SECTION C

45-46-48-49000 REAR SUSPENSION

CONTENTS

DIVISION I SPECIFICATIONS AND ADJUSTMENTS

40-11 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.
Nut & Bolt	Track Bar, 49000	5/8-18	100-140
Nut & Bolt	Rear Shock to Upper Bracket	5/16-18	12-24
Nut	Rear Shock to Lower Bracket	1/2-20	30-60
Nut	Wheel & Brake Drum to Rear Axle Shaft	1/2-20	65-85
Nut	Rear Lower Control Arm to Frame	1/2-13	65-85

b. Shock Absorbers and Springs

Shock Absorbers	Delco Direct Double Acting
Springs	Coil

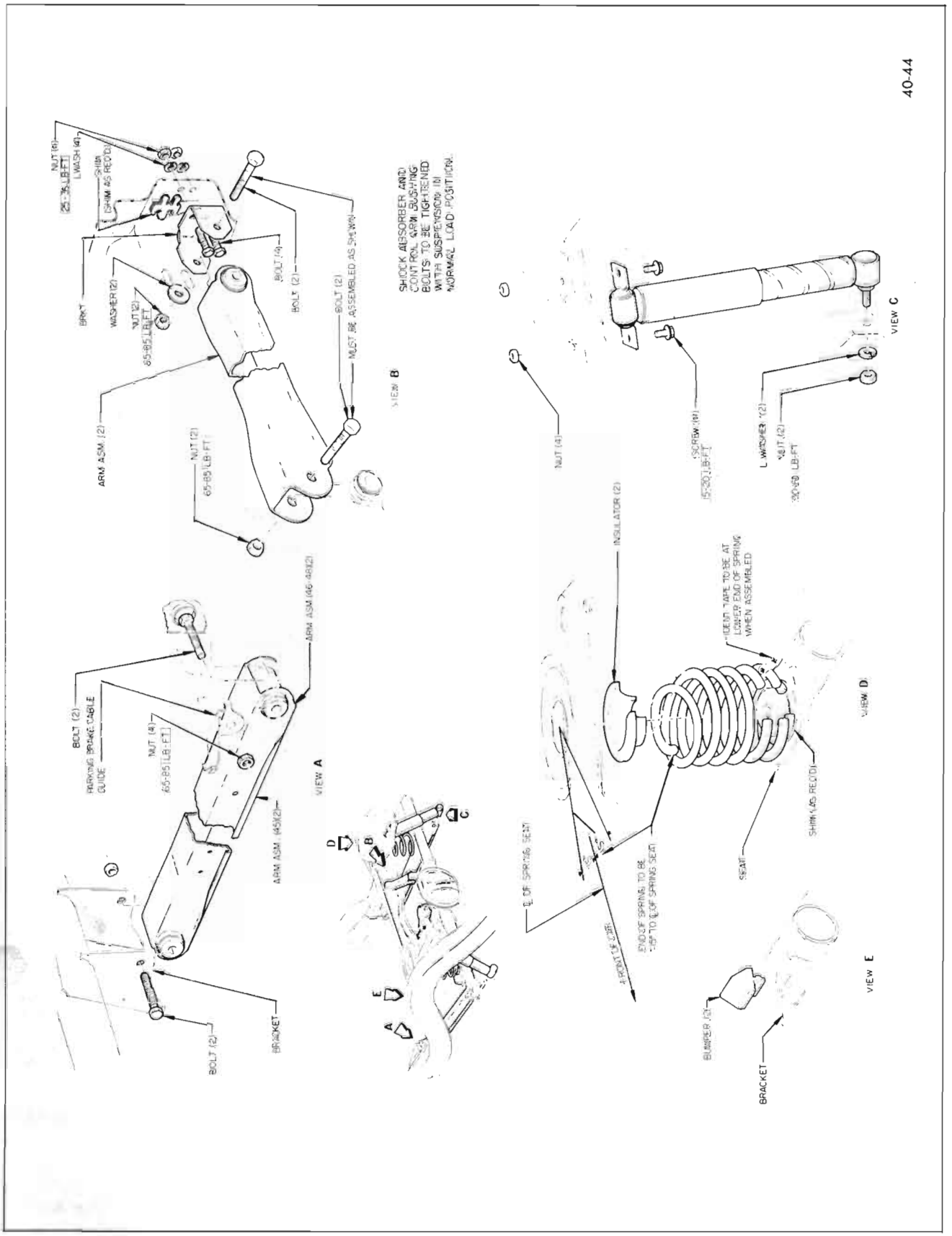

Figure 40-44 45-46-48000 Rear Suspension

DIVISION II
DESCRIPTION AND OPERATION

40-12 DESCRIPTION OF REAR SUSPENSION

a. Rear Suspension, 45-46-48000 Series

On the 45-46-48000, the rear wheels are not independently sprung, being incorporated in the rear axle assembly. Alignment is maintained by the rigid rear axle housing. See Figure 40-44.

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 through the rear floor pan than would be possible with a conventional rear suspension. See Figure 40-45.

The rear upper control arms control drive forces, side sway and pinion nose angle. In order to control pinion nose angle, provisions have been made for the installation of shims between the frame and the control arm mounting bracket. Pinion angle adjustment can greatly affect car smoothness and must be maintained as specified.

The rear chassis springs are located between brackets on the axle tube and spring seats in the frame. The springs are held in place by the weight of the car and by the shock absorbers which limit axle movement during rebound.

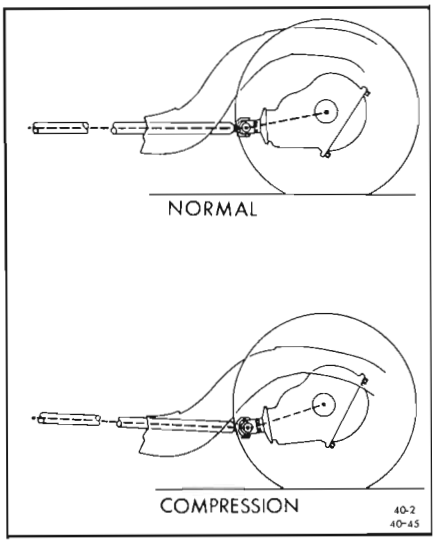

Figure 40-45—Differential Tilting Action

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

b. Rear Suspension, 49000 Series

On the 49000 Series, 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 and by a pair of lower control arms. With the use of an open-type drive line, driving and braking forces are taken by these control arms. The control arms are connected to the frame at their front ends and to a bracket welded to the axle tube at the opposite ends. Both mounting joints are pivoted through rubber bushings. See Figure 40-46.

To prevent the axle housing from rotating about the two lower control arms during braking and acceleration and to adjust rear universal joint angle, and adjustable upper control arm is mounted between the right frame side rail and a bracket on the upper right side of the axle assembly.

To control pinion nose angle, vernier holes are provided in both inner and outer pieces of the two piece control arm. When correct pinion nose angle is obtained, a bolt is installed through the vernier holes which are in line. Two other bolts, in slotted holes, are then tightened. Because of the constant velocity joints at the center and rear of the 49000 propeller shaft, the car is not sensitive to pinion angle adjustment.

The rear chassis springs are located between brackets on the axle tube and spring housings in the frame. The springs are held in place by the weight of the car 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 housing and to the frame spring seats.

A track bar is used to control the sideways motion of the axle. Brackets for attaching the track bar are located on the left frame side rail rearward of the axle assembly and on the right axle tube. The track bar is rubber mounted at each end.

40-13 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

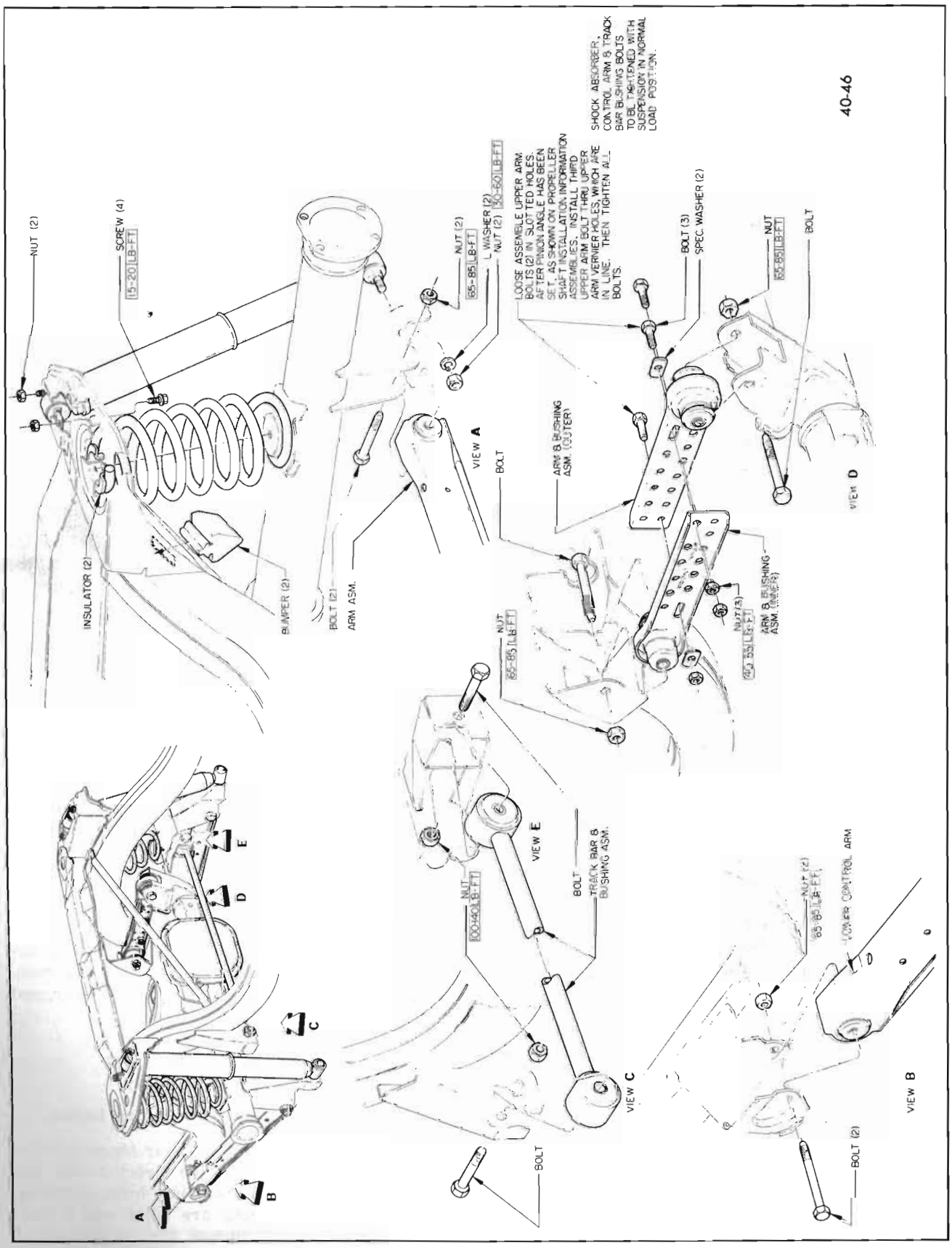

Figure 40-46 49000 Rear Suspension

during production; therefore, no refilling or other service is necessary or possible.

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. Rear shock absorbers are interchangeable in respect to right and left. 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 40-47.

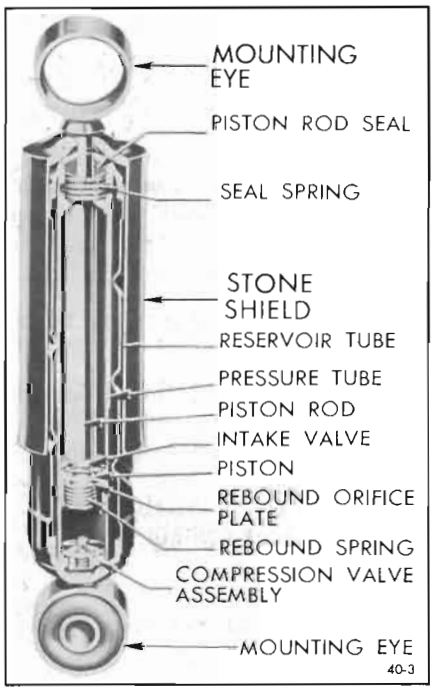

Figure 40-47—Typical Shock Absorber

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.

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

40-14 REMOVAL AND INSTALLATION OF REAR SHOCK ABSORBER

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. Remove nut and washer from lower mounting stud.

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.

3. Remove (2) upper retaining bolts and nuts. Remove shock absorber.

b. Installation

1. Make certain the 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. Attach upper shock bracket with 2 nuts and bolts. Torque evenly to 12-24 lb. ft.

3. Lower rear end of car. Then tighten lower mounting stud nut to 45 lb. ft.

NOTE: Car weight must be on rear wheel when tightening the lower mounting nut to insure that the bushing is in the 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 may adversely affect car performance and is normally not recommended by Buick Motor Division.

40-15 REMOVAL AND INSTALLATION OF REAR CHASSIS SPRING

a. Removal

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

2. Mark universal joint and pinion flange for correct reinstallation. This maintains the balance between these two parts as installed during original assembly. Disconnect by removing "U" bolt clamps at pinion flange (4 bolts on 49000 Series).

3. Slide propeller shaft forward on slip spline far enough to clear rear companion flange. Wire or otherwise suitably support propeller shaft up out of the way. This will prevent damage to constant velocity universal joint center ball caused by allowing it to bend to the end of its travel.

4. Remove bolt attaching brake line bracket to rear suspension cross member to provide slack in brake line.

5. Position jack under rear axle housing and raise jack slightly to relieve tension on shock absorber.

6. Disconnect shock absorber at axle bracket by removing nut.

7. Carefully lower jack to fully extend spring after disconnecting shock and remove spring.

CAUTION: Do not completely lower jack as this will cause strain on brake hose.

b. Installation

1. Install insulator on top of spring and position so that end with identification code tape is at bottom of the spring seat. Rotate spring so that top end is located as shown in Figure 40-44.

2. Raise rear axle and connect shock absorber. Tighten mounting stud nut to 45 lb. ft.

3. Carefully attach the propeller shaft to the rear companion flange observing the following precautions:

a. Compress the bearing cups using a 4" C-clamp to assure that the snap rings do not gouge the companion flange when seating.

b. Do not use the "U" bolts to draw the bearing cups into place. "U" bolts should be seated and the nuts drawn up evenly.

Use Torque Wrench Adapter J-9113 to torque "U" bolt nuts to 15-18 lb. ft. (On 49000 Series, install four bolts and torque to 85 lb. ft.

4. Reinstall brake line bracket to rear suspension cross member.

5. Remove car stands and lower car.

40-16 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 axle 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.

40-17 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.

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.

40-18 TRACK BAR SERVICE AND REPLACEMENT

a. Removal of Track Bar

1. Raise car and support housing so weight of car will be on rear springs.

2. Remove pivot bolt and nut attaching track bar to bracket on housing.

3. Remove pivot bolt and nut attaching track bar to track bar bracket on left side of car.

4. Track bar can now be removed from brackets. See Figure 40-46.

b. Inspection of Track Bar

1. If track bar is bent, it should be replaced. No attempt should be made to straighten it.

2. Check rubber bushings for evidence of deterioration, tears, etc. Examine center steel sleeve for excessive wear or separation from rubber.

c. Removal and Replacement of Track Bar Bushings

1. Press out old bushing from side which has no flange using a ram of 1-7/8" O.D. Considerable force may be required to remove the bushing.

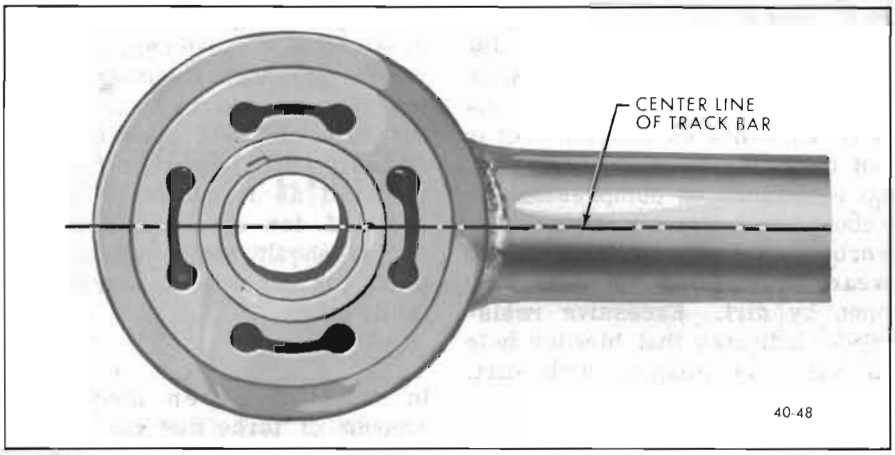

Figure 40-48—Track Bar Bushing Installed in Bar

2. Install new bushing in track bar eye by pressing on flanged side of bushing. Press in bushing until flange is in contact with eye of track bar. See Figure 40-48.

CAUTION: Bushing must be installed so that slots in bushing rubber are in line with centerline of track bar.

d. Installation of Track Bar

NOTE: Track bar to bracket bolts must not be tightened unless car is at normal height.

1. Install pivot bolt and nut attaching track bar to track bar bracket on left side of car. Do not tighten.

2. Install pivot bolt and nut attaching track bar to bracket on housing. Torque track bar attaching nuts to 120 lb. ft.

DIVISION IV
TROUBLE DIAGNOSIS

40-19 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 40-14. 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.

40-20 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 not passengers. See Figure 40-49.

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.

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
45000	9 11/16 ± 1/2	9 11/16 ± 1/2
46000	9 5/8 ± 1/2	9 11/16 ± 1/2
48000	9 13/16 ± 1/2	9 15/16 ± 1/2
49000	7 15/16 ± 1/2	7 5/8 ± 1/2

Figure 40-49—Trim Dimensions