SECTION A

43-44000 REAR SUSPENSION

CONTENTS

DIVISION I SPECIFICATIONS AND ADJUSTMENTS

40-1 REAR SUSPENSION SPECIFICATIONS

a. 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.
Bolt & Nut	Coil Spring to Axle Tube	1/2-13	15-25
Nut	Rear Shock Absorber Upper Mounting (Sportwagon only)	3/8-24	5-10
Bolt & Nut	Rear Shock Absorber Upper Mounting (Less Sportwagon)	5/16-18	12-24
Nut	Rear Shock Absorber Lower Mounting	1/2-20	30-60
Bolt & Nut	Upper and Lower Control Arm (Either End)	1/2-13	65-85
Bolt & Nut	Rubber Bumper Spacer Attaching	7/16-14	35-60

b. Shock Absorbers and Springs

Shock Absorbers	Delco Direct Double Acting
Springs	Coil

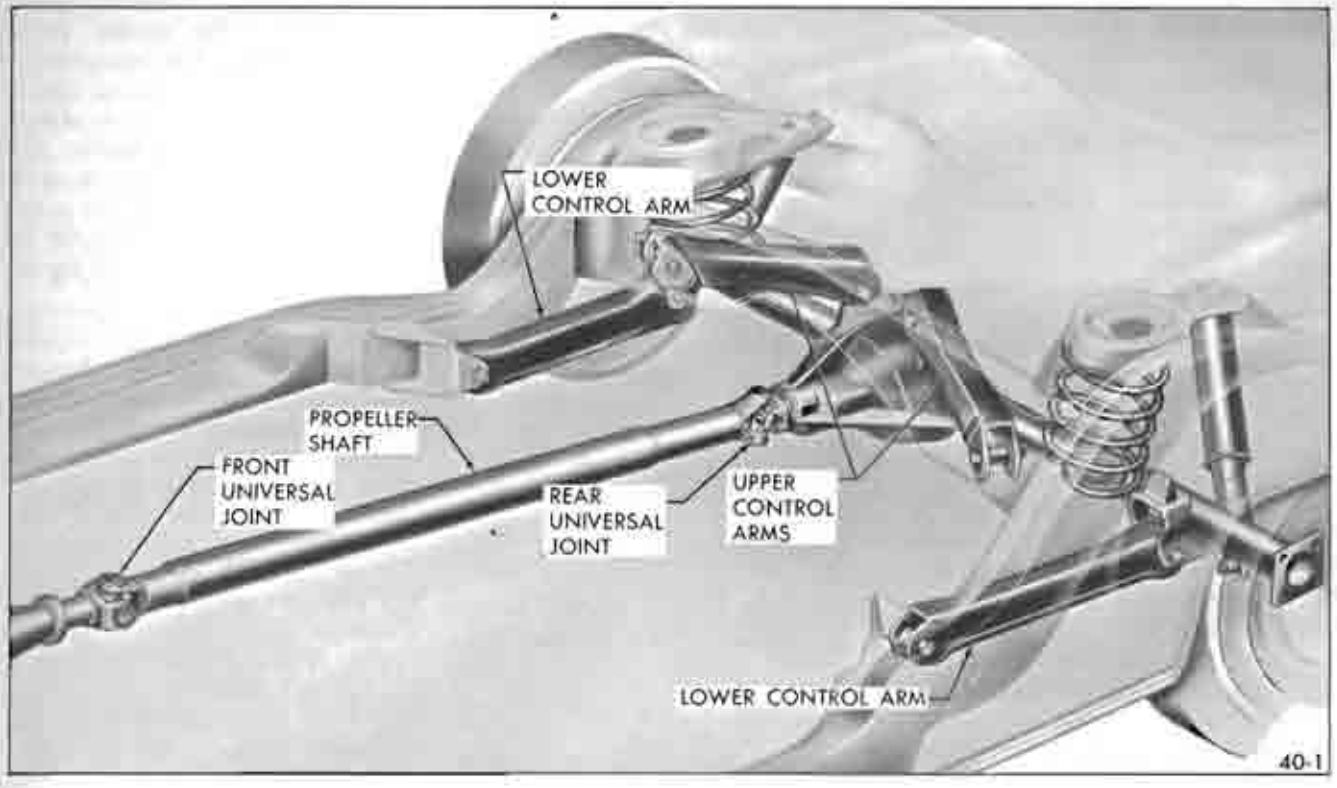

Figure 40-1—Rear Suspension

DIVISION II

DESCRIPTION AND OPERATION

40-2 DESCRIPTION OF REAR SUSPENSION

The rear wheels are not independently sprung, being incorporated into the rear axle assembly. Alignment is maintained by the rigid rear axle housing. See Figure 40-1.

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 frame. Two rubber bushed upper control arms, angularly mounted with respect to the centerline of the car, control 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 through the rear floor pan than would be possible with a conventional rear suspension. See Figure 40-2.

The rear upper control arms control drive forces and side sway.

The rear chassis springs are located between the spring seats on the frame and brackets on the axle tubes. A clamp secures the spring to the axle bracket and is attached with a bolt. A rubber bumper attached to the axle tube just outboard of the coil spring, limits axle travel during spring compression.

Ride control is provided by two direct double acting shock absorbers angularly mounted between brackets on the frame and axle. Rubber bushings at both ends of the shock absorbers reduce vibration and noise transference to the frame.

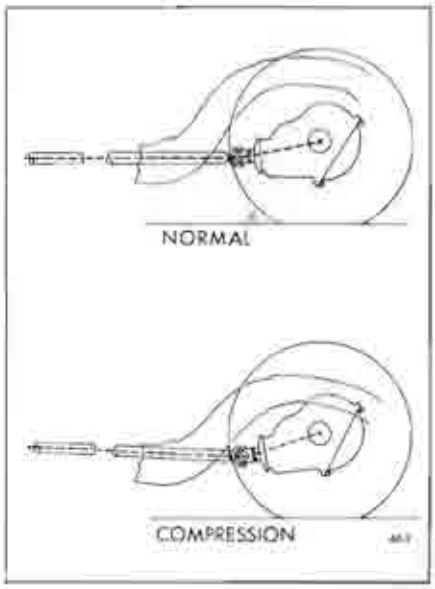

Figure 40-2—Differential Tilting Action

40-3 DESCRIPTION OF REAR SHOCK ABSORBERS

a. Shock Absorber Type and Location

Both front and 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 other than replacement of deteriorated rubber bushings.

Each rear shock absorber is mounted on 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 shock absorbers are basically the same for all models but vary as to calibration. Front shock absorbers are interchangeable in respect to right and left, as are the rear. However, front and rear are not interchangeable with each other.

b. Shock Absorber Construction and Operation

The shock absorber consists of two concentric tubes, a piston and rod, and valves for controlling hydraulic resistance. The rear shock absorber has an additional tube which acts as a stone shield. See Figure 40-3.

The pressure (inner) tube provides a cylinder in which the piston and rod operate. The upper end is sealed by a piston rod seal and the lower end is closed by the compression valve assembly. This tube is completely filled with fluid at all times. The reservoir outer tube provides space for reserve fluid and for overflow from the pressure tube during operation.

The piston, piston rod and outer tube are attached to the car frame, while the pressure and reservoir tubes are attached as a unit to the chassis suspension through the lower mounting. As the wheel moves up and down with respect to the frame, the chassis spring is compressed or elongated and the shock absorber is compressed or extended. This action forces the fluid to move between the pressure and reservoir tubes through small restricting orifices in the valves. The relative slowness of fluid movement imposes restraint on the telescoping or extension of the shock absorber, thus providing the required dampening effect on spring action.

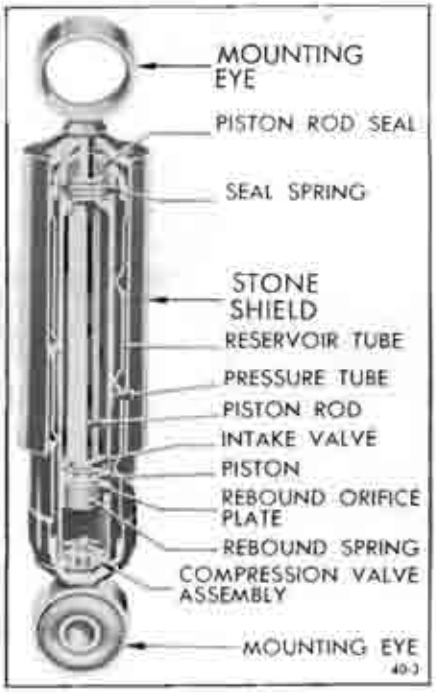

Figure 40-3—Typical Shock Absorber

1. Compression Stroke Operation. When the chassis spring is being compressed, the shock absorber is compressed causing the piston to move down in the pressure tube, forcing fluid through holes in the piston. The pressure lifts the intake valve plate, allowing fluid in lower chamber to pass into the upper chamber. As the piston rod moves downward into the pressure tube, it occupies space previously filled with fluid and this displaced fluid is forced out of the lower chamber into the reservoir through the restricting orifice in the compression valve. On fast or extreme movements when the fluid flow exceeds the capacity of the orifice, the spring loaded relief valve in the compression valve assembly is forced open to permit more rapid escape of fluid. The amount of compression control is governed by the area of the orifice, the area of the piston holes, and the strength of the compression relief valve spring.

2. Rebound Stroke Operation. When the chassis spring expands or rebounds, the shock absorber is extended and its resistance is instantly effective. As the piston is pulled upward, the intake valve plate seats and fluid in the upper chamber is forced through slots in the plate and holes in the piston to build up pressure against the rebound orifice plate. As the pressure increases, the rebound spring is compressed and the orifice plate leaves its seat to permit fluid to pass into the lower chamber. As the piston rod moves upward out of the pressure tube, the space previously occupied by the rod is filled with fluid drawn into the lower chamber from the reservoir. A separate intake valve in the compression valve assembly opens to permit return of this fluid.

DIVISION III

SERVICE PROCEDURES

40-4 REMOVAL AND INSTALLATION OF REAR SHOCK ABSORBER

NOTE: This Section covers the standard shock absorber only. See Section B for Automatic Level Control.

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

a. 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. See Figures 40-4 and 40-5.

Figure 40-4—Rear Shock Absorber Installation

CAUTION: A hex is located on the stud between the axle bracket and shock absorber lower bushing so that a wrench can be used to remove the lower attaching nut without turning the stud. Failure to hold the stud in this manner will result in damage to the mechanical bond between the shock absorber bushing and the lower mounting stud.

b. Installation

1. Make certain that new shock absorber is correct for car model as indicated by part number stamped on the outer tube. See Master Chassis Parts Catalog Group 7.345 for standard and optional parts.

2. Loosely attach shock to both mounting points. Torque upper bolts to 18 lb. ft. (8 lb. ft. Sportwagons) and the lower hex nut to 45 lb. ft.

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

40-5 REMOVAL AND INSTALLATION OF REAR CHASSIS SPRINGS

a. Removal

1. Raise rear end of car and support on frame stands.

2. Provide slack in parking brake cable to allow rear axle to be lowered without damaging cable. See Group 50. Disconnect shock absorber at lower end on same side that spring is being removed. See paragraph 40-4.

3. Remove bolt and nut that hold spring clamp to axle tube bracket. See Figure 40-5.

4. Carefully lower jack to fully extend spring and remove spring.

CAUTION Do not over travel propeller shaft "U" joint or stretch brake hose.

b. Installation

1. Position spring so that the small end of spring is on the lower spring seat. Install spring clamp, bolt and nut. Do not tighten.

2. Raise rear axle and rotate spring into position in upper seat. See Figure 40-5. Tighten clamp nut to 25 lb. ft.

3. Install shock absorber and tighten to specifications. See paragraph 40-3.

4. Tighten parking brake cable, remove car stands and lower car. See paragraph 40-9 for checking procedure.

40-6 INSTALLATION OF REAR SPRING SHIMS

The Upper Series spring seat (Group 7.545) is used as a shim on the rear springs for the Special and Skylark. The number of shims at any one location should be limited to three. Place shims between the bottom of the rear spring and the lower spring seat on the axle tube. Secure with the attaching bolt at this location. Height at the wheel opening will increase approximately the same distance as the thickness of the shims installed.

40-7 REMOVAL AND INSTALLATION OF REAR LOWER CONTROL ARM

a. Removal

1. With axle housing 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.

b. Installation

1. Position control arm in front bracket and install bolt and nut. Do not tighten.

2. Raise or lower nose of carrier slowly with jack until bushing in arm and holes in bracket align. Install nut and bolt.

3. Torque attaching nuts and bolts to 75 lb. ft.

CAUTION: Attaching parts should be tightened with suspension in normal load position.

40-8 REMOVAL AND INSTALLATION OF REAR UPPER CONTROL ARM

a. Removal

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

2. Disconnect control arm at carrier housing by removing attaching lock nut and bolt.

3. Disconnect arm at frame by removing lock nut and bolt.

b. Installation

1. Position arm in the frame bracket with lock nut and bolt. Do not tighten.

2. Align holes in bushing and holes in axle housing. Install lock nut and bolt. Torque attaching nuts and bolts to 75 lb. ft.

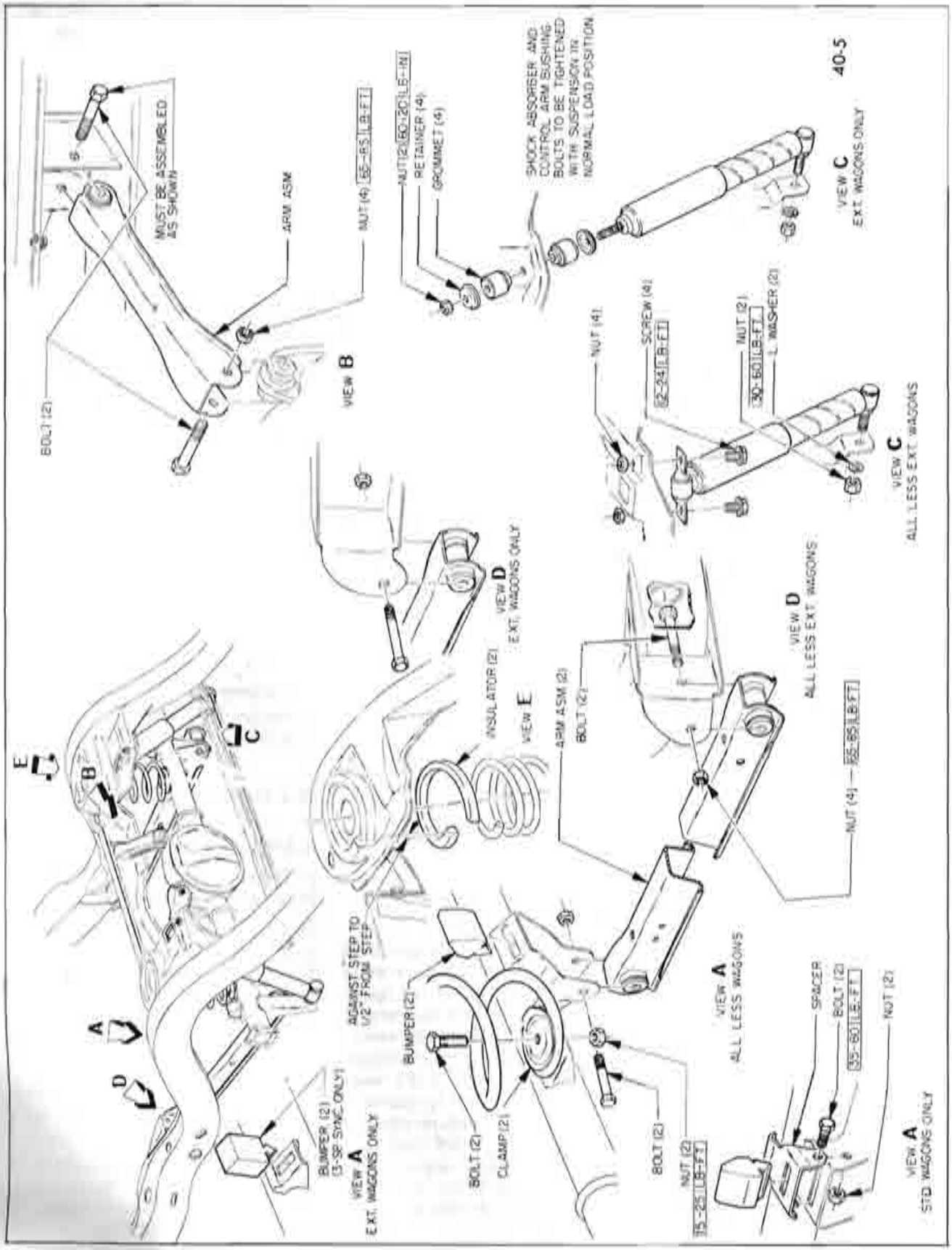

Figure 40-5—Rear Suspension Details

CAUTION: Attaching parts should be tightened with suspension in normal load position.

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

DIVISION IV TROUBLE DIAGNOSIS

40-9 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 erroneous methods were used in judging the operating condition of the shock absorbers.

Before attempting to test shock absorbers, make sure that all attaching bolts and nuts are tight. Tires should be uniformly inflated to specified pressure (Group 100). 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. Little or no resistance on compression or rebound indicates air in shock absorbers, internal leakage due to wear or that the valve is held open by dirt. Excessive resistance indicates that bleeder hole in valve is plugged with dirt.

If there is any doubt about the action of a shock absorber after testing as described above, remove the unit from car. See paragraph 40-4. Mount it vertically in a vise with jaws gripping the mounting eye firmly, then move the piston rod up and down by hand. There should be no free movement in this test. Lack of resistance to movement indicates air in the shock absorber, internal leakage due to wear 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.

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 as well as any leakage 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.

40-10 CHECKING CHASSIS REAR SPRINGS

Optional equipment, undercoating, accumulated dirt, etc., change the car weight and must be considered when checking spring dimensions. When checking spring dimensions, be sure that car is at curb weight. Curb weight includes gas, oil, water and spare tire but no passengers. See Figure 40-6.

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.

If shimming is required, see paragraph 40-5.

Dimensions are for cars with no load, but with full fuel tank, from bottom of rocker panel to level surface. Note: On cars with oversize tires add 1/4"

SERIES	FRONT ROCKER	REAR ROCKER
WAGON	10 7/8 ± 1/2	11 3/16 ± 1/2
SPORTWAGON	11 3/8 ± 1/2	11 13/16 ± 1/2
GRAN SPORT	9 3/8 ± 1/2	9 1/8 ± 1/2
SEDANS, COUPES, CONVERTIBLES (EXCEPT G.S.)	9 13/16 ± 1/2	9 13/16 ± 1/2

Figure 40-6—Trim Dimensions