

1967 (Late) - 1968 CORVETTE TELESCOPING STEERING COLUMN DISASSEMBLY & REPAIR INSTRUCTIONS PAPER #2

Disassembly and Repair Instructions Addressed in this Paper

	Degree of Difficulty	Page
DROP OR REMOVE STEERING COLUMN FROM VEHICLE	Moderate	2 & 3
REPLACE LOWER COLUMN BEARING	Moderate	4 & 5
DISASSEMBLE UPPER STRG SHAFT FROM LOWER SHAFT	Moderate	5
REMOVE UPPER TUBE & FLANGE FROM MAST JACKET	Moderate	6
STEERING COLUMN ALIGNMENT CHECKS	Easy	9

How the Paper is Setup

There are a limited number of telescoping steering column service procedures addressed in this paper. This paper starts at the point where the steering wheel and horn parts are already removed from the steering column. These procedures were described in detail in 1967-68 Corvette Telescoping Steering Column Disassembly & Repair (D&R) Paper #1. The turn signal switch and upper bearing are still intact on the column.

This paper includes drawings of the steering column installations for the two specific years. It also contains a corrected steering column blowup drawing and a sectional view.

Types of Steering Columns Addressed in this Paper

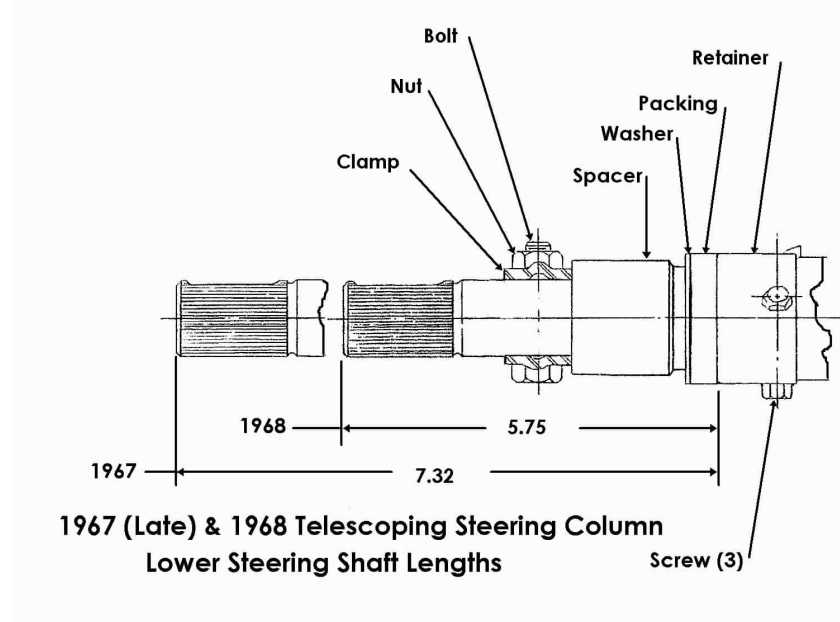
The 1967 Corvette telescoping steering column is included in this paper because it is so close in design to the 1968 C3 model. However, they will not interchange because they have different mounting patterns under the dash. So we are really looking at unique, one year only, steering columns. Therefore, parts are very rare (and expensive.)

Please note that I believe that the instructions in the 1967 and/or 1968 Chevrolet Chassis Service Manuals are confusing at best. The 1967 manual does not reflect the revised lower bearing design that was introduced early during 1967 production. The 1968 manual confuses 1967 lower column attaching procedures with the new 1968 design.

The 1967-68 Corvette steering columns (and 1967, 68, 69 Corvair) were quite unique from the rest of the General Motors columns in that the steering column jackets were smaller in diameter than any other Saginaw steering columns (for just those years.) They are also unique in that they use virtually no parts from earlier years nor do they use any parts from the second generation, function locking steering columns that followed in 1969. Specifically this paper covers the 1967 (Late) and 1968 Corvette standard steering columns that are quite similar to each other and use several common parts.

All part numbers in parenthesis () refer to Steering Column Mounting Pics on page 3.
All part numbers beginning with # refer to the Steering Column Blowup on page 4.

The 1967 model year saw the introduction of the General Motors first generation, energy absorbing, collapsible steering columns. Right after the start of 1967 production the lower bearing and steering shaft were redesigned. This is why we identify the steering shaft and lower bearing parts for the 1967 Corvette in this paper as being (Late).



Words of Caution:

To maintain the energy absorbing function of the steering column, always replace screws, bolts, and nuts with identical fasteners as specified.

Disconnect your car's battery whenever you work on the steering column.

Instructions for Dropping and/or Removing the Steering Column

In order to replace the lower steering column bearing the steering column first must be removed from the car.

Upper End

1967 – The steering column has two separate plastic covers and a collar called an escutcheon. The covers attach together with screws. Remove the covers and detach the escutcheon from the instrument cluster. (Picture included in Telescoping Strg Column D&R Paper #1, Page 3.)

1968 - Remove the fasteners and the four plastic covers that enclose the upper end of the steering column. Remove the four fasteners and the closeout panel that is underneath the column. (Picture included in Telescoping Steering Column D&R Paper #1, Page 4.)

1967-68 All

Detach air ducts, crossover bars, and any other dash components that prevent the steering column from dropping straight down from the instrument panel structure. Disconnect the steering column curved turn signal switch connector from the body harness.

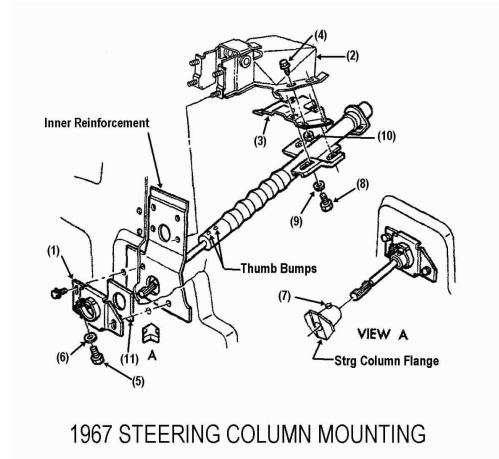
Dropping and/or Removing the Steering Column (Continued)

Lower End Mounting – 1967

Remove the clamp bolt (5) and washer (6) from the support assembly (1) on the engine compartment side of the lower dash panel. You should be able to pry the clamp open sufficiently to be able to clear the thumb bumps on the lower end of the steering column.

Use a crayon or piece of chalk to mark the orientation of the steering column shaft to the steering column flange.

Remove pinch bolt (7) from the steering column flange and spring the flange open with a large screwdriver.

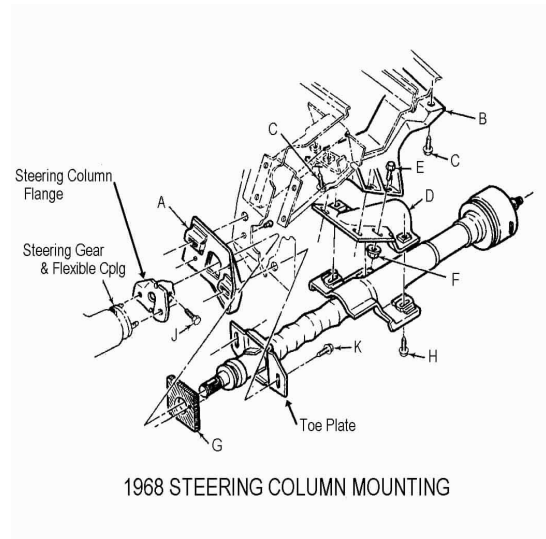


1967 STEERING COLUMN MOUNTING

Lower End Mounting – 1968

If you have a manual transmission, you may find a fairly heavy clutch pedal spring attached to support (A) and to the Z-bar. You should detach one end of the spring at this time. **Hint!** Detach the clutch pedal rod from the Z-bar. This will allow the Z-bar to rotate rearward and take some tension off the spring.

Use a crayon or piece of chalk to mark the orientation of the steering column shaft to the steering column flange. Remove pinch bolt (J) from the steering column flange. Spring the flange open with a large screwdriver. Go back inside the car and remove two screws (K).



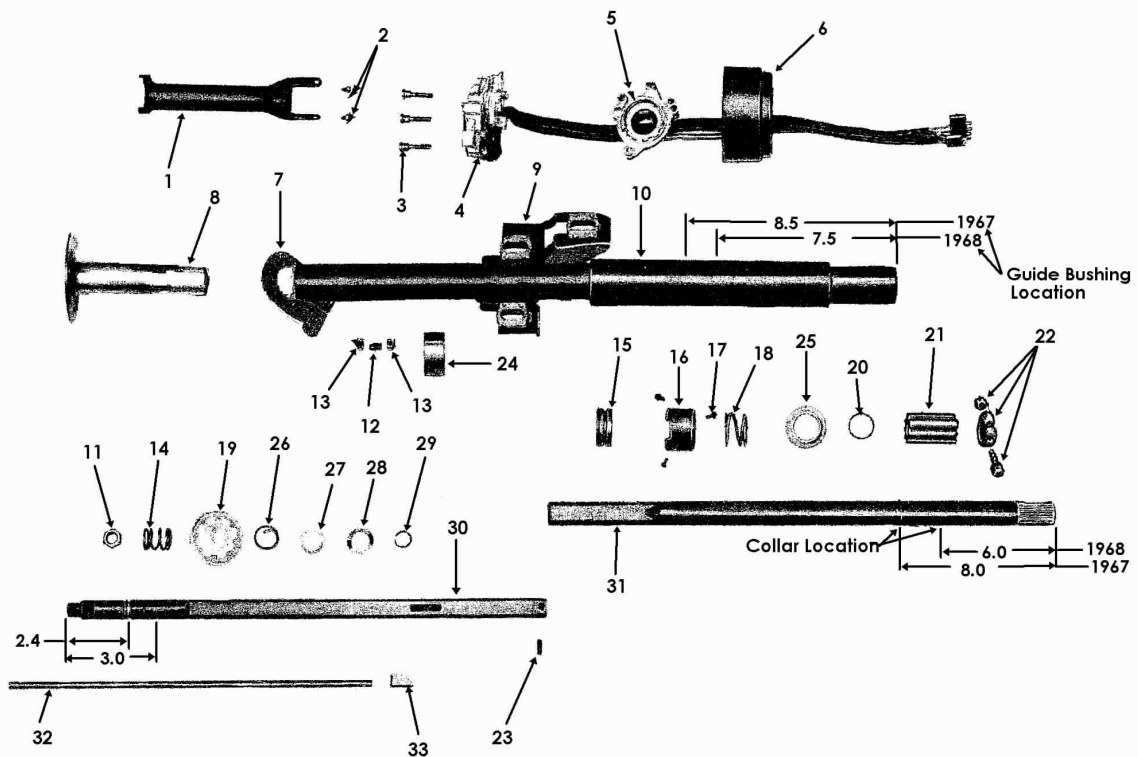
1968 STEERING COLUMN MOUNTING

Column Removal Procedures 1967-68

Note: The steering column flange is shown loose from the flexible coupling in both of the above mounting pictures. However, in order to remove the steering column from the car I do not think that it needs to be detached from the flexible coupling. For one thing I am quite sure that the steering column flange is too large to fit through the holes in support plates 1967 (1) or 1968 (A). Therefore my removal procedure detaches the steering column shaft directly from that flange (leaving the flange attached to the flexible coupling assembly.)

Unfasten the three vertical bolts & washers 1967 (8 & 9) or bolts 1968 (H) that hold the column up into the dash. **NEVER** just remove the three vertical main mounting bolts and let the column “hang” by the attachments at the flexible coupling and the plates and fasteners on the lower dash panel. Letting the column “hang” in that manner puts very high loads on the steering column jacket and the lower bearing and could cause failure.

Now pull the column straight back, disconnecting the column shaft from the steering column flange.



- | | | | |
|----------------------------|------------------------|---------------------------|-------------------------------|
| 1. Wiring Protector | 10. Mast Jacket | 19. Cancelling Cam | 28. Wave Washer |
| 2. Screws | 11. Steering Wheel Nut | 20. Packing | 29. Round Wire Retaining Ring |
| 3. TS Switch Screws | 12. Bumper | 21. Spacer | 30. Upper Telescoping Shaft |
| 4. Turn Signal Switch | 13. Key | 22. Clamp, Bolt, & Nut | 31. Lower Steering Shaft |
| 5. Upper Bearing Housing | 14. Spring | 23. Spiral Pin | 32. Locking Rod |
| 6. Signal Switch Cover | 15. Lower Bearing | 24. Bumper Key Strap | 33. Locking Wedge |
| 7. Escutcheon (1967) | 16. Bearing Retainer | 25. Washer | |
| 8. Upper Tube & Flange | 17. Screws | 26. Spiral Retaining Ring | |
| 9. Column Mounting Bracket | 18. Spring | 27. Thrust Washer | |

1967 (Late) Corvette Telescoping Steering Column Blowup

1968 Telescoping Steering Column Similar

Remove and Replace the Lower Bearing

Now that the steering column is out of the car, place it on a suitable workbench. Do not use a bench vise to clamp around the steering column mast jacket. It is actually quite fragile. Clamp on the heavy column mounting bracket. Do not clamp on the aluminum capsules.

The following bearing replacement procedures should be straight forward AS LONG AS THE PARTS ARE NOT ALL CORRODED TOGETHER. If you find a lot of corrosion on your lower column parts, it is a good idea to soak them in penetrating oil for a day or two before trying to remove them.

Option 1 – Remove Lower Bearing with Steering Shaft In Place

The Chassis Service Manuals are unclear as to exactly how to remove the lower column bearing #15 for service. Let's try the simplest approach. Mark the location of the clamp #22 on the lower steering shaft #31. Unfasten and remove the bolt, nut, and clamp #22 from the steering shaft. Then remove the spacer #21, packing #20, washer #25, and spring #18. Remove three screws #17 from bearing retainer #16. Slide the retainer and then the bearing off the steering shaft. I would suggest trying this approach first.

Option 2 – Remove Lower Bearing and Steering Shaft Through Lower End

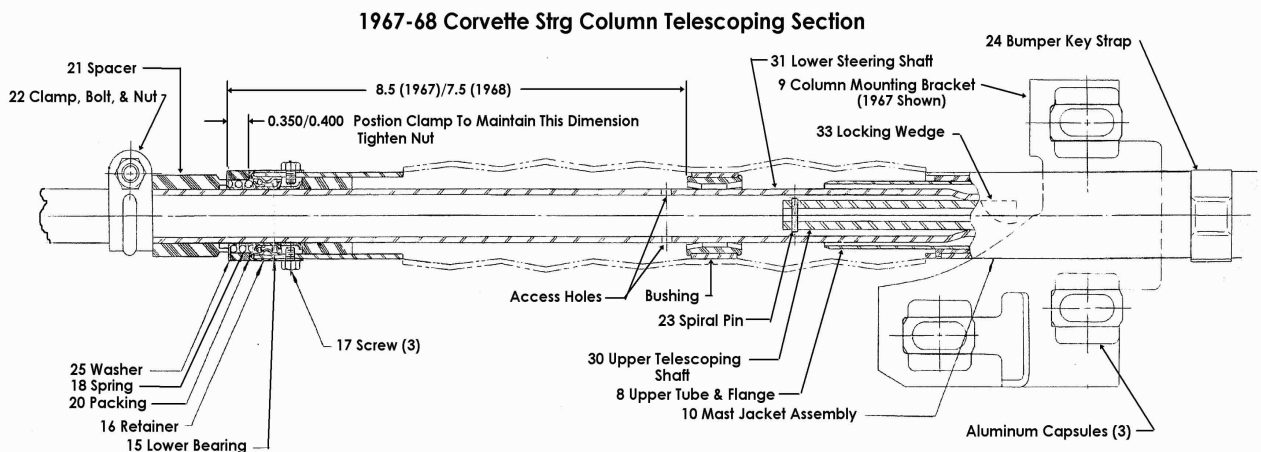
Remove the spiral retaining ring #26, the thrust washer #27 and the wave washer #28 from the upper steering shaft. Reinstall and tighten the star screw that locks the upper and lower shafts from telescoping (The star screw #4 is shown in the steering wheel drawing on Page 2 of Telescoping D&R Paper #1.) Remove three screws #17 from bearing retainer #16. Carefully slide the steering shaft assembly down through the mast jacket. When it comes out, the lower bearing and all the other parts will come with it.

Mark the location of the clamp #22 on the lower steering shaft #31. Unfasten and remove the bolt, nut, and clamp from the steering shaft. Remove the spacer #21, washer #25, packing seal #20, spring #18, retainer #16, and bearing #15 from the shaft.

Steering Shaft Check

The steering shaft assembly consists of two telescoping shafts. An upper shaft where the steering wheel hub attaches and a tubular lower shaft where the steering column flange attaches. They are locked together or allowed to telescope by tightening or loosening the star screw (4) shown on the steering wheel drawing on page 2 of the Telescoping Strg Column Disassembly & Repair Paper #1. The end of the star screw pushes on locking rod #32 which cocks the small locking wedge #33 and locks the two shafts together.

Disassemble upper steering shaft #30 from lower shaft #31. You will find that they only extend so far and will not pull apart any further. About $\frac{3}{4}$ of the way up the shaft from the lower end there are two small holes opposite each other. These holes provide access to a small spiral pin #23 that is a press fit in the upper shaft. Align the shafts so that the pin matches the holes. Use a small punch and drive the pin out through the hole in the opposite side.



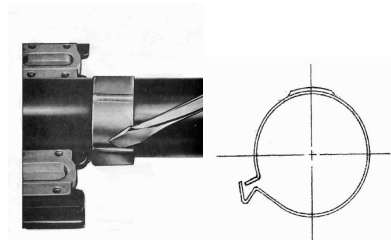
Steering Shaft Reassembly

The two shafts can now be disassembled and grease applied to the various telescoping and locking surfaces. When you disassemble the two shafts you will note that you can reassemble them in two possible orientations. When you reassemble the two shafts you want to make sure that your index mark/indentation on the end of the solid upper shaft is right in line with the notch that is machined across the splines on the lower tubular shaft.

Mast Jacket Disassembly & Lubrication

The upper tube and flange #8 is a matched fit to the mast jacket assembly #10. They are not serviceable. If you want to disassemble them in order to add lithium based chassis grease to the sliding area, here are the instructions.

The key bumper strap #24 retains a rubber bumper #12 and two metal keys #13 in a slot in the mast jacket. You must pry open the bent over portion of the strap as shown in the accompanying pictures.



The bumper and keys can then be removed and the upper tube flange assembly will then slide out of the mast jacket. Note that on the 1967 column removing the upper tube and flange assembly will also allow removal of the escutcheon #7.

Mast Jacket Reassembly

Grease the two plastic bushings inside the mast jacket. **REMEMBER** to assemble the escutcheon (1967 only) to the mast jacket. Slide the upper tube and flange assembly into the mast jacket. Assemble the metal keys to the bumper and place the bumper assembly in the rectangular hole in the mast jacket. Reassemble the key bumper strap with the pocket in the strap over the bumper assembly. Crimp and fold ends of the strap securely so that it will not rotate or move axially on the mast jacket.

Guide Bushing Lubrication

Referenced on the blowup picture is a plastic bushing that is a light press fit and located about 8.5 inches (1967) or 7.5 inches (1968) up into the mesh section of the mast jacket from the lower end. It should have generous clearance to the steering shaft. You might want to apply some lithium based chassis grease to the bushing before assembling the steering shaft.

Locating a Replacement Lower Bearing

The 1967 (late) and 1968 Corvette standard & telescoping steering columns use a lower bearing that is unique to just those two years. (The energy absorbing Corvair steering column (1967, 68, & 69) may use the same lower bearing as well.) I have found the lower bearing at these and other locations:

Paragon Reproductions www.corvette-paragon.com (800)-882-4688

Doc Rebuild www.docrebuild.com 1-800-866-9362

Reassembly Lower Bearing

Option 1 Reassemble Lower Bearing - Steering Shaft In Place

Slide the bearing assembly up the steering shaft and lightly tap it into the lower end of the jacket. It is a press fit. Assemble retainer #16 and secure it with three screws #17 torque to 25 inch-lbs.

Option 2 Reassemble Lower Bearing & Steering Shaft Assembly

Apply a thin coating of a good lithium based chassis grease to all friction surfaces as you reassemble the column parts.

Tighten the star screw so that the steering shaft assembly does not telescope. Slide the assembly up into the mast jacket until the retaining ring on the upper shaft bottoms against the upper bearing. Slide the wave washer #28, thrust washer #27, and the spiral retaining ring #26 onto the steering shaft. Install the retaining ring making sure that it is fully seated in the groove in the steering shaft.

Slide the lower bearing #15 up the steering shaft and slide it into the lower end of the mast jacket #10. Place the retainer #16 on the lower end of the mast jacket and secure it with three screws #17. Torque them to 25 inch-lbs.

Reassembly Spring, Packing, Washer, Spacer, Clamp, Nut & Bolt

The steering column assembly drawings have a note that indicates that with the steering shaft in the straight ahead position (notch on lower end of the steering shaft at 12 o'clock); the clamp bolt should be vertical, passing through the 3 o'clock position, with the nut on top (correct clamp orientation shown on pages 2 & 5). I cannot think of a functional reason why the clamp has to be orientated but all of the drawings are specific to this requirement.

Assemble the spring #18 with the small end toward the bearing. Assemble the packing #25, washer #20, and spacer #21. Roughly position the clamp, bolt, & nut #22 on the end of the steering shaft to the location that you originally marked during disassembly. The assembly drawing on page 5 indicates that the distance from the inner edge of the washer to the edge of the retainer must be 0.350/0.400 inch. Orient and position the clamp and tighten the nut to 35 ft-lbs.

Steering Column Installation

This paper assumes that the steering column was correctly installed and positioned into the car previous to it being removed for repair. Therefore the 1967 support plate (3) and 1968 bracket (B) and support plate (D) do not have to be repositioned to correctly locate the steering column. Steering column to instrument cluster gapping procedures can be found in the AIM or other chassis service manuals if needed.

It is best to have someone positioned out under the hood to assist in aligning and installing the steering column shaft into the flexible coupling on the gear.

Steering Column Installation – 1967

If previously removed, loosely secure the seal (11) and support plate (1) to the engine side of the dash panel with two screws. Otherwise loosen the two screws that hold the support plate to the dash.

Feed the lower end of the steering column through the dash. Make sure that the clamp part of the support assembly is between the two thumb bumps on the lower end of the steering column jacket. Insert the steering shaft into the flange on the flexible coupling assembly. Make sure that you align the paint or chalk marks on the flange and steering column shaft for correct orientation of the parts. Loosely install the pinch bolt (7) into the flange.

Slide the escutcheon into position on the instrument cluster. Allow the lower dash panel attachment to float as you secure the steering column into the dash with the three vertical bolts (8) and washers (9). Torque the bolts to 20 ft-lbs.

Connect the curved turn signal switch connector to the vehicle body harness.

Secure the seal and support assembly to the dash panel on the engine compartment side by torquing the two screws to 13 ft-lbs.

Tighten the bolt and washer to clamp the lower end of the steering column to the support assembly. Torque the bolt to 13 ft-lbs.

Tighten the pinch bolt on the steering column flange to 30 ft-lbs.

Reattach any ducting and the crossover bar under the steering column. Secure the escutcheon to the dash with screws.

Steering Column Installation - 1968

Install gasket (G) into toe plate on the steering column.

Hold support assembly (A) to dash panel on the engine side of the dash panel. Carefully insert the steering column through the hole in the dash panel and the support assembly.

Insert the steering shaft into the flange on the flexible coupling assembly. Make sure that you align the paint or chalk marks on the flange and steering column shaft for correct orientation of the parts. Loosely install the pinch bolt (J) into the column flange.

Loosely install bolts (K) through the steering column toe plate and thread them into the floating nuts that are part of the support assembly.

Allow the support assembly to float as you secure the steering column into the dash with the vertical three bolts (H) (20 ft-lbs). Secure the support assembly to the dash panel by tightening the two screws (K) (13 ft-lbs) inside the car.

Tighten the pinch bolt (J) on the steering column flange to 30 ft-lbs.

Steering Column Installation - 1968 (Continued)

Connect the curved turn signal switch connector to the vehicle body harness.

Reattach the ducting, the crossover bar, and plastic closeout panel under the steering column.

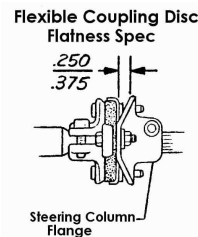
1967-68 All

Refer to Disassembly & Repair Paper #1 for reinstalling the steering column covers, steering wheel, horn parts, and adjusting the telescope lock.

Checking for Proper Alignment

Important! The following visual checks should be performed with the vehicle on the ground. All four wheels of the vehicle should be supporting vehicle weight.

Check for distortion in the rubber flexible coupling disc. The distance from the underside of the steering column flange to the metal reinforcement plate must be within the dimension shown.



Next visually check that the flexible coupling stop pins are central in the column flange slots. Turn the steering wheel one quarter turn and recheck the pin to flange centrality. If the pins are not central, you must loosen the support assembly to dash panel and the three vertical column bolts to allow the column to seek a position that is not binding. Follow steering column alignment directions in the AIM or Chassis Service Manual. Then recheck the stop pin to flange slot centrality at both steering wheel positions.

Driving checks – Sticking or slow returnability when completing a turn; metallic noise; or an irregular feel as the steering wheel is turning are conditions which may indicate that the steering column needs to be readjusted and realigned.

Final Words of Caution:

If a steering column assembly is removed from the car, special care must be taken as you handle it. Remember, plastic parts that are over 25 years old can be very brittle! Handle your steering column parts with care.

Never allow the steering column to just “hang” under the dash by only the floor pan connections and the flexible coupling. This places very high stresses on the lower column bearing and the mast jacket itself. Always have someone hold the column; block it up; or wire it in place if you must remove the vertical bolts that hold it into the dash.