BUMPERS

CONTENTS

DESCRIPTION AND OPERATION

DESCRIPTION AND OPERATION OF THE ENERGY ABSORBING UNIT

The bumpers on all 1973 Buicks have increased metal thickness, larger backing plates, and on the front only, energy absorbing units. These modifications allow the vehicle to withstand a 5 M.P.H. barrier impact at the front bumper and a 2.5 M.P.H. barrier impact at the rear bumper without any major damage.

Energy Absorbing Unit

The energy absorbing unit (Figure 2B-1) is located between the front bumper and frame. It provides the mounting for the bumper and is designed to absorb low speed impact energy and return the bumper to it original position without any major damage.

The unit consists of two sub-assemblies. The piston tube and the cylinder tube (Figure 2B-2).

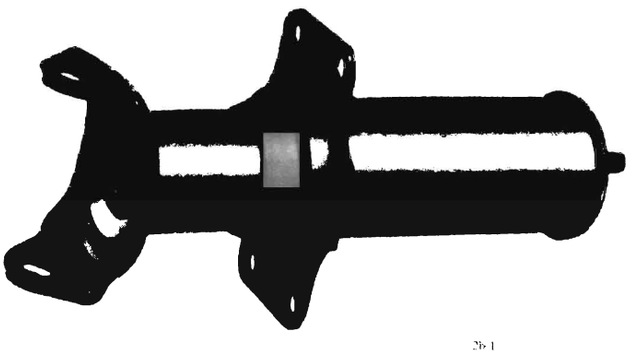


Figure 2B-1 Energy Absorbing Unit

The piston tube assembly is filled with a pressured gas and consists of a bumper bracket, piston tube, orifice, seal, piston seal, piston and stop ring.

The cylinder tube assembly is filled with a hydraulic fluid and consists of a frame bracket, cylinder tube, mounting stud and metering pin.

The piston tube assembly is inserted into the cylinder tube assembly and the cylinder tube is crimped. The crimp mates with the stop ring to hold the unit together. The recess in the stop ring area is filled with grease to keep out foreign material.

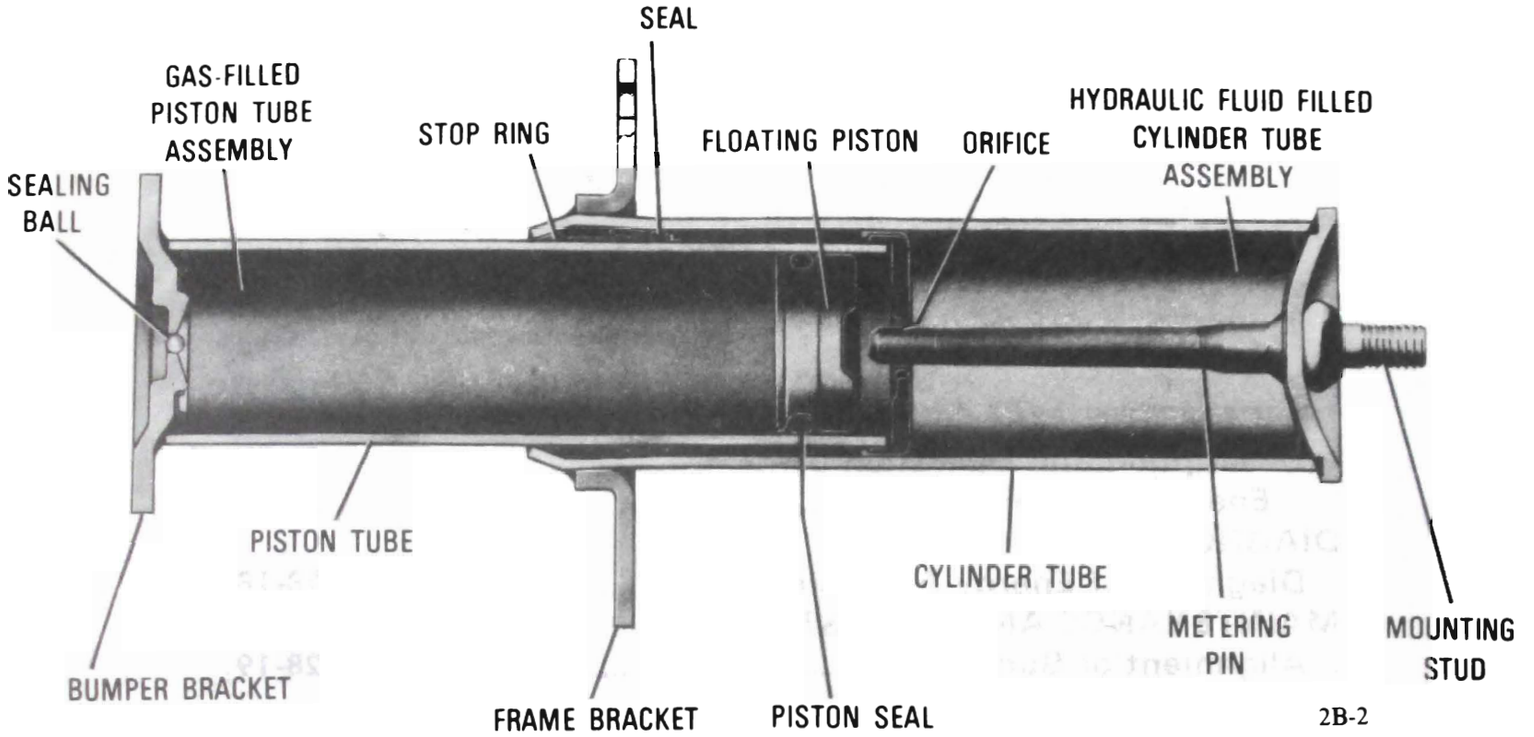


Figure 2B-2 Cutaway Energy Absorbing Unit

When attached to the vehicle the piston tube attaches to the bumper and the cylinder tube to the frame (Figure 2B-3).

The gas pressure in the piston tube assembly maintains the unit in the extended position. Extension is limited by the stop ring on the outside of the piston tube engaging the matching contour of the crimp on the cylinder tube. The engagement is also intended to provide strength to withstand jacking and towing stresses.

As the energy absorber is collapsed upon impact the hydraulic fluid in the cylinder tube is forced into the piston tube through the orifice.

The metering pin controls the rate at which the fluid passes through the orifice. This controlled passage of fluid provides the absorbing action.

The hydraulic fluid that is forced into the piston tube displaces the floating piston compressing the gas behind the floating piston. After impact the pressure of the compressed gas behind the piston forces the hydraulic fluid back into the cylinder tube extending the unit to its original position.

DIAGNOSIS

DIAGNOSIS OF ENERGY ABSORBING UNIT

NOTE: *Each energy absorber must be diagnosed separately.*

1. Do not repair weld or apply heat to the units.
2. Do not drive into barriers to test the units.

Recommendations for Handling Energy Absorbing Units

1. If a unit is to be scrapped, relieve pressure by breaking the weld at the sealing ball in the end of the piston tube with a punch and hammer (Figure 2B-4).

WARNING: Wear approved safety glasses.

2. If a unit is bound-up and will not extend, provide a positive restraing such as a chain or cable and stand clear of the bumper. Relieve the gas pressure by drilling a small hole in the piston tube near the bumper bracket. Remove the unit only after the pressure has been relieved.

WARNING: Wear approved safety glasses.

3. When removing one unit from the vehicle it may be necessary to support the bumper to prevent rotation of the other unit.

4. Do not test the units by driving the vehicle into barriers.

5. Do not immerse units in solvents.

Leakage

Some oil wetting may be due to the greased packed into the crimp recess. However, if oil is continuously dripping from the crimp or the stud end of the unit, the unit should be replaced.

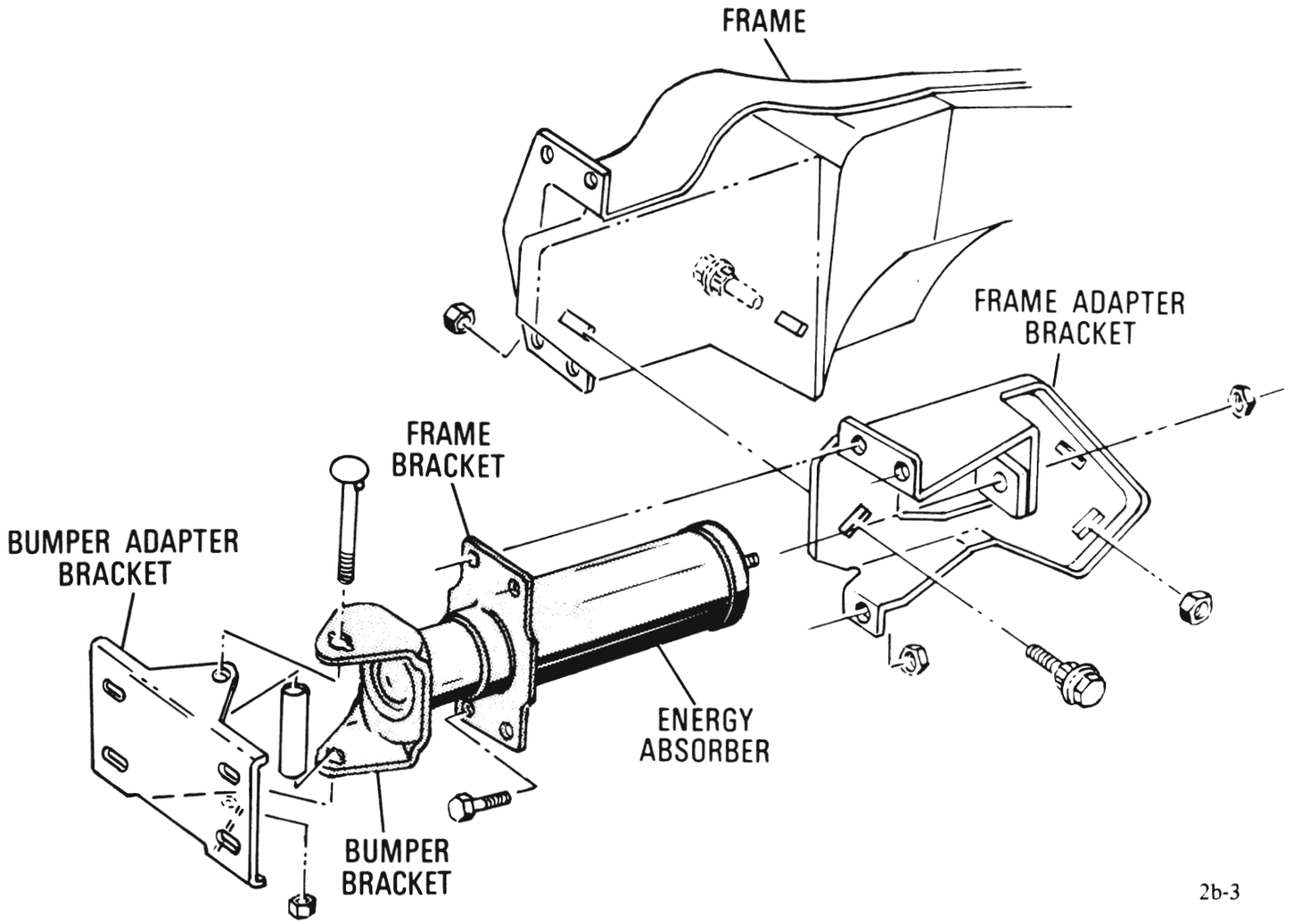


Figure 2B-3 Typical Mounting Energy Absorbing Unit

Damage

Observe the bumper bracket, piston tube, frame bracket and cylinder tube for collision damage. Scuffing of the tube is normal (Figure 2B-5). If there is obvious damage replace the unit.

On Car Test

This test involves compressing EACH unit separately 3/8" or more and observing that the bumper returns to its normal position.

1. Turn off ignition, transmission in park, parking and service brakes set.

2. Use a barrier such as a pillar, wall, post, etc.

3. Align a pressure device, such as a hydraulic jack, with the jacking slot in the bumper. Make sure it is positioned squarely with the bumper so it will not slip.

4. Apply pressure to compress the unit 3/8". Use a 6" scale to determine travel. Release pressure and note if the bumper returns to its normal position.

5. If either unit fails to return to its normal position, replace it.

Bench Test

A suitable arbor press should be used to compress the unit 3/8". Observe if it returns to its normal position. If not, this unit should be replaced.

MAINTENANCE AND ADJUSTMENTS

ALIGNMENT OF BUMPERS

The front bumper brackets and supports are slotted to allow alignment to adjacent parts. The rear

Figure 2B-4 Relieve Pressure Before Scrapping

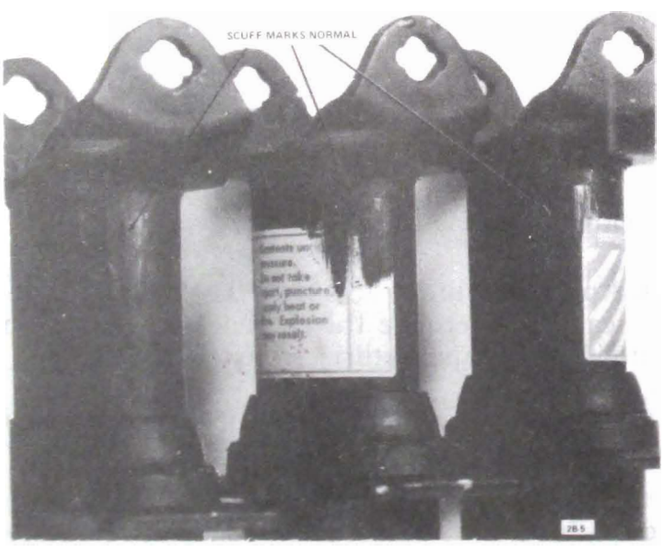


Figure 2B-5 Operated Unit

bumper brackets and braces are also slotted for alignment.

MAJOR REPAIR

"A" SERIES FRONT BUMPER

Faceplate Removal

1. Remove the top and bottom bolts from the two center grill supports (Figure 2B-6) and swing out of the way.

2. Remove the faceplate to reinforcement nuts by using the access holes in the reinforcement plate. It may be helpful to place body calk inside of the socket to retain the nuts during removal and installation (Figure 2B-7).

3. Remove the two faceplate to energy absorbing unit, bracket bolts (Figure 2B-8).

4. Remove the faceplate and protect it from scratching.

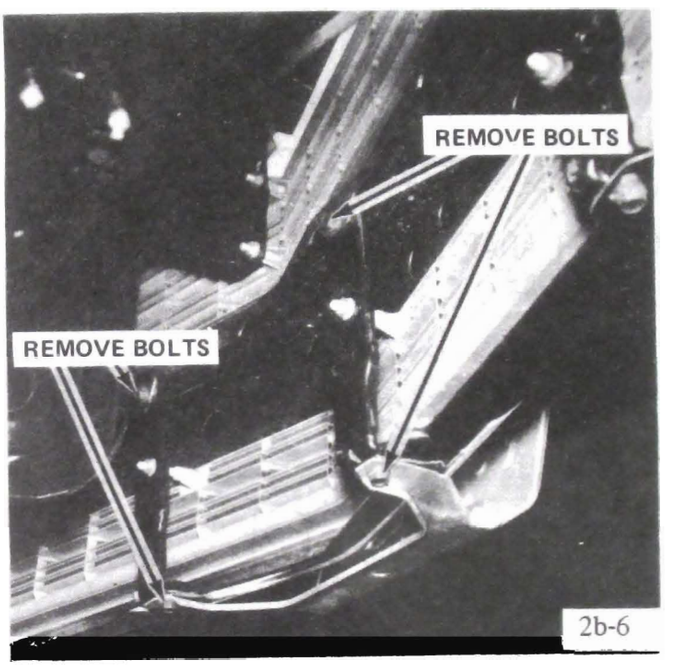


Figure 2B-6 Removal of Grill Supports

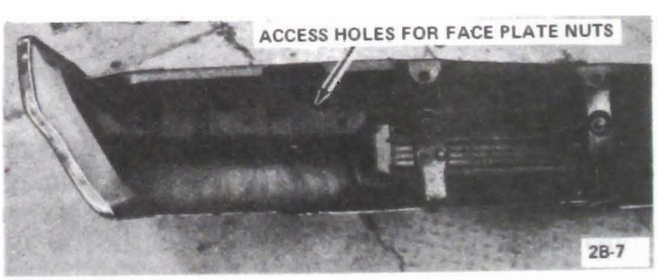


Figure 2B-7 Access Holes for Faceplate Nuts "A" Series

Faceplate Installation

1. Position faceplate on reinforcement and align, as per Figure 2B-22.

2. Reverse the removal procedure for installation of the faceplate.

Energy Absorbing Unit Removal

1. Support the bumper assembly to prevent it from accidently falling.

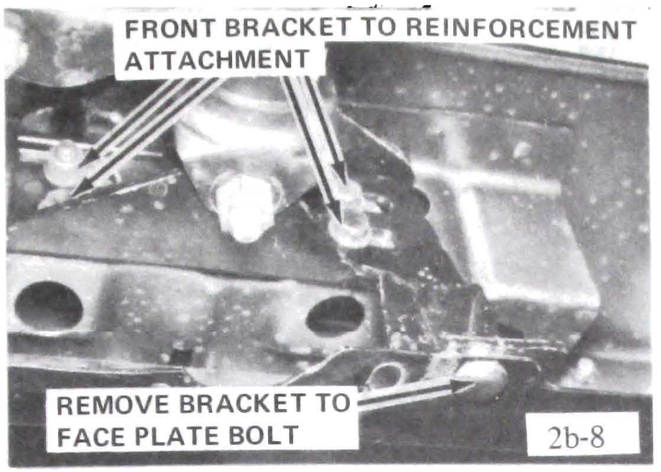


Figure 2B-8 Faceplate to Unit Bracket Bolt "A" Series

2. Remove the 6 bolts and 2 nuts that attach the energy absorbing unit front brackets to the bumper reinforcement. Remove the 2 energy absorbing unit front bracket to faceplate bolts (Figure 2B-8).

3. With the aid of a helper, remove the bumper assembly.

4. Remove the energy absorbing unit front bracket to unit bolts (Figure 2B-9).

5. Remove the nuts on the back of the unit and 4 bolts that attach this unit to the frame bracket (Figure 2B-9). Slide the unit forward to remove.

Energy Absorbing Unit Installation

CAUTION: *Bumper and energy absorbing unit must be aligned properly to assure effective operation of the system. Align per Figure 2B-22.*

1. Reverse the removal procedure for installation and aligning.

"A" SERIES (LESS WAGON) REAR BUMPER

Faceplate Removal

1. Disconnect license plate light.

2. Remove the nuts attaching the bumper to frame (Figure 2B-10).

3. With the aid of a helper remove the bolts attaching bumber bracket to frame and then remove bumper assembly. Protect faceplate from scratches.

4. Remove reinforcement assembly from the faceplate and brackets.

5. Remove the 2 center support brackets from the faceplate.

6. Remove the 2 bumper anchor brackets. Refer to Figure 2B-10.

Faceplate Installation

1. Reverse the removal procedure for installation and alignment of the bumper assembly. Flatten mounting areas on frame and brackets before installation to allow proper alignment and bolt retension. See Figure 2B-22.

A SERIES WAGON REAR BUMPER

Removal and Installation

Refer to Figure 2B-11. Flatten mounting areas on frame and brackets before installation to allow proper alignment and bolt retension.

"B-C" SERIES FRONT BUMPER

Faceplate Removal

1. Raise front of car to gain access under car.

2. Remove the bottom 4 faceplate to reinforcement bolts (Figure 2B-12).

3. Remove the faceplate to reinforcement plate nuts (Figure 2B-12). These nuts also retain the rub strips on cars so equipped.

4. Disconnect the left side rubber flap from the reinforcement to allow free movement of faceplate (Figure 2B-12).

5. Remove the faceplate and protect from scratching.

Faceplate Installation

1. Position faceplate on reinforcement and align, as per Figure 2B-23.

2. Reverse the removal procedure for installation of the faceplate.

Energy Absorbing Unit Removal

1. Raise front of car.

2. Remove the bolts that attach the energy absorbing unit bracket to reinforcement and bumper (Figure 2B- 13). With the aid of a helper remove the bumper assembly.

3. Remove the 2 energy absorbing unit front bracket to unit bolts and remove bracket (Figure 2B-14).

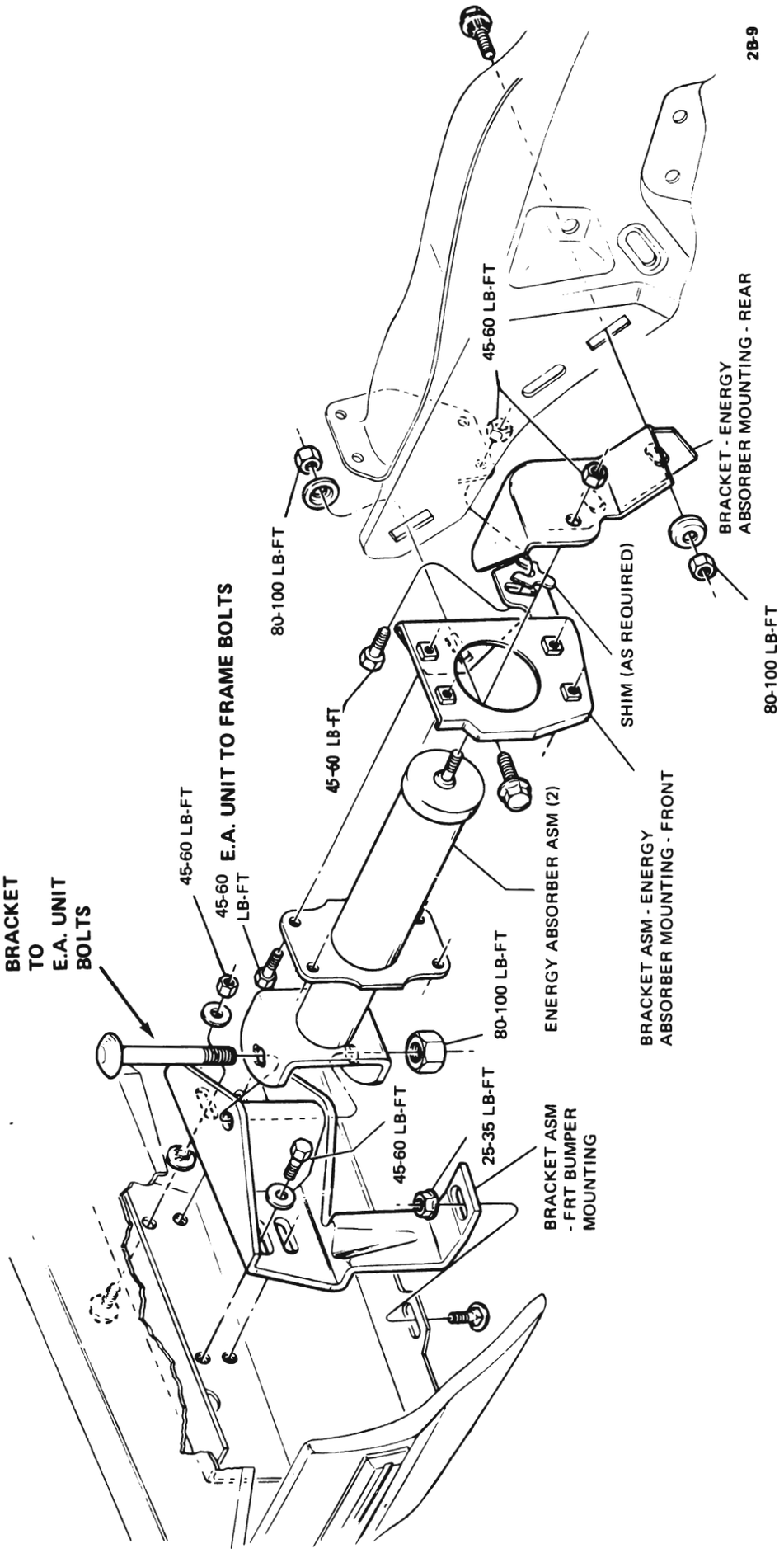


Figure 2B-9 Energy Absorbing Unit Mounting "A" Series

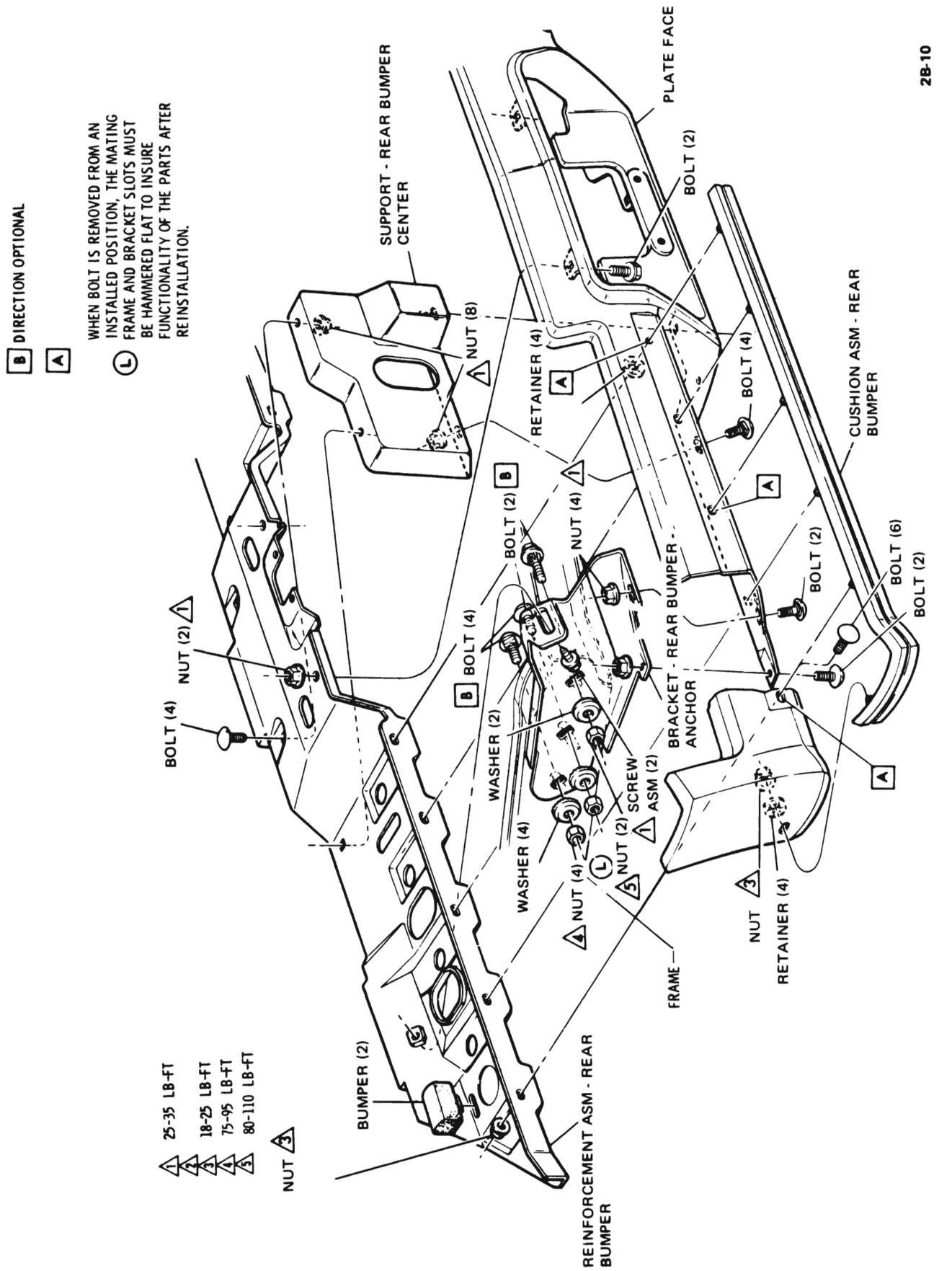


Figure 2B-10 "A" Series Rear Bumper

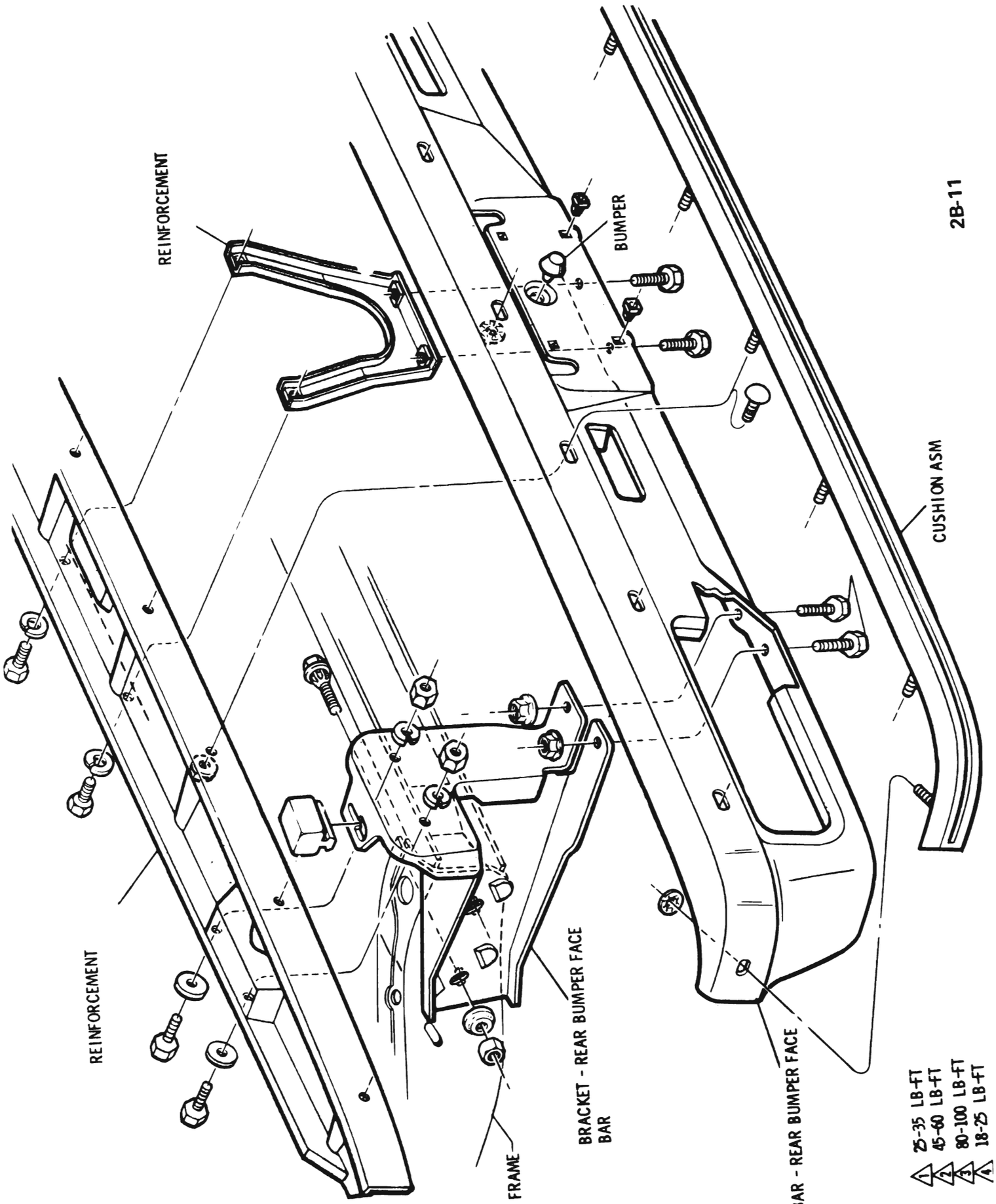


Figure 2B-11 "A" Wagon Rear Bumper

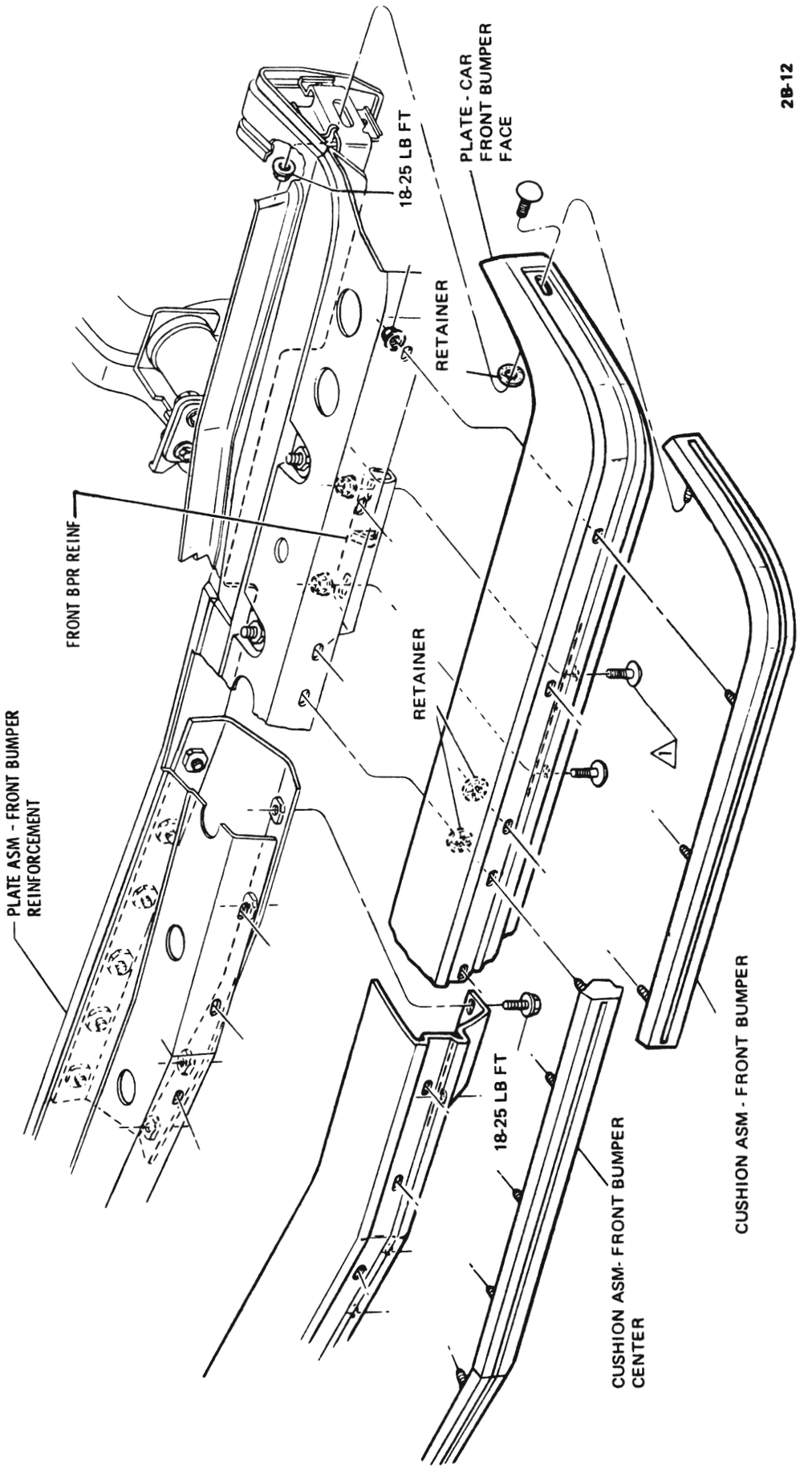


Figure 2B-12 "B-C" Series Front Bumper

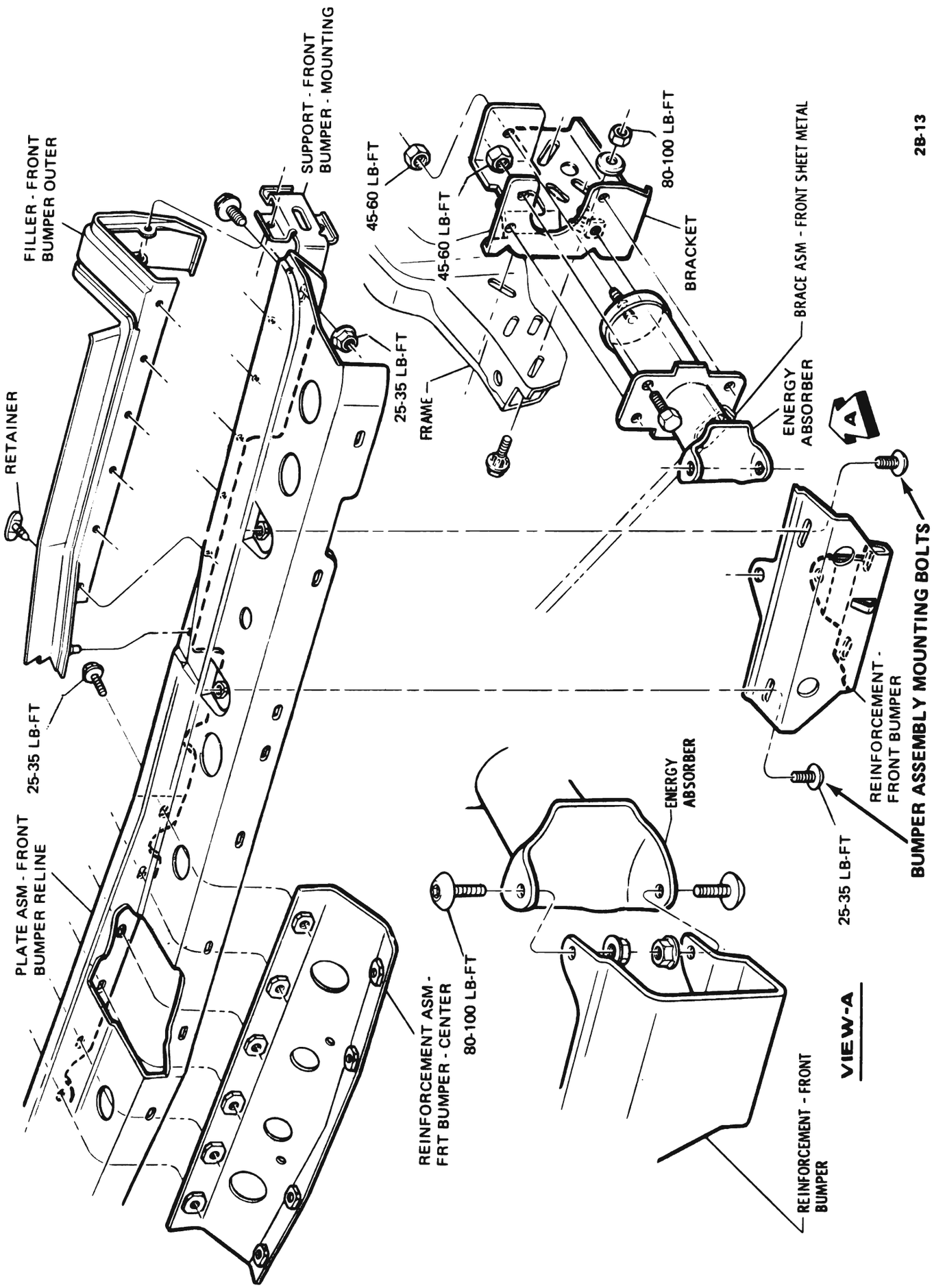
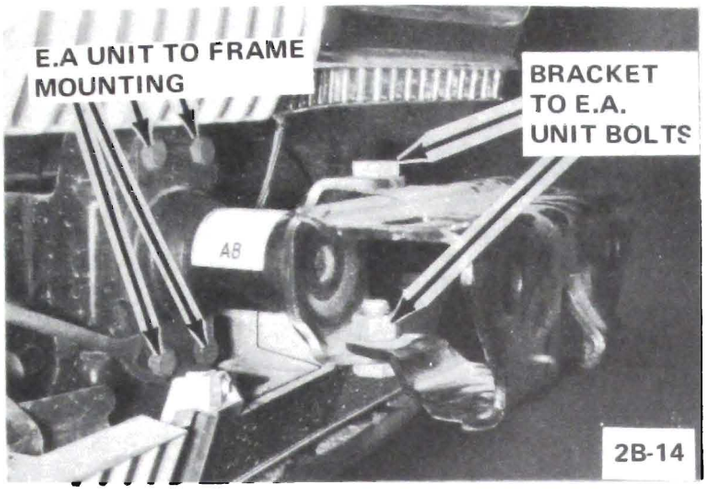


Figure 2B-13 Unit Bracket to Reinforcement "B-C" Series

4. Remove the nut on back of the unit and 4 bolts that attach the unit to the frame bracket. Remove the unit. (Figure 2B-14).



Unit to Frame Mounting "B-C" Series

Energy Absorbing Unit Installation

> **CAUTION:** *Bumper and energy absorbing unit must be aligned properly to assure effective operation of the system. See Figure 2B-23.*

1. Reverse the removal procedure for installation and aligning.

"B-C" SERIES (LESS WAGON) REAR BUMPER

Faceplate Removal

1. Disconnect battery and all sockets and grounds from inner lamp housings.

2. On "B" Series, remove the two lamp housing opening support brackets by removing the two screws and moving the bracket free. (Figure 2B-15). Completely free the wiring harness from the bumper assembly.

3. Remove the 4 nuts that attach the bumper brackets to the frame. (Figure 2B-15 or 2B-16).

4. With the aid of a helper remove the 4 bolts and then the bumper assembly. Protect the faceplate from scratching.

5. Remove all light housings from the assembly.

6. Remove the reinforcement plate from the faceplate by removing all attaching nuts and bolts. Lift the reinforcement from the faceplate.

7. If equipped with rubber cushion strips remove all attaching nuts and remove strips.

Faceplate Installation

1. Reverse the removal procedure for installing and aligning bumper assembly. Flatten mounting areas on frame and brackets before installation, to allow proper alignment and bolt retension. See Figure 2B-23.

2. Check the operation of rear lights for correct hook-up.

"B" SERIES WAGON REAR BUMPER

Removal and Installation

Flatten mounting areas on frame and brackets before installation to allow proper alignment and bolt retension.

Refer to Figure 2B-17.

"E" SERIES FRONT BUMPER

Faceplate Removal and Installation

Refer to Figure 2B-18.

Energy Absorbing Unit Removal and Installation

> **CAUTION:** *Bumper and energy absorbing unit must be aligned properly to assure effective operation of the system. See Figure 2B-24.*

Refer to Figure 2B-19.

"E" SERIES REAR BUMPER

Removal and Installation

Flatten mounting areas on frame and brackets before installation to allow proper alignment and bolt retension.

Refer to Figures 2B-20 and 2B-21.

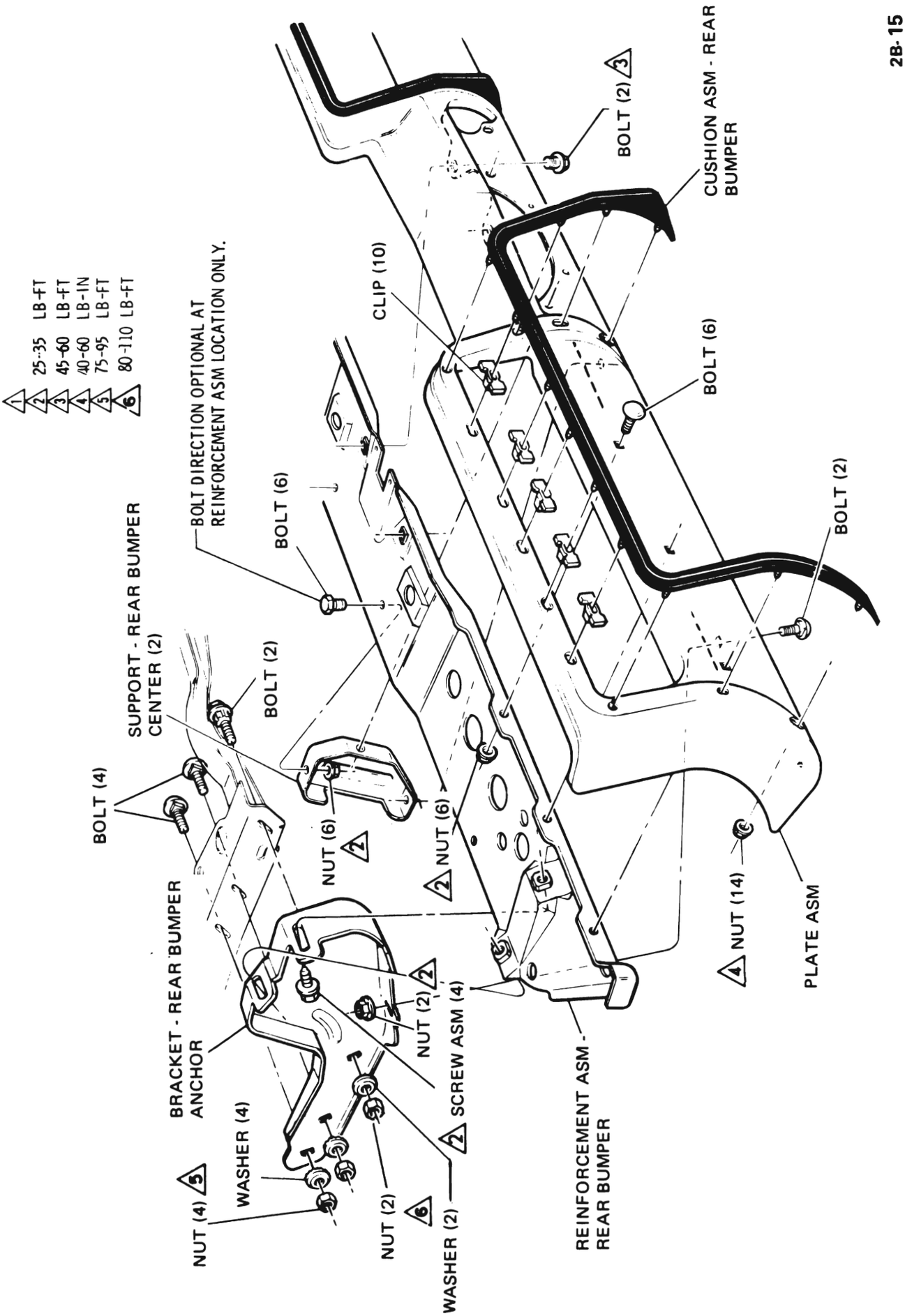


Figure 2B-15 "B" Series Rear Bumper

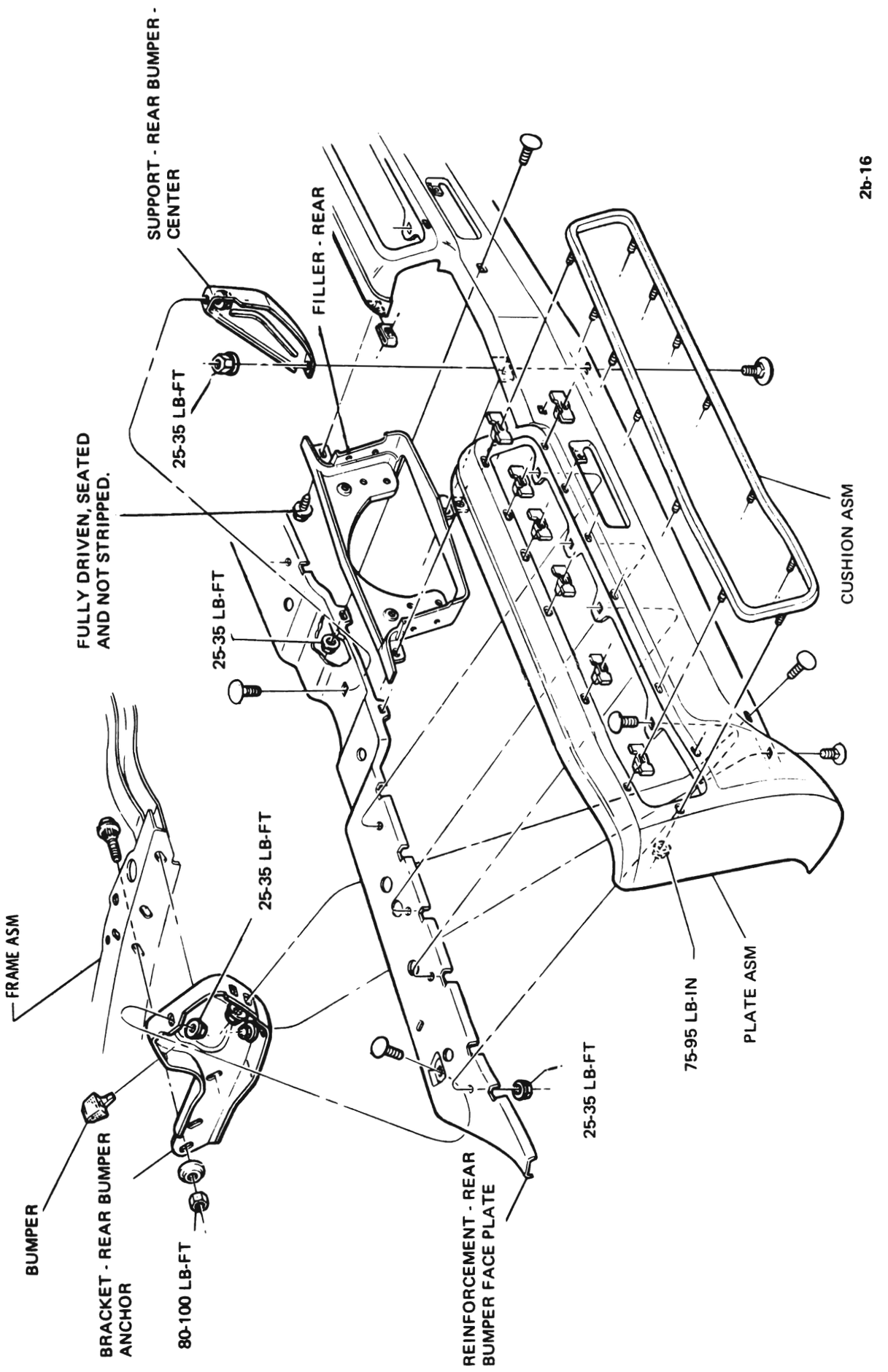


Figure 2B-16 "C" Series Rear Bumper

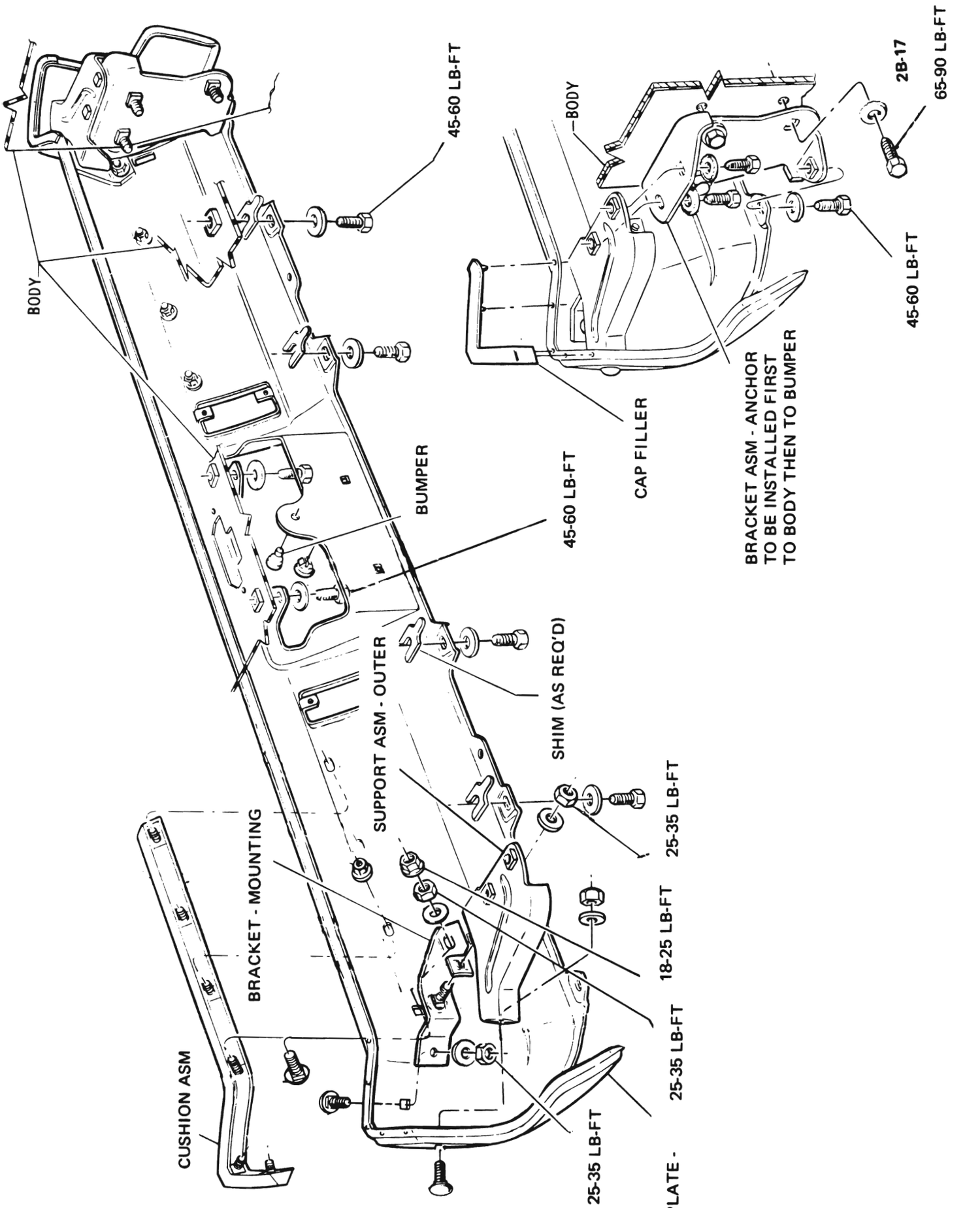


Figure 2B-17 "B" Wagon Rear Bumper

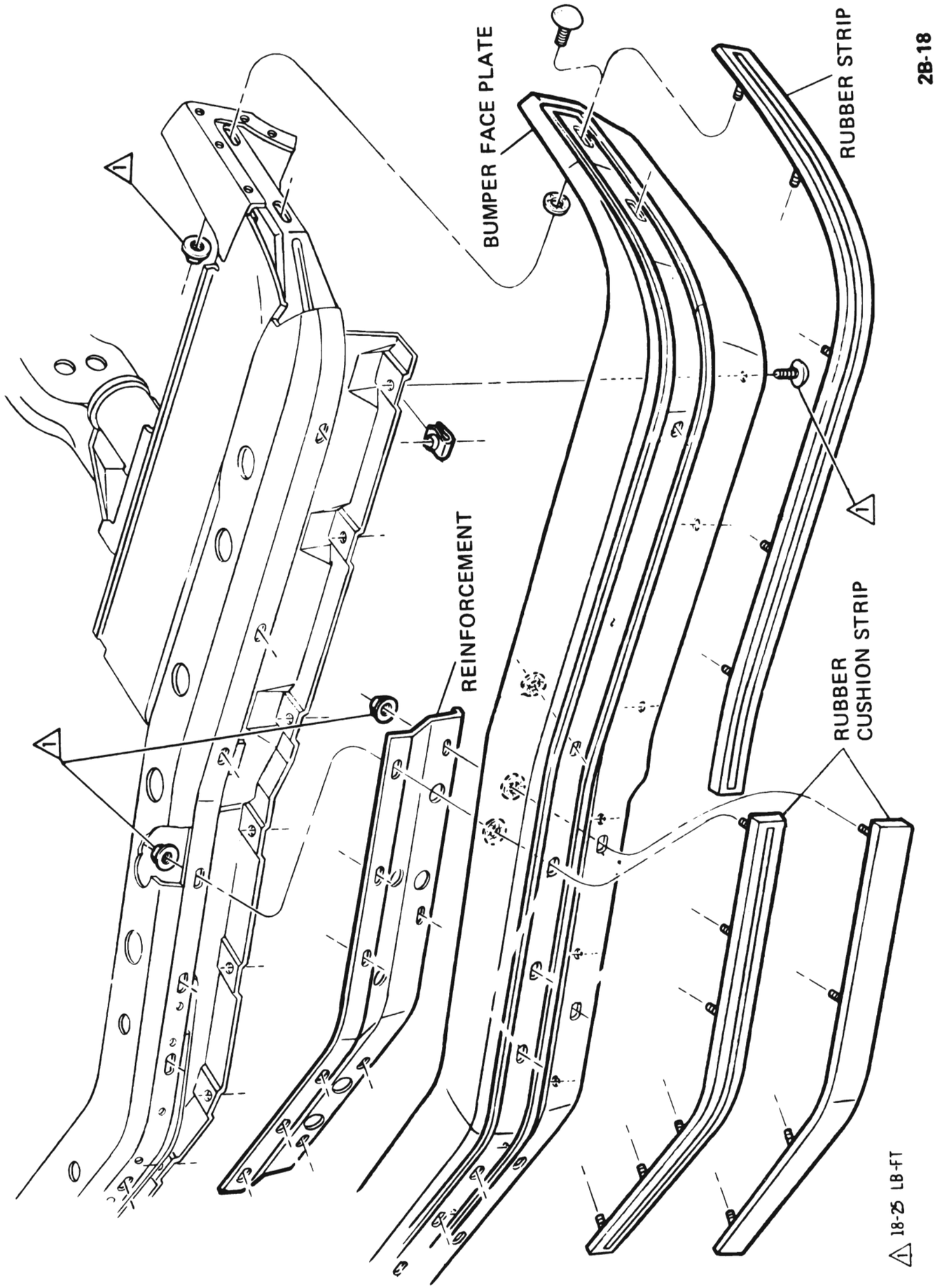


Figure 2B-18 "E" Series Front Bumper

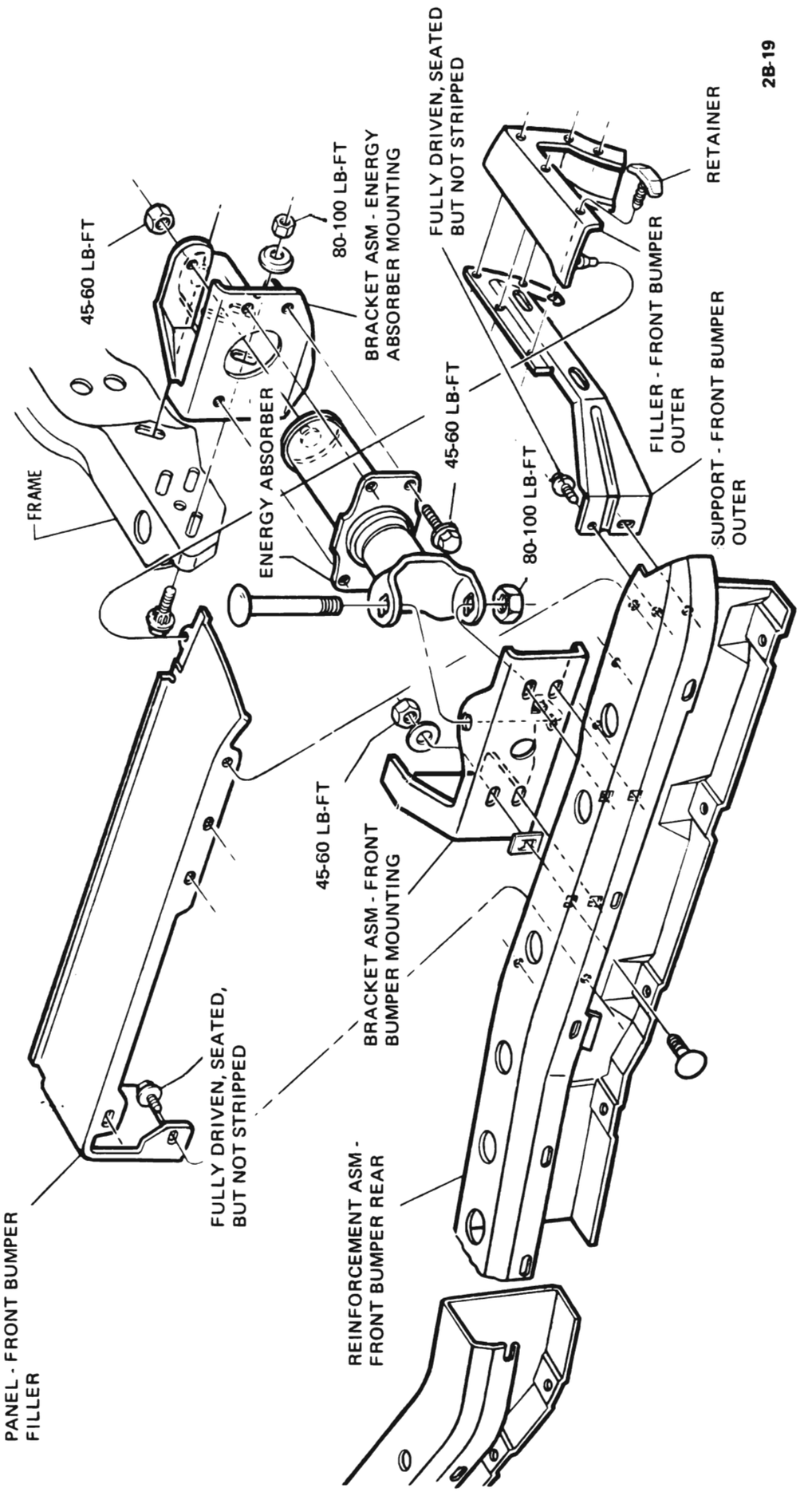


Figure 2B-19 "E" Series Energy Absorbing Unit

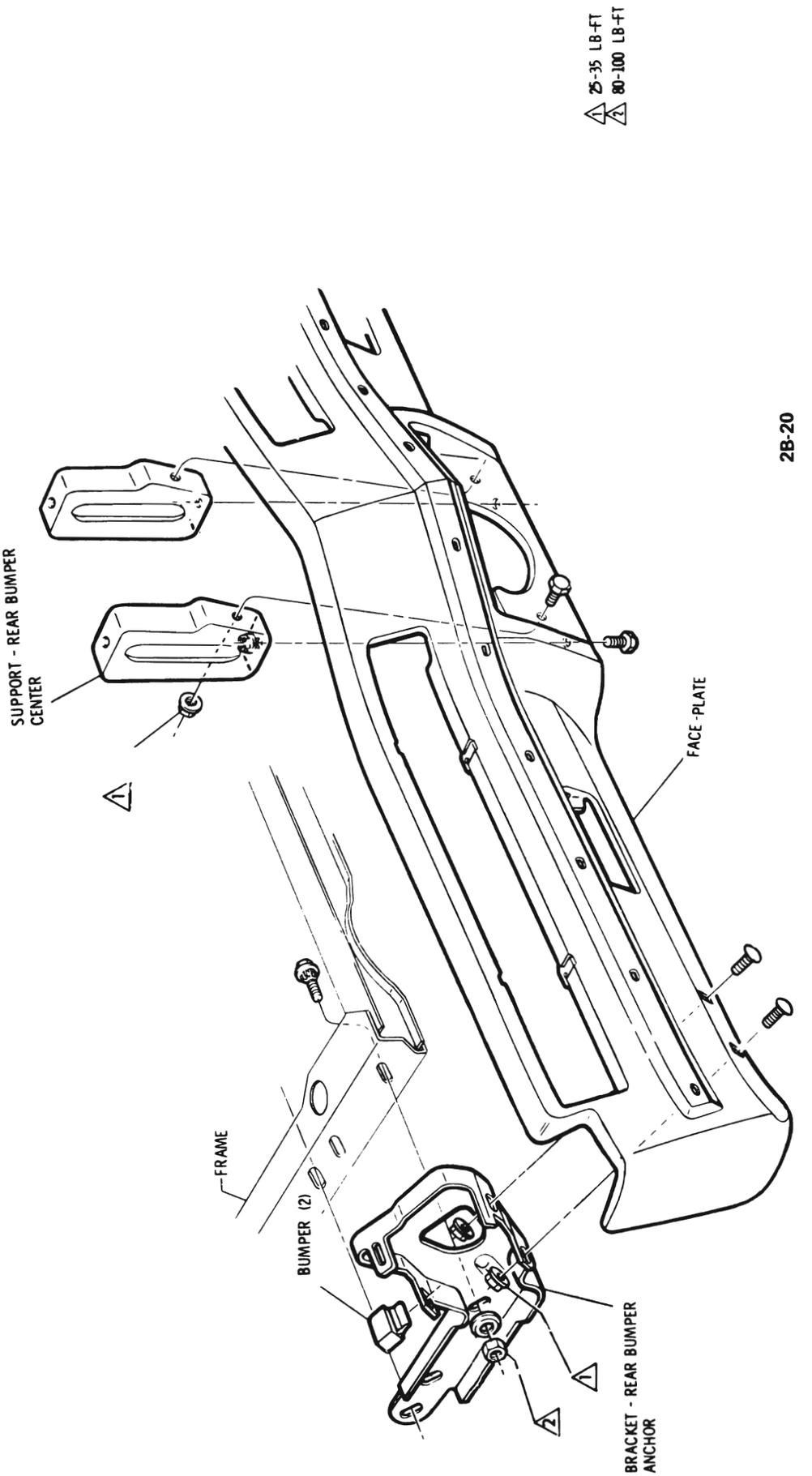


Figure 2B-20 "E" Series Rear Bumper Faceplate

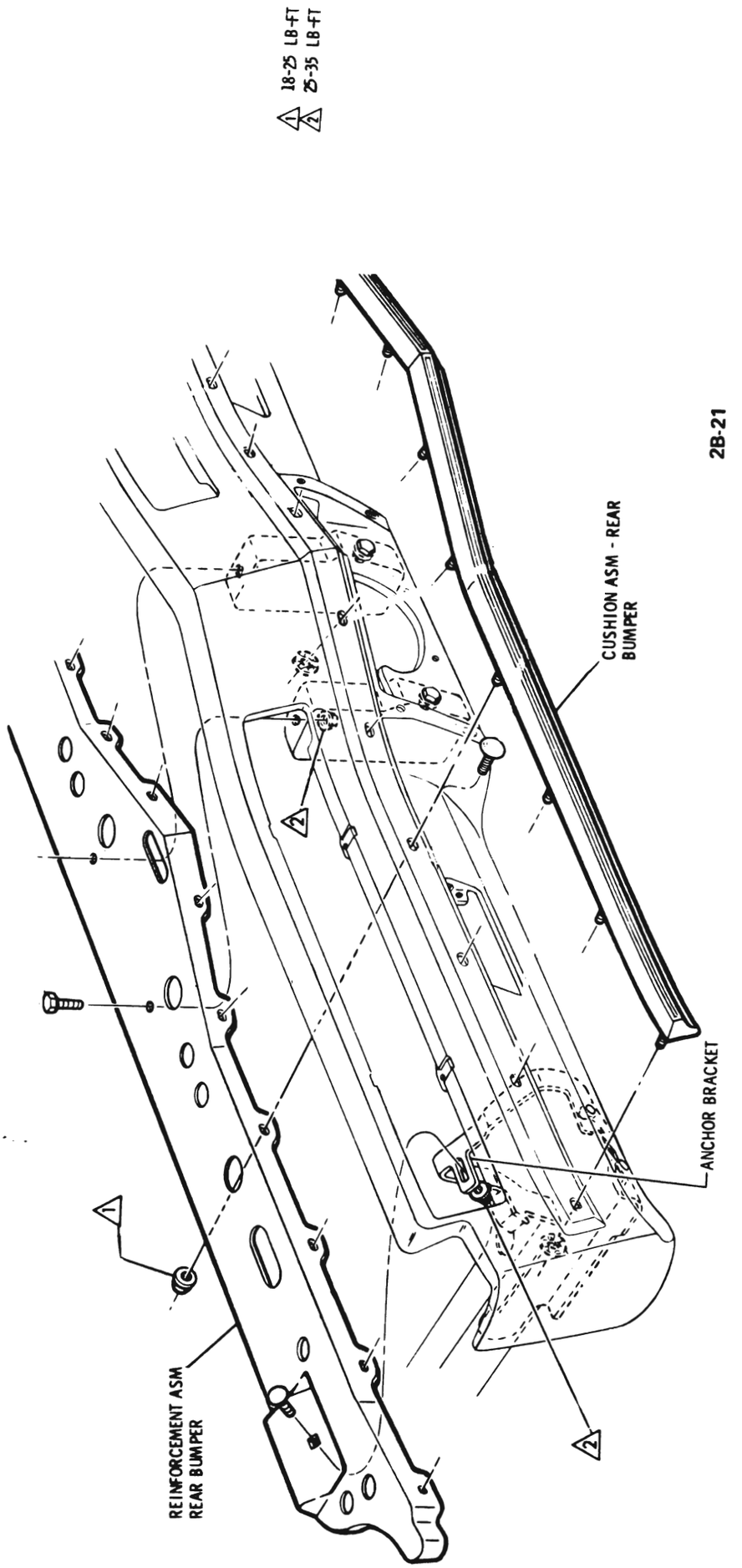
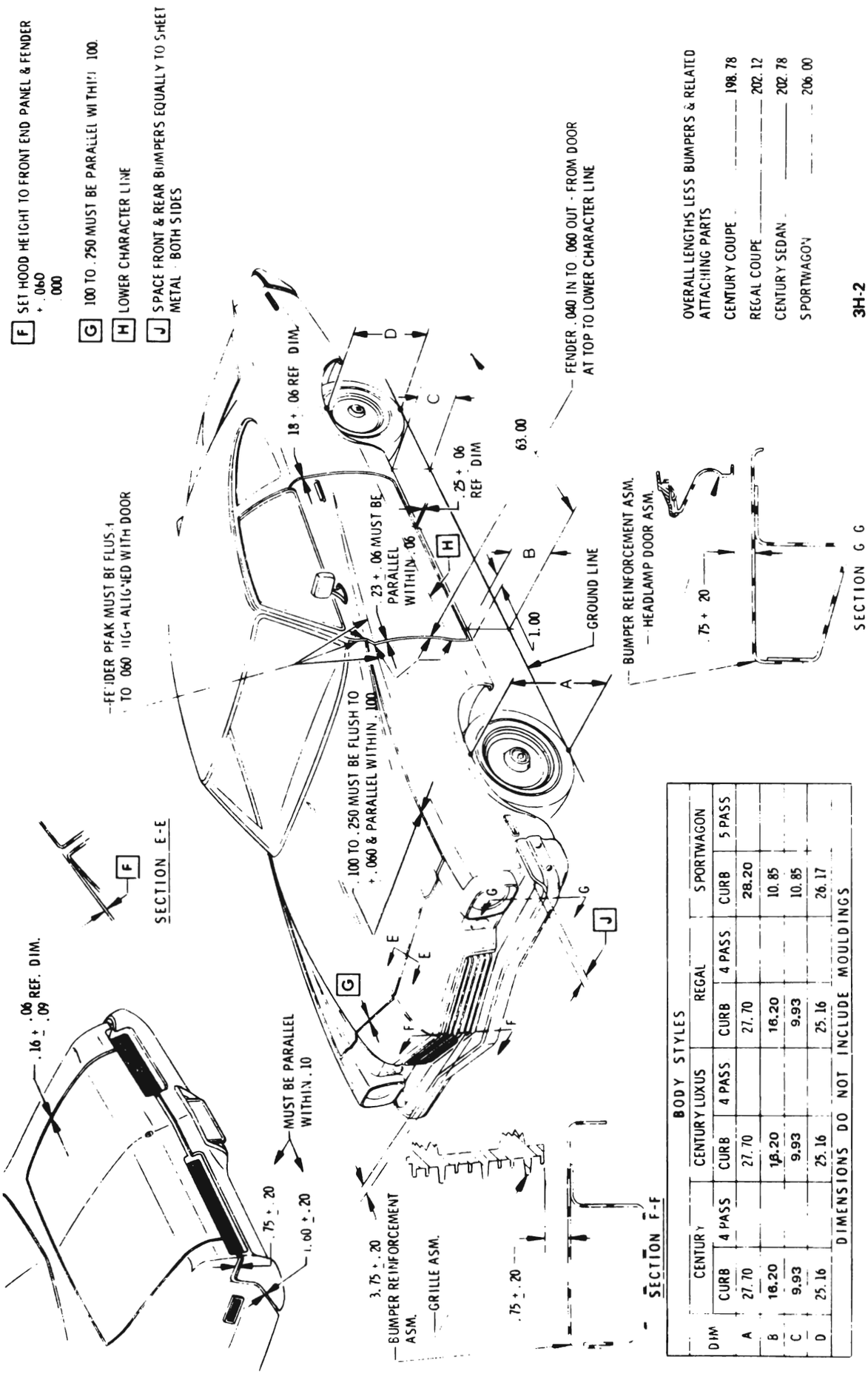
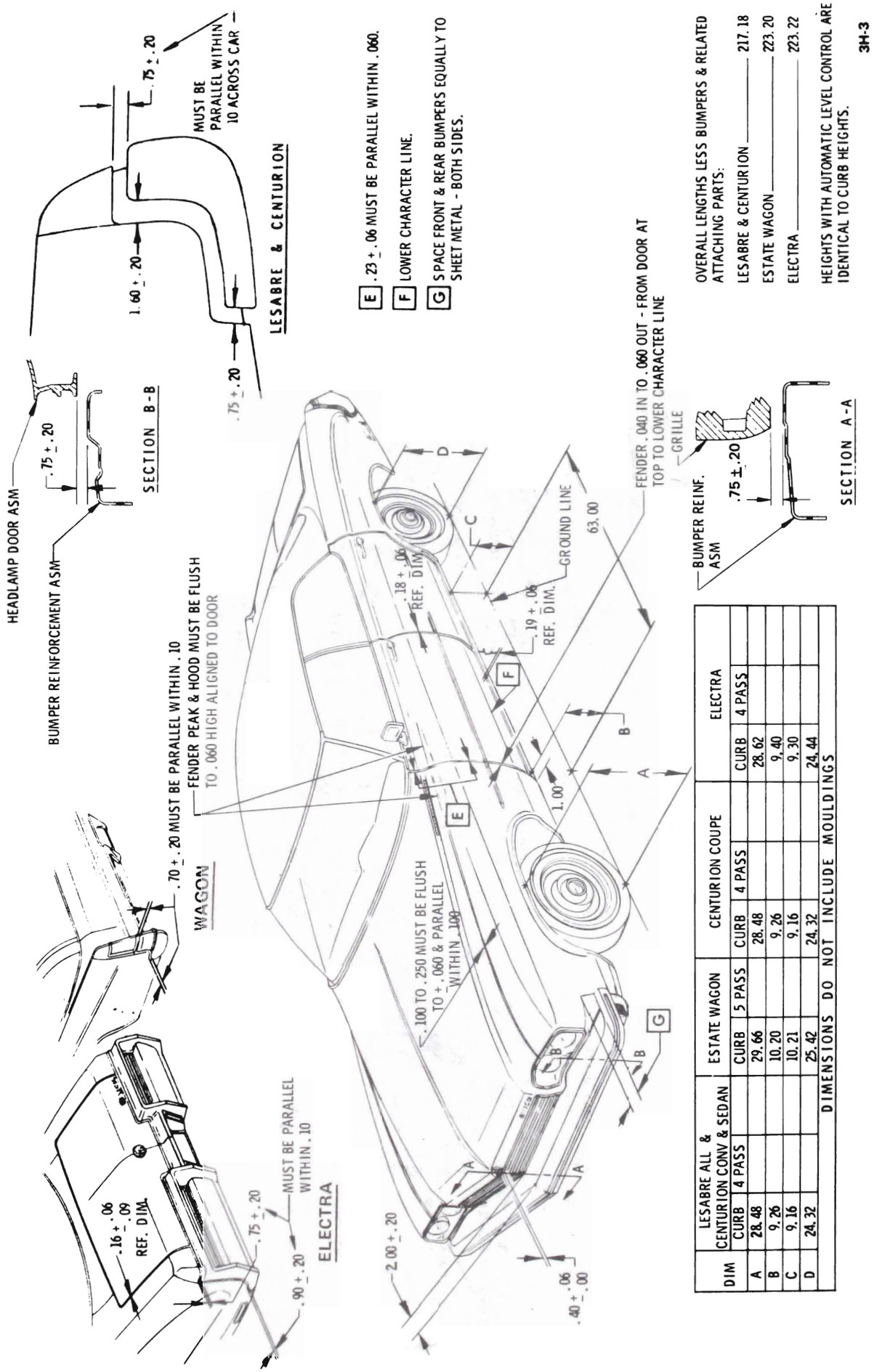


Figure 2B-21 "E" Series Rear Bumper Reinforcement



DIM	BODY STYLES								
	CENTURY		CENTURY LUXUS		REGAL		SPORTWAGON	
	CURB	4 PASS	CURB	4 PASS	CURB	4 PASS	CURB	5 PASS
A	27.70		27.70		27.70		28.20	
B	18.20		18.20		18.20		10.85	
C	9.93		9.93		9.93		10.85	
D	25.16		25.16		25.16		26.17	
DIMENSIONS DO NOT INCLUDE MOULDINGS								

Figure 2B-22 "A" Series Bumper Alignment



DIM	LESABRE ALL & CENTURION CONV & SEDAN		ESTATE WAGON		CENTURION COUPE		ELECTRA	
	CURB	4 PASS	CURB	5 PASS	CURB	4 PASS	CURB	4 PASS
A	28.48		29.66		28.48		28.62	
B	9.26		10.20		9.26		9.40	
C	9.16		10.21		9.16		9.30	
D	24.32		25.42		24.32		24.44	
DIMENSIONS DO NOT INCLUDE MOULDINGS								

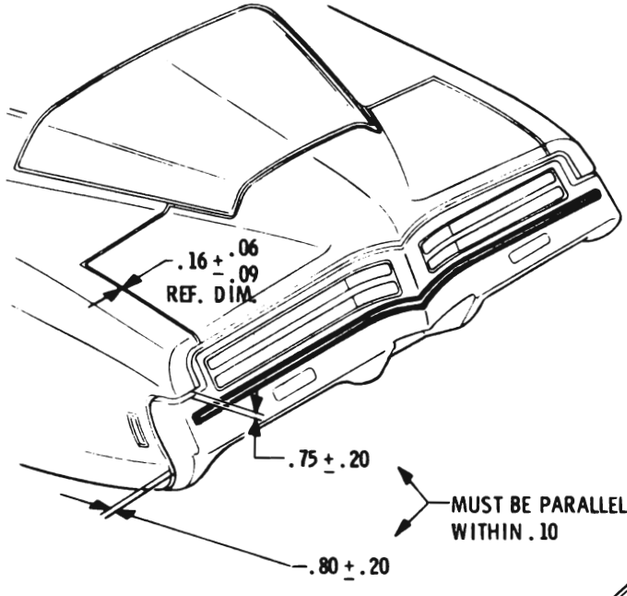
Figure 2B-23 "B-C" Series Bumper Alignment

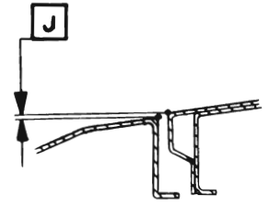
OVERALL LENGTH LESS BUMPERS & RELATED ATTACHING PARTS - 207.40

MOULDINGS NOT INCLUDED IN DIMENSIONS

HEIGHTS WITH AUTOMATIC LEVEL CONTROL ARE IDENTICAL TO CURB HEIGHTS

- **A** FENDER PEAK & HOOD MUST BE FLUSH TO .060 HIGH- ALIGNED WITH DOOR
- **B** LOWER CHARACTER LINE
- **C** FENDER .040 IN TO .060 OUT - FROM DOOR AT TOP TO LOWER CHARACTER LINE
- **D** .23 + .06 MUST BE PARALLEL WITHIN .060.
- **E** .100 TO .250 MUST BE FLUSH TO +.060 AND PARALLEL WITHIN .100
- **F** SPACE FRONT & REAR BUMPERS EQUALLY TO SHEET METAL - BOTH SIDES
- **G** .100 TO .250 AND PARALLEL WITHIN .100
- **H** FRONT OF FENDER & FRONT END PANEL MUST ALIGN WITHIN .06
- **J** SET HOOD TO FRONT END PANEL + .060 / .000





SECTION A-A

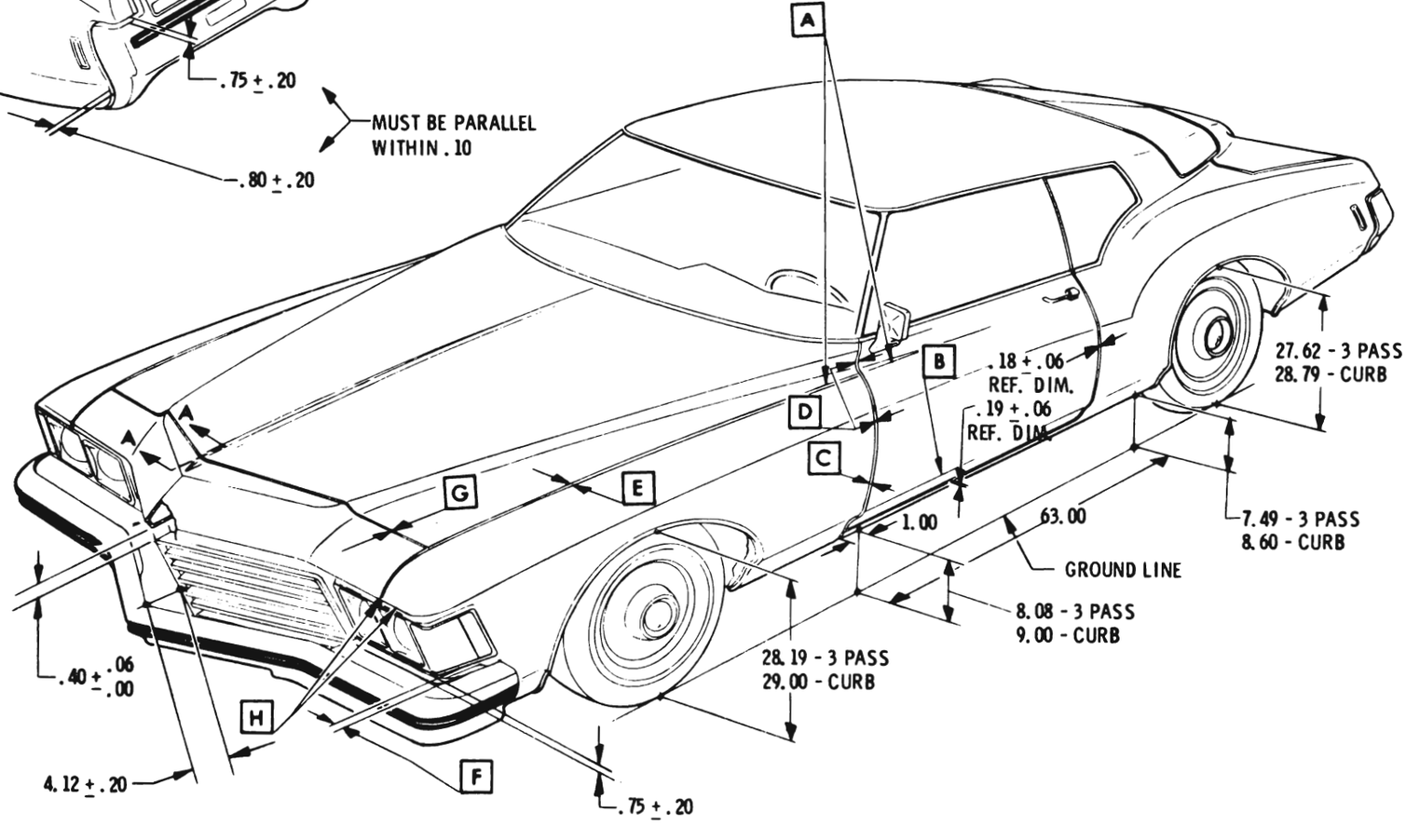


Figure 2B-24 "E" Series Bumper Alignment

3H-4