

# SECTION 4

## STEERING

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## CORVAIR PASSENGER CAR 500, 700 AND 900 SERIES

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### GENERAL DESCRIPTION

The steering system for 1963 remains the same as the proven 1961 design. However, the 1963 steering system incorporates the extended lubrication interval by using new tie rod sockets and idler arm seals and washers. There are certain parts which have been re-designed and improved in the area of service proce-

dures for both 1962 and 1963 as covered in the following pages. Those procedures not covered in this section may be assumed to be serviced as outlined in the 1961 Corvair Shop Manual. Additions or changes in this supplement will apply to both 1962-1963 unless otherwise noted.

### MAINTENANCE AND ADJUSTMENTS

#### STEERING GEAR ADJUSTMENT

The adjustment of the steering gear was formerly checked by rotating the wormshaft with an inch-pound calibrated torque wrench placed on the steering wheel retaining nut. In order to eliminate the necessity of removing the horn button, and to make this procedure consistent with that used on the rest of the Chevrolet vehicles, the adjustment is now checked with a pull scale (J-5178) as shown in Figure 1.

Before attempting steering gear adjustments to correct such conditions as shimmy, loose or hard steering, etc., 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.

1. Pull pitman arm as outlined on Page 4-2, Operation 1 of 1961 Corvair Shop Manual.
2. Loosen lash adjuster screw lock nut and turn screw out of gear case enough to remove sector high point loading (about 2½ to 3½ turns).



Fig. 1—Checking Steering Adjustment

3. Check effort required to keep steering wheel in motion, using Tool J-5178 as shown in Figure 1. The desired amount is  $\frac{7}{16}$ - $1\frac{1}{16}$  lbs. If adjustment is necessary, loosen worm bearing adjuster lock nut and turn adjuster in appropriate direction to increase or decrease worm bearing load. Lock nut should be snugged up after each adjustment and before scale is read. Fully tighten lock nut when desired worm bearing adjustment is reached and recheck scale reading.

With worm bearings correctly adjusted, turn lash adjuster screw into gear case until a scale reading of  $1\frac{1}{8}$ - $1\frac{1}{2}$  lbs. is obtained when steering wheel is rotated through an area  $\frac{1}{4}$  of a turn on each side of straight ahead steering wheel position. Locate straight ahead position by turning the steering wheel gently from one stop to the other counting the total number of turns; then turn wheel back half to center position. Wheel spokes should be horizontal. Approach end of travel with care;

striking end of travel with force can severely damage gear. When desired adjustment is obtained, tighten lash adjuster lock nut and recheck.

**NOTE:** During adjustment, always turn lash adjuster screw in clockwise direction.

Install pitman arm on shaft after making sure steering wheel and front wheels are in straight ahead position.

## LUBRICATION

### 1962 Steering

Lubrication is the same as outlined in the 1961 Corvair Shop Manual.

### 1963 Steering

A new design is available for extended lubrication. Refer to Lubrication, Section 2, for lube points and intervals.

# SERVICE OPERATIONS

## STEERING GEAR OVERHAUL

After gear is overhauled, lubricated and assembled, it is suggested that it be installed in the vehicle and adjusted instead of adjusted on the work bench. See 1961 Corvair Shop Manual for overhaul and installation instructions; adjust as outlined in 1961 Shop Manual under Maintenance and Adjustments.

### Worm Bearing Cup

The worm bearing cup in the steering gear housing may be serviced as follows:

#### Removal

1. With gear dismantled as outlined in 1961 Corvair Shop Manual and seal removed, cup may be tapped out of housing with a punch and hammer.
2. Use care to avoid damaging housing. Support it on a wood block while driving out old cup.

#### Installation

1. With all foreign material out of cup bore in housing, position new cup over bore. Place old cup on top of new and press new cup in with arbor press.
2. Install new seal as outlined on Page 4-7 of 1961 Corvair Shop Manual. Figure 4-1 in the 1961 Manual shows installed position of seal and cup.

## STEERING ARMS

If, through collision or other damage, it becomes necessary to remove and replace either steering arm, proceed as follows:

#### Removal

1. Remove tie rod from steering arm as outlined under *Steering Linkage—Tie Rod—Removal*, Operations 1 and 2, Page 4-11 of 1961 Corvair Shop Manual.
2. Remove front wheel, hub and brake drum as a unit by removing hub cap and dust cap, cotter pin from spindle nut and the spindle nut. Pull assembly toward outside of vehicle. If removal is difficult, it may be necessary to back off brake adjustment to increase brake shoe-to-drum clearance; see *Hydraulic Brake Adjustment*, Page 5-6, 1961 Corvair Shop Manual.
3. With wheel and drum assembly removed, steering arm retaining bolt heads are accessible and removal of steering arm from vehicle may be accomplished by removing retaining nuts.

#### Installation

1. Place steering arm in position on vehicle and install retaining bolts. Note that longer bolt is installed in forward hole.
2. Install nuts and torque to 40-50 ft. lbs. Use only the special locknut listed for this use in the Chevrolet Parts Catalog.
3. Pack wheel bearings using a high quality wheel bearing lubricant. Install bearings and wheel-hub-brake drum assembly removed previously.
4. Install keyed washer and spindle nut. Proceed as outlined on Page 3-2 of 1961 Corvair Shop Manual under *Front Wheel Bearings—Adjust*.
5. Install tie rod ball stud in steering arm. Be sure that the dust cover is in place on ball stud.

6. Install castellated nut on ball stud, tighten securely and install cotter pin.
7. Following directions given on Pages 3-4 and 3-5 of 1961 Corvair Shop Manual, check cornering wheel relationship and toe-in. Note, however, that 1962 cornering wheel relationship is  $20^{\circ} \pm 1^{\circ}$  for inner wheel and  $18^{\circ} \pm 1^{\circ}$  for outer wheel, and that toe-in is  $\frac{1}{4}$ " to  $\frac{3}{8}$ ", total of both wheels.

## 1963 STEERING LINKAGE—IDLER ARM

### Removal

The idler arm to relay rod connection has been redesigned to incorporate the extended lubrication interval.

1. Remove cotter pins and back nuts from ends of idler arm until castellated surface is flush with end of stud.
2. Remove washer and seal from between the relay rod end and idler arm bushing while removing the idler arm from the relay rod by using the previously described method in the 1961 Corvair Shop Manual.
3. Repeat above Step 2 for removal of idler arm to idler arm bracket.

### Installation

Reverse above removal procedures and torque idler

arm nuts at bracket and at relay rod from 15 to 22 ft. lbs.

## IDLER ARM ASSEMBLY

The steering idler lever and spacer change for 1963 revises the replacement procedure of the entire idler arm assembly which must be replaced under the condition of excessive play in the pivoting joints or by apparent damage to the forged parts.

### Removal

1. Remove cotter pin from ball stud and back nut off until castellated surface is flush with end of stud.
2. Free ball stud from relay rod by using the previously described method in 1961 Corvair Shop Manual.
3. Remove bolts retaining idler assembly to body frame member and remove idler lever-to-frame spacer.

### Installation

1. Assemble the idler assembly to frame member by attaching the upper attaching bolt first, then the lower bolt and spacer. Torque bolts to 15-22 ft. lbs.
2. With seal in place, position ball stud in relay rod boss. Install castellated nut and torque to 29 to 43 ft. lbs.; then tighten to next notch for insertion of cotter pin.

# CORVAIR 95 AND GREENBRIER 1200 SERIES

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## GENERAL DESCRIPTION

The steering system for 1962 and 1963 remains the same as the proven design used on the 1961 vehicle except for the idler lever support and spacer. There are, however, certain service procedures and adjustments which have been changed; these are covered in

the following pages.

Adjustments and service procedures not covered herein may be assumed to be the same as outlined in the 1961 Shop Manual.

## MAINTENANCE AND ADJUSTMENTS

### TOE-IN ADJUSTMENT

The toe-in adjustment is performed in the same manner as outlined in the 1961 Corvair Shop Manual on Page 3-30, except that the desired amount of total toe-in should be  $\frac{1}{16}$ " to  $\frac{3}{16}$ ".

### CORNERING WHEEL RELATIONSHIP

This measurement, also known as "toe-out on turns," is non-adjustable; it is designed into the steering link-

age and may be changed only by replacing the steering arm on the side affected. The desired cornering wheel relationship is  $23^\circ$  at the inner wheel and  $20^\circ$  at the outer. Both measurements  $\pm 1^\circ$ .

Directions for replacing a steering arm may be found in this section. Checking procedure furnished with front end equipment used must be followed for best results.

## SERVICE OPERATIONS

### Steering Arms

If, through collision or other damage, it becomes necessary to remove and replace either steering arm, proceed as follows:

#### Removal

1. Remove tie rod from steering arm as outlined under *Steering Linkage-Tie Rod Assembly*, Page 4-23 of 1961 Corvair Shop Manual.
2. Remove front wheel, hub and brake drum as a unit by removing hub cap and dust cap, cotter pin from spindle nut and the spindle nut. Pull assembly toward outside of vehicle. If removal is difficult, it may be necessary to back off brake adjustment to increase brake shoe-to-drum clearance: see *Hydraulic Brake Adjustment*, Page 5-15, 1961 Corvair Shop Manual.
3. With wheel and drum assembly removed, steering arm retaining bolt heads are accessible and removal of steering arm from vehicle may be accomplished by removing retaining nuts.

#### Installation

1. Place steering arm in position on vehicle and in-

stall retaining bolts. Note that longer bolt is installed in forward hole.

2. Install nuts and torque to 45-55 ft. lbs. Use only the special locknut listed for this use in the Chevrolet Parts Catalog.
3. Pack wheel bearings using a high quality wheel bearing lubricant. Install bearings and wheel-hub-brake drum assembly removed previously.
4. Install keyed washer and spindle nut. Proceed as outlined on Page 3-29 of 1961 Corvair Shop Manual under *Front Wheel Bearings—Adjust*.
5. Install tie rod ball stud in steering arm. Be sure that the dust cover is in place on ball stud.
6. Install castellated nut on ball stud, tighten securely and install cotter pin.
7. Following directions given on Page 3-4 of 1961 Corvair Shop Manual, check toe-in: adjust to  $\frac{1}{16}$ " to  $\frac{3}{16}$ " total. Cornering wheel relationship should also be checked. Follow directions furnished with the equipment used. The cornering relationship should be  $23^\circ$  for the inner wheel and  $20^\circ$  for the outer wheel; both measurements  $\pm 1^\circ$ .