PART ONE—CHASSIS

SECTION 8—FRAME, REAR SPRINGS, SHOCK ABSORBERS

1. FRAME

The dimensions shown in Figures 2, 3, 4 and 5 are the distances between the indicated points as measured with a steel tape. Frame measurements on cars should be taken from the radiator support bracket holes.

Measuring from these points is the most accurate way of showing the true relationship of the various frame parts.

Diagonal measurements can be taken to check the squareness of the frame. See Figure 1. If the frame brackets are bent, these measurements may be taken from corresponding points on the frame side rails and cross members. **Any two diagonals compared must represent exactly corresponding points on each side of the frame.** Diagonal measuring will determine which section of the frame is bent and where force should be applied to restore correct alignment.

CHECKING FRAME ALIGNMENT

To check the frame for alignment, measure the distance between the points connected by line "A." Compare this measurement with the distance between the points connected by line "B." See Figure 1. Compare all corresponding diagonals in this manner. The distance between the points connected by any two corresponding diagonals should be within ¼ inch.

With the body removed, diagonals may be measured with a steel tape. Measurements may be taken without removing the body by using a plumb bob and chalk line.

To take diagonal measurements with the body on the car, place the car on a level floor. Suspend the plumb bob directly under the center of one of the rear body bolts and mark the floor at that point. Repeat the same procedure under the center of other body bolts. The marks made on the floor will represent various points which can be checked diagonally.

CORRECTING FRAME ALIGNMENT

Correct frame alignment can usually be restored by straightening the frame parts. If frame cross members, side rails or brackets are badly distorted, it is a better practice to replace the entire assembly or the individual parts.

When installing such parts as body hangers or rear engine support cross members, use the old rivet holes as a guide for correct positioning and weld these parts to the frame.

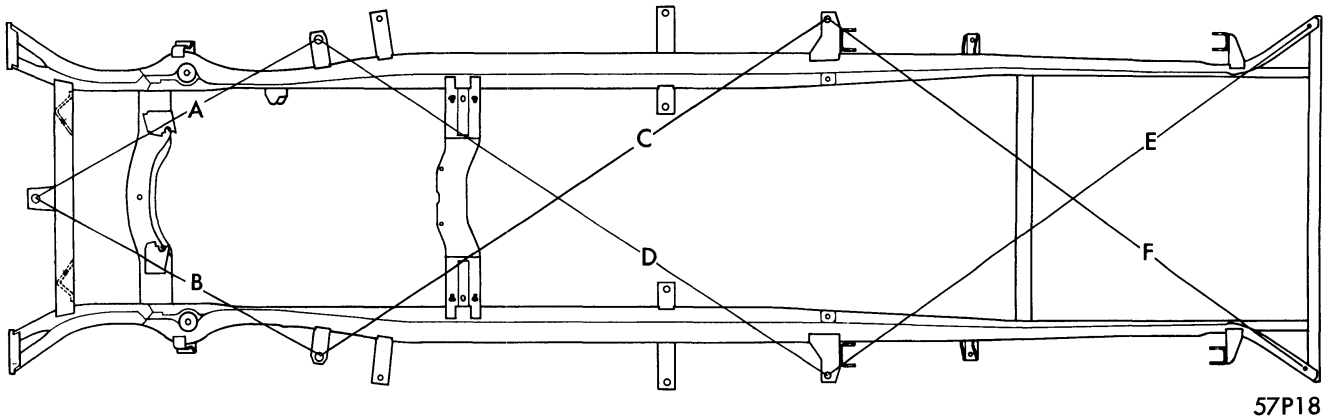

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Figure 1—Diagonal Measurements

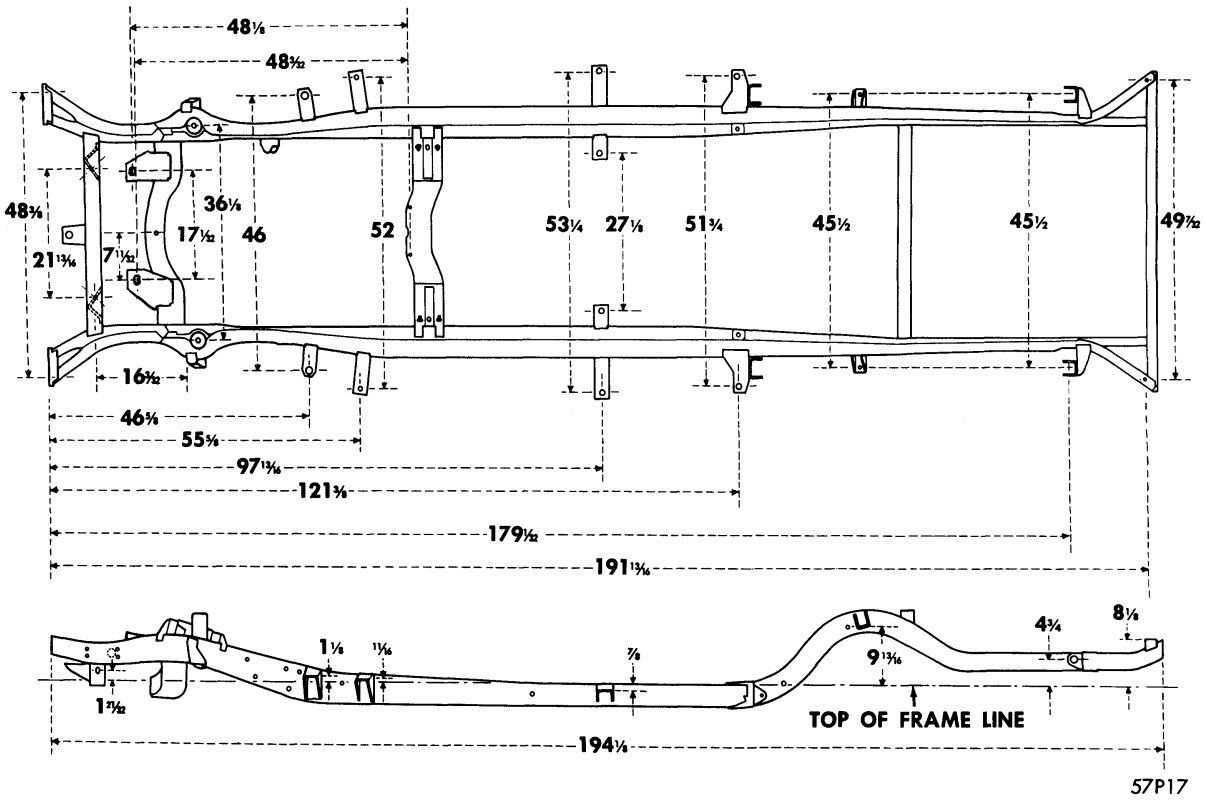

Figure 2—Frame Dimensions—All Models—P-30, LP-1 Except Convertible Coupe and Suburban

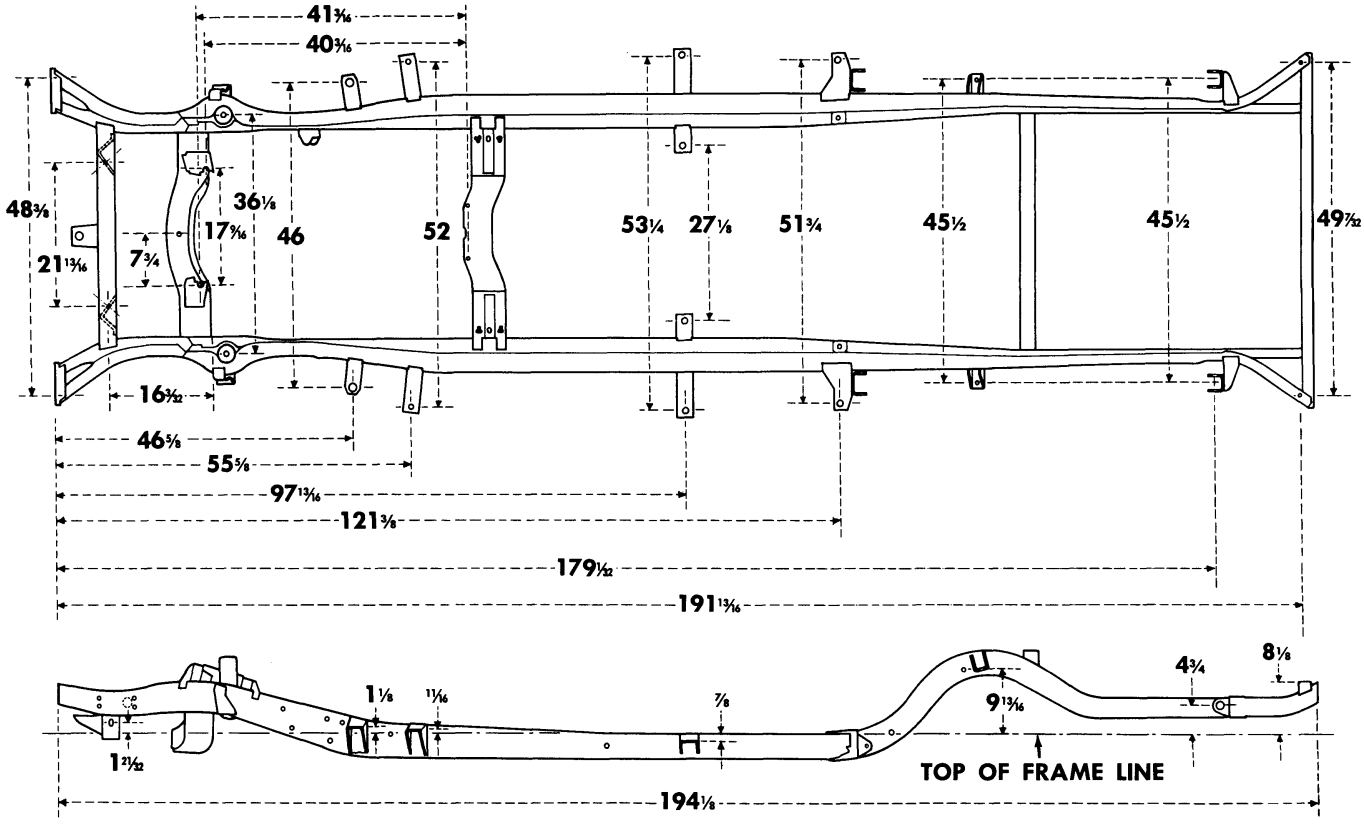

Figure 3—Frame Dimensions—All Models—P-31, LP-2 Except Convertible Coupe and Suburban

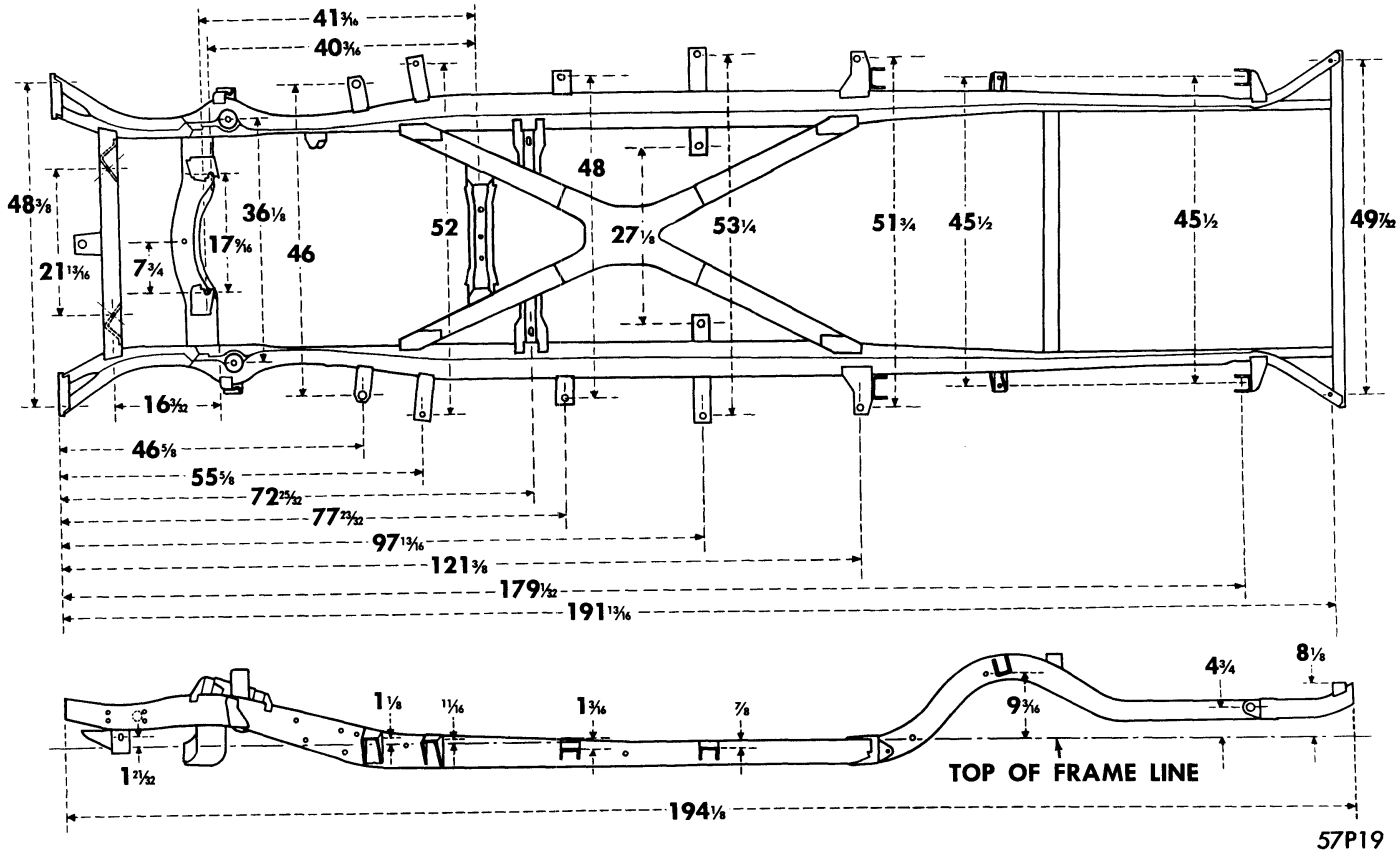

Figure 4—Frame Dimensions
P-31, LP-2 Convertible Coupe

DATA AND SPECIFICATIONS

FRAME				
Models	**P-30**	**P-31**	**LP-1**	**LP-2**
Type	Box Section			
Frame Dimensions	See Figures 2, 3, 4 and 5			

REAR SPRINGS			
Type	Semi-Elliptic with Grooved Leaves		
Number of Leaves	4 (exc. Sub.)	4 (exc. Sub.)	5 (exc. Sub.)
	6 (all Suburbans)		
	Heavy duty springs—6 leaves (except Suburban) —7 leaves (Suburban)		
Type Shackle	Side strapped with rubber bushed bolts		
Type Pivot Front End	Rubber Bushings		

TORQUE SPECIFICATIONS	
Rear spring silent block nut	60 ft. lbs.
Shock absorber stud nut ½ in.	60 ft. lbs.
Rear spring U-clip bolt nuts	70 ft. lbs.
Rear spring shackle nuts 7/16 in.	50 ft. lbs.

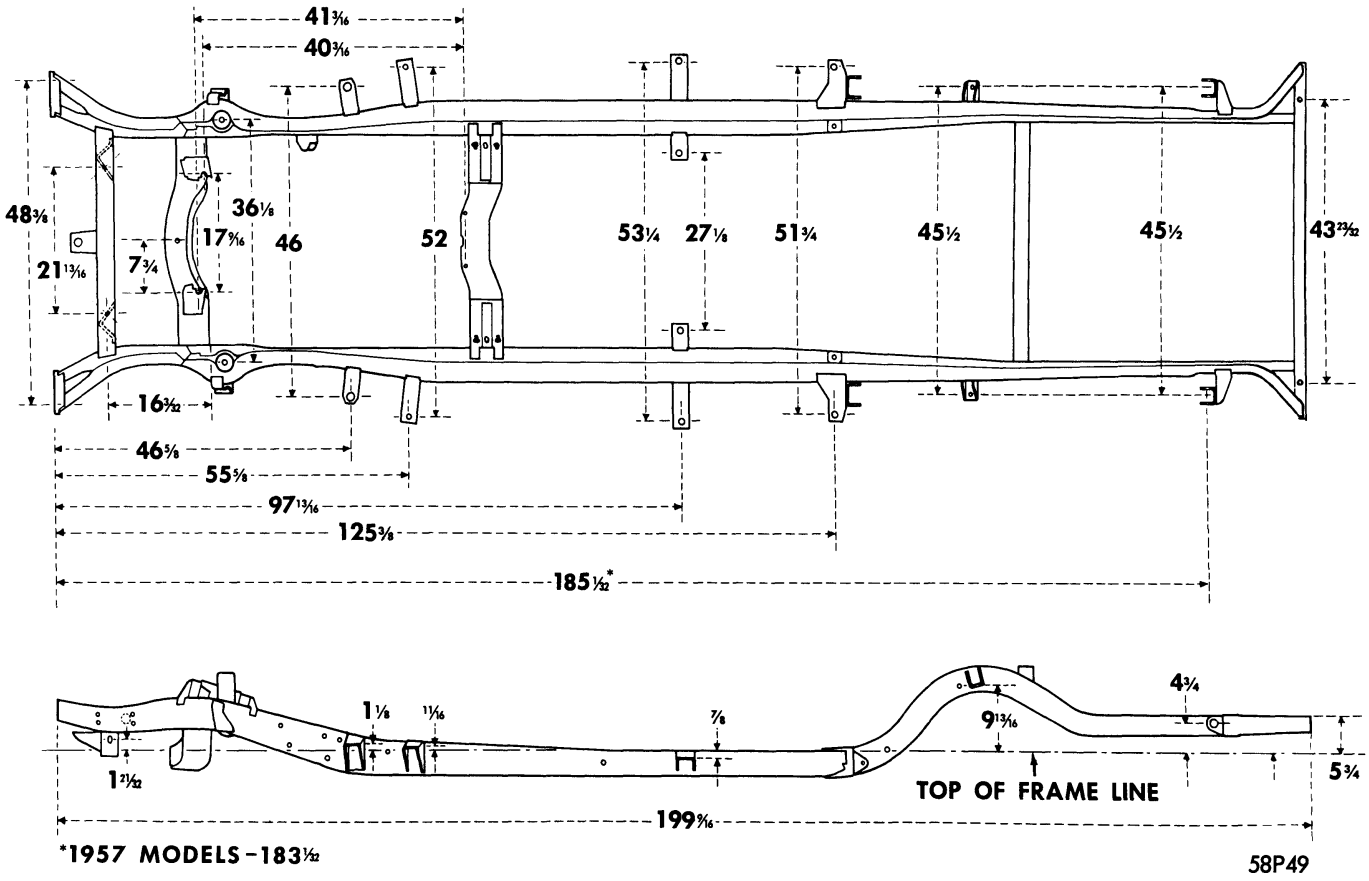

Figure 5—Frame Dimensions—Suburban Models

2. REAR SPRINGS

The spring front pivot bolts are cushioned in rubber to help reduce noise and increase riding comfort through a reduction in torque and brake reaction shock. (No lubrication is required at this point.) See Figure 6.

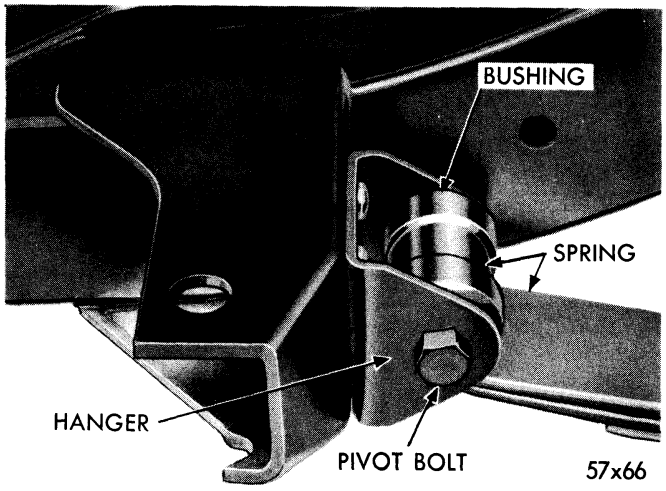

Figure 6—Spring Front Mounting

The rear ends of the springs are attached to the frame through the medium of flat plate shackles, rubber shackle bushings, shackle bolts and nuts. Thus, the suspension of the rear springs in rubber tends to reduce road noise to a minimum. (No lubrication is required at the rear shackles.) (See Figures 7 or 8.)

All models are equipped with 4 leaf springs, except the suburban models, which are equipped with 6 leaf springs. (Refer to Specifications.)

Tighten spring "U" bolt nuts to 70 foot-pounds. The spring shackles should be inspected occasionally to make sure they are tight, but not binding. Tighten to 50 foot-pounds. **No lubrication of any kind must be used on rubber bushings.**

Front suspension heights may be affected if the rear spring height varies more than ¾ inch on one side as compared with the other side. To check this, measure the vertical distance from the top of the rear spring main leaf to the underside of the frame side rail on both sides of the car. If these distances differ by more than ¾ inch, this is an indication that one of the rear springs may need replacing if condition is not due to a bent frame.

Springs are expected to "bottom" under abnormal con-

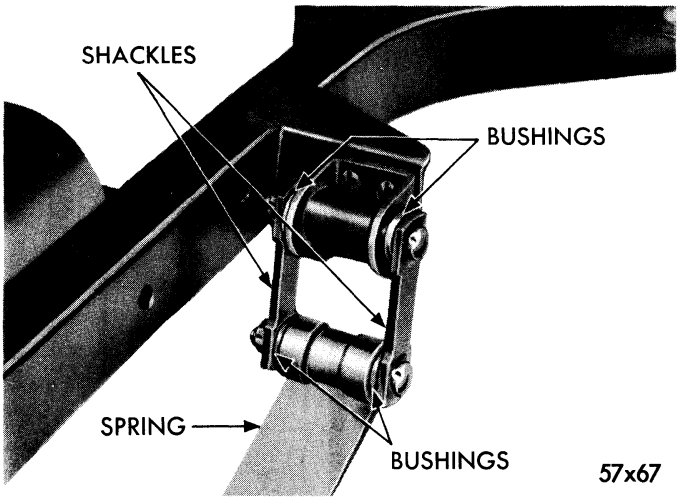

Figure 7—Spring Rear Mounting

NOTE

It should be remembered that on current vehicles, it is perfectly normal for rear springs to show some reverse arch, even with no load, so appearance alone should not be the cause for the rejection of a spring.

ditions particularly when road dips, railroad crossings and the like, are encountered at relatively high speeds.

3. SPRING INTERLINERS

REMOVAL

To replace the interliners, unload the rear springs by jacking up the rear end of the frame until the rear shock absorbers are fully extended.

Remove the alignment clips from the springs. Examine the spring interliners. If any of them are missing, or if any of them have lost their metal fasteners, they will have to be replaced. To replace these interliners pry out the metal fasteners directly beneath the spring leaf surface and slip out the old interliner, after separating the spring leaf from the next longer spring leaf. To effect this separation, pry open the slight gap between the leaves with a screwdriver until a tapered bar can be hammered in place between the screwdriver and the interliner, as shown in Figure 9. Keep the tapered bar in place.

Clean the lower (grooved) surface of the longer spring leaf as far as the interliner makes contact. Use sandpaper wrapped around a flat file and scrub vigorously to remove any dirt or rust spots and to obtain smooth metallic surfaces to the left and right of the groove. Wipe off excess particles, including dirt in the groove itself, with a clean cloth. In order to reach between the leaves, open the gap by bearing down on the end of the tapered bar.

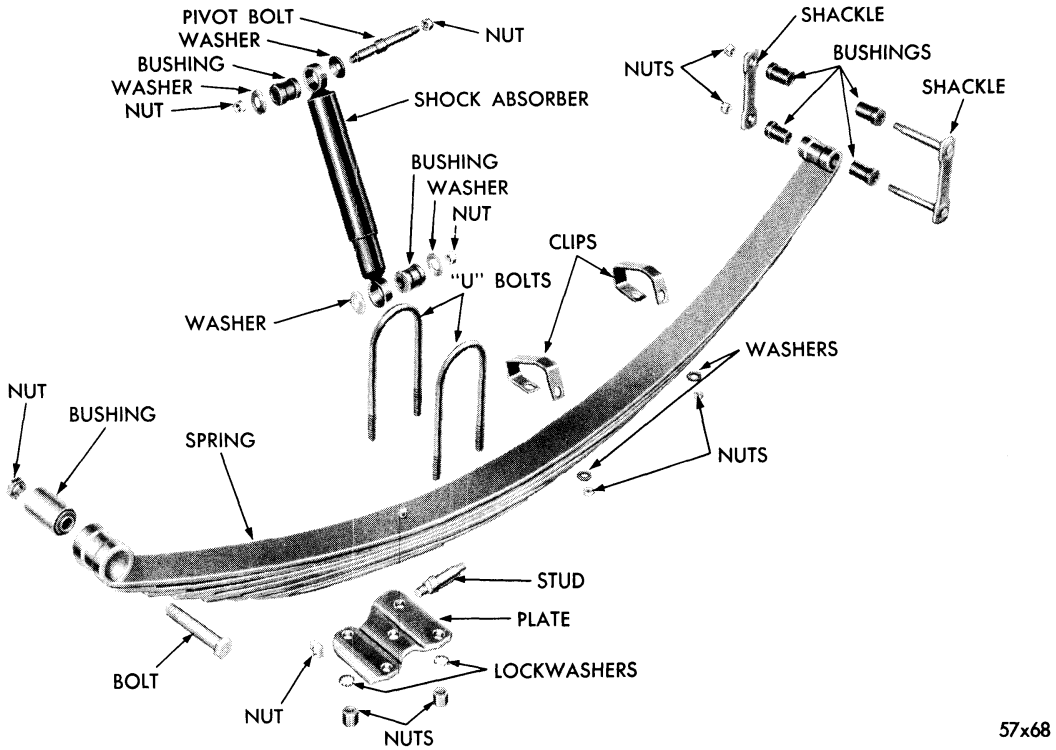

Figure 8—Rear Spring Suspension

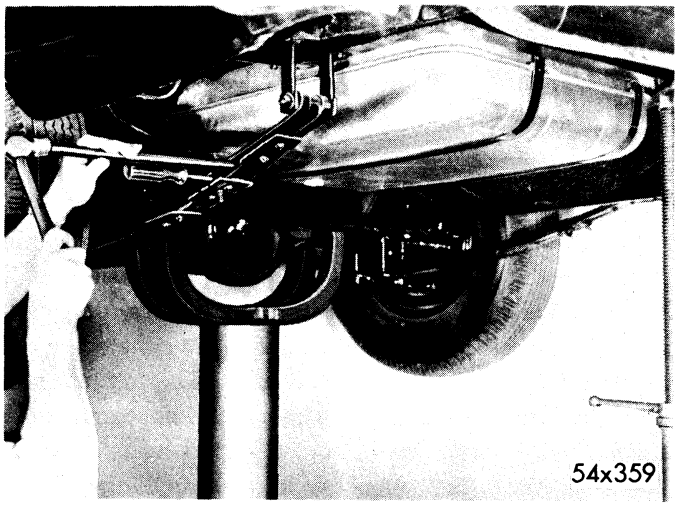

Figure 9—Separating Spring Leaves

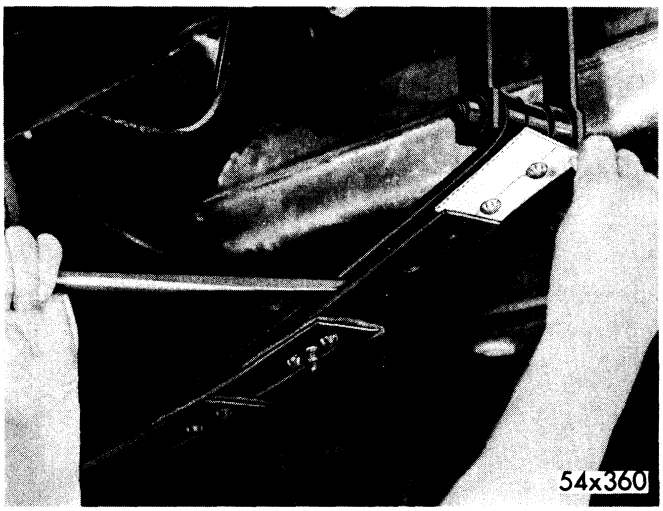

Figure 10—Positioning New Interliner

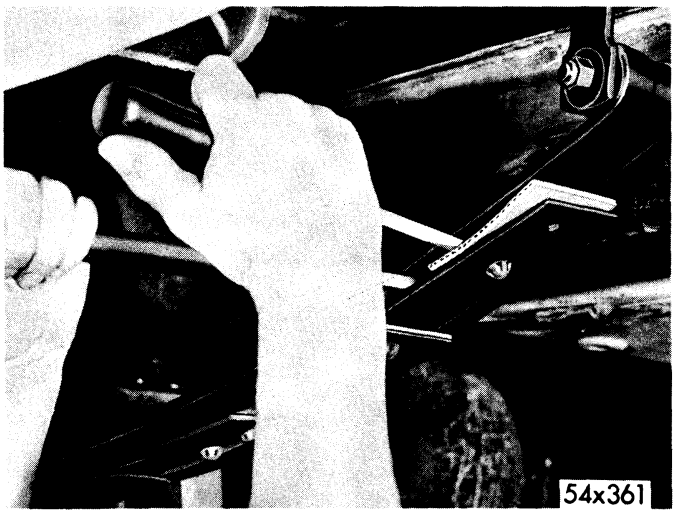

Figure 11—Prying Fastener Prong Through Leaf

INSTALLATION

Slip the new interliner in place by opening the gap between the spring leaves with a tapered bar and moving the interliner until the prongs of the metal fasteners are aligned with the holes in the shorter leaf, as shown in Figure 10. With the tapered bar still in place, pry the prong end of each metal fastener through the hole in the spring leaf, as shown in Figure 11.

Remove the tapered bar from between the leaves. The bar may be withdrawn while a screwdriver is placed alongside. Then the screwdriver may be pulled out.

Position the wrap-around alignment clip and tighten retainer nut, as shown in Figure 12. Peen the end of the bolt over the nut so it will not loosen.

The interliners used on the front of the rear springs are different than those on the rear, as shown in Figures 13 and 14. However, the same service procedures are used whether installing the front or rear interliners.

4. SHOCK ABSORBERS

The Plymouth cars are equipped with Oriflow shock absorbers. Oriflow shock absorbers are double acting and provide a smoother, steadier gliding ride with greater comfort and stability, which is particularly noticeable at high speeds or on rolling or rough roads. The Oriflow shock absorbers permit the car's wheels to follow the road surfaces (and the springs to flex) without the harshness and jitter usually found in the conventional single action shock absorbers.

REMOVAL AND INSTALLATION

See Front Suspension Section paragraph 2 for the removal and installation of front shock absorbers.

OPERATION

The springs permit the wheels to move up and down with respect to the body. However, springs alone cannot provide as smooth a ride as desired, because of energy stored up in the springs during rebound and compression. In an unrestrained spring, the energy is released suddenly and the spring continues to vibrate for a period of time.

SERVICING ORIFLOW SHOCK ABSORBER

The Oriflow shock absorber cannot be refilled or disassembled. Where servicing is required, the shock must be removed and a new unit installed. Shock absorbers should only be replaced if they have lost their resistance in one or both directions or if they drip oil.

NOTE

Evidence of oil moisture is not cause to replace them as the seal must weep to prevent scoring.

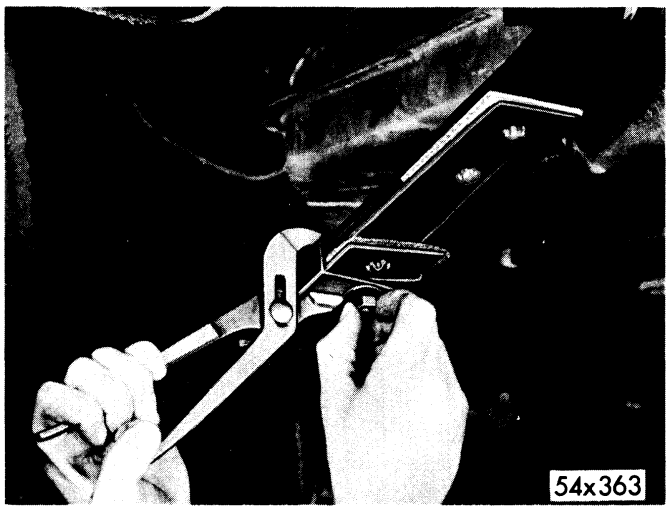

Figure 12—Preparing to Tighten Alignment Clip

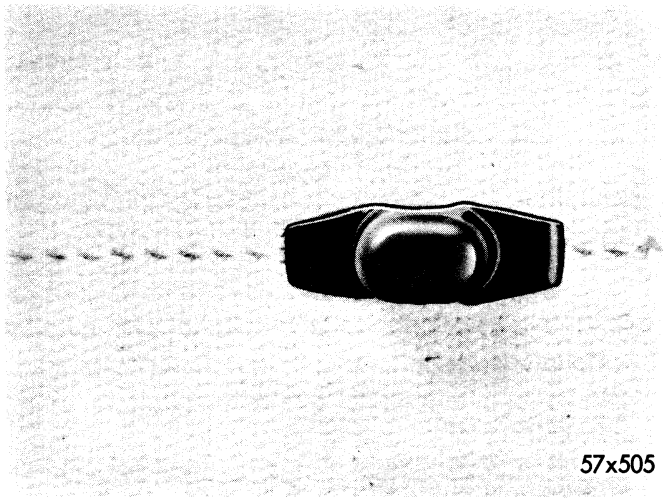

Figure 13—Rear Spring Interliners (Front)

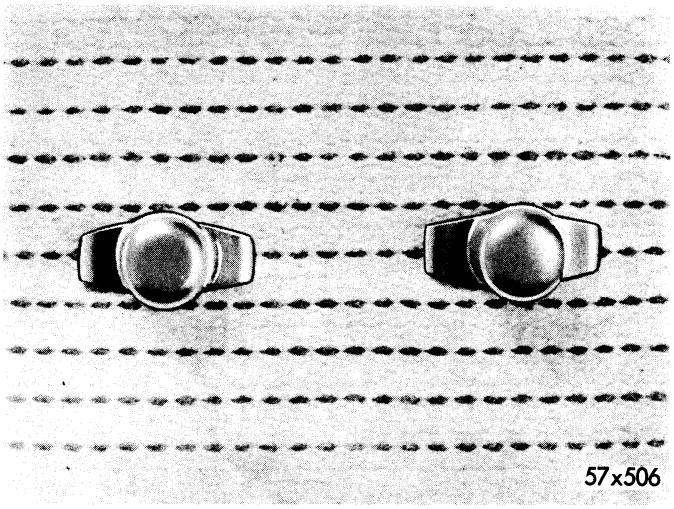

Figure 14—Rear Spring Interliners (Rear)

5. DIAGNOSIS PROCEDURE

TESTING ORIFLOW SHOCK ABSORBERS

Oriflow shock absorbers are designed to operate with low resistance when operated slowly with high resistance when operated rapidly. Since they operate with little resistance when compressed by hand or by bench test methods, their true operating efficiency can be determined best by a road test. It is impossible to determine the operating efficiency of Oriflow shock absorbers by rocking the car by the bumper.

Hand testing Oriflow shock absorbers will only reveal complete failure. The amount of ride control evident from a hand test on the bench is small, compared with the control exerted under actual ride conditions. For this reason, it is impossible to feel any sudden resistance in an Oriflow shock absorber, no matter how fast it is operated by hand.

UNSATISFACTORY RIDE

1. SHOCK ABSORBERS—When the car bounces or pitches excessively, or the springs "bottom" (with the car not overloaded), it may be due to lack of control of the shock absorbers. If the car rides hard, or steering is difficult at high speeds, it may be due to binding in the shock absorbers.

2. SPRINGS—A certain amount of spring bottoming on certain types of uneven road surfaces, such as a broad hump in the road, is normal. Rubber bumpers are provided to absorb the shock of bottoming. Excessive bottoming on rough roads (with the car not overloaded) may be due to sagging front springs, or sagging or broken rear springs. This will also cause the car to rock or pitch excessively on rough roads.

NOISE

1. RUBBER BUSHINGS—When the rubber bushings at the shock absorbers or spring hangers become worn or deteriorated, the metal parts may come in contact causing squeaks. Inspect for shiny spots at points where rubber bushings are located. No lubricant of any kind (oil, grease or soap) should be applied to these bushings, as this would destroy the bond between bushing and mounting.

2. MISALIGNED REAR SPRING—This condition may cause a squeaking noise. Check for a twisted or incorrectly seated rear spring. Straighten the spring by loosening the spring clips (U-bolts), center the spring and retighten the bolts.

MANUAL TRANSMISSION
DATA AND SPECIFICATIONS

Models		P-30, LP-1, P-31	LP-2*
Gears, Type		Helical	
Bearings	Mainshaft Pilot	14 Steel Rollers	
	Countershaft	22 Steel Rollers (each end)	
	Reverse Idler	22 Steel Rollers	
End Play	Countershaft (Controlled by Thrust Washers)	.003 to .008 inch (.003 inch preferred)	
	Second Speed Gear	.003 to .008 inch	
	Drive Pinion Bearing	.004	
	Rear Mainshaft Bearing	.004	
Thrust Washer Thickness		.089 inch (marked "A") .093 inch (marked "B")	
Snap Ring Thickness		.088-.091-.094-.097 inch	
Transmission Bearing Retainer Gasket Thickness		.001-.0165 inch .022-.0275 inch	
Clutch Housing Run-Out		.003 inch maximum	
Clutch Housing Bore Run-Out		.003 inch maximum	
Gear Ratio	First	2.50	2.31
	Second	1.68	1.55
	Third	1.00	1.00
	Reverse	3.20	3.20
Lubricant Capacity		2¾ pts.	

*All 1958 8 cylinder transmissions will contain heavy duty parts.

6 cylinder heavy duty transmissions will use the same transmission that is used on 8 cylinder cars.

TORQUE SPECIFICATIONS

Main Shaft Flange Nut	200 ft. lbs.
Case to Clutch Housing Screws	50 ft. lbs.
Extension or Rear Cover to Case Screw	30 ft. lbs.