

SECTION 6-C

REPAIR OPERATIONS—CHASSIS SUSPENSION

CONTENTS OF SECTION 6-C

Paragraph	Subject	Page	Paragraph	Subject	Page
6-13	Replace and Adjust Stabilizer Link Grommets.....	6-15	6-19	Replace or Rebush Lower Control Arm Assembly.....	6-18
6-14	Replace and Adjust Front Wheel Bearings.....	6-15	6-20	Chassis Rear Spring Trim Dimension.....	6-19
6-15	Replace or Rebush Steering Knuckle.....	6-16	6-21	Replacement of Chassis Rear Springs.....	6-20
6-16	Replace Upper Pivot Pin and Bushings.....	6-17	6-22	Replace or Rebush Radius Rod.....	6-20
6-17	Chassis Front Spring Trim Dimension.....	6-18	6-23	Checking and Filling Shock Absorbers.....	6-20
6-18	Replacement of Chassis Front Spring.....	6-18	6-24	Replace Shock Absorbers or Valves.....	6-21
			6-25	Removal and Installation of Tire and Tube.....	6-22

SERVICE BULLETIN REFERENCE

Bulletin No.	Page No.	SUBJECT

6-13 REPLACE AND ADJUST STABILIZER LINK GROMMETS

The construction of the stabilizer links is clearly shown in figure 6-15. To disassemble, remove nut from lower end of the link rod, then remove rod, spacer, retainers, and grommets. When new, the link grommets are $\frac{7}{8}$ " free length. When assembling, install rubber grommets dry and use care to center the grommets in the seats on stabilizer shaft and lower

control arm plate, also center the retainers on grommets before tightening rod nut. Tighten rod nut to the limit of thread on rod.

When the rod nut is tightened to limit of threads on rod, the overall dimension between sides of grommet retainers as shown at "A" in figure 6-15 should be $1\frac{1}{16}$ ". If dimension "A" is not $1\frac{1}{16}$ " when nut is tight, adjust the nut to obtain this dimension. *This is important to insure proper riding qualities and stabilization.*

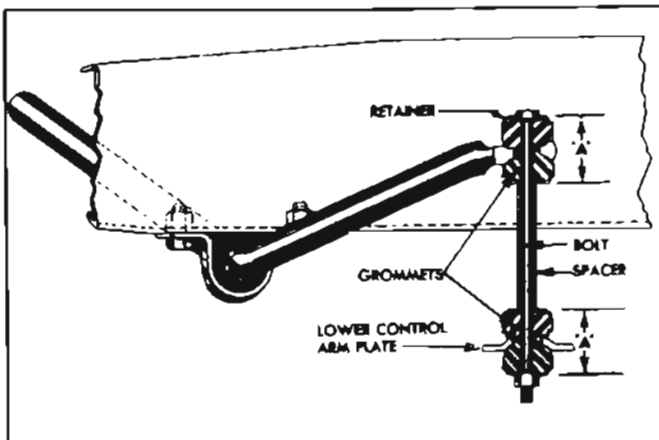


Figure 6-15—Front Stabilizer Link—Sectional View

6-14 REPLACE AND ADJUST FRONT WHEEL BEARINGS

a. Replacement of Bearings

1. Remove wheel with hub and drum assembly. Remove oil seal packing from hub so that inner bearing can be properly cleaned and inspected.

2. Wipe old grease out of hub and from steering knuckle spindle. Clean and inspect all bearing parts as described under Bearing Service (par. 1-11 and 1-12), and replace any that are faulty.

3. If a bearing cup has to be replaced, drive

the old cap out with a punch. Use care when installing the new cap to start it squarely into hub, to avoid distortion and possible cracking.

4. When inspecting or replacing bearing cones (inner races) make sure that cones are free to creep on spindle of steering knuckle. The cones are designed to creep on the spindle in order to afford a constantly changing load contact between the cones and the ball bearings. Polishing the spindle and applying bearing lubricant will permit creeping and prevent rust forming between cone and spindle.

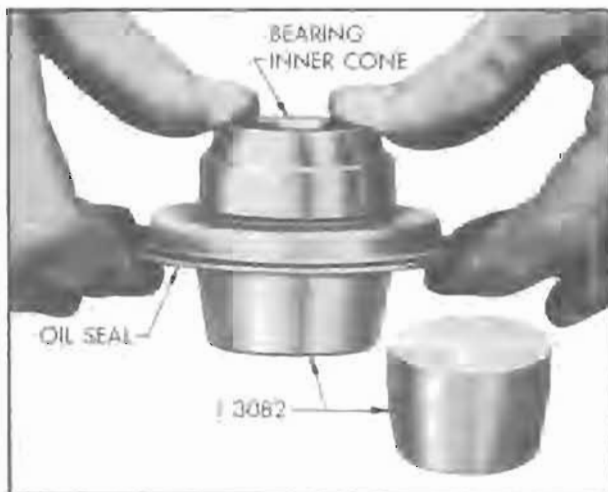


Figure 6-16—Installing Bearing Cone in Oil Seal with Packing Expander J 3082

5. Always install a new wheel bearing oil seal. To avoid damaging the oil seal packing use Packing Expander J 3082 to install bearing inner cone in seal before installation of seal in hub. Push the tapered expander into the seal, place inner cone against expander and push cone into seal until packing bears fully on cylindrical surface of cone. See figure 6-16.

6. Work approximately one tablespoon of wheel bearing lubricant into inner bearing assembly and place it in bearing cup. Install the assembled oil seal and cone, driving the seal squarely into the hub to avoid distortion. An old inner bearing cup and a flat plate may be used to drive seal into place.

7. Work approximately one tablespoon of wheel bearing lubricant into outer bearing assembly then install wheel, outer bearing and cone, safety washer, and nut on spindle. Adjust bearings as described below.

NOTE: *If wheel is removed from spindle for any reason and new oil seal is not installed, push inner bearing cone into seal before reinstalling wheel on spindle, to avoid damaging the seal packing.*

b. Adjustment of Front Wheel Bearings

1. Tighten spindle nut with 10" wrench until bearings are preloaded at least one hex, then rotate wheel one revolution to make sure bearings are seated.

2. Back off spindle nut until bearings are slightly loose. Tighten nut until all bearing looseness is just removed, then line up nut to nearest cotter hole and install cotter pin. Do not mistake loose king pin bushing, etc., for wheel bearing looseness. **CAUTION:** *Bearing preload must not exceed 1/12 turn of spindle nut.*

3. Before installation of grease cap in hub, make sure that end of spindle and inside of cap are free of grease so that radio static collector makes a good clean contact. Make sure that static collector is properly shaped to provide good contact between end of spindle and the grease cap.

6-15 REPLACE OR REBUSH STEERING KNUCKLE

a. Removal of Steering Knuckle

1. Remove front wheel with hub and drum assembly.

2. Remove brake backing plate and steering arm from steering knuckle. Do not disconnect brake hose but support backing plate out of way to avoid strain on hose.

3. Drive out king pin lock pin.

4. Remove upper welsh plug from knuckle by piercing with a sharp pointed punch and prying out.

5. Drive king pin down and out, which will drive lower welsh plug from knuckle. Remove thrust bearing and shims.

b. Rebush Steering Knuckle

New steering knuckles have bushings installed and reamed to size. Bushings are also furnished separately for installation as follows:

1. Remove grease fittings and press old bushings from steering knuckle, using Driver J 1382-3 and Press Plate J 1649. If bushings are so tight that pressure springs yoke end of knuckle, place Spacer J 722-2 between yoke ends to one side of bushing.

2. With oil hole in bushing in line with hole for grease fittings, and with the short groove on inside of bushing leading toward the expansion plug seat, press new bushing into arm of steering knuckle, using Driver J 1382-3, Spacer J 722-2, and Press Plate J 1649. See figure 6-17.

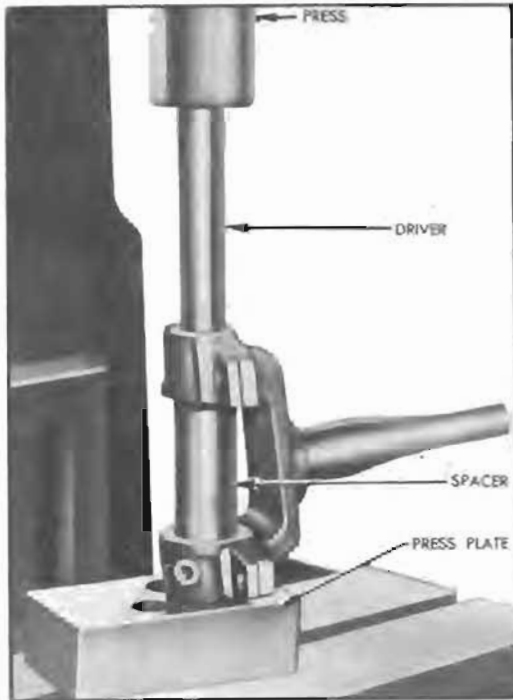


Figure 6-17—Installing Steering Knuckle Bushing

3. Burnish bushings, using Burnisher J 722-1, Spacer J 722-2, and Press Plate J 1649. See figure 6-18. The burnisher expands the bushings tightly in place and sizes the holes for reaming.

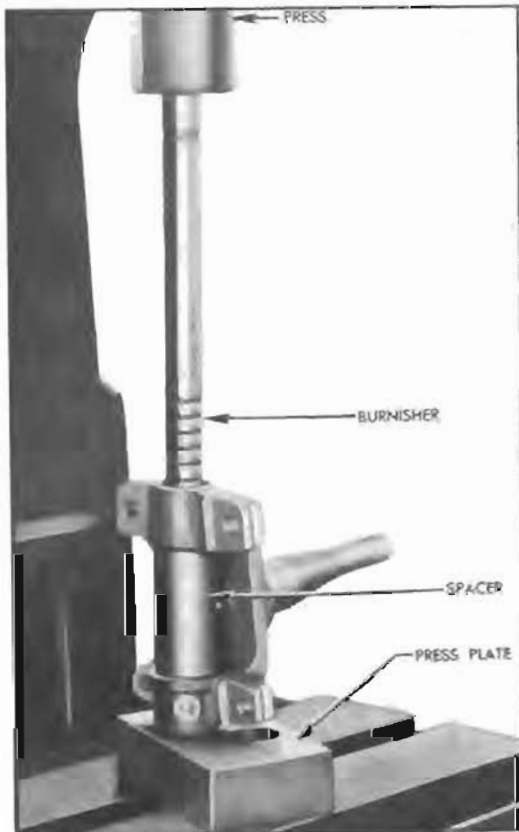


Figure 6-18—Burnishing Steering Knuckle Bushings

4. Use Reamer HM 592 to line ream bushings to provide .0005" to .0025" clearance on king pin.

5. Install grease fittings.

c. Installation of Steering Knuckle

1. Install steering knuckle by reversing the removal procedure. Use shims as required between lower boss of knuckle and the thrust bearing to provide .003" end play of knuckle on knuckle support. Use new expansion plugs at both ends of king pin.

2. Lubricate and adjust front wheel bearings as described in paragraph 6-14.

3. Check and adjust caster, camber, and toe-in (par. 6-30). Be sure to install grease fitting in pivot pin bushing.

6-16 REPLACE UPPER PIVOT PIN AND BUSHINGS

a. Removal of Bushings and Pivot Pin

1. Place jack under lower control arm, raise wheel off floor, and remove wheel and tire assembly.

2. Remove pivot pin bushing clamp bolt in upper control arm, then remove both pivot pin bushings from upper control arm, and remove rubber seals.

3. Loosen clamp bolt in knuckle support and remove pivot pin, using $\frac{1}{4}$ " hex Allen wrench. **NOTE:** Tie steering knuckle support to upper control arm to prevent damage to brake hose.

b. Installation of Pivot Pin and Bushings

1. Hold knuckle support in line with hole through control arm and screw pivot pin into knuckle support, with adjusting wrench hole in pin toward the split side of control arm.

2. Turn pivot pin until the large diameter section is centralized in knuckle support and tighten the clamp bolt. Install rubber seals on both ends of pivot pin.

3. Centralize knuckle support boss in upper control arm yoke and start the externally threaded bushing on threads of pivot pin and into threads of control arm.

4. Start the plain (grooved) bushing on threads of pivot pin, then turn the opposite bushing up tight. Turn the plain bushing up until hex is just clear of control arm, then install and tighten clamp bolts.

5. Check and adjust caster, camber, and toe-in (par. 6-30). Be sure to install grease fitting in upper pivot pin bushing.

6-17 FRONT CHASSIS SPRING TRIM DIMENSION

Before measuring front spring trim dimension, bounce front end of car up and down several times to make sure there is no bind in front suspension and to let springs take a natural position.

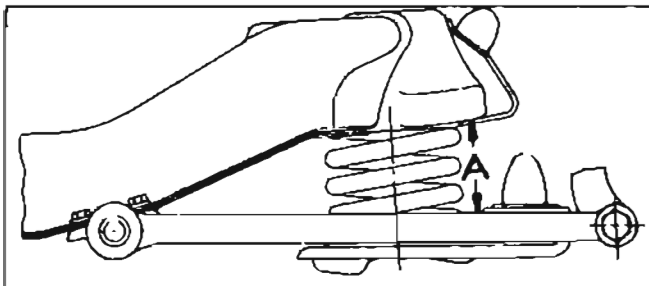


Figure 6-19—Front Spring Trim Dimension

On a car having service miles the front springs are considered too high or too low when the trim dimension shown at "A" in figure 6-19 is not within the following limits, *with car at curb weight*.

All models except 56C, 56R,	
76C, 76R	3 $\frac{3}{4}$ "-4 $\frac{1}{4}$ "
Models 56C, 56R, 76C, 76R	3 $\frac{1}{2}$ "-4"

NOTE: Add $\frac{3}{16}$ " when checking a NEW car.

When the trim dimension is found to be too low, correction may be made by installing special shims (Group 7.425), $\frac{1}{8}$ " thick, between upper end of spring and the frame. If more than three shims are required, replace the spring.

6-18 REPLACEMENT OF CHASSIS FRONT SPRING

a. Removal of Front Spring

1. Place jack under lower control arm, raise wheel off floor, and remove wheel and tire assembly.

2. Disconnect stabilizer link from lower control arm and disconnect outer end of the tie rod from steering arm.

3. Remove lower pivot pin nut, pivot pin, lockwasher, and dirt seals.

4. Support car frame by another jack, then slowly lower the jack under lower control arm. This will allow lower control arm to drop low enough to remove chassis spring.

b. Installation of Front Spring

Before installation of front spring, check the part number which is stamped on one end coil to make sure that spring is correct for the car model, as specified in Group 7.412 of Master Parts List.

1. Make sure that the rubberized fabric spring insulator is in place around the spring center cup on frame, and is in good condition.

2. Place small end coil of spring over the center cup and as lower control arm is raised, position lower end of spring so that the end coil seats in the recess provided in spring seat. Support lower control arm on a jack.

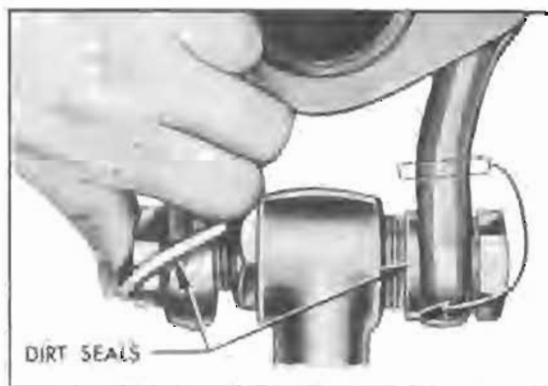


Figure 6-20—Installing Dirt Seals

3. Slip the lower pivot pin dirt seals over outer ends of lower control arm. Centralize lower end of knuckle support between outer ends of lower control arm, then install lower pivot pin and lockwasher from front side and tighten securely. Install and tighten nut. Snap dirt seals into place over pivot pin. See figure 6-20.

4. Connect tie rod outer end to steering arm, and connect stabilizer link to lower control arm. Adjust stabilizer link grommets as described in paragraph 6-13.

5. Install wheel and tire assembly, then check and adjust caster, camber, and toe-in (par. 6-30).

6-19 REPLACE OR REBUSH LOWER CONTROL ARM ASSEMBLY

If a lower control arm is bent or broken it should be replaced with a new assembly which includes the shaft, bushings, and dirt seals. The riveted parts of the assembly are not furnished separately. If only the shaft and bushings require replacement these can be obtained separately.

Use all of the following steps for replacement of control arm shaft and bushings. Use only steps 1, 9 and 10 for replacement of control arm and shaft assembly.

1. Remove front chassis spring (par. 6-18) then remove lower control arm assembly from frame front cross member.

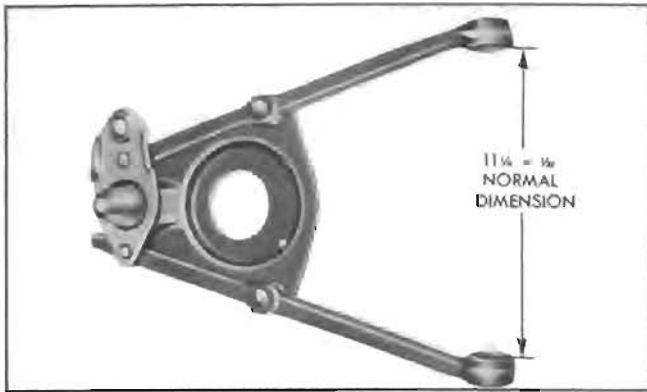


Figure 6-21—Correct Spacing of Control Arm Inner Ends

2. Unscrew bushings and remove shaft from control arm.

3. Check the distance between inner ends of control arm. The normal dimensions is $11\frac{1}{4}$ " plus or minus $\frac{1}{32}$ ", from inside to inside. See figure 6-21.

4. Install a rubber seal over each threaded end of new control arm shaft, with the large or bell ends of seals outward toward ends of shafts

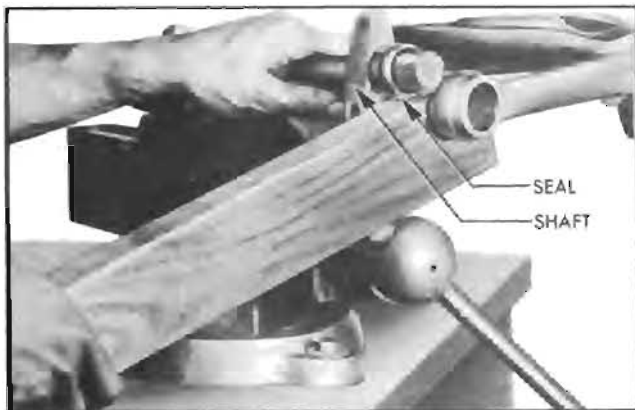


Figure 6-22—Springing Arm Over End of Shaft

5. Insert one end of shaft with the seal in place in one control arm end and force opposite end of shaft into the other control arm end. A piece of wood approximately $11\frac{1}{4}$ " x $2\frac{1}{2}$ " x 24" long can be used as a pry. See figure 6-22.

6. Fasten control arm securely in vise close to one end to prevent springing or distortion. NOTE: Apply a liberal amount of white lead or Lubriplate to both bushings before installing in arms.

7. Start first bushing on shaft and into control arm at the same time. Turn bushing until head is tight against arm and tighten to a minimum of 100 ft. lbs. torque.

8. Center the shaft between the arms and install the second bushing as in Step 7, turning shaft as required to thread into the bushing so that no binding exists.

9. Before installing lower control arm and

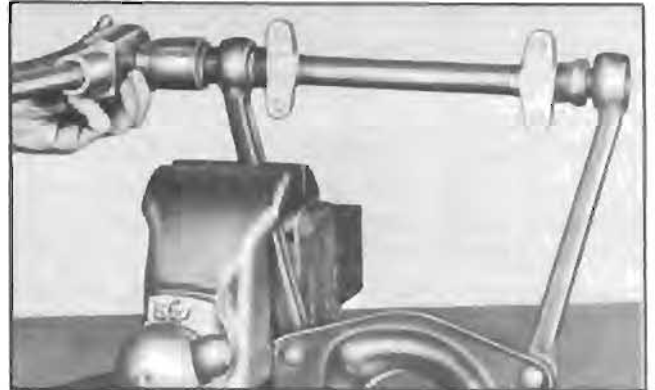


Figure 6-23—Installing First Bushing

shaft assembly, turn shaft to locate the bolt holes at both ends so they are equally distant from the inside surface of the arms, then bolt shaft to frame front cross member.

10. Install front chassis spring and other part (par. 6-18). Check and adjust caster, camber, and toe-in (par. 6-30).

6-20 CHASSIS REAR SPRING TRIM DIMENSION

Before measuring the rear spring trim dimension, bounce rear end of the car up and down several times to make sure there is no bind in rear suspension and to let spring take a natural position.

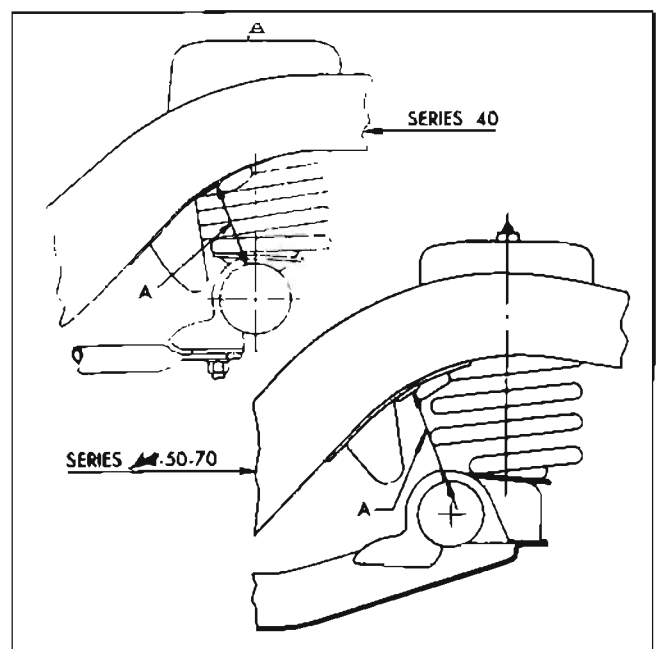


Figure 6-24—Rear Spring Trim Dimension

On a car having service miles the rear spring trim dimensions shown at "A" in figure 6-24 should be within the following limits, with car at curb weight.

All models except 46C, 56C, 56R, 59, 76C, 76R, 79	5 $\frac{3}{16}$ "-6 $\frac{1}{16}$ "
Models 46C, 56C, 76C, 76R	5 $\frac{1}{2}$ "-6 $\frac{1}{4}$ "
Model 56R	5 $\frac{5}{8}$ "-6 $\frac{3}{8}$ "
Models 59, 79	5 $\frac{5}{8}$ "-6 $\frac{3}{8}$ "

NOTE: Add $\frac{3}{8}$ " when checking a NEW car.

If trim dimension "A" is not within specified limits the weak spring should be replaced. In each case new spring installation should not increase spring dimension "A" more than 1" over limit given above.

6-21 REPLACEMENT OF CHASSIS REAR SPRINGS

a. Replacement Procedure

1. Disconnect links from rear shock absorber arms.
2. Hoist rear end of car until all load is off rear springs and place floor stands under frame for safety.
3. Remove spring clamps at lower and upper ends and remove spring. Lower clamp bolts on Series 44-50-70 have left hand threads.
4. Check part number stamped on one end coil of new spring to make certain that spring is correct for the car model as specified in Group 7.503 of Master Parts List.
5. Be sure that spring insulator in upper seat is in good condition then attach upper end of spring using spring clamp, bolt insulator, flat washer, lockwasher and bolt in the order named. Attach lower end of spring with spring clamp, lockwasher and nut (Ser. 40) or bolt (Ser. 44-50-70).
6. Lower rear end of car and attach links to shock absorber arms.

b. Use of Special Overload Rear Springs

Special 500 pound overload rear springs are available for service installation in cases where heavy loads are carried or heavy trailers are towed. *Overloading any series rear axle in excess of 500 pounds is not recommended.*

In estimating rear spring overloads, place rear wheels of car on scale, with car at curb weight and no load in rear compartment other than spare wheel and tire. After obtaining weight, hook trailer to car, or place desired load in rear compartment, and read scale again. The additional weight is the amount of overload on springs and rear axle.

Trailer design, and distance that trailer coupling is located to rear of rear axle center line, are the major factors governing effective trailer overload. Instructions for attaching trailers to

Buick cars may be obtained from Buick Motor Division Factory Service Department.

6-22 REPLACE OR REBUSH RADIUS ROD

1. Support rear end of car on jacks placed under rear axle housing so that weight of car will be on rear springs.

2. On right end, remove radius rod pin nut and lockwasher, then disconnect pin support from bracket on axle housing. On left end, remove pin nut and lockwasher then remove pin support (Ser. 40) or frame bracket brace (Ser. 44-50-70). Remove rod and bushings from pin on frame bracket.

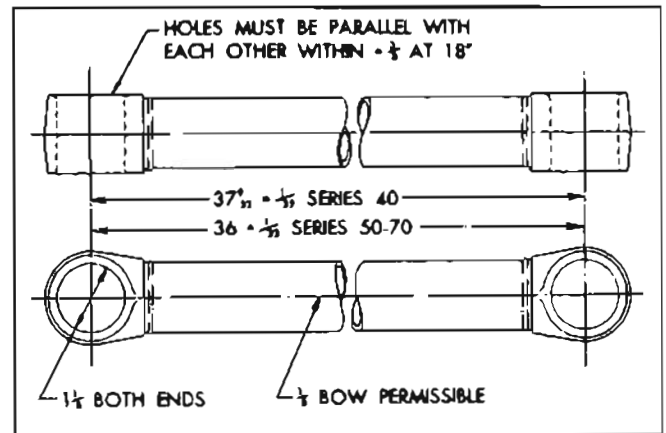


Figure 6-25—Radius Rod Dimensions

3. Check radius rod for twist and bow, which should be within limits shown in figure 6-25. If rod is twisted or bowed it must be straightened *without heating*; otherwise, replace with a new part.

4. Install rod with new rubber bushings, reversing procedure for removal. When radius rod pin nuts are tightened, normal weight of car must be on rear springs so that rubber bushings in rod will be clamped in neutral position.

6-23 CHECKING AND FILLING SHOCK ABSORBERS

CAUTION: Thoroughly clean off all dirt from top of shock absorbers, front and rear, to avoid getting dirt into absorbers when filler plugs are removed. Blow off all loose dirt from the surrounding area of chassis so that dirt will not be brushed off into filler opening while filling shock absorbers. A few grains of dirt can readily plug a shock absorber valve and seriously affect performance of the unit.

a. Filling Front Shock Absorbers

Remove filler plugs and add fluid until it overflows, using only G. M. or Delco Shock Ab-

sorber Fluid. Install plugs loosely to exclude dirt and bounce front of car up and down by front bumper to force out any air in cylinders. Repeat addition of fluid and bouncing of car until no more fluid can be added, then install filler plugs securely. An air space is built into the front shock absorber body above the filler opening to provide for expansion of the fluid when hot.

b. Filling Rear Shock Absorbers

Remove filler plugs and add G. M. or Delco Shock Absorber Fluid until level is $\frac{1}{2}$ " to $2\frac{3}{32}$ " below filler openings. Install plugs loosely to exclude dirt and bounce car up and down by rear bumper to force out any air in cylinders. Add additional fluid, if necessary, until fluid level is $\frac{1}{2}$ " to $2\frac{3}{32}$ " below filler openings, then install filler plugs securely.

Shock absorbers require some air space for expansion of fluid when hot, otherwise fluid may be forced out. This air space must be provided in rear absorbers by leaving fluid level $\frac{1}{2}$ " to $2\frac{3}{32}$ " below filler opening. Correct level in rear absorbers may be conveniently obtained by use of Shock Absorber Gun KMO 1026 and Adapter J 1611. Use gun to fill absorber and place the adapter on gun nozzle to suck out surplus fluid.

c. Checking for Fluid Leaks in Shock Absorbers

An empty or almost empty shock absorber indicates leakage which should be located and corrected.

To check for leaks, clean off the entire body with an air hose, then fill shock absorber as described above. Drive car over a rough road for a few blocks, then inspect the unit with a good light. A slight leak at the seal around cam shaft is of little consequence and is due to initial expansion after filling. Leakage at end caps of front shock absorber will require removal of unit for installation of new gaskets. Leakage at gaskets of rear shock absorbers may be corrected by installation of new gaskets without removal of the unit.

6-24 REPLACE SHOCK ABSORBERS OR VALVES

In front shock absorbers, the end cap gaskets may be replaced to correct fluid leaks, and the valves may be replaced, if the proper special tools are available in the shop.

In rear shock absorbers, the cover or gasket, rebound and compression valves, valve nuts and gaskets may be replaced with ordinary hand tools. The intake valves in pistons cannot be replaced.

If any other parts replacements or repairs are required in either a front or rear shock absorber, a complete replacement unit is required. Replacement shock absorbers are available through Buick Parts Warehouses on an exchange basis.

Shock absorber calibrations as furnished in production, and as given in Chassis Suspension Specifications (par. 6-1) have been carefully engineered to provide the best ride control over a wide range of driving conditions. Substitution of other calibrations should not be attempted under any circumstances, unless authorized by Buick Motor Division.

a. Removal and Installation

A front shock absorber can be removed by removing the knuckle support upper pivot pin (par. 6-16) and the three shock absorber attaching bolts. The outer bolt (located at upper end of chassis spring) may be removed with a socket wrench and extension through the opening in lower control arm spring seat. When shock absorber is installed by reversing removal procedure, caster, camber, and toe-in must be checked and adjusted (par. 6-30).

A rear shock absorber can be removed by disconnecting link from shock absorber arm, and removing shock absorber from brake backing plate after removal of brake drum.

b. Removal of Front Shock Absorber Valves

1. Thoroughly clean outside of shock absorber, then mount it on Holding Fixture J 895. *Do not hold shock absorber in a vise.*

2. Remove end cap, using End Cap Wrench J 766. See figure 6-26. *Do not use a pipe wrench as this will ruin the cap.*

3. Remove fluid. With a screwdriver, remove retainer ring that holds the valve in place. Lift out the valve assembly, return spring, and the two thin steel discs located under the valve seat.

4. Remove valve assembly from opposite piston in the same manner.

5. Inspect the valves. If air cannot be blown through bleed hole, valve is plugged and should be replaced with new valve assembly.

6. Thoroughly clean inside of shock absorber with gasoline or kerosene, working shock

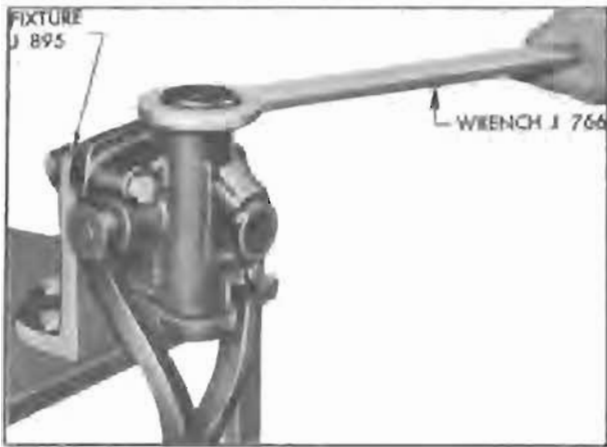


Figure 6-26—Removing Front Shock Absorber End Cap

absorber arm through complete travel while cleaning. Drain cleaning solution and blow out absorber with air.

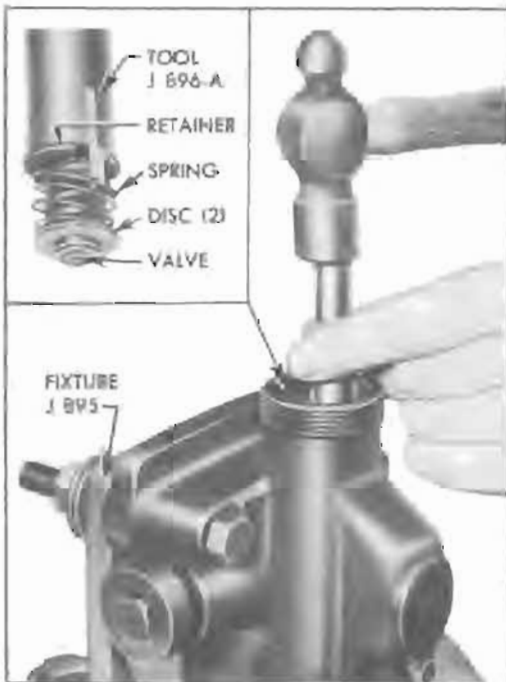


Figure 6-27—Installing Front Shock Absorber Valve Retainer

c. Installation of Valve in Front Shock Absorber

1. Mount shock absorber on Holding Fixture J 895. Install compression and rebound valve discs, valves and retainers, using Valve Installing Tool J 896-A to install the retainers. The blade of tool is placed in the gap in retainer and it holds valve spring down while retainer snaps into notches in piston. See figure 6-27.

2. Install one end cap, using new end cap gasket and tighten securely with Wrench J 766. **CAUTION:** A small amount of Lubriplate or soft soap should be placed between the end cap and the end plate and between the end plate

and gasket before installation to prevent the gasket tearing when tightening end cap. Tap end cap with hammer after tightening and then re-tighten. End cap must be tight.

3. Turn shock absorber over on holding fixture and fill open end with fluid, holding the valve off its seat while filling. Move shock absorber arm through complete travel while filling to remove any air trapped in closed end.

4. When completely filled, install end cap securely, using new gasket and being careful not to tear gasket, as mentioned in step 2 above.

5. Place shock absorber flat on bench, remove filler plug, and add fluid to completely fill shock absorber, move arm up and down several times and recheck for complete filling, then install filler plug and gasket.

d. Replacement of Rear Shock Absorber Valves

After thoroughly cleaning outside of shock absorber, remove rebound or compression valve as required by removing valve nut and gasket. The rebound valve consists of one assembly. The compression valve consists of an orifice assembly, blow off spring, static valve, and static spring, which must be installed in the order given. See figure 6-7.

6-25 REMOVAL AND INSTALLATION OF TIRE AND TUBE

With the synthetic tubes and drop center rims, care must be taken in removal and installation to avoid injury which would result in early failure of tube in service. The following instructions must be carefully followed.

1. Deflate tube completely. Loosen both beads from rim ledges, using tool if necessary. Insert two tire tools about 8 inches apart between bead and rim flange near valve stem and pry short lengths of bead over flange. See figure 6-28, view A. Then, leaving one tool in position, follow around rim with the other tool, taking small bites, to remove remainder of bead.

2. Remove inner tube. See figure 6-28, view B. Stand wheel in upright position with bead in well of rim at bottom. Insert tool between bead and rim flange at top side of wheel and pry wheel out of tire. See figure 6-28, view C

3. Inspect inside of tire and remove any dirt or other foreign materials. Inspect for cracks in casing which would pinch the tube.

4. Insert the deflated tube in tire and inflate just enough to round it out, placing valve at red balance mark.



Figure 6-28—Removing Tire and Tube

5. Make solution using water with tube mounting compound or prepared liquid tire soap, and work it into a heavy suds. With a cloth or sponge, swab thoroughly all around the base of the tube, between the tube and beads of tire and on the face of the beads. See figure 6-29, view A. *Do not use oil or grease.*

6. The soap acts as a lubricant and reduces the friction as the tube passes over the beads down into the well of the rim when inflated. If tube and tire are not properly lubricated, friction will prevent tube from sliding into the well of rim, consequently the tube will be stretched thin in this area when inflated. See figure 6-29, views B and C.

7. Lay wheel flat with valve hole up. Start to mount tire with valve pointing toward valve hole. Apply the first bead by pushing a portion of it into the well and then working the remaining part over the flange with a tire tool. Spread the tire and place valve stem through the hole in rim. The use of a valve fishing tool

or valve extension will aid in pulling the valve into position.

8. Force the portion opposite the valve down into the well of the rim and with tire tools work the remainder of the bead over the flange, alternating from right to left to prevent the tire from creeping on the rim. Make certain that the beads are out of the well and in position to seat properly against the flange, then pull the valve out so as to hold the base snugly against the rim. While holding the valve in this position, inflate the tire until both beads are seated, with the centering ribs (when marked on the tire) showing evenly above the rim flange.

9. The tube then should be deflated completely to allow for adjustment of position and insure against pinching of tube under beads. Re-inflate to recommended pressure for use (par. 6-8).

10. If tube or tire was repaired by patching, the wheel and tire assembly should be statically and dynamically balanced before use, as described in paragraph 6-28.

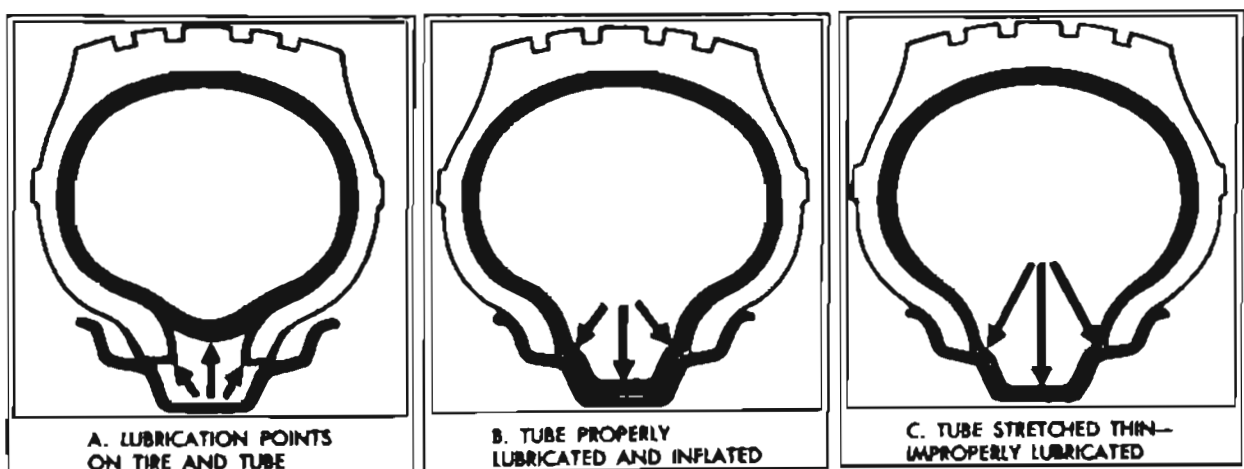


Figure 6-29—Lubrication and Inflation of Tube