors, headlamp housing and disconnect headlamp wiring at sealed beam unit.

- (2) Remove screws, bolts and washers securing grille.
- (3) Remove grille.

WAGONEER GRILLE INSERT

Replacement

- (1) Push the pin through and out the back of the button-shaped plastic fasteners using a 1/8-inch diameter tool (fig. 14-10).
- (2) Remove and discard plastic fastener buttons.
- (3) Remove grille insert from grille panel and disconnect parking light wiring at harness connectors.

(4) Connect parking light wiring to harness connectors and position grille insert in grille panel.

(5) Align holes in grille insert with grille panel holes and install plastic fasteners. Push pin in flush with fastener button, expanding fastener prongs.

FENDERS

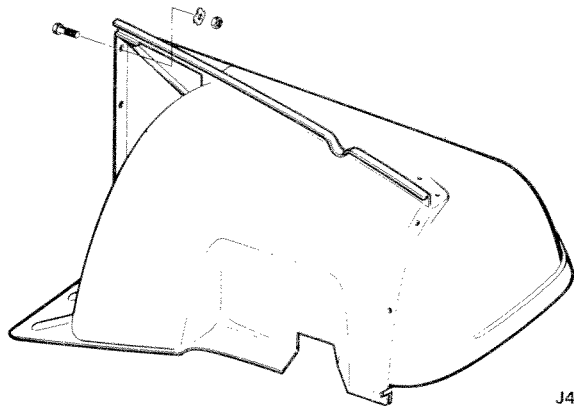
FRONT FENDER AND APRON REMOVAL

CJ Models

(1) Remove or disconnect all items attached to the apron of fender.

(2) Remove hood retaining latch and side marker light from fender.

(3) Remove bolts, washers and nuts securing fender and brace to firewall (fig. 14-12).



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Fig. 14-12 Front Fender - CJ Models

(4) Remove bolts, washers, and nuts securing fender to radiator grille guard panel.

(5) Pull fender outboard and lift from vehicle.

Cherokee-Wagoneer-Truck

(1) Remove front bumpers.

(2) Remove headlight to gain access through opening.

(3) Reach through headlight opening and remove bolts and washers attaching fender to grille face panel.

(4) Remove side marker lamp reflector lens and disconnect lamp socket assembly from lens.

(5) Remove bolts and washers holding fender to grille face panel.

(6) Disconnect brace at fender.

(7) Remove bolts and washers attaching fender extension bracket to fender apron.

(8) Remove bolts and washers attaching fender to rocker panel just below the hinge pillars.

(9) Remove the bolts and washers that attach the top of the fender to the fender apron, the hood hinge sup-

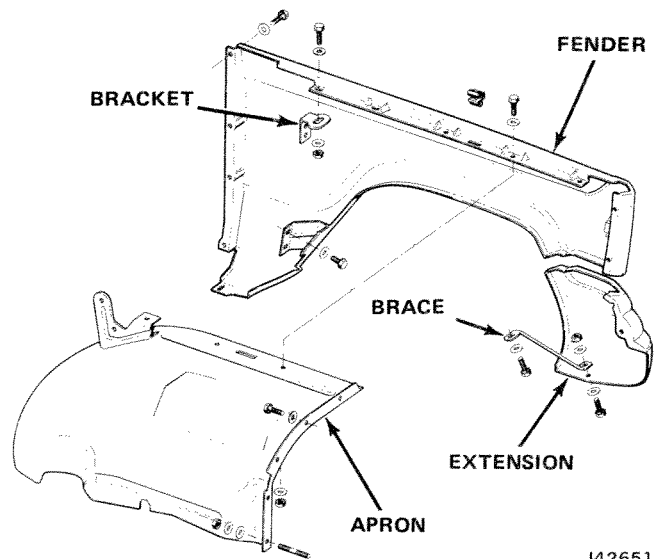
port bracket, and the fender-to-firewall bracket.

NOTE: The number and position of shims between fender and rocker panels so they can be reinstalled in the same way.

(10) With the doors in the open position remove the fender from the vehicle.

(11) Remove or disconnect all items attached to the apron.

(12) Remove bolts and washers that attach the fender apron to the radiator support and to the two brackets on the firewall.



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Fig. 14-13 Front Fender - Cherokee - Wagoneer - Truck

INSTALLATION

(1) Spread sealer evenly over and along surfaces where fender and apron make metal-to-metal contact with other sheet metal parts.

(2) Install apron and fender in place with finger-tightened bolts until all bolts and washers have been installed. Then secure all nuts and bolts.

(3) Install and reconnect all items removed from the fender and apron, such as wiring harness, electrical components, etc.

(4) Secure items such as headlight, grille and/or front bumper which were released or removed to facilitate removal of fender and apron.

HOOD

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GENERAL

The CJ hood consists of an outer flanged panel with inner U-channels welded at the front and rear of the hood panel.

The Cherokee, Wagoneer, and Truck hood consists of an inner and outer panel flanged and welded together at the outer edges.

(1) Mark the position of hinges on their respective mounting panels before removing hood.

(2) Detach hood panel from hinges by removing the attaching bolts, lockwashers and flat washers.

(3) Disassembly of the CJ hood is accomplished by removing the hood prop rod, hood prop rod retainer clip, hood side catch brackets, footman loop, and windshield bumpers (fig. 14-14).

(4) Disassembly of the Cherokee, Wagoneer, and Truck hood is accomplished by removing the hood lever lock assembly, left and right hood panel brace rods, and the insulation pad (Cherokee and Wagoneer) that is cemented to the hood panel (14-15).

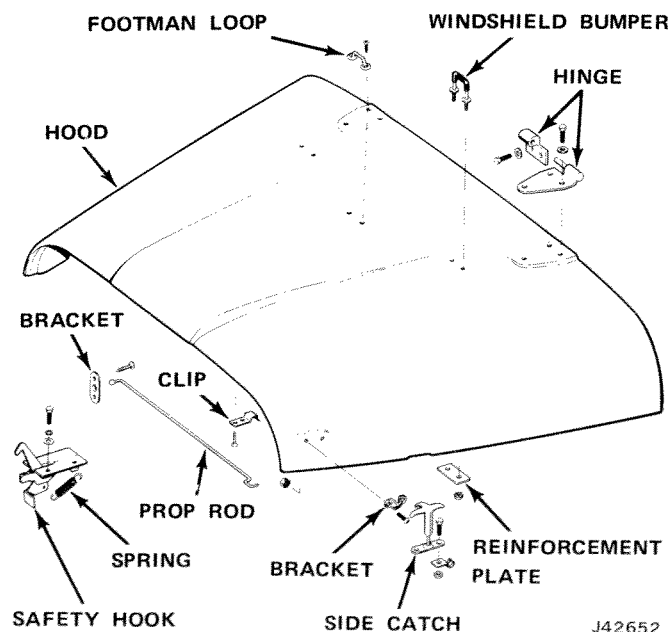


Fig. 14-14 Hood and Related Parts - CJ Models

ASSEMBLY AND INSTALLATION

(1) Finger-tighten related component parts and assemblies to hood panel.

(2) If the Cherokee or Wagoneer hood panel insulation pad has been removed, clean off all loose cement

and pad particles from panel to ensure good adhesion when recemented.

(3) Position hood panel assembly and align hinges with scribe marks on the respective mounting panels. Torque all attaching bolts.

(4) Check hood alignment. If not correct, apply following procedure.

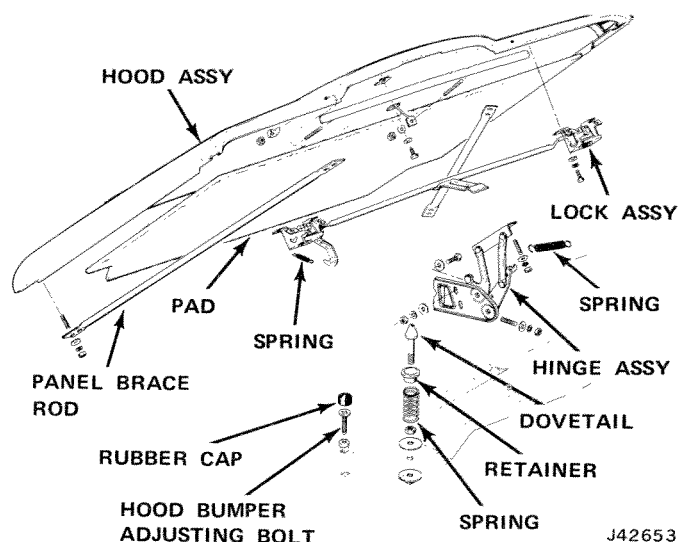


Fig. 14-15 Hood and Related Parts - Cherokee, Wagoneer, and Truck

ALIGNMENT

The hood hinge mounting holes are oversized to permit adjustment when aligning the hood.

NOTE: If the hood must be moved to either side, the hood lock loop striker, hood lever lock, and/or the safety hook assembly, according to vehicle model, must first be loosened.

(1) Loosen the hinge mounting bolts slightly on one side and tap hinge in the opposite direction hood is to be moved.

(2) Secure bolts.

(3) Repeat the procedure on the opposite hinge.

(4) The hook lock loop striker, hood lever lock and/or the safety hook assembly, must be moved to ensure positive locking.

(5) On the Cherokee, Wagoneer and Truck, shim between hinge and hood with caster and camber shims or flat washers at the rear bolt, if the hood is low in relation to the cowl top.

(6) If the hood is too high at the cowl, shim at the front bolt.

HOOD LOCK

The hood lock and safety catch of the Cherokee, Wagoneer and Truck incorporates a release system, whereby the release lever operates the hood lock and the safety catch.

The CJ hood is secured to the front fenders by two hood retaining latches. To release, pull the latches straight up and turn slightly at the end of travel. The hood may now be raised with the release of the safety catch by inserting fingers between the grille bars to the right of center and by pulling to the left on the catch. To secure the hood in the raised position, remove the support bar from its retaining clip and insert the free end

into the support bar bracket.

The hood lock release latch on the Cherokee, Wagoneer, and Truck is located under the front center of the hood, above the grille. To release the latch, reach under the hood, lift up and raise the hood.

The hood lock striker, hood lever lock and/or the safety hook assembly are adjustable. Lubricate all pivot points periodically.

HOOD BUMPER

A combination weatherstrip and hood bumper is located across the top of the radiator grille guard in a fixed position on CJ Models.

The hood bumper on the Cherokee, Wagoneer, and Truck are adjustable. Rubber caps must be removed to adjust the bumper bolts.

BUMPERS

GENERAL

Front and rear bumpers on CJ models are of one-piece construction.

Front bumpers on the Cherokee, Wagoneer, and Truck models are of three piece construction. Rear bumpers of three-piece construction are used on the Cherokee and Wagoneer. Trucks, when equipped with a rear bumper have a one piece bumper.

Bumper bar ends on the Cherokee, Wagoneer, and Truck may be removed individually.

Front and rear energy-absorbing bumpers are available as optional equipment on CJ, Cherokee, and Wagoneer models. They are not available on Trucks, nor on CJ's with rear-mounted spare tire.

Front bumper guards are available as an option on standard bumpers on all except CJ models.

ENERGY-ABSORBING BUMPER SYSTEM

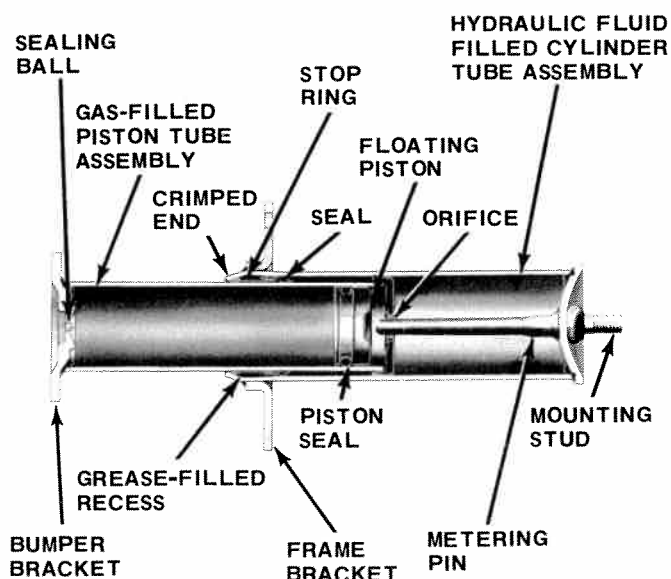
Description

The energy-absorbing bumper system consists of the bumper assembly, mounting brackets, and two energy absorbers.

The energy absorbers consists of a piston tube assembly (fig. 14-16). The piston tube is charged with an inert gas, and the cylinder tube is filled with hydraulic fluid.

The piston and cylinder tube assemblies are united by crimping the cylinder tube at the piston tube stop ring. The recess in the stop ring area is filled with grease to prevent the entrance of water and other contaminants.

The piston tube assembly is attached to the vehicle bumper and the cylinder tube assembly is attached to the frame.



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Fig. 14-16 Cross-Section of Front Energy Absorber in Extended Position

Operation

Gas pressure in the piston tube assembly maintains the unit in an extended position with sufficient rigidity to withstand normal jacking and wrecker towing stresses. Extension is limited by a stop ring on the outside of the piston tube.

Upon impact hydraulic fluid from the cylinder tube is forced into the piston tube through a metering orifice. The rate at which the hydraulic fluid passes through the orifice is controlled by a metering pin. It is this controlled passage of hydraulic fluid which dampens the impact and provides energy absorption.

Hydraulic fluid that is forced from the cylinder tube into the piston tube displaces the floating piston and

compresses the gas behind it. After impact, the pressure of the compressed gas behind the floating piston forces the hydraulic fluid back into the cylinder tube, and returns the absorber to its extended position.

Diagnostic Procedure

CAUTION: Energy absorbers must not be tested by driving vehicle against posts, walls, or barriers.

NOTE: The right and left energy absorbers should be diagnosed separately.

Leakage

Some oil wetting may be visible due to slight seepage of the grease packed as a sealant in the recess above the crimp (fig. 14-16). Such stains or oil traces on the piston tube near the crimped end are normal. If hydraulic fluid drips continuously from the crimped end, or from the mounting stud end of the unit, a leak is indicated and the unit should be replaced.

Damage

Inspect bumper assembly, mounting brackets, and energy absorbers for evidence of collision damage. Some scuffing of the piston tube will occur and is to be considered normal. If there is obvious damage to the unit (dents, torn mounts, etc.), it should be replaced.

On-Vehicle Test

Energy absorbers can be tested on the vehicle by compressing each unit separately $3/8$ -inch (or more), and observing whether the bumper returns to its normal position. The ignition should be off, the transmission in park (P) position, the parking brake set, and service brake pedal depressing tool installed. A suitable barrier can be utilized, such as pillar, wall, post, or an anchorable device such as that used for body or frame repair. The jacking device can be a hydraulic or mechanical jack or a hydraulic pump-type unit. Refer to fig. 14-17 for typical test setup.

(1) Align jacking device with energy absorber being tested.

NOTE: The jacking device should be positioned squarely with the bumper to avoid slipping.

(2) Apply pressure to compress energy absorber at least $3/8$ -inch, using an indicator (such as a six-inch scale) to detect travel.

(3) Relieve pressure and allow bumper to return to original position.

(4) Repeat above procedures for each energy absorber.

If bumper returns to its original position, the energy absorber is capable of withstanding low-speed impacts. If an energy absorber fails to return to its original position, it should be replaced.

fluid drips continuously from the crimped end, or from the mounting stud end of the unit, a leak is indicated and the unit should be replaced.

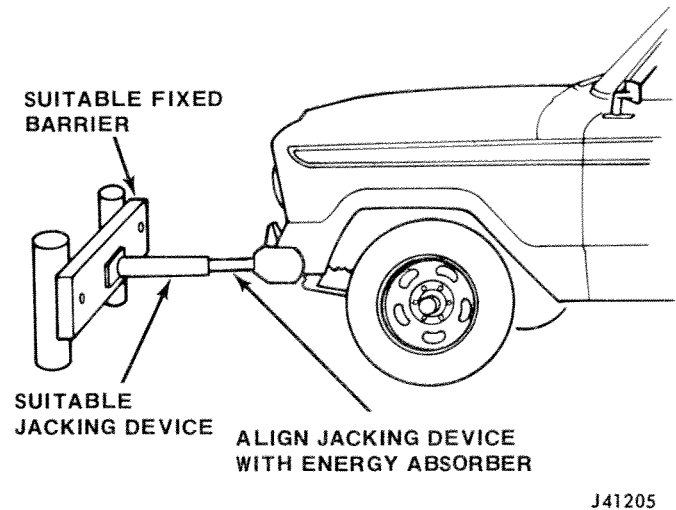


Fig. 14-17 Typical On-Vehicle Energy Absorber Test

Bench Test

Energy absorbers may be bench tested prior to installation on a vehicle or to check energy absorbers removed while making collision repairs.

Use a suitable arbor press to compress energy absorber at least $3/8$ -inch. Observe whether the energy absorber returns to its original position. If not, the unit should be replaced.

Disposal

Relieve gas pressure if the energy absorber is to be scrapped. Use a heavy metal punch and hammer, and break the weld at the sealing ball in the end of the piston tube (fig. 14-16).

WARNING: Wear approved safety glasses when depressurizing an energy absorber. Never apply heat or attempt to weld or repair pressurized units.

When an energy absorber is bound-up as a result of a collision it should be removed from the vehicle only after the gas pressure has been relieved.

Use the following procedure to depressurize the unit.

(1) Stand clear of the bumper.

(2) Provide positive restraint by securing the bumper to the frame or bumper support with a chain or cable.

(3) Relieve gas pressure by drilling a $1/16$ -inch hole in the piston tube near the bumper bracket end.

(4) Remove energy absorber from vehicle.

Replacement

(1) Support one end of the bumper and remove energy absorber-to-bumper bolts at supported end.

- (3) Remove hardware attaching energy absorber to vehicle frame and remove energy absorber from vehicle.

(5) Position bumper assembly on energy absorbers and install attaching hardware loosely.

CAUTION: Do not allow either end of the bumper assembly to drop. If dropped, the energy absorber at the opposite end could be turned and the crimped seal damaged.

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