

SECTION 4

STEERING

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CORVAIR 500, 700 and 900 SERIES

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GENERAL DESCRIPTION

The steering gear used in all Corvaair 500, 700 and 900 models is of the recirculating ball type with a ratio of 8:1. Ease of handling is assured by transmitting forces from the worm to the sector gear through ball bearings (fig. 4-1). Overall steering ratio is 23.5 to 1.

Steering linkage (fig. 4-2) is of the relay type, with

the pitman and idler arms connected to the relay rod and adjustable tie rods running from the relay rod to the steering arms. The tie rods have self adjusting ball and socket joints (fig. 4-3) which automatically compensate for normal internal wear by forcing the ball into precise contact with the low friction bearing surface through pressure of a conical spring.

MAINTENANCE AND ADJUSTMENTS

LUBRICATION

The steering gear is filled at the factory with a special all-season gear lubricant. Seasonal change is unnecessary and the housing should not be drained. Lubricant level should be checked at every lubrication period (1000 miles). When required, add steering gear lubricant.

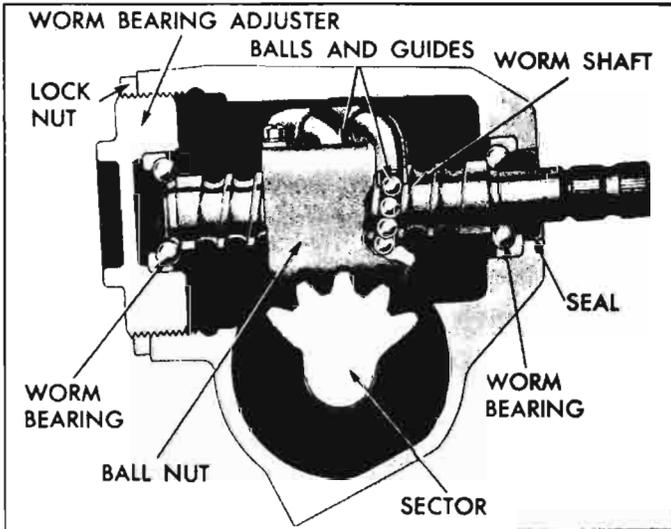


Fig. 4-1—Steering Gear Worm and Ball Nut Circuits

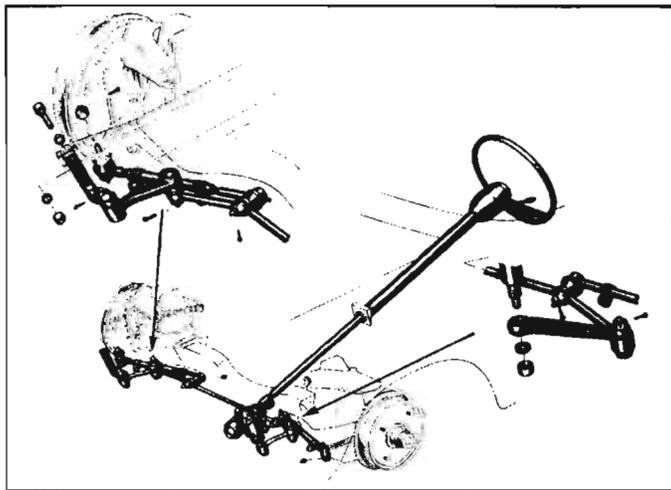


Fig. 4-2—Steering Linkage

Lubricate the steering gear linkage every 1000 miles with chassis lubricant. Lube points on the steering linkage are located in the ball and socket joints at each end of each tie rod (fig. 4-3). More specific lubrication information will be found in Section 2—General Lubrication.

ADJUSTMENTS

STEERING GEAR

Before attempting steering gear adjustments in an attempt to correct such conditions as shimmy, loose or hard steering, or road shocks, make a careful check of front end alignment, shock absorbers, wheel balance and tire pressure for possible causes.

Correct adjustment of the steering gear is very important. Only two adjustments are possible but they must be made in the following manner, step by step, in the order given.

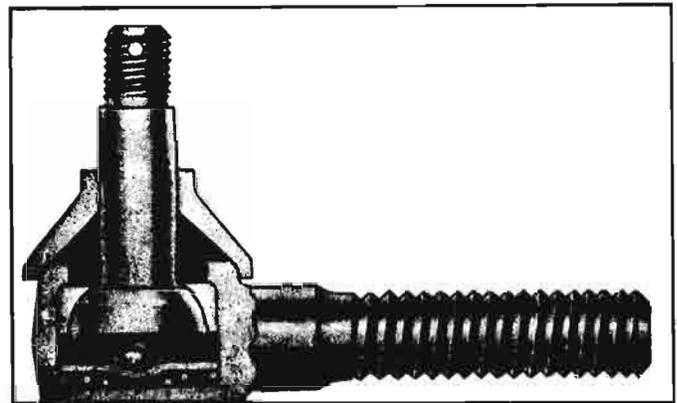


Fig. 4-3—Tie Rod End

1. Remove pitman arm nut and lockwasher and, using Tool J-6627, pull pitman arm from pitman shaft (fig. 4-4).

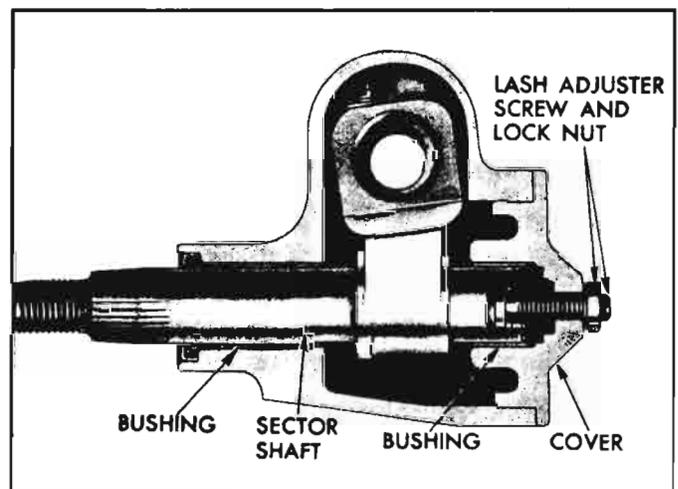


Fig. 4-4—Sector Gear and Pitman Shaft

2. Loosen pitman shaft lash adjuster screw lock nut (fig. 4-5) and turn the lash adjuster screw a few turns counterclockwise to remove overcenter load (increase lash). Gently turn the wheel in one direc-

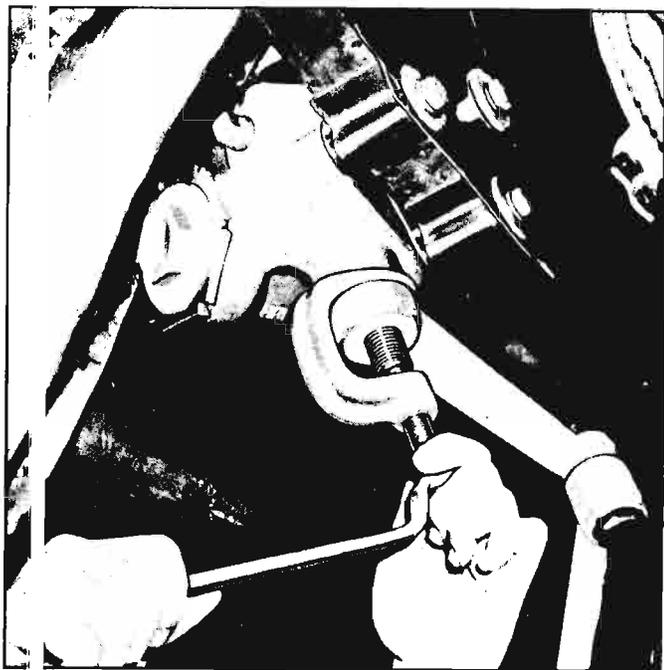


Fig. 4-5—Removing Pitman Arm With Tool J-6627

tion until stopped by gear and then back off one turn of the steering wheel.

CAUTION: Do not turn the wheel hard against the stops when the pitman arm is disconnected since this may damage the ball guides.

3. Pry off the horn button. Using a suitable size socket and a low reading (inch lbs.) torque wrench on the steering shaft nut, measure the torque needed to keep the wheel in motion. This should be between 2 and 6 inch lbs. If the torque does not fall within these limits, adjustment of the worm bearing is necessary.
4. To adjust the worm bearings (see fig. 4-1): loosen the worm bearing adjuster lock nut and turn worm bearing adjuster down until there is no perceptible end play in worm. Check the pull at the torque wrench, readjusting the adjuster nut as necessary to obtain proper pull. Tighten the lock nut and recheck pull. If the gear feels "lumpy" after worm bearing adjustment, the bearings are probably damaged and the gear should be removed and disassembled for replacement of the damaged parts. See "Service Operations."
5. After proper worm adjustment is obtained, and all mounting bolts are securely tightened, adjust the lash adjuster screw (fig. 4-4). First turn the steering wheel gently from one stop all the way to the other, counting the total number of turns. Then turn the wheel back exactly half way to the center position. The mark on the wormshaft should be at the 6 o'clock position. The sawcut in the coupling should be lined up with this mark. Turn the lash adjuster screw clockwise to take out all lash in the

gear teeth, then tighten the lock nut. Check the highest torque needed to turn the wheel through the center position (fig. 4-6). Torque should be between 7 and 12 inch lbs. Readjust if necessary to obtain proper pull.

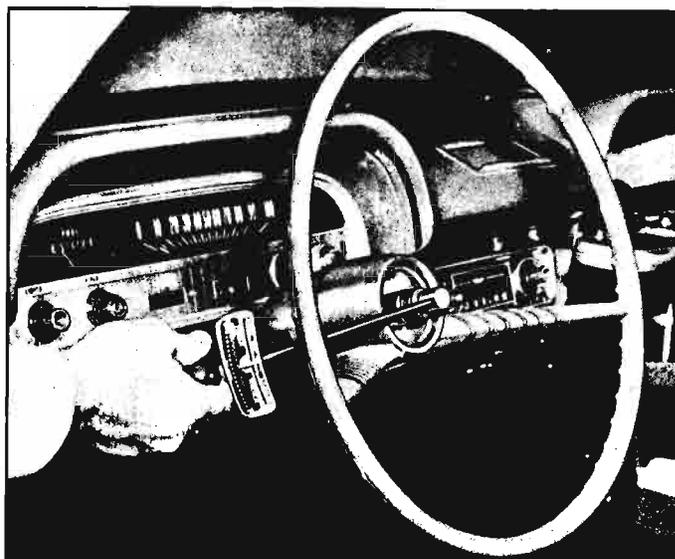


Fig. 4-6—Checking Steering Wheel Turning Torque

6. Tighten lock nut and recheck. Torque must lie between the specified limits.

NOTE: Always make the final lash adjustment in the clockwise direction.

7. Reassemble pitman arm to pitman shaft, first making sure that wheels are straight ahead and that the steering wheel and gear are centered.

STEERING WHEEL ALIGNMENT AND HIGH POINT CENTERING

1. Set front wheels in straight ahead position. This can be checked by driving vehicle a short distance to determine steering wheel position at which vehicle follows a straight path.
2. With front wheels set straight ahead, check position of sawcut on coupling. This sawcut, and the mark on the wormshaft designating steering gear high point, should be at the bottom side of the shaft at 6 o'clock position.

NOTE: The sawcut should be lined up with the mark on the wormshaft designating steering gear high point.

Remove steering wheel, if necessary, and align wheel with mark on bottom of steering shaft (wheel should be set in straight ahead position).

3. If gear has been moved off high point when setting wheels in straight ahead position, loosen adjusting sleeve clamps on both left and right hand

STEERING 4-4

tie rods, then turn each sleeve an equal amount in the same direction to bring gear back on high point.

CAUTION: Turning the sleeves an unequal number of turns or in different directions will disturb the toe-in setting of the wheels.

4. Tighten all sleeve clamp bolts.

CAUTION: Tie rod clamp bosses must be towards the front of the vehicle with the bolt pointing down.

STEERING SHAFT AND MAST JACKET RELATIONSHIP AND ALIGNMENT

The proper relationship between mast jacket, steering shaft and steering gear is determined by the location of the mast jacket and the steering gear.

The steering shaft is centered in the upper mast jacket by a bearing and attaches through a coupling to the steering gear worm shaft.

NOTE: The marks on the steering gear worm-shaft and on the lower end of the steering shaft should line up with the sawcut in the coupling.

Adjustment is secured by shifting the lower end of the mast jacket so that the jacket runs concentric to the steering shaft. Oversize bolt holes are provided for this purpose. When adjustment is completed, tighten all mast jacket attaching bolts.

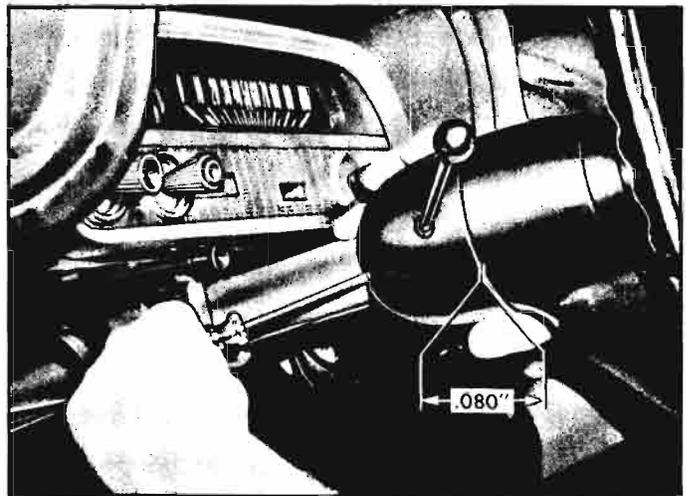


Fig. 4-7—Adjusting Turn Signal Housing Clearance

TURN SIGNAL HOUSING TO STEERING WHEEL CLEARANCE

Loosen locking screw on turn signal housing, slide housing on mast jacket to provide .080" clearance to steering wheel (fig. 4-7) then tighten lock screw.

CAUTION: Care must be taken not to pull the bowden cable wire from turn signal switch.

TOE-IN ADJUSTMENT

A procedure for adjusting the steering linkage for proper toe-in setting is described in Section 3.

SERVICE OPERATIONS

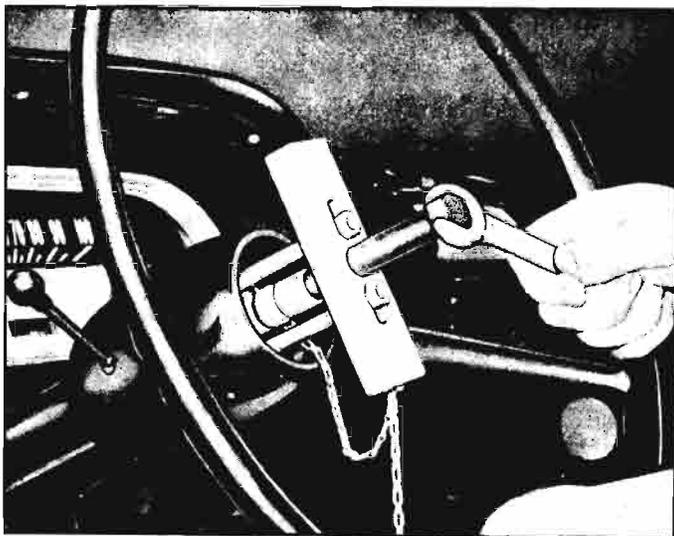


Fig. 4-8—Steering Wheel Removal

STEERING WHEEL

Removal

1. Pry out horn button.

2. Remove three screws attaching receiver cup and bushing spacer to steering wheel, then remove flat bellville spring.
3. Remove steering wheel nut and washer from steering shaft.
4. Use Tool J-2927 to remove steering wheel (fig. 4-8).

NOTE: Do not lose the spring or seat located on the shaft under the steering wheel.

5. Direction signal canceling cam may be removed if desired.

Installation

1. Replace all components in the order removed. Make sure that the mark on the steering shaft lines up with the mark on the steering wheel (fig. 4-9). Torque wheel nut 35-40 ft. lbs.

STEERING GEAR

Removal

1. Place car on suitable hoist or jackstand and disconnect pitman arm from pitman shaft, using Tool J-6627.

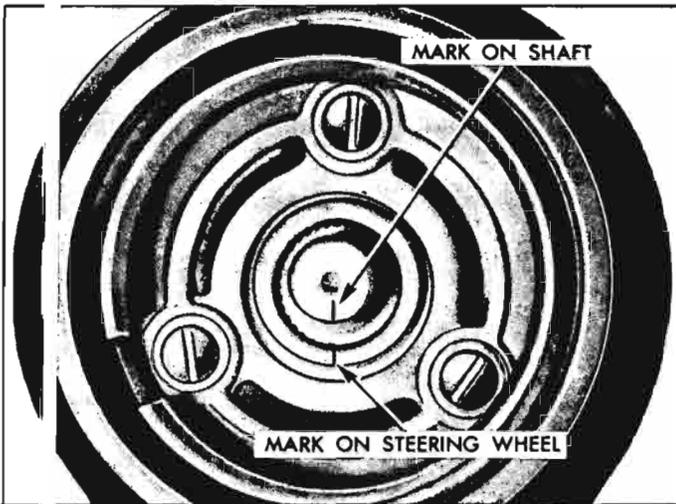


Fig. 4-9—Steering Wheel Alignment Marks

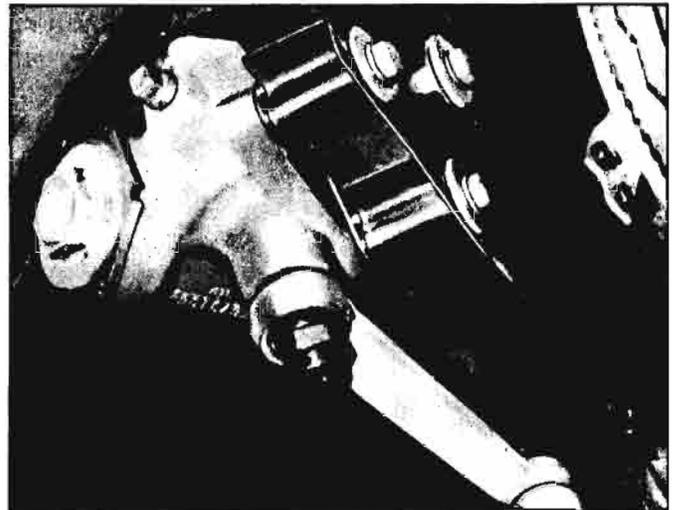


Fig. 4-10—Steering Gear Attachment

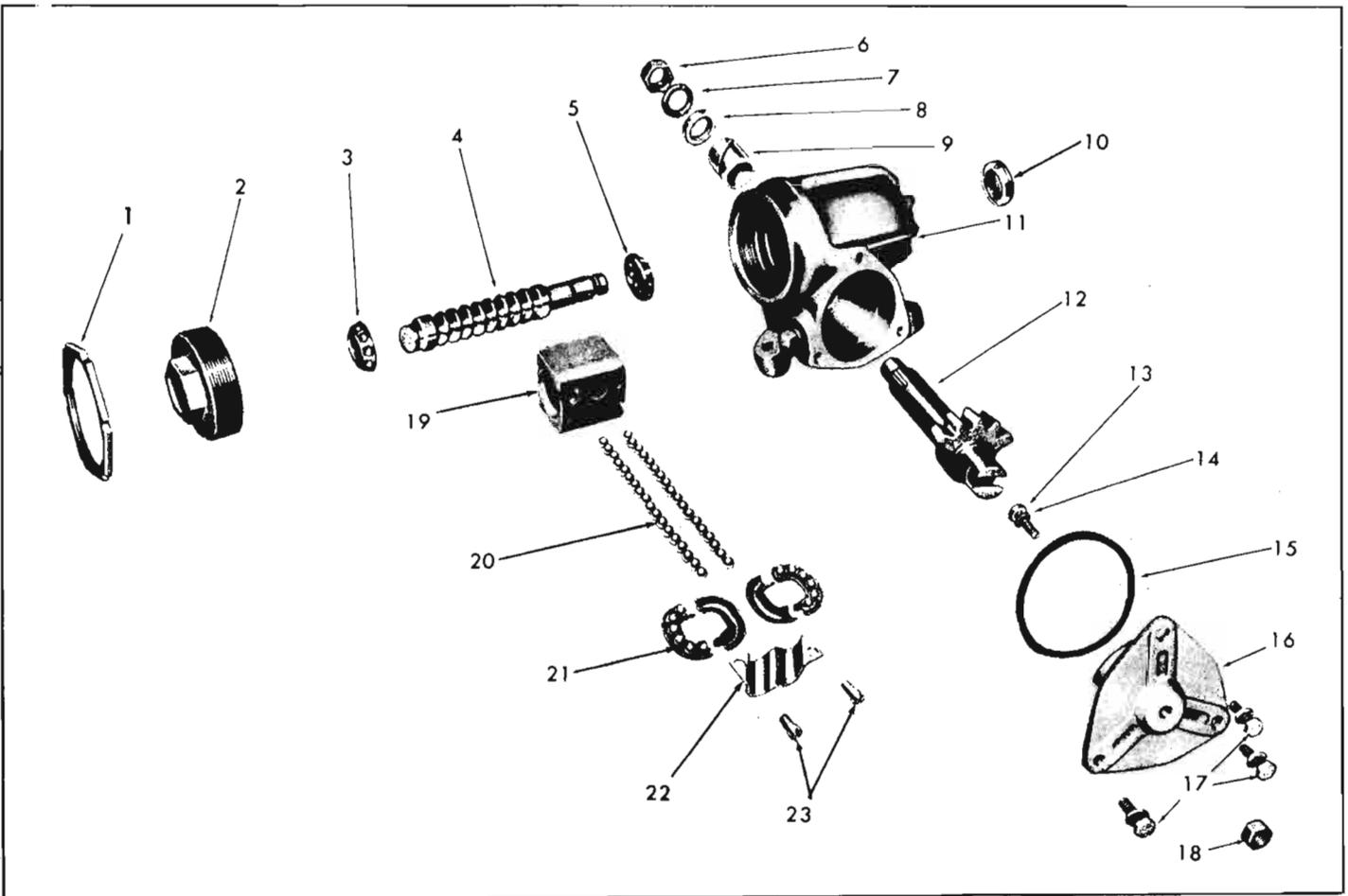


Fig. 4-11—Exploded View of Steering Gear

- | | | | |
|--|---------------------------|--|----------------------------------|
| 1. Wormshaft Bearing Adjuster Lock Nut | 6. Pitman Arm Nut | 12. Pitman Shaft | 18. Lash Adjuster Screw Lock Nut |
| 2. Wormshaft Bearing Adjuster | 7. Pitman Arm Lock Washer | 13. Lash Adjuster Screw | 19. Ball Nut |
| 3. Wormshaft Bearing | 8. Pitman Shaft Seal | 14. Lash Adjuster Screw Shim | 20. Balls |
| 4. Wormshaft | 9. Pitman Shaft Bushing | 15. "O" Ring | 21. Ball Guides |
| 5. Wormshaft Bearing | 10. Wormshaft Outer Seal | 16. Side Cover | 22. Ball Guide Retainer |
| | 11. Steering Gear Housing | 17. Side Cover Screws and Lock Washers | 23. Ball Guide Retainer Screws |

2. Remove the three bolts and washers attaching the steering gear to the frame side member. See Figure 4-10.
3. Remove the nuts and bolts on the steering gear shaft coupling and slide the steering gear forward and down, removing it from the vehicle.

Disassembly

All steering gear parts must be kept clean and free from dirt. Spread clean paper or rags on the bench before starting disassembly of the steering gear. Figure 4-11 shows a disassembled view of the gear.

1. Loosen lock nut on end of pitman shaft and turn the lash adjuster a few turns counterclockwise. This will remove the load from the worm bearings caused by the close meshing of the rack and sector teeth.
2. Loosen the lock nut on the worm bearing adjuster and turn the adjuster counterclockwise a few turns.
3. Place a pan under the assembly to catch the lubricant and remove the three bolts and washers attaching side cover to housing.
4. Pull the side cover, with the pitman shaft, from the housing (fig. 4-12).

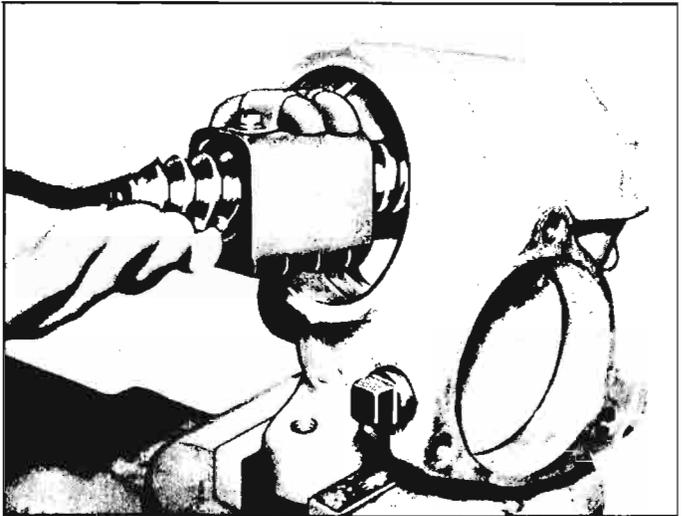


Fig. 4-13—Removing Wormshaft and Ball Nut

the nut is allowed to rotate until stopped at the end of the worm.

7. Remove lock nut from lash adjuster and unscrew adjuster from side cover by turning adjuster clockwise. Slide adjuster and shim out of slot in end of pitman shaft.

Ball Nut Disassembly

As a rule, disassembly of the ball bearing nut will not be necessary if it is perfectly free with no indication of binding or tightness when rotated on the worm. However, if there is any indication of binding or tightness, the unit should be disassembled, cleaned and inspected as follows:

1. Remove screws and clamp retaining ball guides in nut. Draw guide out of nut.
2. Turn the nut upside down and rotate the wormshaft back and forth until all 48 balls have dropped out of the nut into a clean pan. With the balls removed, the nut can be pulled endwise off the worm.

Inspection

With the steering gear completely disassembled, wash all parts in cleaning solvent. Dry them thoroughly with clean rags. With a magnifying glass inspect the ball bearings, bearing cups, worm and nut grooves and the surface of all balls for signs of indentation. Also check for any signs of chipping or breakdown of the surface.

Any parts that show signs of damage should be replaced. Balls must be replaced with genuine Chevrolet parts made according to specifications for this steering gear.

Inspect wormshaft seal for defects.

Inspect the pitman shaft for wear and check the fit of the shaft in the housing bushings.

Inspect the fit of the pilot on the end of the pitman shaft in its bushing in the side cover. If this bushing is

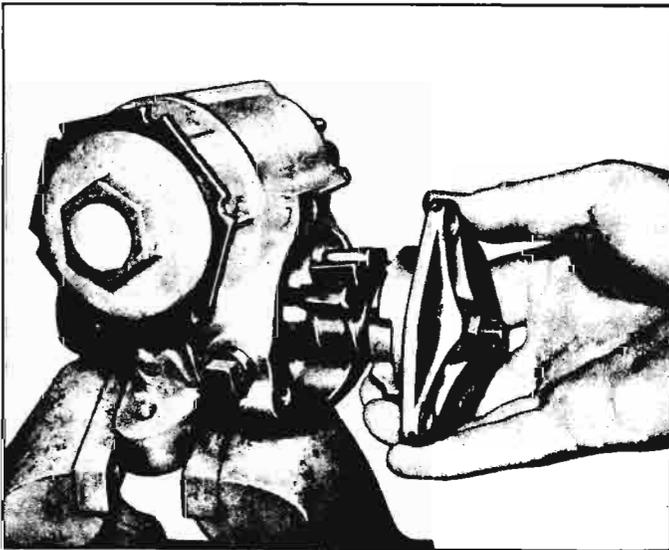


Fig. 4-12—Removing Pitman Shaft

NOTE: If the sector does not clear the opening in the housing easily, turn the wormshaft by hand until the sector will pass through the opening in the housing.

5. Remove the worm bearing adjuster, adjuster lock nut and lower ball bearing from housing.
6. Draw wormshaft and nut assembly from housing (fig. 4-13). Remove upper ball bearing.

CAUTION: Use care that the ball nut does not run down to either end of the worm. Damage will be done to the ends of the ball guides if

work, a new side cover and bushing assembly should be installed.

Check ball guides for damage at ends where they pick up the balls from the helical path. Any damaged guides should be replaced.

Check steering gear wormshaft assembly for bent or damaged shaft.

Repairs

Sector Shaft Bushing Replacement

1. Support steering gear housing in an arbor press and press sector shaft bushing from housing with Tool J-8366-2, inserted from lower end of housing (fig. 4-14).

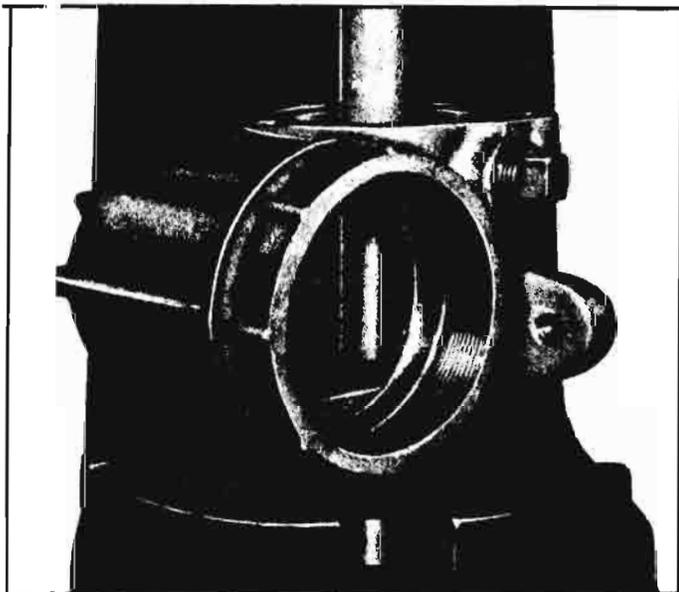


Fig. 4-14—Removing Sector Shaft Bushing

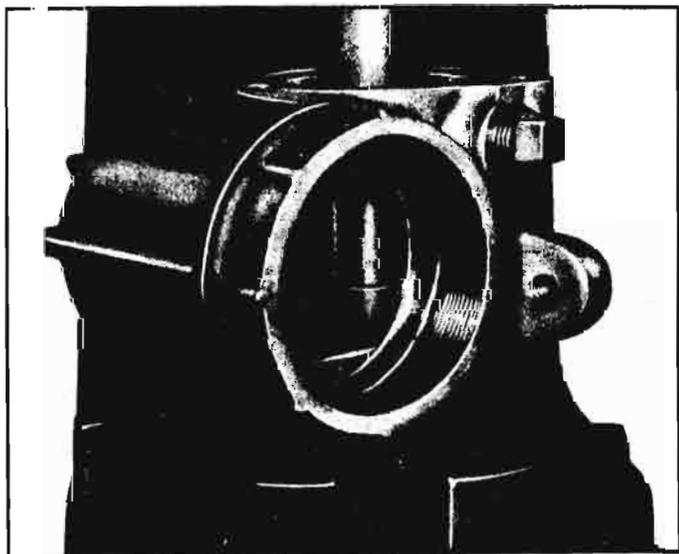


Fig. 4-15—Replacing Sector Shaft Bushing

2. Press new bushing into position using Tool J-8366-1 (fig. 4-15).

NOTE: Service bushings are diamond bored to size and require no further reaming.

Side Cover Bushing Replacement

The entire side cover assembly, including bushing, is serviced as a unit and should be replaced where it is desired to replace the bushing.

Wormshaft and Sector Shaft Seal Replacement

If either of the above seals indicates need of replacement, it should be removed and a new seal pressed into position in the housing. A suitable socket pressing on outer diameter of seal may be used.

NOTE: Care should be taken to insure that seal is not assembled in a cocked position.

Assembly

Ball Nut

1. Place the wormshaft flat on the bench and slip the nut over the worm with the ball guide holes up and the shallow end of the rack teeth to the left from the steering wheel position. Align the grooves in the worm and nut by sighting through the ball guide holes.
2. Count 48 balls into a suitable container. This is the proper number of balls for this ball nut. Drop 18 balls into each of two holes on the same side of nut (this operation may be performed from either side of nut, but two holes on the same side must be used, not two holes on same end). Turn the worm gradually away from hole being filled (fig. 4-16). Continue until all 36 balls are installed.

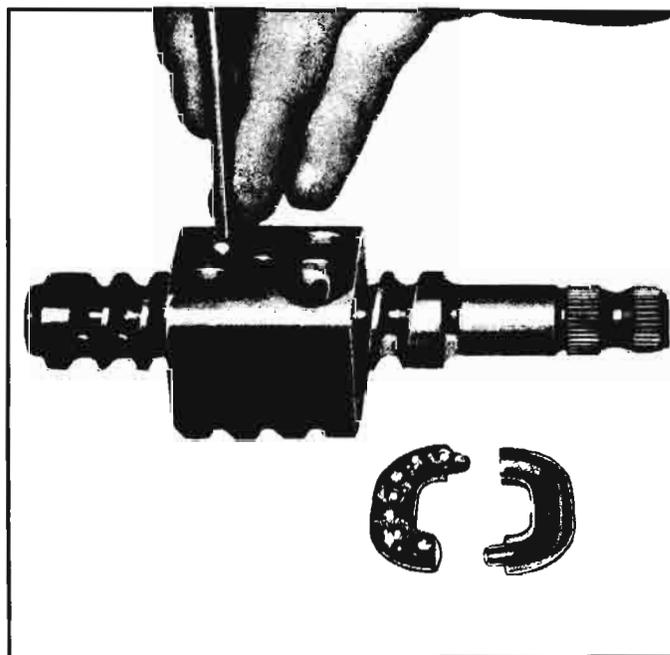


Fig. 4-16—Placing Balls in Nut

NOTE: In cases where the balls are stopped by the end of the worm, hold down those balls already dropped into the nut with the blunt end of a clean rod or punch and turn the worm in the reverse direction a few turns. The filling of the circuit can then be continued. It may be necessary to work the worm back and forth, holding the balls down first in one hole then the other, to close up the space between the balls and fill the circuit completely and solidly.

3. Place remaining 12 balls in halves of ball guides, six in each of two halves (fig. 4-17).



Fig. 4-17—Filling Ball Guides

4. Close this half of guide with the other half. Hold the two halves together and plug each open end

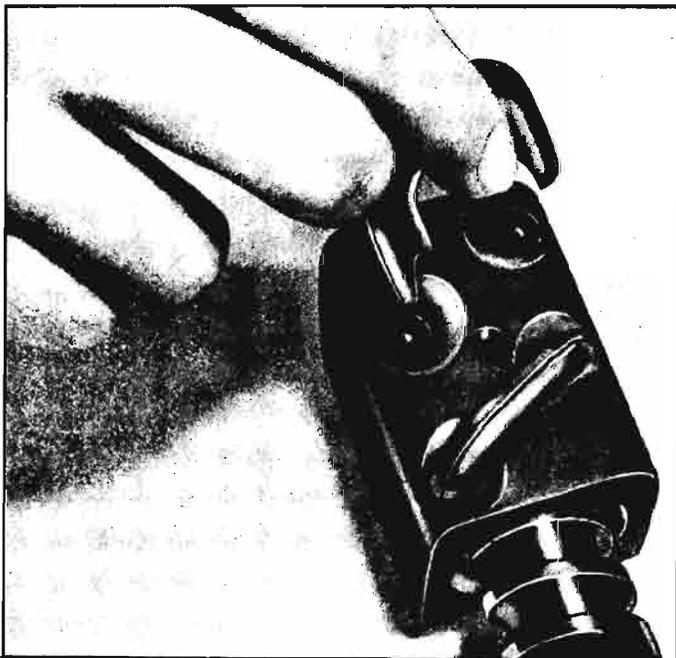


Fig. 4-18—Inserting Ball Guides in Nut

with vaseline so balls will not drop out while installing guide.

5. Push the guides into the guide holes of the nut (fig. 4-18). If the guides do not push all the way down easily, tap lightly into place.
6. Assemble the ball guide clamp to the nut, being sure to use a lock washer under the clamp screw, then tighten the screw securely.

Check the assembly by rotating the nut on the worm to see that it moves freely. Do not rotate the nut to the end of the worm threads as this may damage the ball guides. If there is any "stickiness" in the motion of the nut, some slight damage to the ends of the ball guides or to other gear components may have been overlooked.

Steering Gear

After a major service overhaul where all of the original factory installed lubricant has been washed out of the steering gear assembly, the thread of the adjuster, side cover bolts and lash adjuster should be coated with a suitable non-drying, oil resistant sealing compound such as Permatex No. 2. This is to prevent leakage of gear lubricant from the steering gear assembly. The compound should not be applied to female threads and extreme care should be exercised in applying this compound to the bearing adjuster, as the compound must be kept away from the wormshaft bearing. Also apply grease to the worm bearings, pitman shaft bushing, and ball nut teeth.

1. With wormshaft and pitman shaft seals and bearing cups installed and ball nut assembly installed on wormshaft, slip upper ball bearing over wormshaft and insert wormshaft and nut assembly into housing, feeding end of shaft through upper ball bearing cup and seal.
2. Place ball bearing in adjuster cup and install adjuster and lock nut in lower end of housing.
3. Assemble the lash adjuster with shim in the slot in

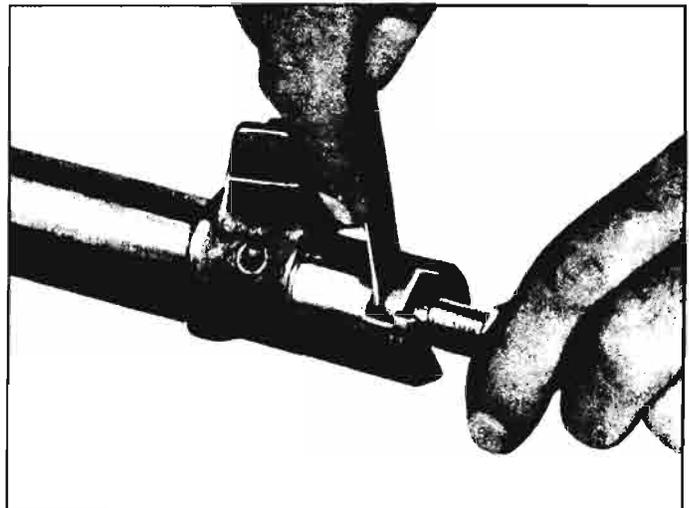


Fig. 4-19—Checking Lash Adjuster End Clearance

the end of sector shaft. Check the end clearance which should not be greater than .002" (Fig. 4-19). For the purpose of adjusting this end clearance, a steering gear lash adjuster shim unit Part Number 5673960 is available. It contains four shims—.063", .065", .067" and .069" thick.

4. After lash adjuster end clearance has been adjusted, start shaft pilot into side cover. Then, using a screwdriver, through the hole in cover, turn lash adjuster in a counterclockwise direction to pull sector shaft pilot into side cover as far as it will go.
5. Rotate wormshaft by hand until ball nut is about in the center of travel. This is to make sure that the rack and sector will engage properly with center tooth of the sector entering center tooth space of the nut.
6. Place a new gasket on side cover, then push side cover assembly including sector shaft into place. After making sure there is some lash between rack and sector teeth, assemble and tighten side cover bolts.

Adjustment on Bench

1. Tighten the worm bearing adjuster until all wormshaft end play has been removed. Then tighten the lock nut.
2. Using a suitable size socket and a low reading (inch-lb.) torque wrench on the worm shaft, carefully turn the wormshaft all the way in one direction and then back one turn (fig. 4-20).

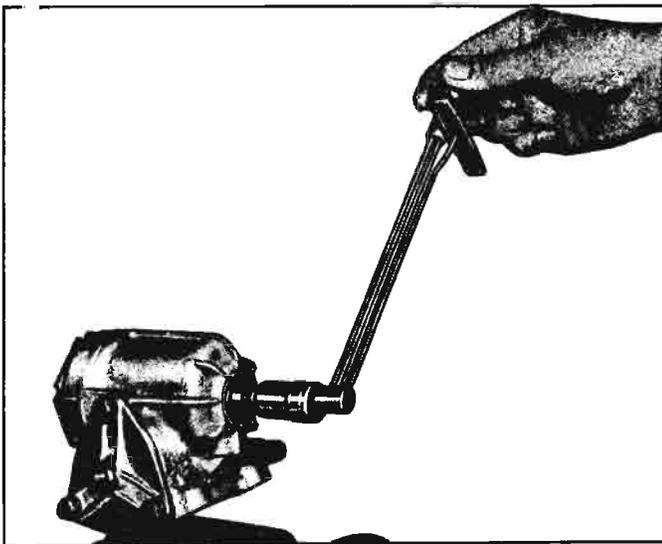


Fig. 4-20—Checking Worm Bearing Pre-Load

3. Continue turning the torque wrench, noting the torque necessary to keep the shaft in motion. This should be between 2 and 6 inch lbs. If necessary, adjust the worm bearing adjuster until proper pull is obtained.

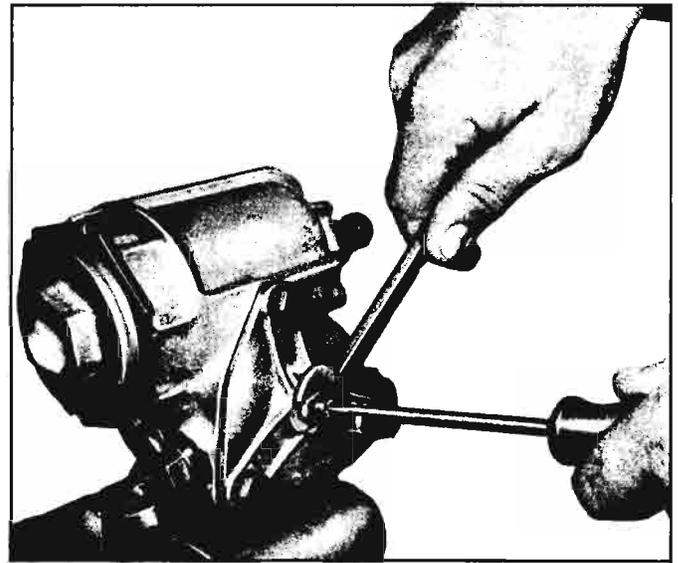


Fig. 4-21—Lash Adjustment

4. Using the torque wrench, turn the gear all the way from one stop to the other, counting the number of turns. Then turn back exactly half that number of turns to the center position.
5. Turn the lash adjuster screw clockwise to remove all lash between rack and sector teeth. Tighten the lock nut (fig. 4-21).

NOTE: Be sure the adjustment is not changed while tightening the locknut.

6. Again check the torque wrench while turning the gear through the center position. The highest reading in the scale should be between 7 and 12 inch lbs.
7. If necessary, readjust lash adjuster screw to obtain proper pull. Tighten lock nut and again check pull at the worm shaft.
8. Fill the assembly with steering gear lubricant to the level of the filler plug hole and replace the filler plug.
9. Place the coupling in the proper position on the wormshaft. The sawcut in the coupling should line up with the mark on the wormshaft and should be in the 6 o'clock position.

Installation

Never substitute bolts of any type, regardless of supposed quality, for the special bolts designed for use in the steering coupling. Consult parts catalog for the order number of these parts when replacement becomes necessary.

Always clean any foreign material from serrations on worm and steering shaft ends and inside of steering coupling before assembly. Battered, rusted or corroded parts must be replaced.

Never attempt salvage of steering parts by welding or bending.

1. Feed the gear (coupling in place) into place from under the front of the car.
2. Guide steering shaft into coupling, aligning mark on the shaft with the sawcut in the coupling clamp. (See Figure 4-22.) If the steering wheel is installed, it should be set for straight ahead driving. Install the steering gear to frame attaching bolts loosely.

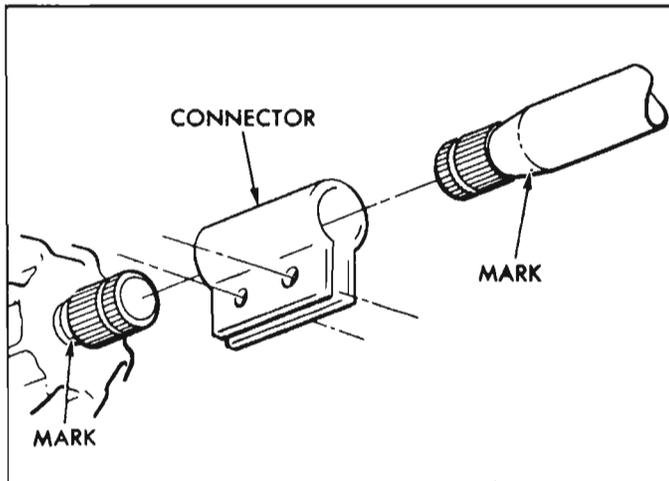


Fig. 4-22—Alignment of Steering Gear Shaft, Steering Shaft and Coupling

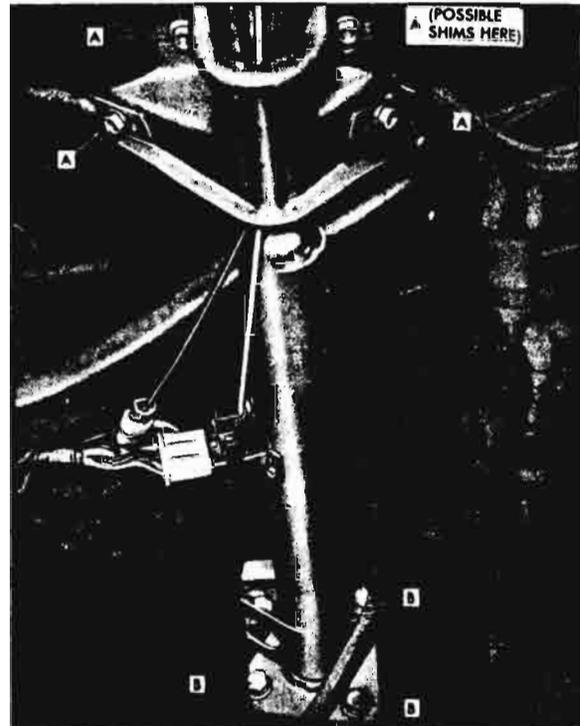


Fig. 4-23—Mast Jacket Wiring Connections and Bolts

3. Insert the special coupling bolts, nuts and lock washers into the steering coupling clamp and tighten to 22-27 ft. lbs. torque.
4. Tighten steering gear attaching bolts.

MAST JACKET

Removal

(See Figures 4-23 and 4-24)

1. Remove steering wheel, as outlined under Steering Wheel Removal, and spring and seat located around the shaft just under the steering wheel.
2. Remove wiring connectors from direction signal switch and horn wire.

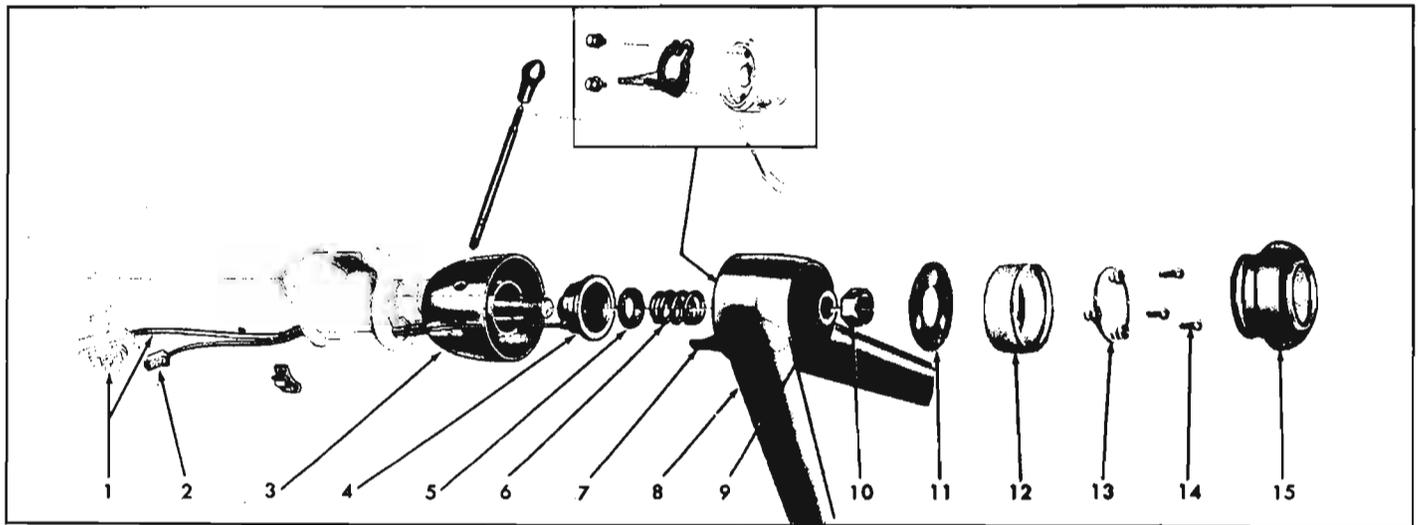


Fig. 4-24—Exploded View of Upper Mast Jacket and Steering Wheel

- | | | | |
|------------------------------|-------------------|------------------------|------------------------------|
| 1. Directional Signal Switch | 5. Spring Seat | 9. Lock Washer | 13. Bushing Spacer |
| 2. Horn Wire Connector | 6. Spring | 10. Steering Shaft Nut | 14. Screws |
| 3. Direction Signal Housing | 7. Cancelling Cam | 11. Bellville Spring | 15. Horn Button and Retainer |
| 4. Bearing Assembly | 8. Steering Wheel | 12. Receiver Cup | |

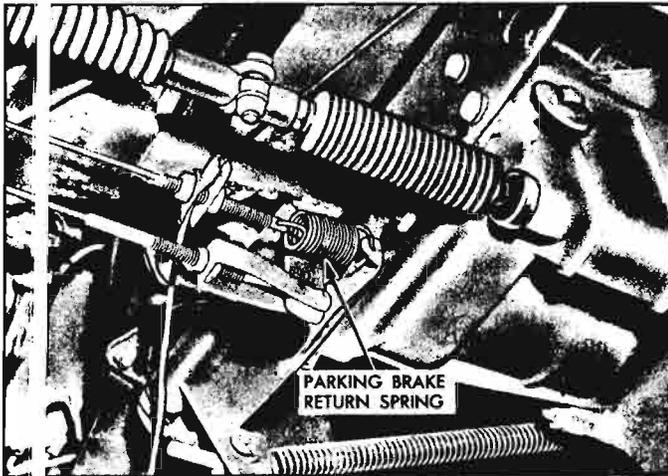


Fig. 4-25—Parking Brake Return Spring

- 3 Disconnect parking brake return spring at rear cross member (fig. 4-25).
- 4 Remove parking brake cable clevis ball from clevis bracket and thread cable and ball past pulley assembly at lower end of mast jacket.

NOTE: If cable cannot be removed from pulley, it may be necessary to remove cotter pin attaching pulley wheel to post and remove pulley.

- 5 Remove 4 bolts and lockwashers (A), Figure 4-23, attaching mast jacket bracket to instrument panel and brace rods and three bolts, plain washers and lockwashers (B), Figure 4-23, attaching lower end of mast jacket to toe pan mounting.

NOTE: Any shims found under the right hand mast jacket bracket to instrument panel attaching bolt must be replaced upon reassembly.

- 6 Carefully work mast jacket from steering shaft.

Repairs

Upper Bearing Replacement

If replacement is necessary, the old bearing and horn wheel assembly may be pried out and a new assembly tapped into place.

Lower Seal Replacement

The lower mast jacket seal may be pried out when necessary and a new seal cemented into place.

Installation

- 1 Carefully work triangular gasket, mast jacket, upper bearing and lower seal in place, down over steering shaft.
- 2 Install bolts and lockwashers attaching mast jacket to instrument panel bracket (and any shims originally removed) and toe pan attaching points. Align mast jacket and shaft, then tighten attaching bolts.

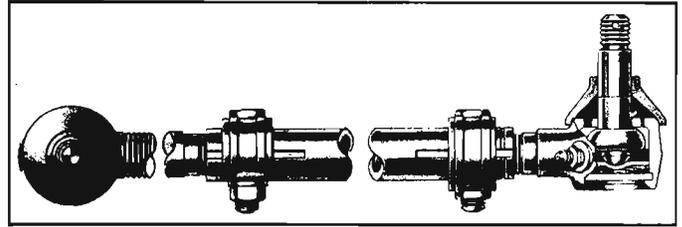


Fig. 4-26—Tie Rod Assembly

STEERING LINKAGE

Tie Rods (fig. 4-26)

There are two tie rods used on all models. Each tie rod is of three piece construction, consisting of the tie rod and two tie rod end assemblies. The ends are threaded into the rod and locked with clamps. Right and left hand threads are provided to facilitate toe-in adjustment and steering gear centering.

The tie rod ends are self adjusting for wear and require no attention in service other than periodic lubrication and occasional inspection to see that ball studs are tight. Replacement of tie rod ends should be made when excessive up and down motion is evident or if any lost motion or end play at ball end of stud exists.

Removal

1. Remove cotter pins from ball studs and remove castellated nuts.
2. Free ball stud from relay rod by backing up boss with a large hammer or dolly and striking opposite side with hammer of slightly lighter weight (fig. 4-27).

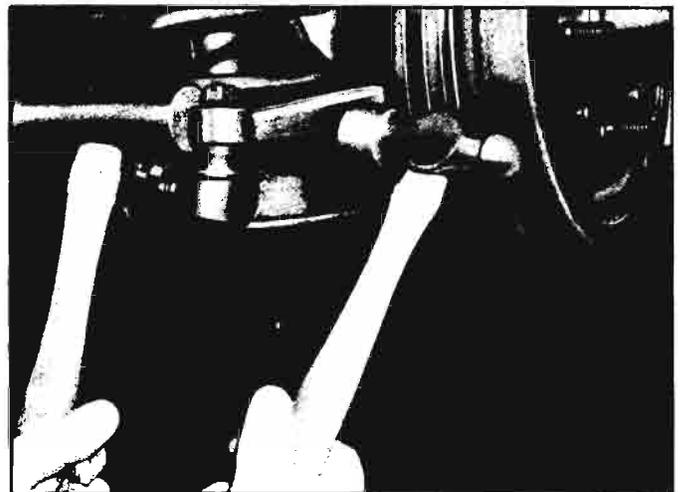


Fig. 4-27—Freeing Ball Stud

3. Remove inner ball stud from relay rod, using same procedure as described in Step 2.
4. To remove tie rod ends from tie rods, loosen clamp bolts and unscrew end assemblies.

Installation

1. If the tie rod ends were removed, install ends on tie rod making sure both ends are threaded an equal distance into the tie rod.
2. Make sure that threads on ball studs and in ball stud nuts are perfectly clean and smooth. Install neoprene seals on ball studs.

NOTE: If threads are not clean and smooth, ball studs may turn in tie rod ends when attempting to tighten nut.

3. Install ball studs in steering arms and relay rod.
4. Install ball stud nut, tighten securely and install cotter pins. Lubricate tie rod ends.
5. Adjust toe-in as described in Section 3.

NOTE: Before locking clamp bolts on tie rods, make sure that the tie rod ends are in alignment with their ball studs (each ball joint is in the center of its travel). If the tie rod is not in alignment with the studs, binding will result. Outer clamps (those closest to wheels) should be installed so that clamp bolts are at right angles to slot in sleeve (See Figure 4-26).

The flanges of the inner clamps must face towards front of car and may vary between horizontal and 90 degrees downward in order to clear front cross member flange in all positions, as shown in Figure 4-28.

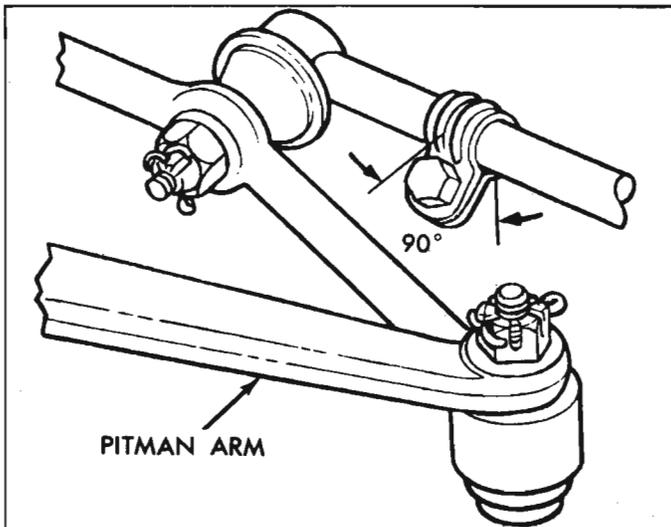


Fig. 4-28—Clamp Flange Position

Position these clamps with bolts as near to being at right angles to sleeve slots as is possible.

Relay Rod

Removal

1. Remove inner ends of tie rods from relay rod as described under Tie Rod—Removal.
2. Remove cotter pin and nut from relay arm bushing bolt at pitman arm and idler arm and remove relay rod from both points.

NOTE: If these conditions cannot be loosened by tapping with a hammer, tool J-6627 may be used.

Cleaning and Inspection

Remove accumulated grease and dirt from assembly and inspect for damage or excessive wear.

Repairs

The relay rod has a bushing at the pitman arm end which may be replaced as follows:

Bushing Removal

1. Use soft hammer to drive bolt out of bushing (fig. 4-29).

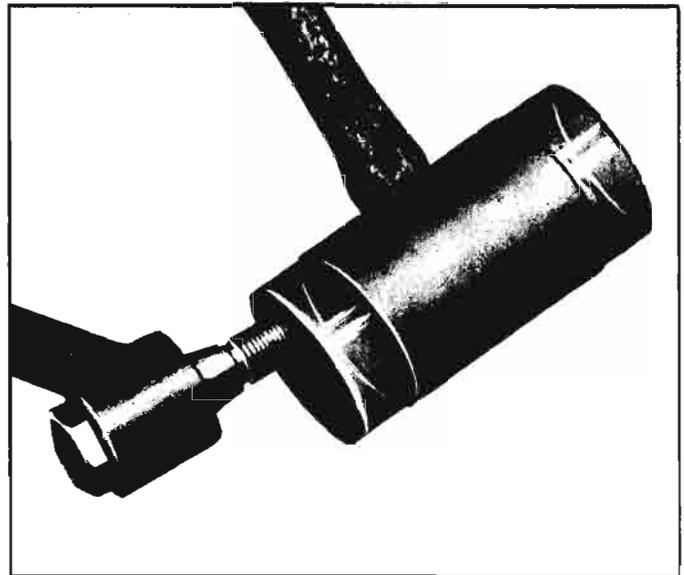


Fig. 4-29—Removing Pivot Bolt

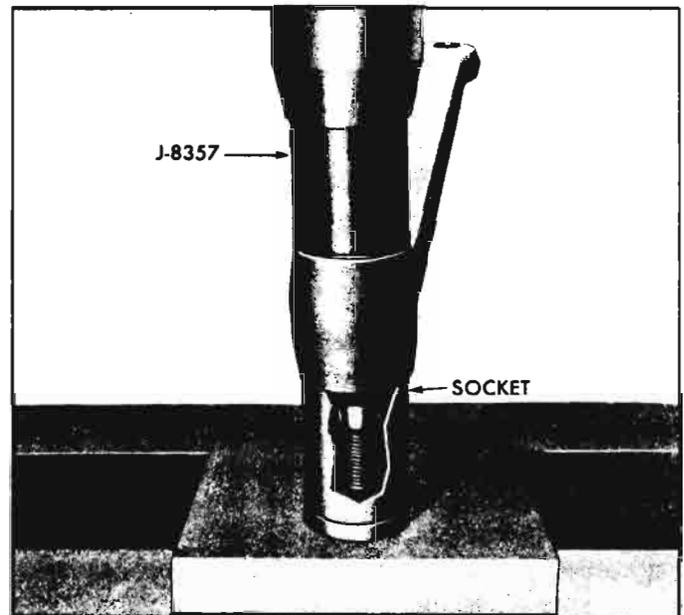


Fig. 4-30—Installing Bushing

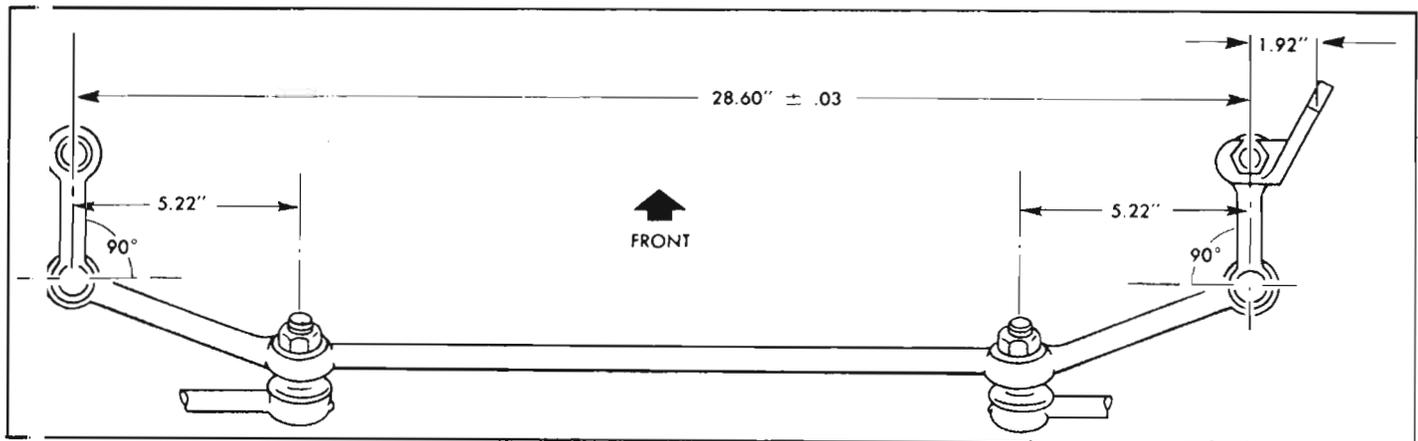


Fig. 4-31—Steering Linkage Alignment

- Use suitable size socket to press rubber and sleeve out of relay rod.

Bushing Replacement

- Place relay rod on press, resting on a deep socket of suitable size. Use tool J-8357 to press new bushing into place in relay rod (fig. 4-30).

Installation

Install idler arm and pitman arm to relay rod. Install and tighten nuts to 29 to 43 ft. lbs. and install cotter pins.

CAUTION: After relay rod bushings are replaced, care must be taken to install the idler arm and pitman arm in the exact alignment shown in Figure 4-31. When installing nuts on the bushing bolts be sure to hold the hex head of the bolt so that no twisting of the bushing will occur. If the bushings are twisted, or if the idler or pitman arm are not correctly aligned, poor steering will result. The same caution applies to the idler arm to idler arm support bushing installation and alignment.

- Adjust tie rod ends to relay rod as previously described under Tie Rods.
- Adjust toe-in (see Section 3) and align steering wheel as described previously in this section under Steering Wheel Alignment and High Point Centering.

Idler Arm

Corvaair passenger models have a bushing at each end of the idler arm. These bushings are not replace-

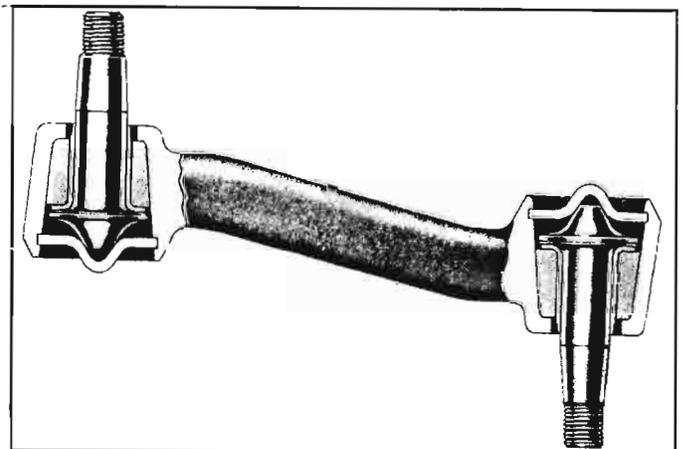


Fig. 4-32—Idler Arm Assembly

able. In the event of their failure the entire idler arm must be replaced (fig. 4-32).

Removal

- Remove cotter pins and nuts from ends of idler arm and remove relay rod from idler arm.
- Remove idler arm from idler arm bracket.

NOTE: If idler arm cannot be removed from the idler arm bracket by tapping with a hammer, the bracket may be removed from the frame side member and tool J-6627 used to remove idler arm.

Installation

Replace the idler arm by reversing the Removal procedure.

CORVAIR 95 AND GREENBRIER- 1200 SERIES

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GENERAL DESCRIPTION

The steering gear and linkage (fig. 4-33) are placed forward of the center line of the front wheels and are rigidly attached to the vehicle underbody. The pitman arm is linked to the relay rod through the rearward extending steering connecting rod and the 90° relay arm assembly. Equal length tie rods connect the relay rod with steering arms which extend forward from each wheel spindle. Tie rod lengths can be altered to provide toe-in adjustment. The steering connecting rod is adjustable to provide a means of centering steering gear and or compensating for body assembly tolerances.

The end of the relay rod opposite the relay arm assembly is supported by the idler arm assembly which is equipped with self-lubricating tapered nylon and rubber and all nylon bushings. The latter type bushing arrangement is also used at the relay rod end of the relay arm assembly. The tie rods and steering connecting rods are equipped with self-tensioning spring loaded ball and socket joints which compensate for normal internal wear automatically.

Service operations are the same as for the 500, 700 and 900 unit, except as outlined in following pages.

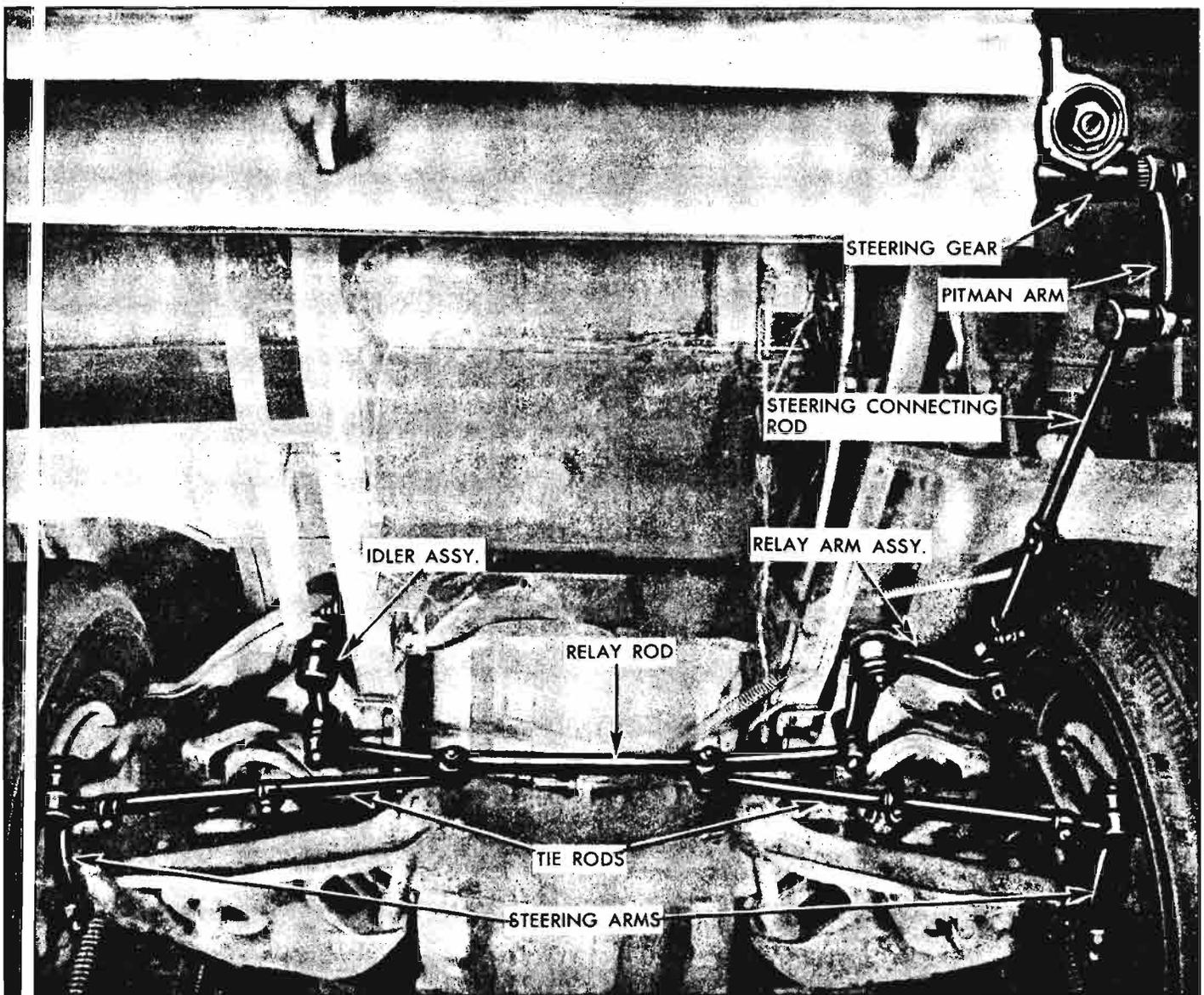


Fig. 4-33—Steering System

MAINTENANCE AND ADJUSTMENTS

LUBRICATION

The Greenbrier and Corvair 95 steering system has the same lube requirements as the 500, 700 and 900 models except for the addition of the relay arm pivot, which must be greased every 1000 miles.

ADJUSTMENTS

STEERING GEAR (FIG. 4-34)

There are two adjustments necessary to proper performance and service life of the steering gear. The first of these adjustments is that of the worm thrust bearing pre-load. This adjustment properly seats the bearings in their races without undesirable looseness or tightness.

The second adjustment is that of the high point pre-load which acts to stabilize the vehicle during "straight ahead" driving by introducing a slight increase in steering wheel turning resistance through an area of approximately one-fourth of a full steering wheel turn in each direction from high point of steering gear travel (straight ahead driving position and center of gear travel). This is accomplished by increasing or decreasing the free play or lash area between the sector gear teeth and the ball nut teeth. As the lash adjuster screw is turned into the steering gear case (to the right) the lash area is decreased, causing tighter mesh

of the gear teeth and more turn resistance or pre-load at the steering wheel.

These two adjustment operations must be performed in specific A-B order; the worm thrust bearing pre-load adjustment being first.

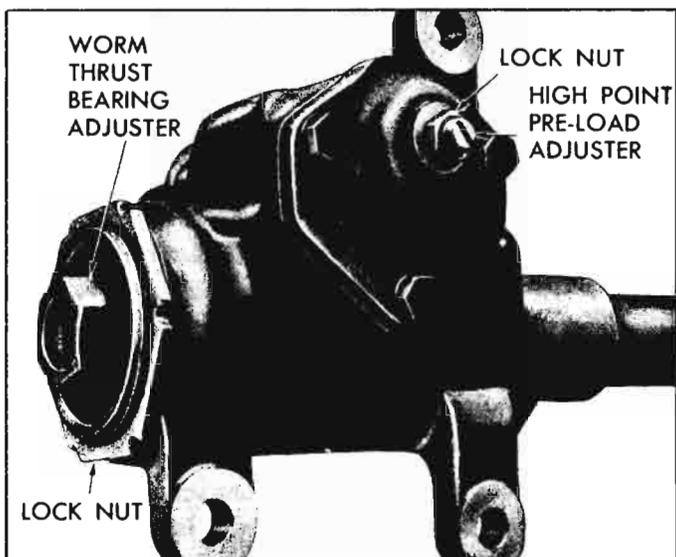


Fig. 4-34—Steering Gear Adjustment Points

Worm Bearing Pre-Load Adjustment

1. Remove cotter pin and loosen nut at steering connecting rod—pitman arm junction.
2. Free connecting rod ball stud from pitman arm by backing up pitman arm boss with heavy hammer or dolly and striking opposite side of boss with

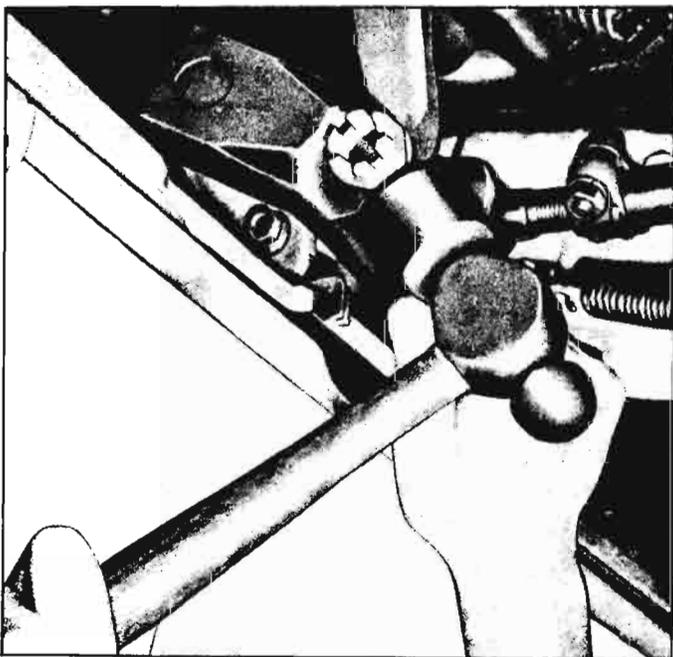


Fig. 4-35—Freeing Ball Stud

- another hammer of slightly lighter weight, as shown in Figure 4-35.
3. Separate connecting rod from pitman arm.
4. Loosen lash adjuster screw lock nut and turn screw out of gear case sufficiently to remove all high spot preload.
5. At steering wheel, gently rotate wheel to end of travel. **Turning wheel hard enough to “bounce off” end of travel can seriously damage internal parts of steering gear assembly.** When end of travel is reached, rotate wheel back one full turn.
6. Position tool No. J-5178 as shown in Figure 4-36 and, keeping barrel of tool as near 90° to center spoke as possible, rotate wheel by pulling at ring of tool. Note reading of scale necessary to keep wheel in motion; this reading must be between 1/2 and 3/4 lb. A scale reading outside the range given requires readjustment of worm bearing pre-load as follows:

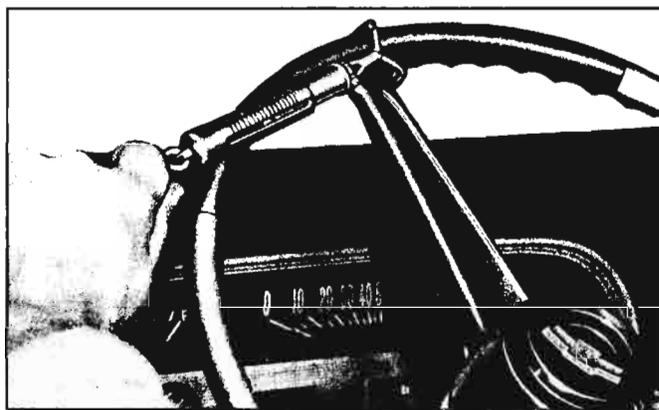


Fig. 4-36—Checking Pre-Load with Tool J-5178

7. Loosen worm bearing adjuster lock nut and turn adjuster in proper direction to increase or decrease pre-load as required (turning adjuster to the right increases pre-load). Tighten adjuster lock nut and check adjustment with tool J-5178 as outlined in operation six. Repeat until desired reading of 1/2 to 3/4 lb. is obtained. If there is a feeling of roughness or a wide variation of scale readings at different points during rotation of steering wheel, gear should be disassembled as outlined in this section and inspected for worn or damaged parts.

High Point Pre-Load Adjustment

1. With worm bearing pre-load properly adjusted, rotate steering gear to center of travel (2 1/2 turns from stop).
2. Turn lash adjusting screw into gear case until light contact is felt between sector gear and ball nut.
3. While holding adjusting screw in position with screwdriver, snug lock nut against gear case. Position tool J-5178 as outlined in operation six of

Worm Thrust Bearing Adjustment. With tool in place, move steering wheel clockwise through high point area ($\frac{1}{4}$ turn each way from center of gear travel) and observe scale reading, which should be $\frac{7}{8}$ to $1\frac{1}{2}$ lbs. Repeat adjustment procedure until reading falls within this range, remembering that turning adjusting screw *in* increases pre-load. Tighten adjusting screw lock nut before each scale reading.

4. Replace steering connecting rod ball stud in pitman arm, torquing attaching nut to 40-60 ft. lbs.

STEERING WHEEL ALIGNMENT AND HIGH POINT CENTERING

1. Set front wheels in straight ahead position. This can be checked by driving vehicle a short distance to determine steering wheel position at which vehicle follows a straight path.

With front wheels set straight ahead, remove horn button and check position of alignment mark on end of wormshaft which designates steering gear high point. Mark should be at the bottom side of the shaft at 6 o'clock position.

Remove steering wheel, if necessary, and align wheel with mark on bottom of steering shaft. See *Steering Wheel—Removal and Installation* in this section.

- If it is determined that gear is off center when vehicle is traveling straight ahead, adjust by the following procedure:
- Without moving steering position of front wheels, disconnect relay rod from relay arm assembly as outlined under *Worm Bearing Pre-load Adjustment—Operation 2*.

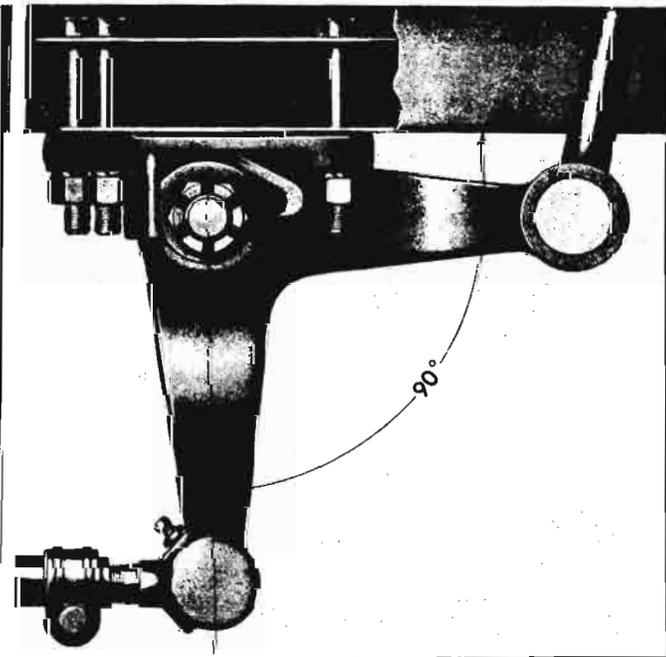


Fig. 4-37—Angle of Relay Arm to Frame

4. Place gear in center of travel by rotating steering wheel two and one-half turns from end of travel. **Do not turn wheel hard enough to "bounce off" end of travel, as internal damage may result.**
5. From under vehicle, check relationship of forward lever of relay arm assembly (the one which points to left front wheel) to the frame rail.

The center line of this lever must be 90° to underbody frame member with steering gear in center of travel, as shown in Figure 4-37. If lever is not 90° to frame member, loosen sleeve clamps on steering connecting rod and adjust length of rod by rotating sleeve in proper direction to obtain 90° angle.

Clamp bolts must be at right angles to slots in sleeve to obtain maximum clamping, as shown in Figure 4-38.

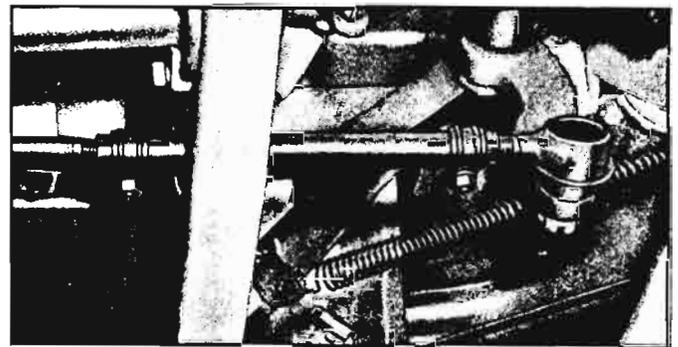


Fig. 4-38—Correct Clamp Position

Before tightening clamp bolts, adjust the relationship of the ball joint housings to the ball studs so that studs enter housings at as near 90 degrees as possible. If ball studs are cocked, they may rub edge of housing opening, thereby causing undesirable friction and premature failure of ball joint assemblies.

6. With wheels in their original straight ahead position and gear still centered, check alignment of hole in end of relay rod with steering relay arm stud; if they do not align, loosen adjusting sleeve clamps on tie rods and rotate sleeves an equal number of turns in same direction to allow stud to be freely assembled into hole.

NOTE: Turning sleeves in different directions, or turning one sleeve more than another will disturb toe-in adjustment.

Before locking clamp bolts on tie rods, make sure that the tie rod ends are in alignment with their ball studs (each ball joint in the center of its travel). If the tie rod is not in alignment with studs, binding may result. Clamp bolts must be at right angles to slots in sleeves to obtain maximum clamping, as shown in Figure 4-38.

7. When stud and hole are aligned and assembled, install castellated nut and torque to 40-60 ft. lbs.

TURN SIGNAL HOUSING TO STEERING WHEEL CLEARANCE

This operation is the same as that used on the 500, 700 and 900 vehicles.

TOE-IN ADJUSTMENT

A procedure for adjusting the steering linkage for proper toe-setting is described in Section 3.

SERVICE OPERATIONS

STEERING WHEEL

Remove and replace steering wheel as outlined in Corvair 500, 700 and 900 Section.

DIRECTION SIGNAL (FIG. 4-39)

Removal

1. Remove steering wheel as outlined in this section.
2. Disconnect horn wire from connector under dash and remove retaining spring, seat and bearing assembly from mast jacket.

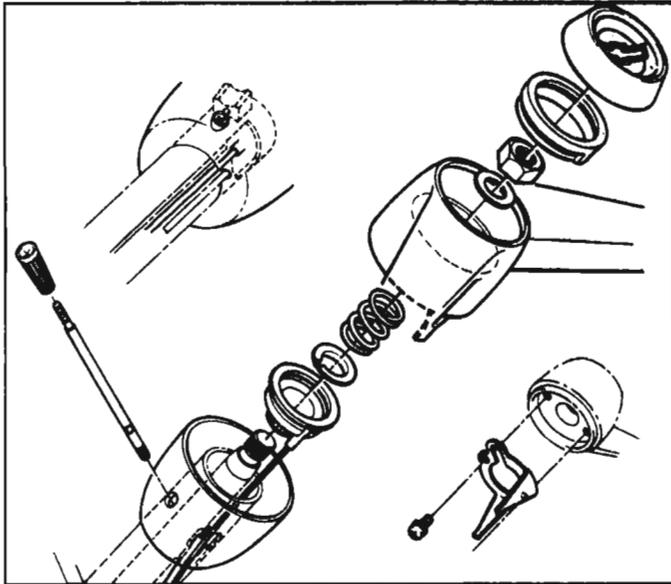


Fig. 4-39—Exploded View of Steering Wheel

3. Disconnect direction signal cable from switch.
4. Loosen clamp screw and lift turn signal control assembly from mast jacket.

Inspection

For service of internal parts, see Section 8, Electrical

Installation

1. Loosen cable support clip screw and pivot clip on screw so that cable housing seats in notch in lower hole of control housing (fig. 4-40). Feed loose end of switch cable through hole at top of groove in mast jacket and slide housing assembly down on to jacket far enough to place notch in housing

well into grooved area. Pivot cable support clip to the right far enough to contact clip stop pin and tighten clip screw.

2. Feed horn button wire through hole in mast jacket. Position bearing assembly, aligning wire junction with notch in end of mast jacket. Set bearing in jacket by placing deep socket of suit-

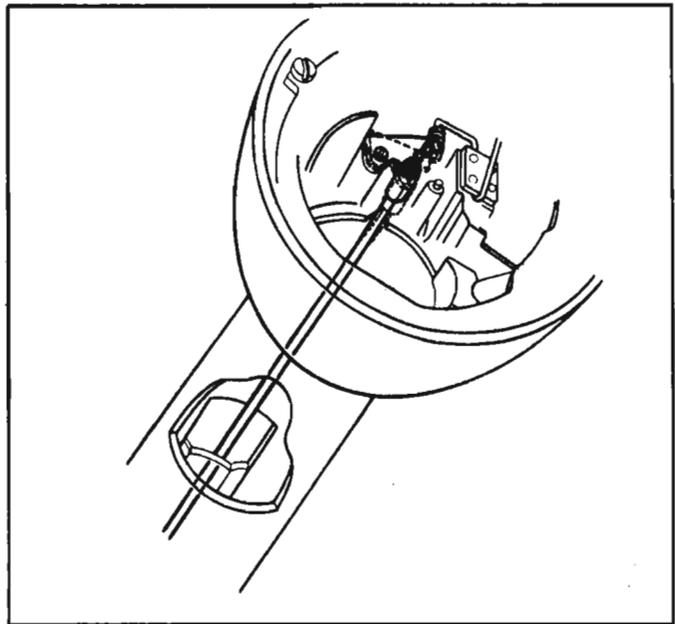


Fig. 4-40—Pivoting Cable Clamp to Install Housing



Fig. 4-41—Seating Shaft Upper Bearing

able diameter on bearing top surface and lightly tapping with hammer as shown in Figure 4-41.

3. Install contact spring seat and contact spring over wormshaft.
4. Install steering wheel as outlined in this section.
5. Position control assembly so that notch in lower (small) opening in control housing is aligned with right hand edge of groove in mast jacket; slide control assembly up toward steering wheel and adjust clearance as outlined under *Maintenance and Adjustments*.
6. When desired clearance is obtained, lock control housing assembly in place by tightening clamp screw.
7. Install cable in switch as shown in Figure 4-42.

as outlined in *Worm Bearing Preload Adjustment*, operation two.

3. Remove steering wheel as outlined under *Steering Wheel—Removal*.
4. Remove direction signal assembly as outlined in this section.
5. Remove mast jacket-to-dash clamp.
6. Remove bolts retaining gear to body rail and remove gear from vehicle (fig. 4-43).

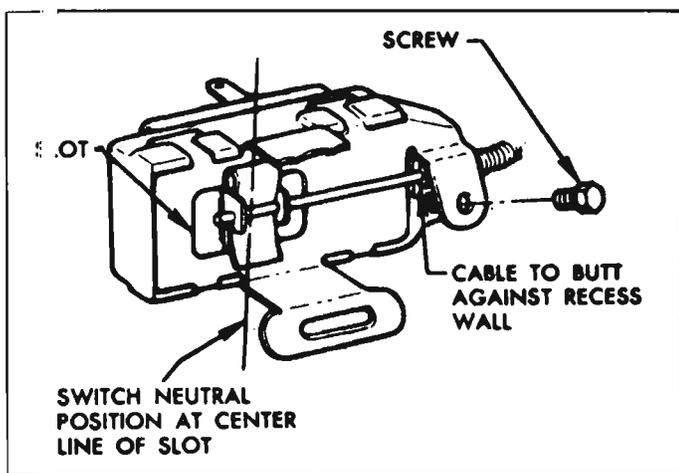


Fig. 4-42—Installation of Cable in Switch

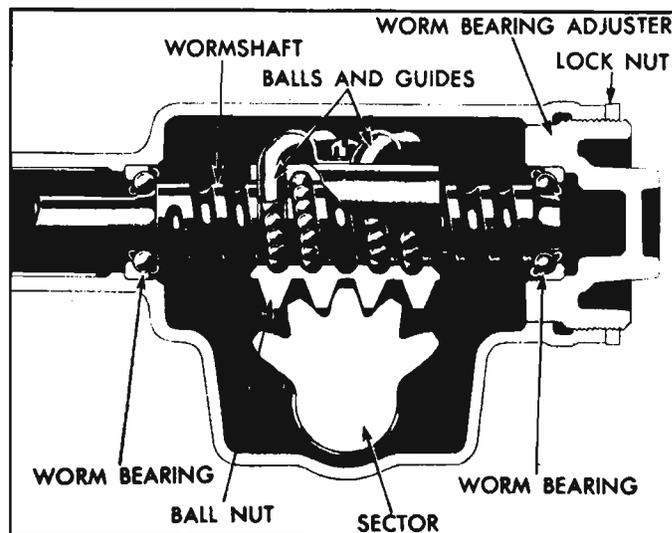


Fig. 4-44—Cross-Section of Steering Gear

STEERING GEAR

Removal

1. Remove bumper and left front outer extension panel as outlined in Section 10.
2. Remove steering connecting rod from pitman arm

Disassembly

As with any ball bearing unit the steering gear parts must be kept free of dirt. Clean paper or rags should be spread on the bench before starting disassembly of the steering gear. Refer to Figure 4-44.

1. Mark position of pitman arm on sector shaft. Remove pitman arm from gear using tool J-6632 as shown in Figure 4-45. Loosen lash adjusting screw



Fig. 4-43—Removal of Steering Gear from Vehicle

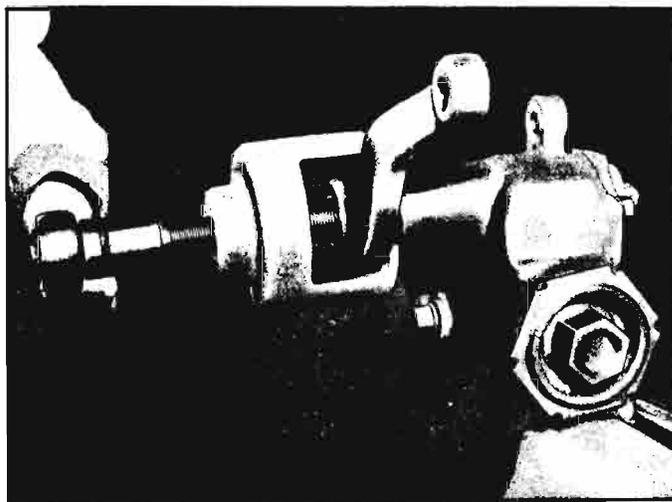


Fig. 4-45—Pulling Pitman Arm with J-6632

- lock nut and turn the lash adjusting screw a few turns counterclockwise (fig. 4-34).
2. Loosen the lock nut on the worm bearing adjuster shown in Figure 4-44 and turn the adjuster counterclockwise a few turns.
 3. Place a pan under the assembly to catch the lubricant and remove the three bolts and washers attaching side cover to housing.
 4. Pull the side cover with the sector and shaft from the housing (fig. 4-46).

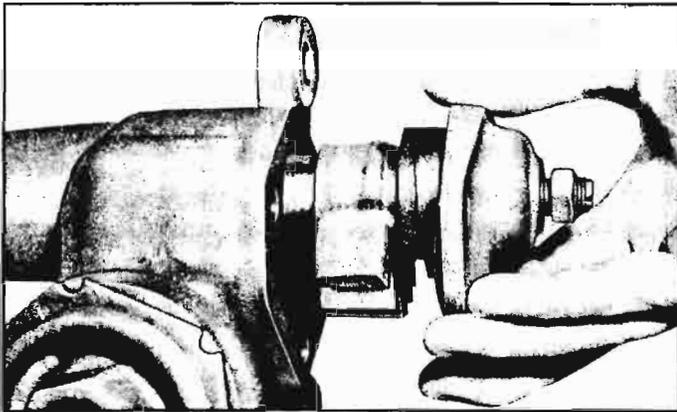


Fig. 4-46—Removing Cover and Sector Shaft

NOTE: If the sector does not clear the opening in the housing easily, turn the wormshaft by hand until the sector will pass through the opening in the housing.

5. Remove the worm bearing adjuster and lower ball bearing from housing.
6. Draw wormshaft and ballnut assembly from housing. Remove upper ball bearing from worm shaft.

CAUTION: Use care that the ball nut does not run down to either end of the worm. Damage will be done to the ends of the ball guides if the nut is allowed to rotate until stopped at the end of the worm.

7. Slide adjuster and shim out of slot in end of sector shaft. Remove lock nut from lash adjuster and unscrew adjuster from side cover.
8. Remove sector shaft seal from gear casting and discard.

Ball Nut Disassembly

Follow procedure outlined in 500, 700 and 900 Section. Note, however, that ball nut used in the Greenbrier and Corvaire 95 steering gear has 54 balls instead of 48.

Inspection

With the steering gear completely disassembled, wash all parts in cleaning solvent and dry thoroughly.

With a magnifying glass inspect the ball bearings, bearing cups, worm and nut grooves and the surface of all balls for signs of wear. Any parts that show signs of damage should be replaced. Balls must be replaced with genuine Chevrolet parts made according to specifications for this steering gear. Inspect the sector shaft for wear and check the fit of the shaft in the housing bushing.

Inspect the fit of the pilot on the end of the sector shaft in its bushing in the side cover. If this bushing is worn, a new side cover and bushing assembly should be installed.

Check ball guides for damage at ends where they pick up the balls from the worm. Any damaged guides should be replaced. Carefully check wormshaft for alignment and general condition. Do not attempt to salvage a damaged shaft by straightening or welding.

Repairs

Sector Shaft Bushing Replacement

1. Support steering gear housing in an arbor press and press sector shaft bushing from housing with Tool J-1614, inserted from lower end of housing as shown (fig. 4-47).
2. Press new bushing into position using the same sector shaft bushing used for removal.

NOTE: Service bushings are diamond bored to size and require no further reaming.

Wormshaft Seal Replacement

If the wormshaft seal indicates need of replacement, it should be removed and a new seal pressed into position in the housing. A suitable socket pressing on outer diameter of seal may be used.

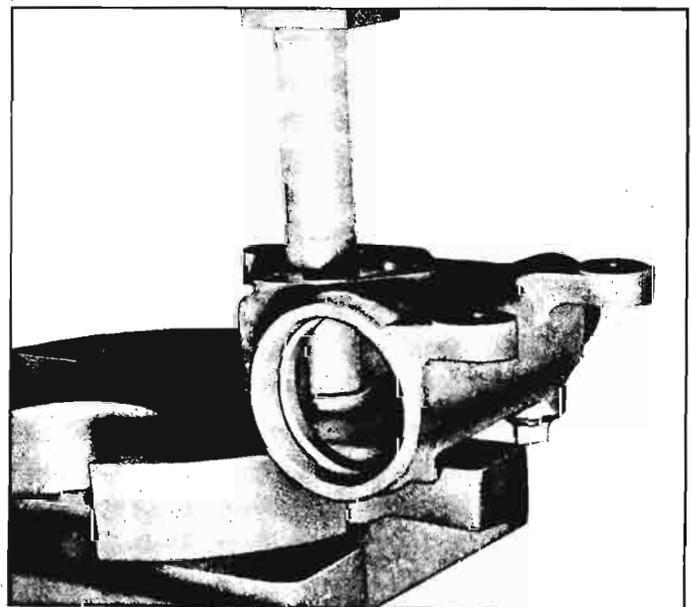


Fig. 4-47—Pressing Bushing with J-1614

NOTE: Care should be taken to insure that seal is not assembled in a cocked position.

Side Cover Bushing Replacement

The entire side cover assembly, including bushing, is serviced as a unit and should be replaced if bushing is defective.

Sector Shaft Seal Replacement

The sector shaft seal must be replaced each time a defective seal is indicated or the steering gear is disassembled. This operation is similar to that described under Wormshaft Seal Replacement.

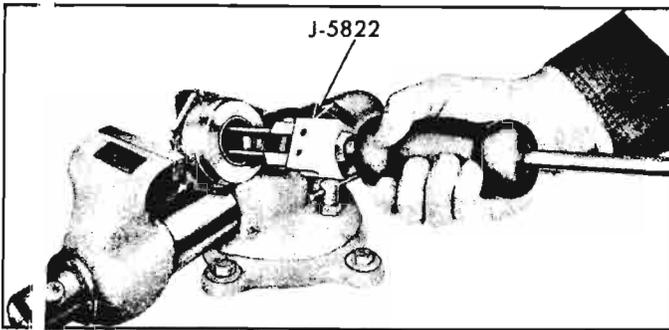


Fig. 4-48—Removing Bearing Cup

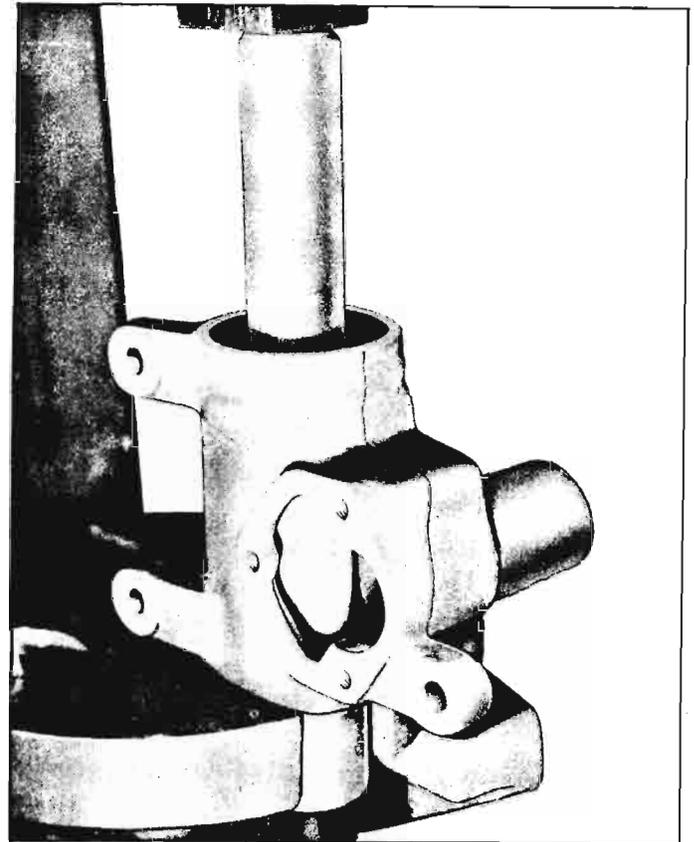


Fig. 4-49—Installing Cup with J-5755

Wormshaft Bearing Cup Replacement

- 1 Remove wormshaft bearing cups using Tool J-5822 with Tool J-2654 (fig. 4-48).
- 2 Press new bearing cups into position using Tool J-755 (fig. 4-49).

Ball Nut Assembly

Follow procedure outlined in 500, 700 and 900 Section. Note, however, that the ball nut used in the Sportswagon and commercial steering gear has 54 balls instead of 48.

Steering Gear Assembly (fig. 4-50)

After a major service overhaul where all of the original factory installed lubricant has been washed out of the steering gear assembly, the threads of the adjuster, side cover bolts and lash adjuster should be coated with a suitable nondrying, oil resistant sealing compound such as Permatex No. 2. This is to prevent leakage of gear lubricant from the steering gear assembly. The compound should not be applied to female threads and extreme care should be exercised in applying this compound to the bearing adjuster, as the compound must be kept away from the wormshaft bearing. Also apply grease to the worm bearings, pitman shaft bushings, and ball nut teeth.

.. With wormshaft and sector shaft seals, bushings

and bearing cups installed in gear housing and ball nut assembly installed on wormshaft, slip upper ball bearing over wormshaft and insert wormshaft and nut assembly into housing, feeding end of shaft through upper ball bearing cup, seal and upper mast jacket bearing.

2. Place ball bearing in adjuster cup and install adjuster and lock nut in lower end of housing.
3. Assemble the lash adjuster with shim in the slot in the end of sector shaft. Check the end clearance which should not be greater than .002" (fig. 4-51). For the purpose of adjusting this end clearance, a steering gear lash adjuster shim unit Part Number 605142 is available. It contains four shims—.063", .065", .067" and .069" thick.
4. After lash adjuster end clearance has been adjusted, start sector shaft pilot into bushing in side cover. Then, using a screwdriver, through the hole in cover, turn lash adjuster in a counterclockwise direction to pull sector shaft pilot into its bushing as far as it will go.
5. Rotate wormshaft by hand until ball nut is about in the center of travel. This is to make sure that the rack and sector will engage properly with center tooth of the sector entering center tooth space of the nut.
6. Place a new gasket on side cover, then push side

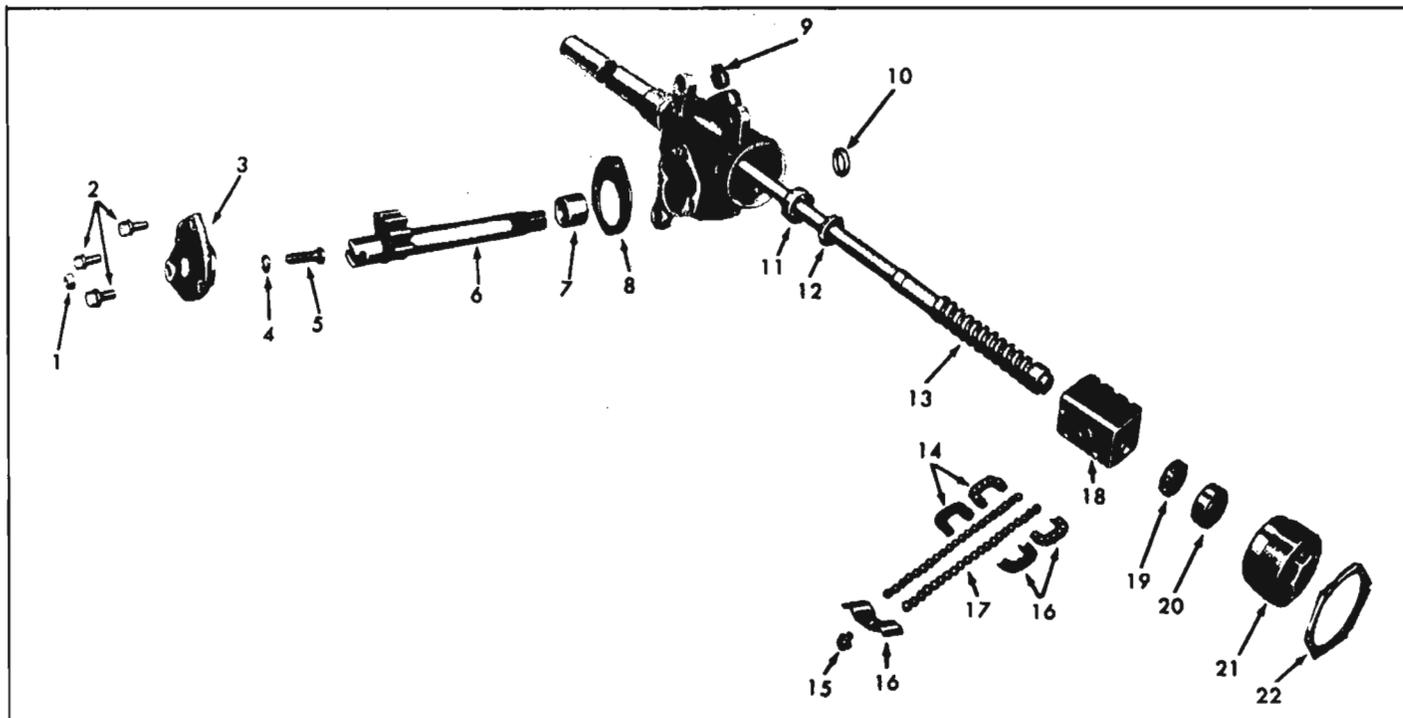


Fig. 4-50—Exploded View of Steering Gear

- | | | |
|---------------------------|----------------------------------|--|
| 1. Lash Adjuster Lock Nut | 8. Side Cover Gasket | 16. Ball Guide Retainer |
| 2. Side Cover Bolts | 9. Filler Plug | 17. Balls |
| 3. Side Cover | 10. Sector Shaft Outer Seal | 18. Ball Nut |
| 4. Lash Adjuster Shim | 11. Upper Worm Shaft Bearing Cup | 19. Lower Worm Shaft Bearing |
| 5. Lash Adjuster | 12. Upper Worm Shaft Bearing | 20. Lower Worm Shaft Bearing Cup |
| 6. Sector Shaft | 13. Worm Shaft | 21. Worm Shaft Bearing Adjuster |
| 7. Sector Shaft Bushing | 14. Ball Guides | 22. Worm Shaft Bearing Adjuster Lock Nut |
| | 15. Ball Guide Retainer Screw | |

cover assembly including sector shaft into place. After making sure there is some lash between rack and sector teeth, assemble and tighten side cover bolts.

7. Install pitman arm on sector shaft, aligning marks made during disassembly. Place arm in vise and torque pitman nut to 80-105 ft. lbs.

Adjustment on Bench

1. Place steering gear assembly in a vise.
2. Install the steering wheel on the wormshaft tem-

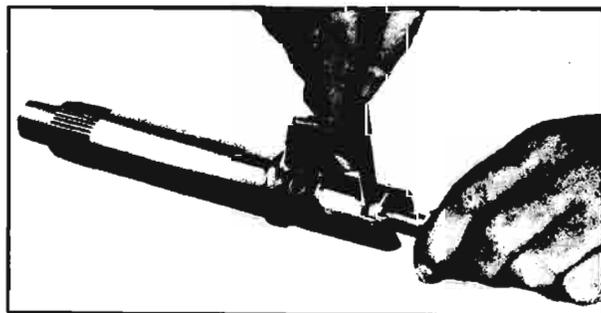


Fig. 4-51—Checking Lash Adjuster End Clearance

porarily and proceed with adjustment as outlined in this section under *Steering Gear Adjustments*.

Installation

1. With steering gear fully assembled and mast jacket gasket in place, insert end of mast jacket through floor pan hole.
2. Position gear on frame outrigger and insert bolts from right hand side.
3. Install lock washers and nuts finger tight.
4. Position mast jacket in instrument panel brace with grommet in place.
5. Install bracket clamp over mast jacket and torque bolts to 6-9 ft. lbs.
6. Install turn signal control and steering wheel as outlined in this section.
7. Torque steering gear-to-outrigger bolts to 45-55 ft. lbs.
8. Install steering connecting rod ball stud in pitman arm. Torque retaining nut to 40-60 ft. lbs. and insert new cotter pin.

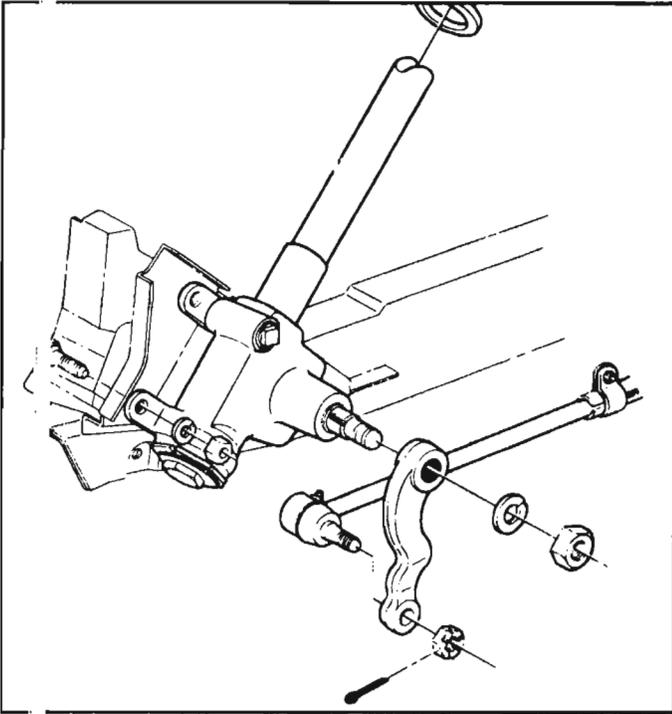


Fig. 4-52—Installation of Steering Gear

STEERING LINKAGE

Tie Rod Assembly

Description and service of tie rods are covered under *Corvaire 500, 700 and 900 Steering Service Operations — Tie Rod*, except for following difference:

If tie rods are adjusted to end of travel, realign steering connecting rod assembly with gear on high

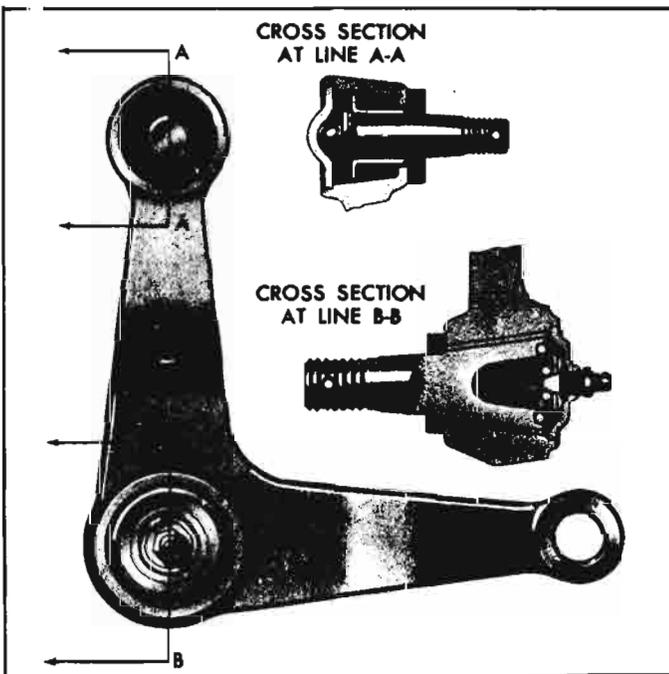


Fig. 4-53—Relay Arm Assembly

spot so that the lateral relay arm lever is approximately 90° to the side rail. See *Steering Wheel Alignment and High Point Centering* in this section for correct procedure.

Relay Arm Assembly (fig. 4-53)

The relay arm assembly is replaced as a unit if damaged or defective. If inspection reveals replacement to be necessary, proceed as follows:

Removal

1. Free steering connecting rod and relay rod from arm by removing cotter pin and backing nuts off ball studs until castellated surface is flush with end of stud. Proceed as outlined in *Worm Bearing Adjustment*, operation two.
2. Remove cotter pin and castellated nut from pivot stud and strike boss of forged mounting bracket with hammer. In stubborn cases it may be necessary to remove mounting pad from body member and "back up" bracket with dolly or hammer somewhat heavier than that used for striking.

Installation

1. With dust cap and seal in position, install pivot stud in mounting bracket. Torque retaining nut to 70-90 ft. lbs. and install new cotter pin. If bracket has been removed from vehicle, position on body member and install mounting bolts, torquing nuts to 24-32 ft. lbs.
2. Install relay rod on ball stud with seal in position. Install retaining nut and torque to at least 35 ft. lbs.; then tighten nut to first notch which will allow installation of cotter pin.
3. With dust cup in place, insert steering connecting rod ball stud in hole provided in relay arm. Install castellated nut and torque as outlined in operation two.
4. Install all grease fittings and lubricate with chassis grease.

Idler Arm Assembly (fig. 4-54)

When defective condition is indicated by excessive play in the pivoting joints or by apparent damage to forged parts, the entire assembly must be replaced as follows:

Removal

1. Remove cotter pin from ball stud and back nut off until its castellated surface is flush with end of stud.
2. Free ball stud from relay rod, using method described in *Worm Bearing Pre-load Adjustment*, operation two.
3. Remove bolts retaining idler assembly to body member.

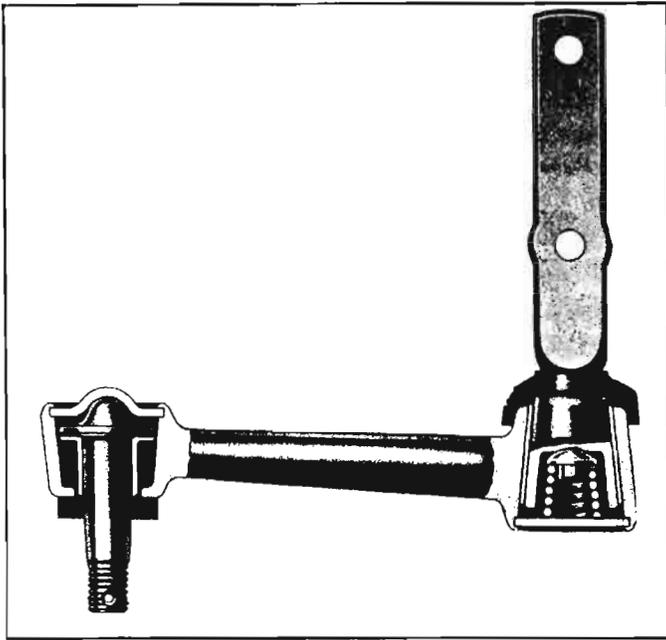


Fig. 4-54—Idler Lever

Installation

1. Assemble idler to frame member, torquing bolts to 15-22 ft. lbs.
2. With dust cap and seal in place, position ball stud in relay rod boss. Install castellated nut and torque to at least 35 ft. lbs.; then tighten to next notch for insertion of cotter pin.

Relay Rod

If relay rod is suspected of being damaged through vehicle collision or other sources, it should be removed and checked for bends and cracks. The proper shape of the rod can be determined by comparing it to a new part or by supporting the rod on 3 blocks of equal height (one at each end and one in approximate center) and checking part against dimensions shown in Figure 4-55.

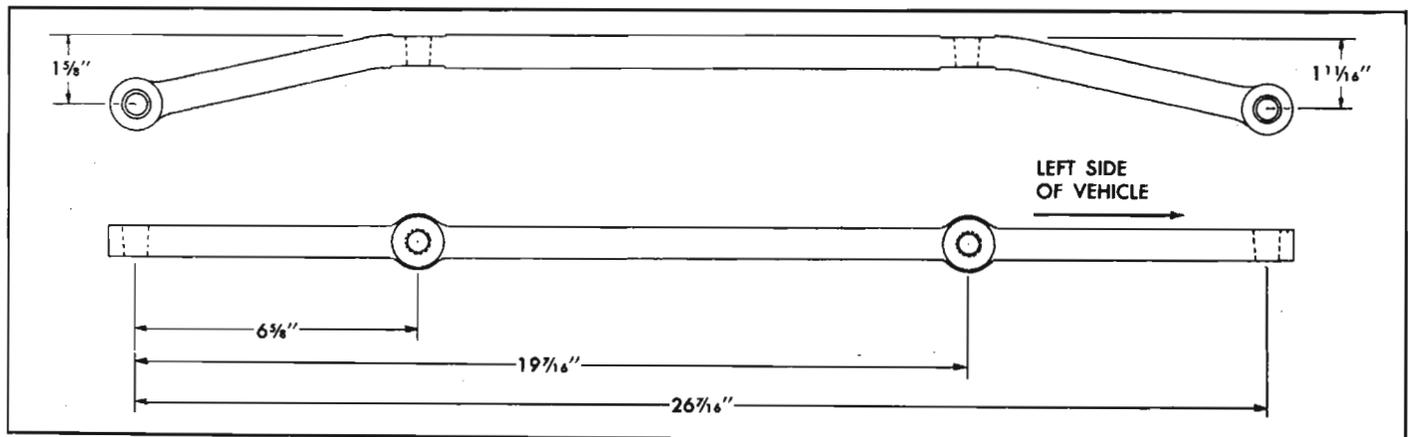


Fig. 4-55—Relay Rod

A defective relay rod should be discarded. Never, under any circumstances, attempt salvage by welding or bending. Remove and replace rod from attached parts by consulting the following write-ups in this section: *Relay Arm Assembly*, *Tie Rod Assembly* and *Idler Arm Assembly*.

Steering Connecting Rod

This assembly is basically similar to the tie rods in construction. The length is adjustable and attachment is made through ball and socket ends which are self adjusting for internal wear. The ends should be replaced when they are found to have excessive looseness in any direction.

Removal

1. Remove cotter pins from both ball studs and loosen nuts until castellated surface is flush with end of ball stud.
2. Free ball studs from relay arm and pitman arm using method described in *Worm Bearing Pre-load Adjustment*, operation two.
3. To remove ball-and-socket assemblies, loosen clamps and unscrew assemblies from rod.

Installation

1. With clamps in place, install ends in rod, threading in both an equal distance. Do not tighten clamps at this time.
2. Be sure nuts turn on ball studs freely; rough threads can cause ball studs to turn in ends as nuts are being tightened during installation.
3. Place dust caps on ball studs and insert ball studs in relay arm and pitman arm. Note that end with longest rod is attached to pitman arm.
4. Install ball stud nuts and torque to at least 45 ft. lbs. then tighten nuts to first notch which will allow installation of cotter pin.
5. Proceed as outlined in this section under *Steering Wheel Alignment and High Point Centering*.

TROUBLES AND REMEDIES

Symptom and Probable Cause	Probable Remedy
Hard Steering	
a. Lack of lubrication.	a. Lubricate steering gear, tie rod ends, steering relay rod ball joints and steering knuckle joints. Replace or repair part if not corrected by lubrication (Sect. 4).
b. Turn signal housing rubbing steering wheel.	b. Adjust to proper clearance (Sect. 4).
c. Underinflated tires.	c. Inflate tires to recommended pressure (Sect. 1).
d. Improper worm bearing and/or high spot pre-load adjustment.	d. Adjust according to instructions (Sect. 4).
e. Interference between steering shaft and mast jacket assembly caused by misalignment, bent steering shaft, or damaged parts within the mast jacket assembly.	e. Adjust or replace parts as required (Sect. 4).
f. Incorrect front suspension alignment.	f. Adjust to specifications (Sect. 3).
Loose Steering	
a. Improper worm bearing and/or high spot pre-load adjustment.	a. Adjust according to instructions (Sect. 4).
b. Defective front wheel bearings.	b. Adjust or replace as required (Sect. 3).
c. Worn steering knuckle ball joints.	c. Replace steering knuckle ball joints (Sect. 3).
d. Worn sector shaft bushings.	d. Replace bushings (Sect. 4).
e. Worn steering linkage components	e. Replace worn parts as required (Sect. 4).
f. Gear assembly loose on body member.	f. Tighten bolts to proper torque (Sect. 4).
Shimmy	
a. Unbalanced front wheels.	a. Balance wheel assemblies (Sect. 3).
b. Faulty front wheel bearings.	b. Adjust or replace as required (Sect. 3).
c. Loose wheel nuts.	c. Tighten to proper torque (Sect. 3).
d. Defective front brakes.	d. Repair as required (Sect. 5).
e. Worn tie rod end or steering connecting rod end.	e. Inspect and repair as required (Sect 4).
Road Wander	
a. Underinflated tires.	a. Inflate to recommended pressures (Sect. 1).
b. Improper worm bearing and/or high spot pre-load adjustment.	b. Adjust to proper specifications (Sect. 4).
c. Defective front wheel bearings.	c. Adjust or replace as required (Sect. 3).
d. Worn tie rod or steering connecting rod ends.	d. Inspect and repair as required (Sect. 4).

SPECIFICATIONS

Specifications may be found in Section 12.

SPECIAL TOOLS

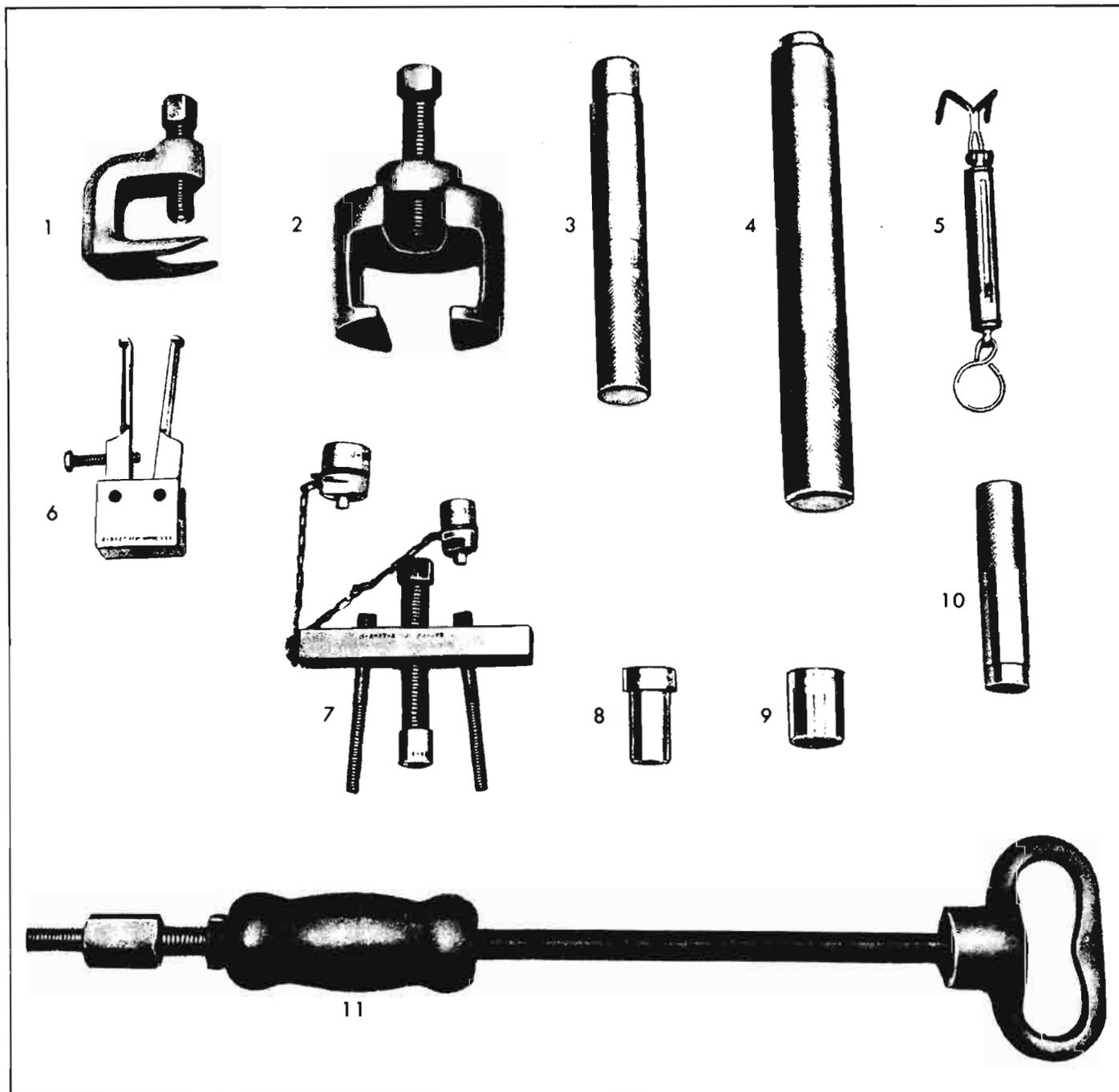


Fig. 4-56—Special Tools

1. J-6627 Pitman Arm Puller
2. J-6632 Pitman Arm Puller
3. J-1614 Sector Shaft Bushing Remover and Replacer

4. J-5755 Worm Bearing Cup Installer
5. J-5178 Checking Scale
6. J-5822 Worm Bearing Cup Remover
7. J-2927A Steering Wheeler Puller

8. J-8366-1 Sector Shaft Bushing Installer
9. J-8357 Relay Rod Bushing Installer
10. J-8366-2 Sector Shaft Bushing Remover
11. J-2619 Slide Hammer