

REAR SUSPENSION

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DESCRIPTION AND OPERATION

DESCRIPTION OF REAR SUSPENSION

Rear Suspension - All Series Except Estate Wagon

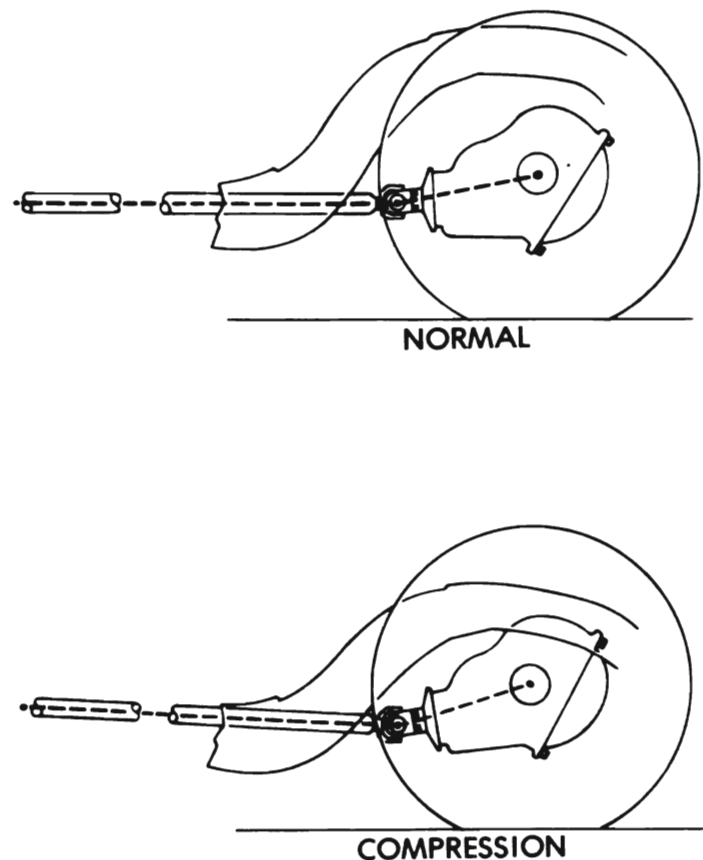
The rear wheels are not independently sprung, being incorporated in the rear axle assembly. Alignment is maintained by the rigid rear axle housing.

The rear axle assembly is attached to the frame through a link type suspension system. Two rubber bushed lower control arms mounted between the axle assembly and the frame maintain fore and aft relationship of the axle assembly to the chassis. Two rubber bushed upper control arms, angularly mounted with respect to the centerline of the car, control driving and braking torque and sideways movement of the axle assembly.

The upper control arms are shorter than the lower arms, causing the differential housing to "rock" or tilt forward on compression. This rocking or tilting lowers the rear propeller shaft to make possible the use of a lower tunnel in the rear floor pan area than would be possible with a conventional rear suspension. See Figure 3H-1.

The rear upper control arms control drive forces, side sway and pinion nose angle. Pinion angle adjust-

ment can greatly affect car smoothness and must be maintained as specified.



3H-1

Figure 3H-1 - Differential Tilting Action

The rear chassis springs are located between brackets on the axle tube and spring seats in the frame. The springs are held in the seat pilots by the weight of the car, with an insulator on top for noise isolation, and by the shock absorbers which limit axle movement during rebound.

Ride control is provided by two identical direct double acting shock absorbers angle-mounted between brackets attached to the axle housing and the rear spring seats.

Rear Suspension Estate Wagon

The rear wheels are not independently sprung, being incorporated into the rear axle assembly. The rear wheels are held in proper alignment with each other by the rigid construction of the axle housing. With the use of an open type drive line, driving and braking forces are taken by multi leaf springs.

Ride control is provided by two identical direct double acting shock absorbers angle-mounted between spring attaching plates at the axle housing and to the frame.

DESCRIPTION OF REAR SHOCK ABSORBERS

Shock Absorber Type and Location

Rear shock absorbers are Delco direct double action, (telescoping) hydraulic type. All shocks are filled with a calibrated amount of fluid and sealed during production; therefore, no refilling or other service is necessary or possible.

Each rear shock absorber is mounted at an angle with the upper end "in" toward the center of the car.

The upper end is attached to a frame bracket. The lower end is attached to a bracket welded to the rear axle tube.

The rear shock absorbers except for Superlifts are interchangeable with respect to left and right.

Front and rear are not interchangeable with each other.

DIAGNOSIS

CHECKING REAR SHOCK ABSORBERS

Many shock absorbers have been replaced and returned to the factory with the report that they were weak. When tested with special factory equipment, very few of these replaced units have been found

weak or otherwise below standard in operation. This indicates that these shock absorbers were needlessly replaced in an attempt to improve riding conditions that were actually standard or that bad methods were used in judging the operating condition of the shock absorbers.

Slight dampness around piston rod seal is normal and represents fluid used to lubricate the piston rod and seal.

Before attempting to test shock absorbers, make sure that all attaching bolts and nuts are tight. Tires should be uniformly inflated to specified pressure. The chassis should be well lubricated to make sure that suspension parts are free moving.

Test each front and rear shock absorber in turn by quickly pushing down and then lifting up on the end of the car bumper adjacent to the unit being checked. Use the same force as near as possible on each test and note the amount of resistance provided by the shock absorber on compression and rebound. A little practice on another car of the same model which has satisfactory ride control will aid in judging the amount of resistance that should exist.

Both rear shock absorbers should provide the same feeling of resistance. Any noticeable variation between right and left shock absorbers indicates that one unit is not operating normally.

If there is any doubt about the action of a shock absorber after testing as described above, remove the unit from car. Mount it vertically in a vise with jaws gripping the lower mounting eye firmly, then move the piston rod up and down by hand several times. There should be no free movement in this test after cycling several times. Lack of resistance to movement indicates air in the shock absorber, or that the valve is held open by dirt. A faulty shock absorber must be replaced as it cannot be disassembled for repairs. However, shocks should not be replaced in pairs (or car sets) to correct one faulty shock.

Do not operate shock absorber in a horizontal position or upside down. This will cause air to be trapped and shock will "lag" (appear defective).

In the test given above, the amount of force that can be applied is not sufficient to open a valve against its spring pressure; therefore, this test only checks the flow of fluid through the valve bleeder hole or due to a valve being held open or due to internal wear of piston and cylinder.

Since it is unlikely that the valve springs will weaken in service, it may be assumed that the shock absorber action is normal if it operates satisfactorily in the test given above.

Condition	Test or Inspection Procedure
Incorrect, weak or inoperative shock absorbers	<p>Visual inspection for oil-slight seepage is normal - could be oil spray from another source - replace if the shock is leaking excessively.</p> <p>Test each rear shock absorber in turn by quickly pushing down and then lifting up on the end of the bumper closest to the unit being checked. Use the same amount of force on each test and note the amount of resistance provided by the shock absorber on compression and rebound. For additional information, refer to Testing and Inspection of Shock Absorbers - this section.</p>
Incorrect, weak or unmatched springs	<p>Check trim height measurements with specifications.</p> <p>Either replace this spring with the correct unit or shim to the desired height. For additional information, refer to Measuring Trim Height and Installing Front Spring Shims - this section.</p>

CHECKING REAR CHASSIS TRIM

Optional equipment, undercoating, accumulated dirt, etc., change the car weight and must be considered when checking trim height. When checking trim height, be sure that car is at curb weight. Curb weight includes gas, oil, water and spare tire but no passengers or luggage. See Figure 3H-2, 3H-3 and 3H-4.

Before measuring spring dimensions, bounce both ends of car up and down several times to make sure there is no bind in suspension members and to let springs take a natural position.

MAJOR REPAIR

REMOVAL AND INSTALLATION OF REAR SHOCK ABSORBER

This Section covers the standard shock absorber only. See correct section for Automatic Level Control.

Both rear shock absorbers are filled and sealed in production and cannot be refilled in service.

Removal

1. Raise rear of car and support rear axle assembly.
2. Disconnect shock at lower end. Disconnect shock at upper end and remove shock.

Installation

Do not operate shock absorber in a horizontal position. This will cause air to be trapped and shock will "lag" (appear defective).

1. Make certain that new shock absorber is correct for car model as indicated by part number stamped on the outer tube. Before installing new shock absorbers, place each one vertically in a vise and stroke through full travel until hydraulic resistance is smooth. This pumps trapped air out of the inner cylinder. Keep the shock in a vertical position until installed in the car.

2. Loosely attach shock at upper and lower mounting points. While observing the following, tighten mounting parts to specified torque.

Car weight must be on rear wheels when tightening shock absorber lower ends in order to clamp rubber bushings in a neutral or unloaded position.

Shock absorber calibrations as furnished in production have been carefully engineered to provide the best ride control over a wide range of driving conditions. Substitution of other calibrations can alter handling and ride characteristics and are not normally recommended by Buick Motor Division.

REMOVAL AND INSTALLATION OF REAR CHASSIS SPRING - ALL SERIES EXCEPT ESTATE WAGON

Removal

1. Depress the brake lever at least 1 inch from the

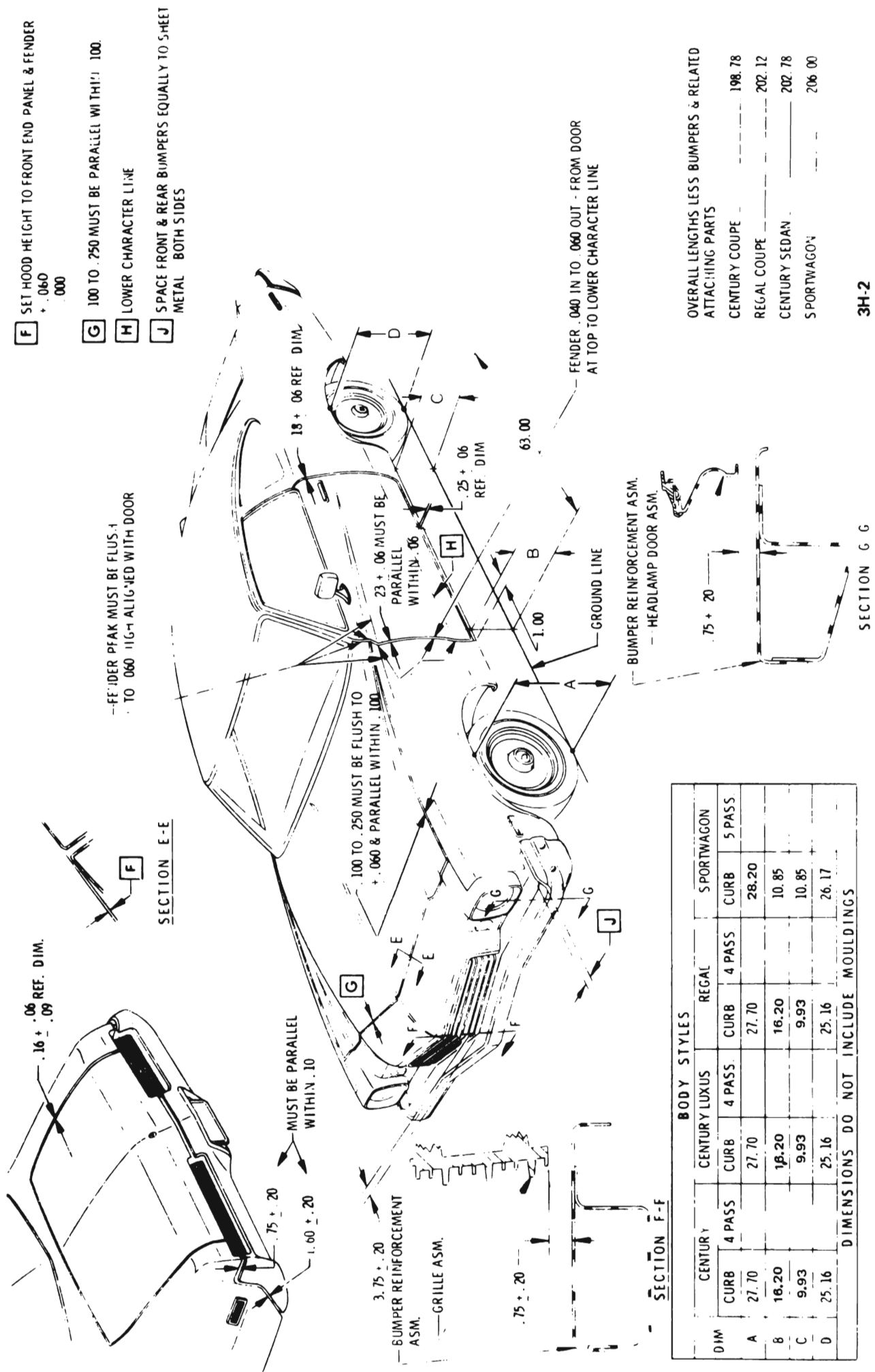


Figure 3H-2 "A" Series Trim Dimensions

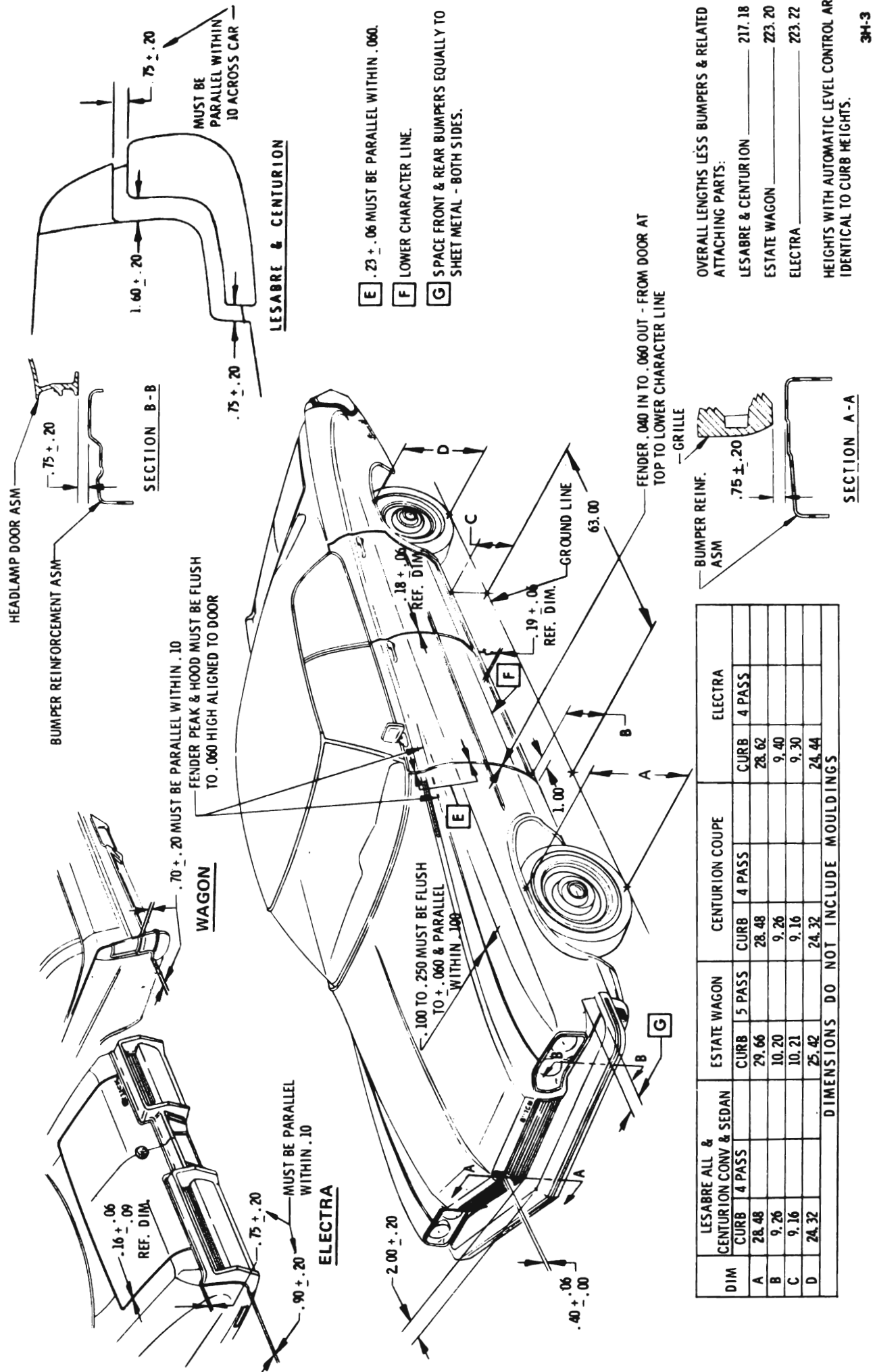


Figure 3H-3 "B-C" Series Trim Dimensions

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 WITHIN .000

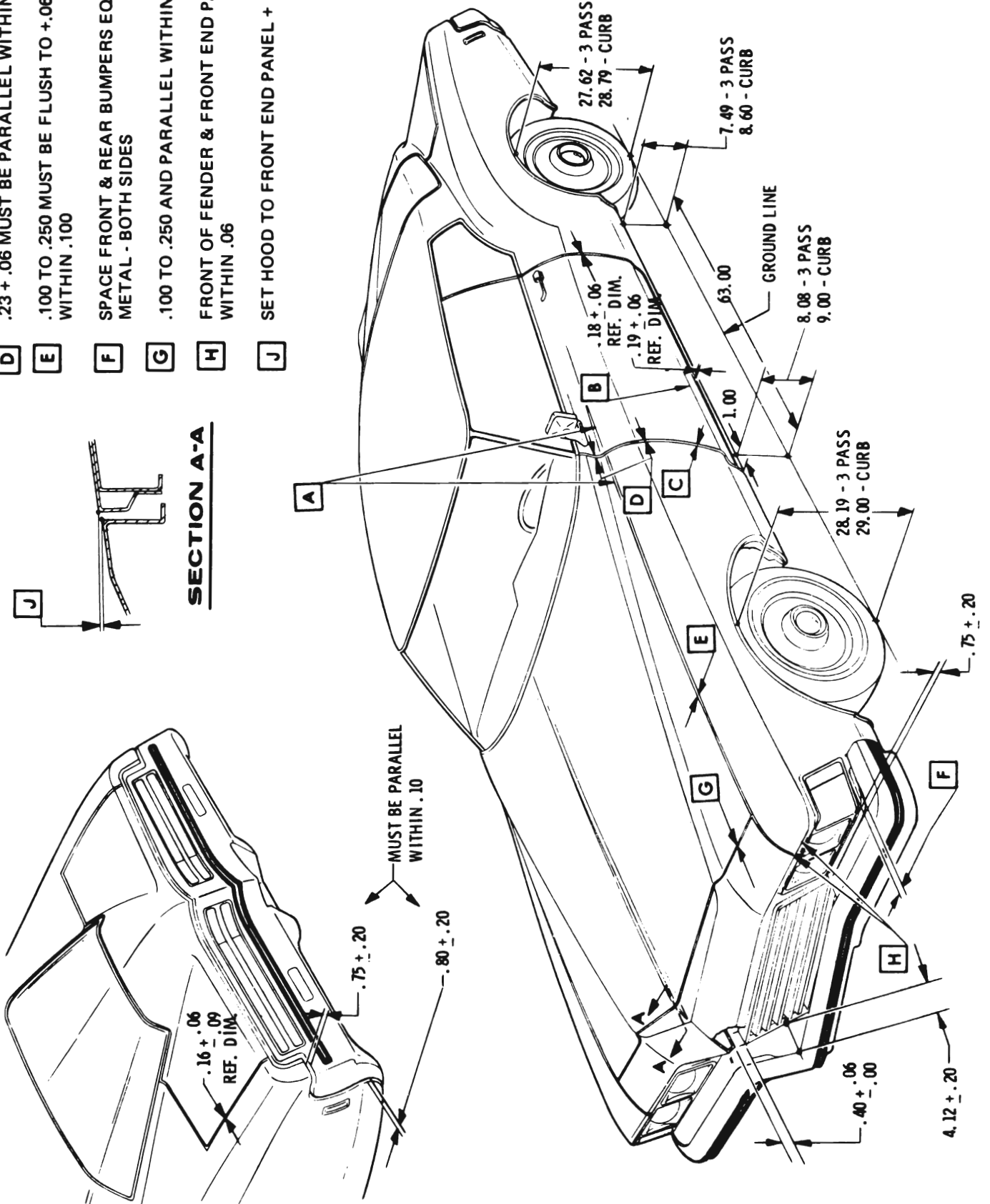


Figure 3H-4 "E" Series Trim Dimensions

relaxed position to prevent the master cylinder from draining when the rear brake line is disconnected.

2. Raise the rear end of the car and support the frame on jack stands.

3. Disconnect the shock absorbers at the axle bracket lower mount.

4. Disconnect the upper control arms at the differential.

5. Disconnect the brake line junction block from the differential and disconnect the two rear brake lines from the junction block. (The axle may have to be lowered slightly to allow access to the junction block - lower only as much as is needed.)

6. When the junction block is free and the lines have been disconnected, slowly lower or separate the axle assembly from the car body to the point where the springs become loose enough to allow removal.

Installation

1. Position spring in correct position. Make sure that the insulator is in position on top of the spring.

2. Reposition the rear axle in correct relationship with the body by raising the axle or lowering the body.

3. Connect the shock absorbers at the lower mounting bracket. Do not tighten to specified torque of 45 lb.ft. unless car weight is on the rear axle.

4. Connect the brake lines to the junction block and connect the junction block to the differential.

5. Connect the upper control arms, but do not tighten to specified torque unless car weight is on rear axle.

6. Bleed the rear brake system.

7. Lower the car to the ground.

REMOVAL AND INSTALLATION OF CHASSIS SPRINGS - ESTATE WAGON

Removal

1. Raise car on hoise.

2. Disconnect shock at lower attachment by removing nut.

3. Support car by placing jack stands at frame in front of leaf springs and at rear of leaf springs at bumper. It is also necessary to support axle.

4. Disconnect right side of exhaust system by removing exhaust hanger screw to rear frame cross member support exhaust system.

5. Remove lower spring plate attaching nuts.

6. Remove front and rear attaching bolts and remove spring.

Installation

1. Connect leaf spring at front attachment.

2. Lubricate rubber spring cushions and attach lower spring plate. It may be necessary to lower axle to attach spring plate. Torque nuts to 40 lb.ft.

3. Attach leaf spring at rear shackle. Torque nut to 115 lb. ft.

4. Torque nut at front attachment to 75 lb. ft.

5. Reconnect shock.

6. Reconnect exhaust system.

7. Remove jack stands and lower hoist.

8. Refer to Rear Axle Group for pinion joint angle adjustment.

REMOVAL AND INSTALLATION OF REAR LOWER CONTROL ARM

If both right and left lower control arms are to be replaced, one side should be completed before opposite side is started in order to keep axle from rotating out of position.

Removal

1. With axle housing and frame supported, remove lower control arm rear bracket bolt. If some difficulty is encountered in removing bolt, reposition jack farther forward under nose of carrier and slowly raise to relieve pressure and bind at control arm bushing. It may be necessary to use suitable brass drift to tap out bolt.

2. Remove lower control arm front bracket nut and bolt. After nut is removed, it may be necessary to tap out bolt with brass drift. Remove lower control arm.

Installation

CAUTION: *Fasteners in steps 1 and 2 are important attaching parts in that they*

could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part or lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.

1. Position control arm in front bracket and install bolt and nut. Do not tighten.
2. Raise or lower nose of axle slowly with jack until bushing in arm and holes in axle bracket align. Install nut and bolt.
3. Torque attaching nuts and bolts to specification.

Attaching parts should be tightened with suspension in curb load position.

REMOVAL AND INSTALLATION OF REAR UPPER CONTROL ARM

If both right and left upper control arms are to be replaced, one side should be completed before opposite side is started in order to keep axle from rotating out of position.

Removal

1. Raise rear of car and support frame and rear axle assembly.

2. Disconnect control arm at axle housing by removing attaching nut and bolt.
3. Disconnect arm at frame by removing nut and bolt.
4. Remove upper arm assembly.

Installation

CAUTION: *Fasteners in steps 1 and 2 are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part or lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.*

1. Position new arm in the frame bracket with nut and bolt. Do not tighten.
2. Align holes in bushing and holes in axle housing. Install nut and bolt. Torque attaching nuts and bolts to specification. Attaching parts should be tightened with suspension in curb load position.

It may be necessary to jack the carrier nose up or down slightly to align the mounting holes for bolt removal or installation.

SPECIFICATIONS

REAR SUSPENSION SPECIFICATIONS

Tightening Specifications

Use a reliable torque wrench to tighten the parts listed to insure proper tightness without straining or distorting parts. These specifications are for clean and lightly-lubricated threads only; dry or dirty threads produce increased friction which prevents accurate measurement of tightness.

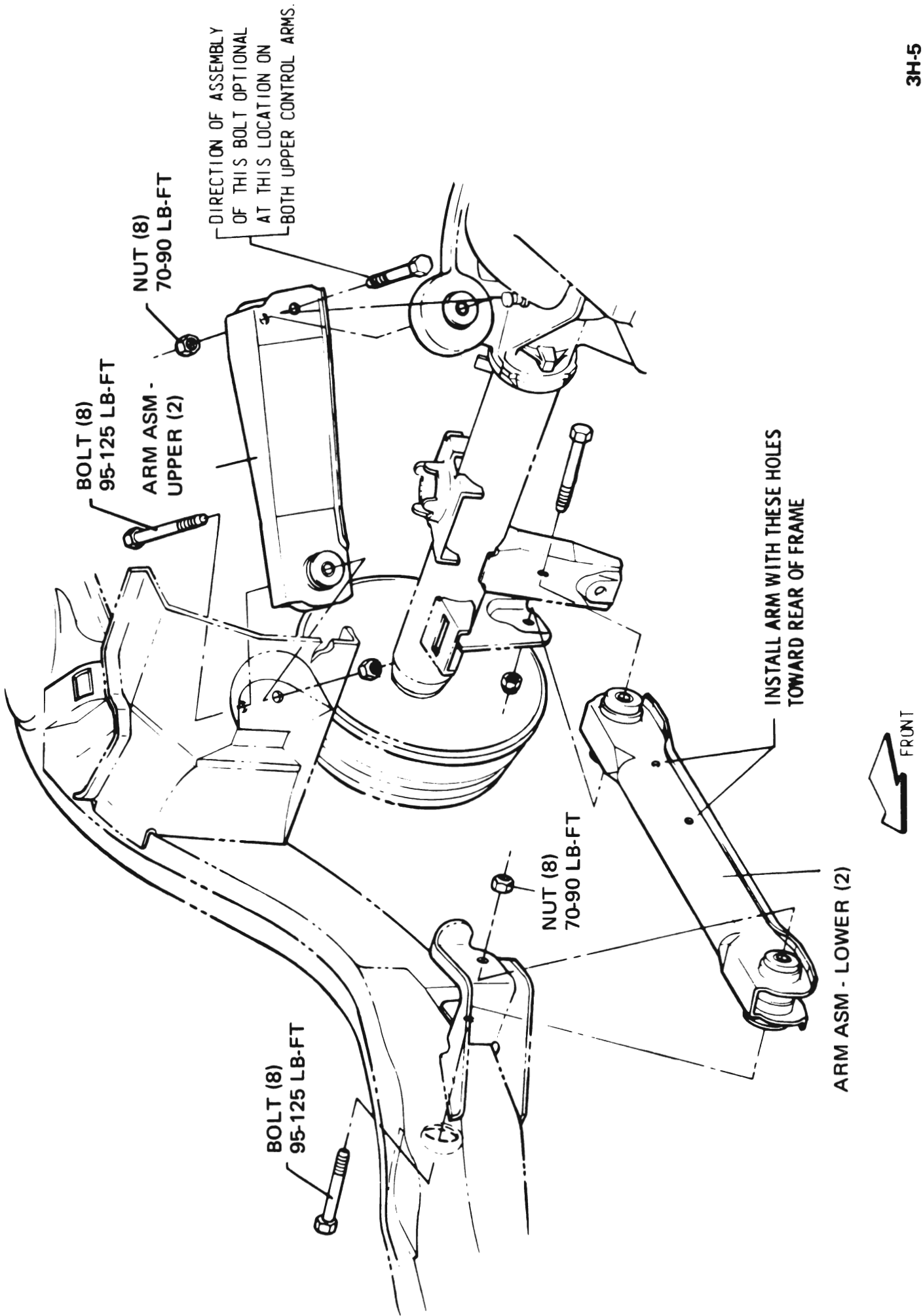
Part	Location	Thread Size	Torque Lb.Ft.
Nut	Rear Shock Upper Mounting	5/16-18	20
Nut	Rear Shock Lower Mounting	1/2-20	65
*Nut	Upper and Lower Control Arm	9/16-13	80
*Bolt	Upper and Lower Control Arm	9/16-13	110
Nut	Rear Propeller Shaft "U" Joint to Pinion Flange ("A" Series)	5/16-18	15

Bolt	Rear Propeller Shaft Flanged Yoke to Pinion Flange ("B-C-E" Series)	7/16-14	80
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*Torquing of nut or bolt to be optional.

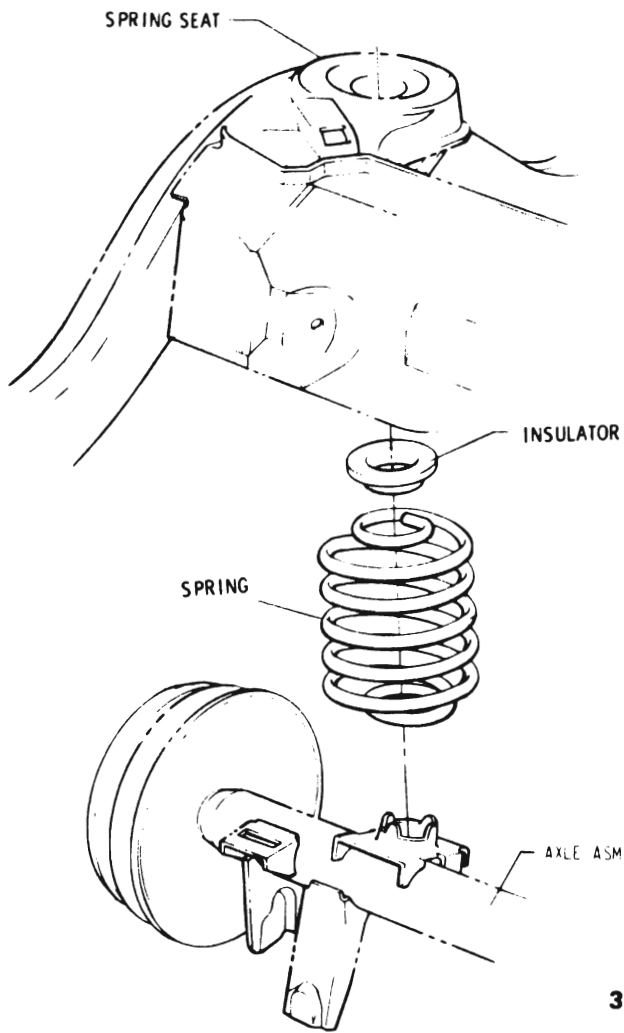
General Specifications

Shock Absorbers	Delco Direct Double-Acting
Springs	(All Except Estate Wagon) Coil
Springs	Estate Wagon - Multi-Leaf



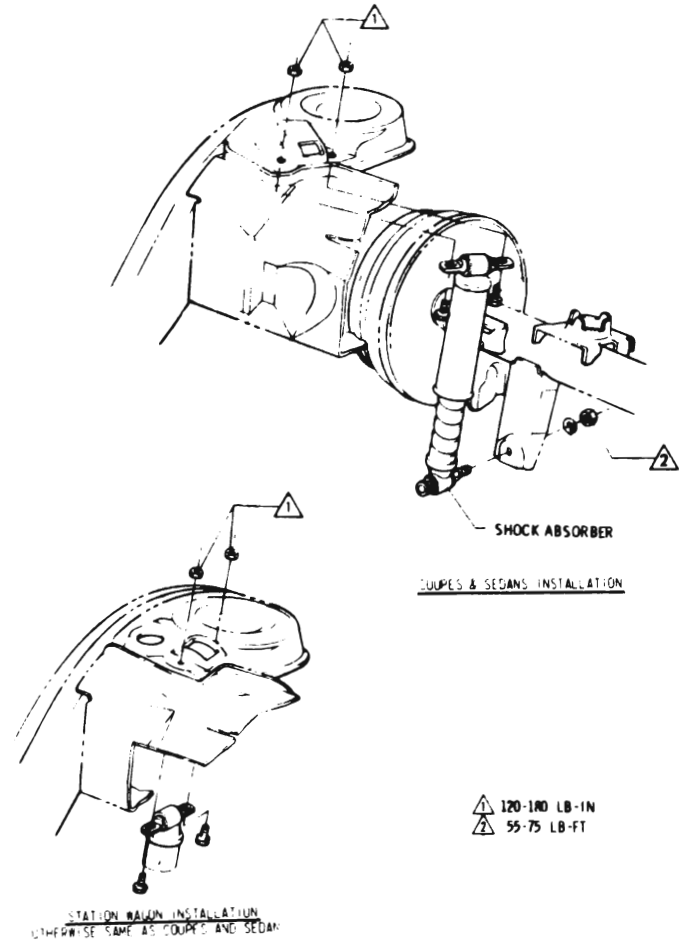
3H-5

Figure 3H-5 "A" Series Rear Control Arms



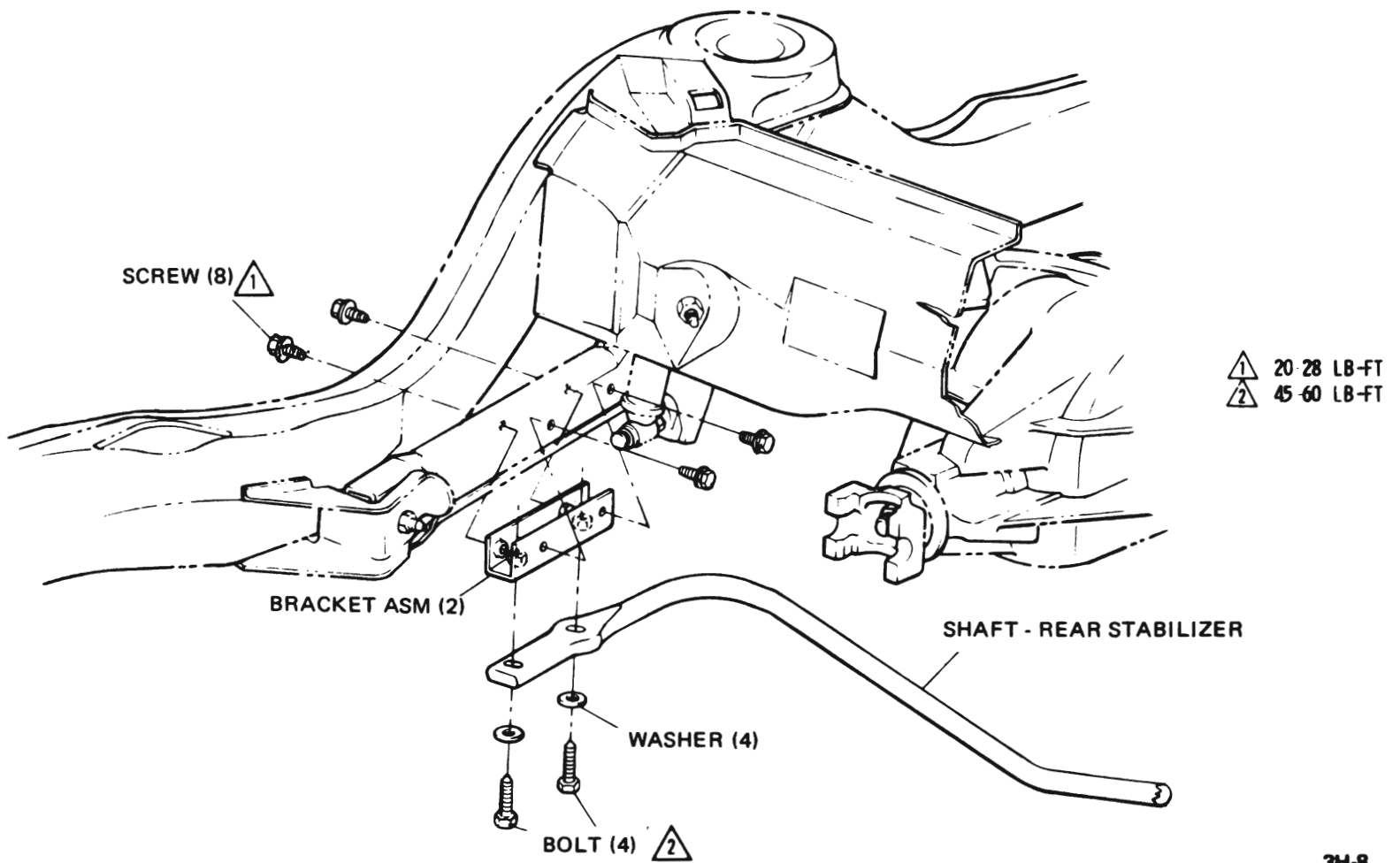
3H-6

Figure 3H-6 A Series Rear Spring



3H-7

Figure 3H-7 "A" Series Rear Shock Mounting



3H-8

Figure 3H-8 "A" Series Stabilizer Bar

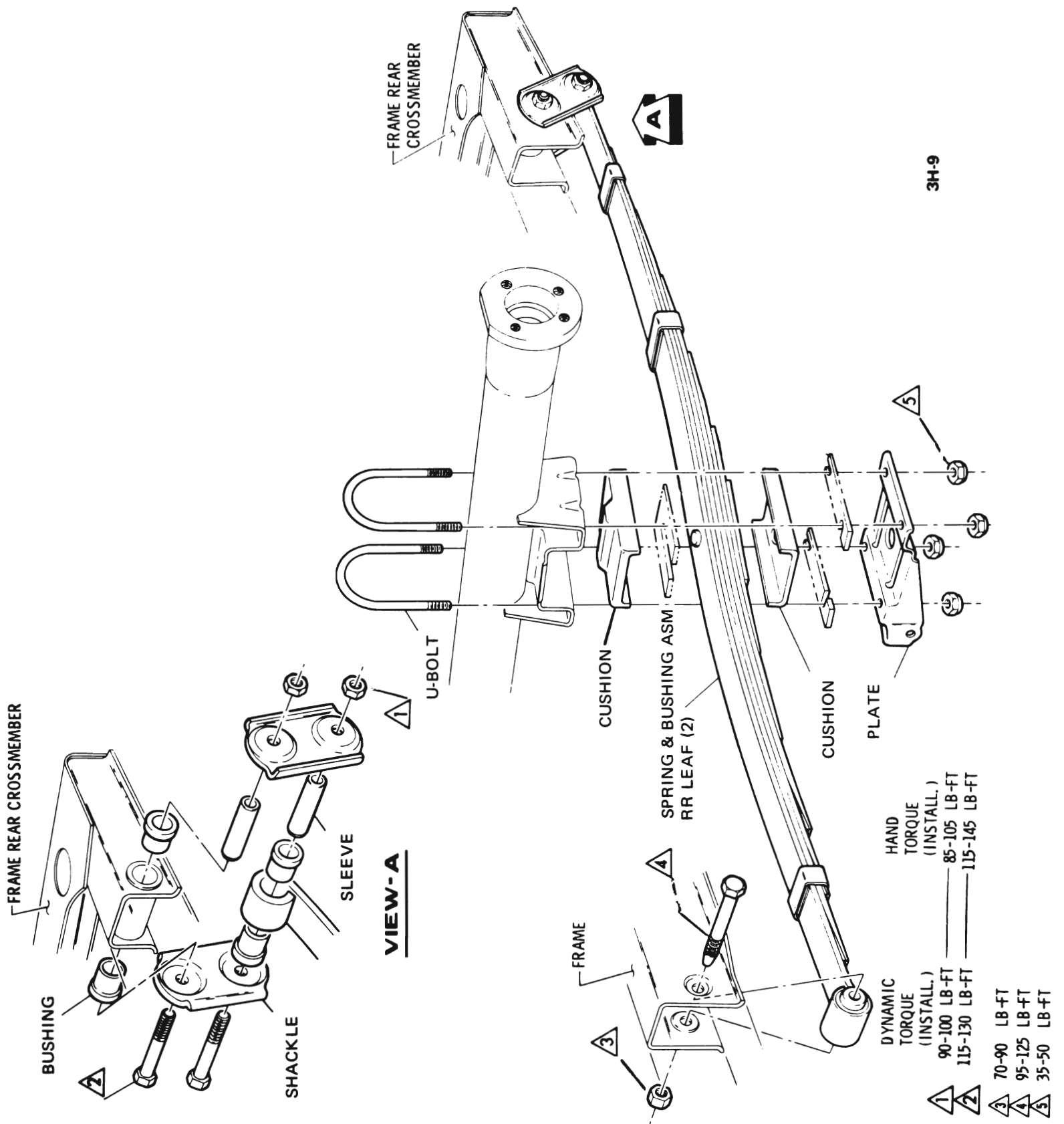


Figure 3H-9 "B" Wagon Leaf Springs

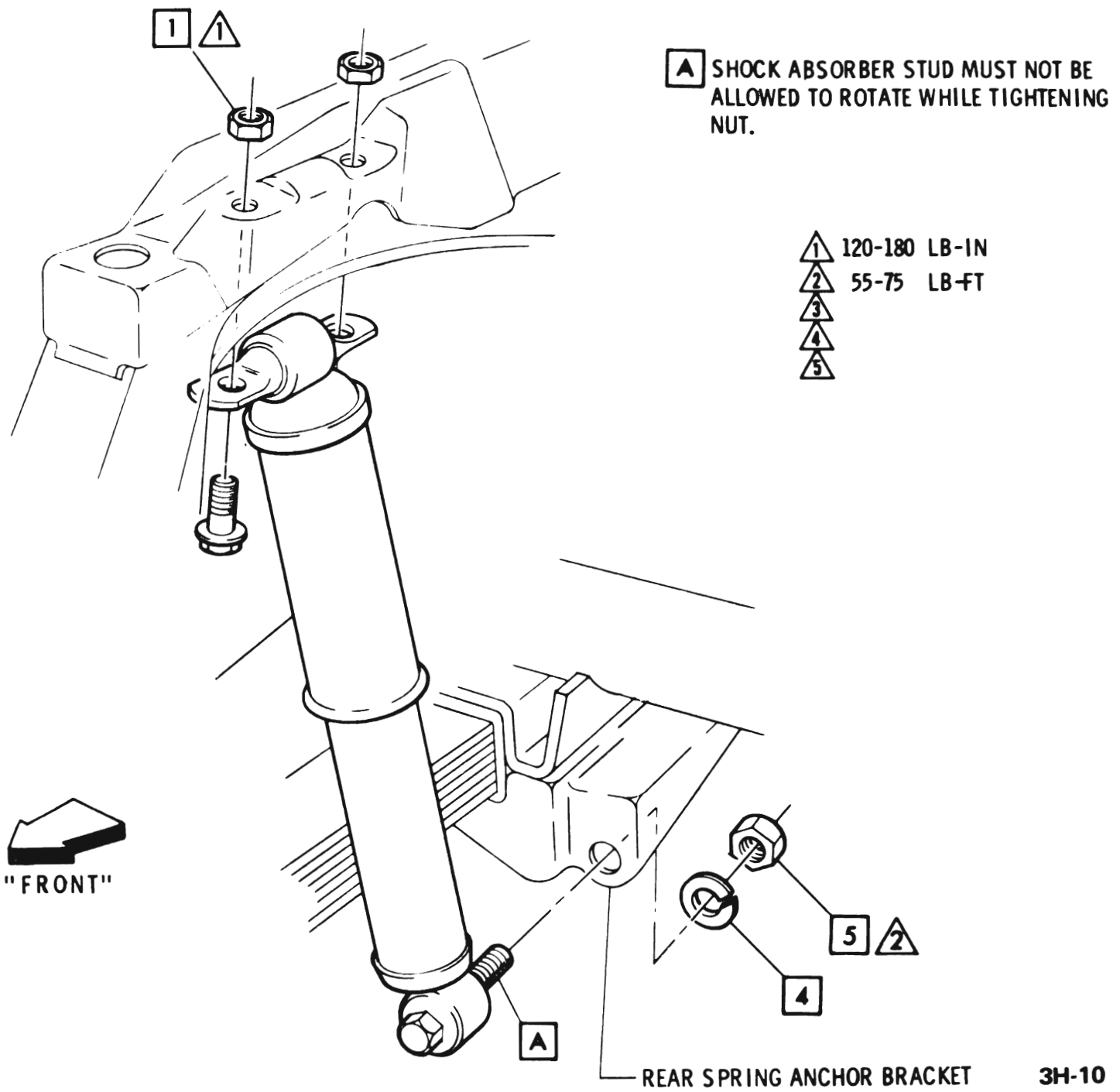


Figure 3H-10 "B" Wagon Shock Mounting

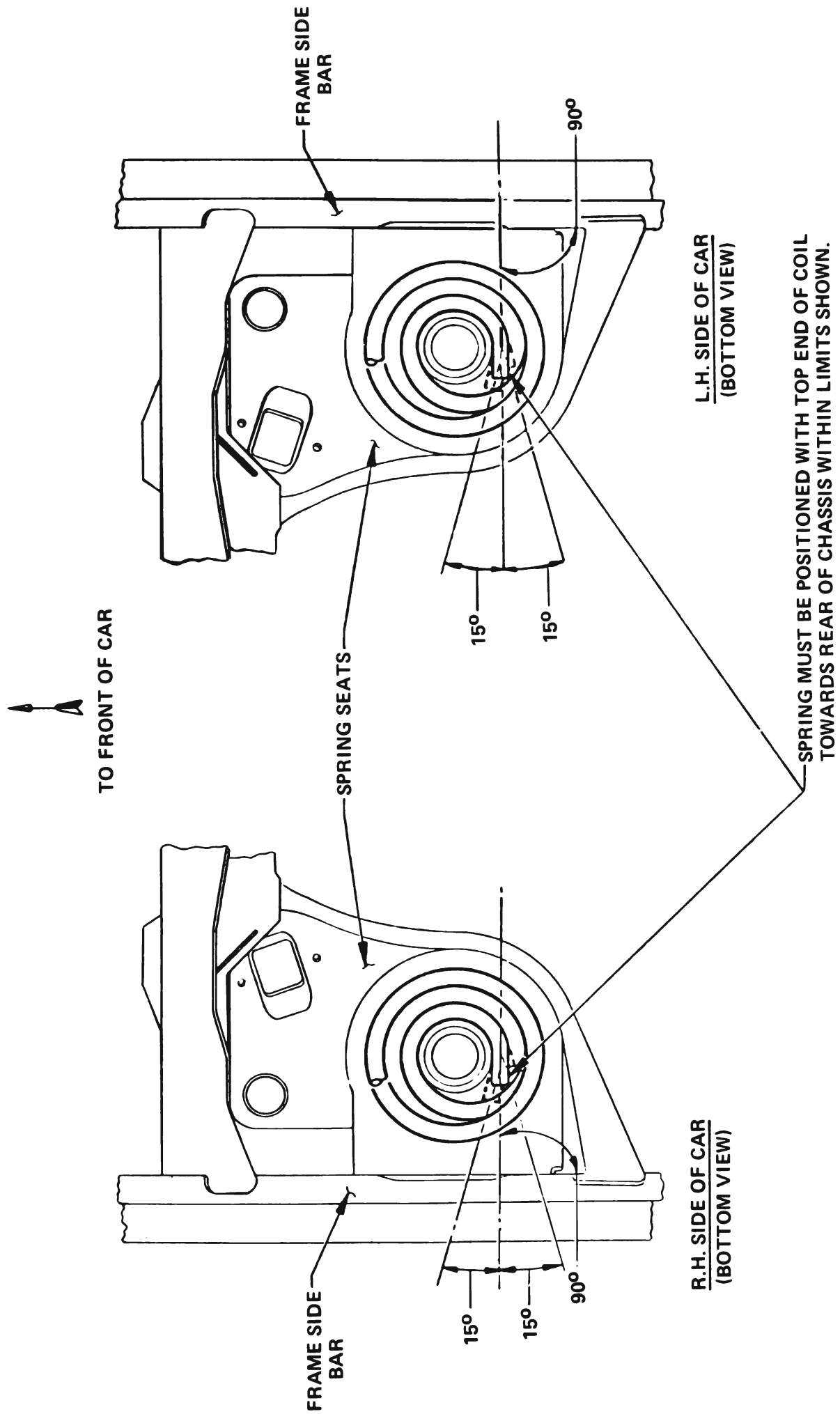


Figure 3H-11 Rear Spring Orientation

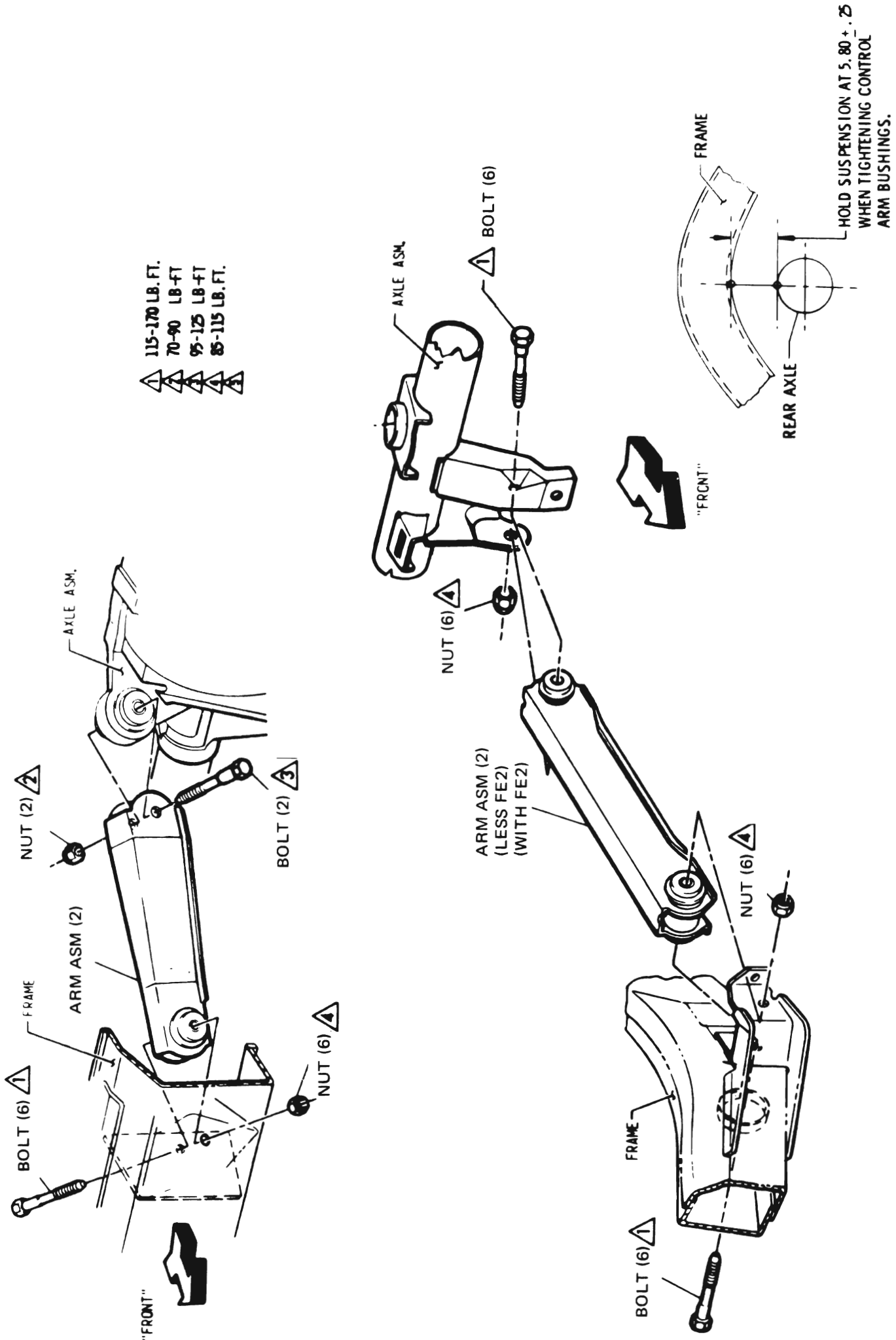


Figure 3H-12 "B-C-E" Rear Control Arms (Less Wagon)

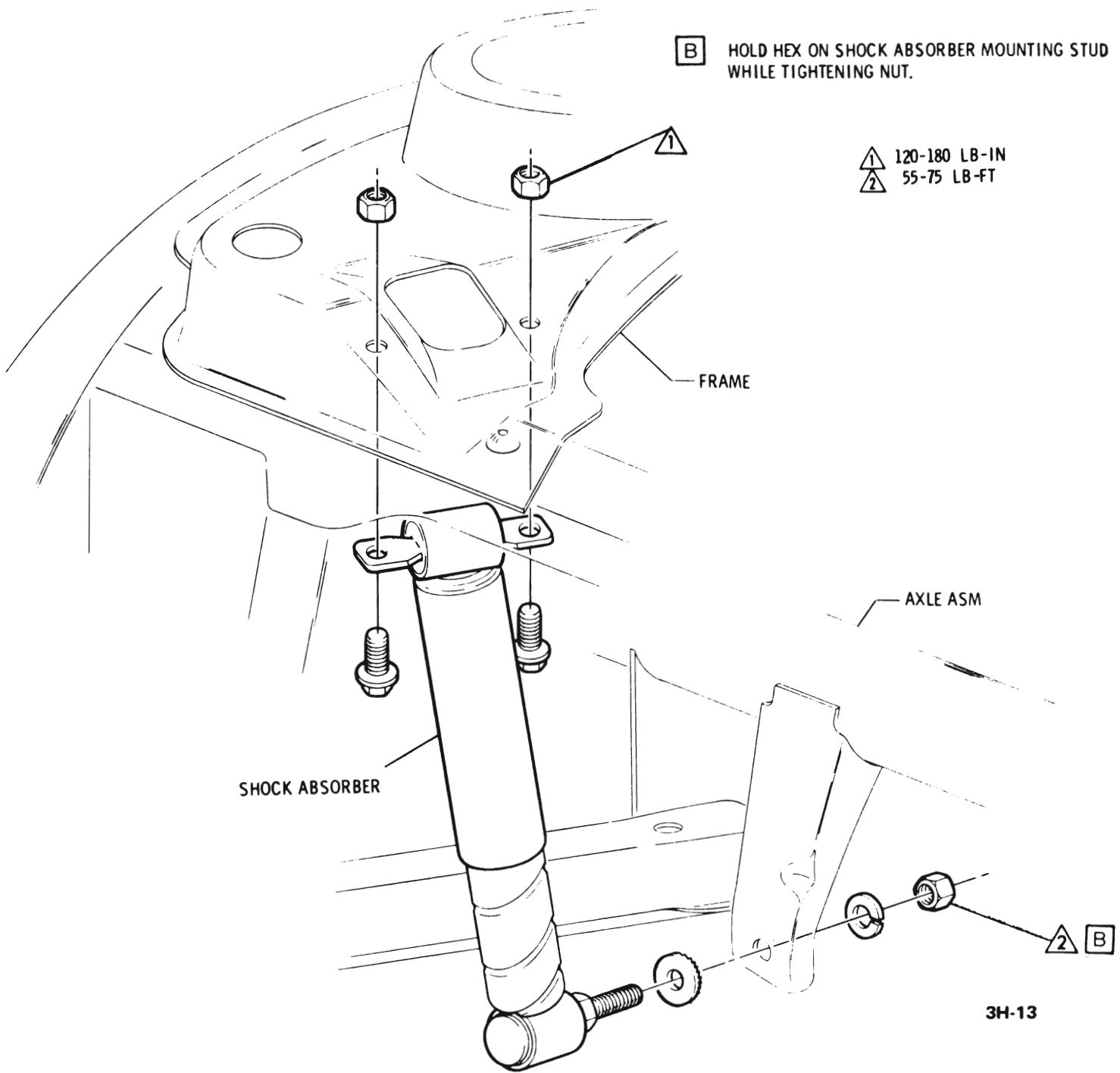
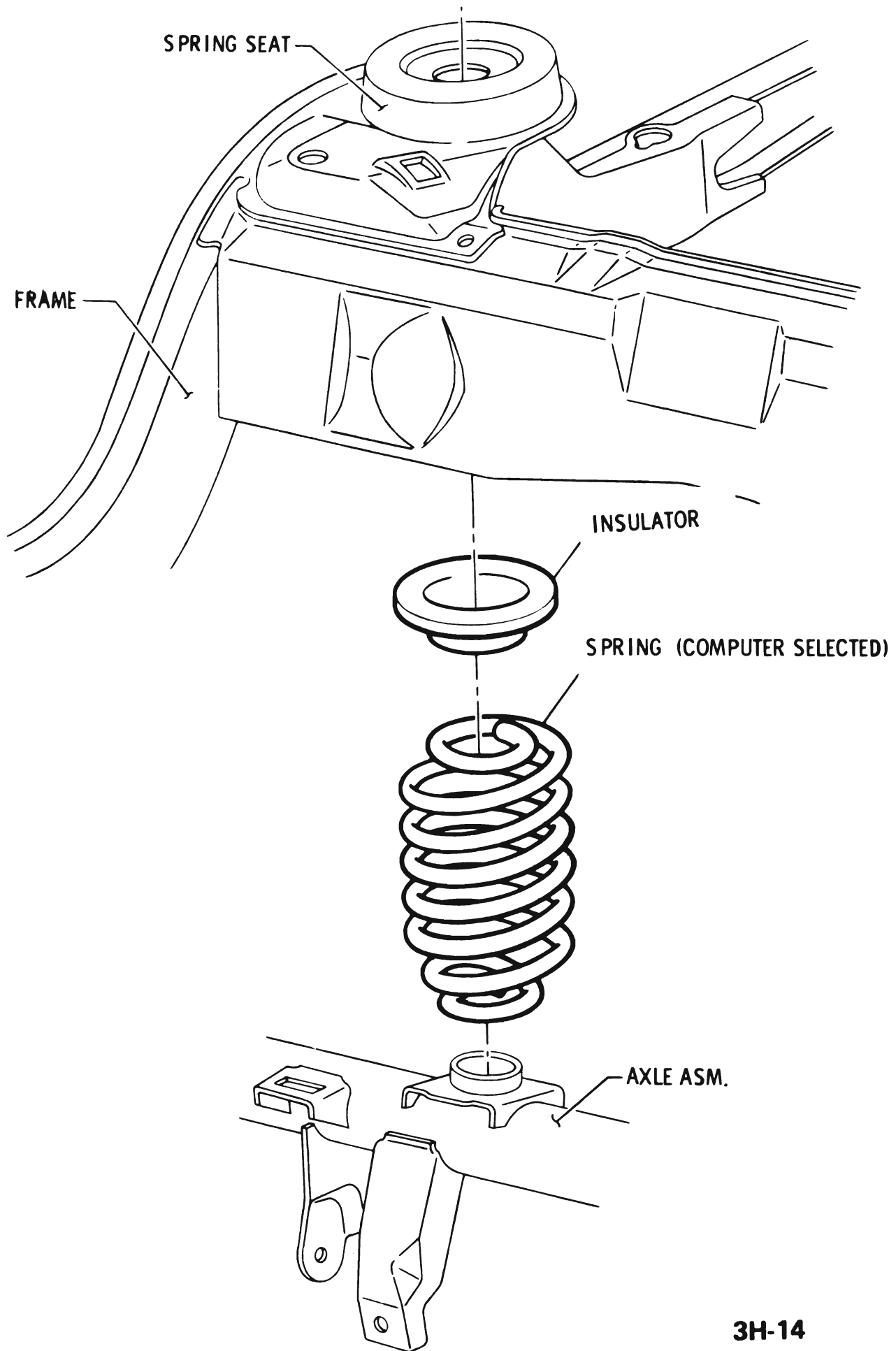


Figure 3H-13 "B-C-E" (Less Wagon) Shock Mounting



3H-14

Figure 3H-14 "B-C-E" (Less Wagon) Rear Spring

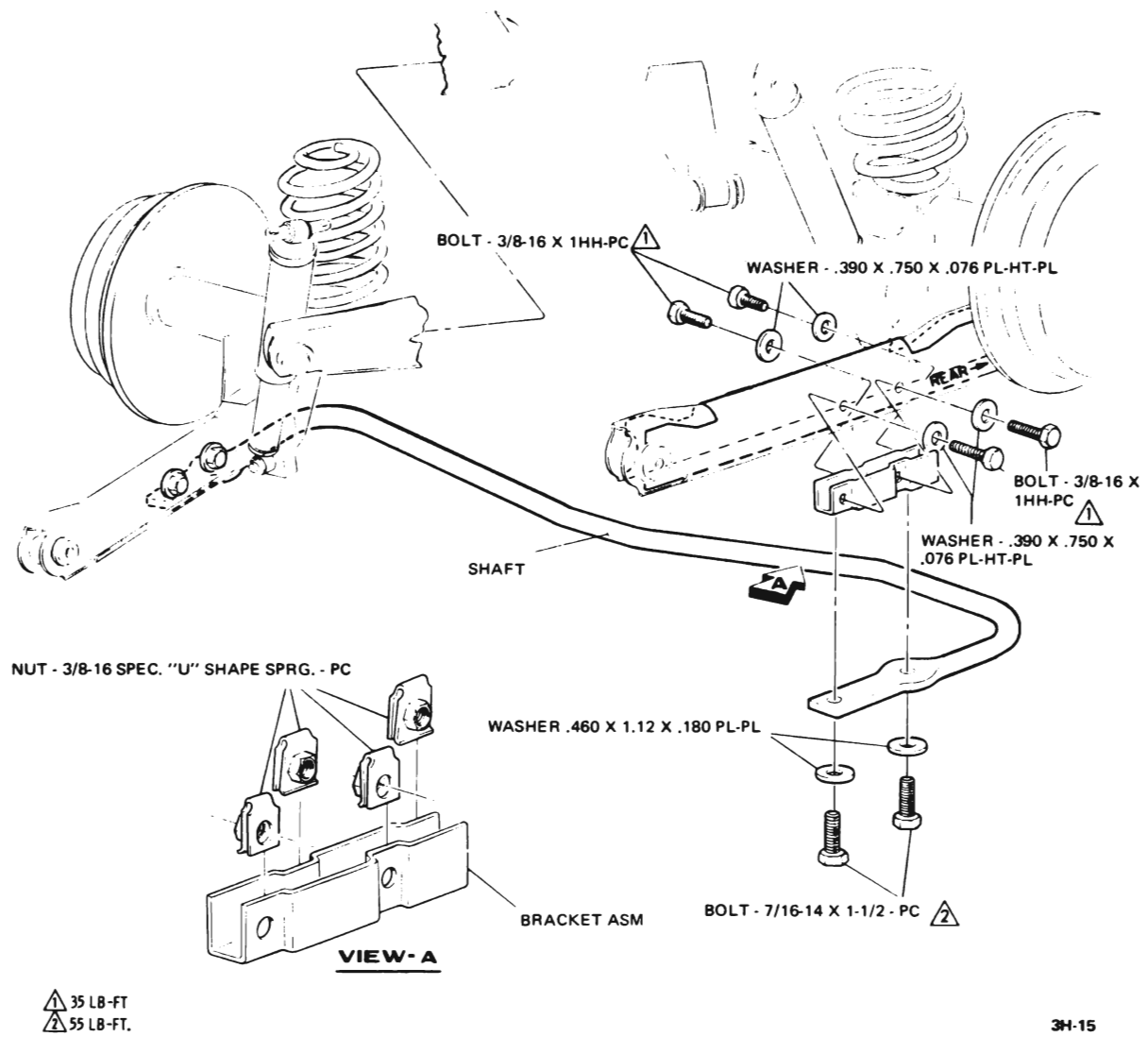


Figure 3H-15 "B-E" Rear Stabilizer Bar