

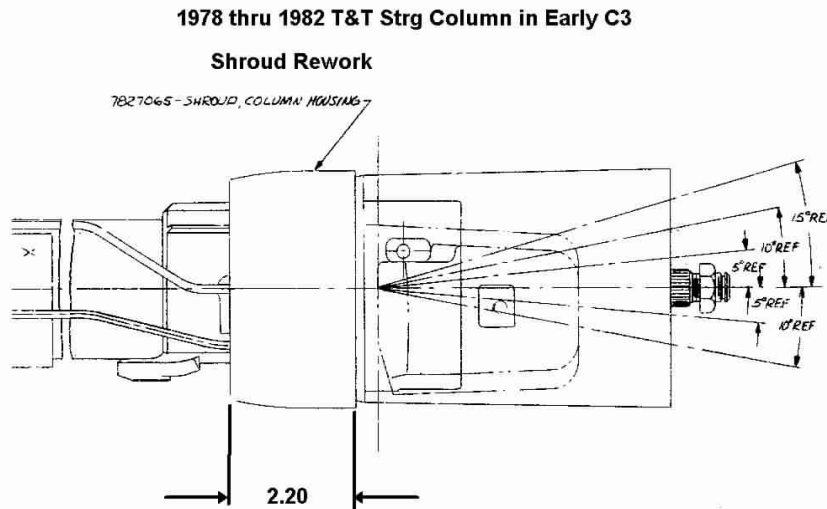
## INSTALLING A 1977 THRU 1982 C3 STEERING COLUMN INTO A EARLIER 1969 THRU 1976 MODEL CORVETTE

### Why Make This Installation

Starting in 1977 and carrying thru 1982, the C3 Corvette steering columns were redesigned and the column head shortened so that the steering wheel was about two inches further away from the driver as compared to the earlier 1969 thru 1976 model steering columns. A shortened column allows easier entrance and egress from your Corvette and most drivers find the added reach to the steering wheel to be more comfortable. These later columns also incorporate a headlamp dimmer switch that is actuated by the turn signal lever. The trouble prone transmission shift interlock system was eliminated and replaced by a key release lever next to the ignition key on the column. The 1977 column is unique for that one model year in that it also has a windshield wash/wipe switch that is integral with the headlamp dimmer pivot and turn signal lever.

### Fit Information About The Installation

Based upon my analysis, the 1977 Corvette steering column (both the standard non-adjustable and the T&T) will bolt directly in the older (1969 thru 1976) C3 models. The 1978 through 1982 columns must have their column shrouds reworked and shortened, so that they will closely match the instrument cluster in the older vehicles.



This drawing shows the rework dimension for the Steering Column Housing Shroud so that a 1978 through 1982 T&T steering column will fit the instrument panel of an earlier C3 Corvette. You should be able to trim the shroud to the 2.20 inch dimension with it still in place on the steering column. Just be very careful that you don't cut any wires exiting the column in this area.

## **Comparisons of Early and Late Steering Columns for Various Functions and Interfaces**

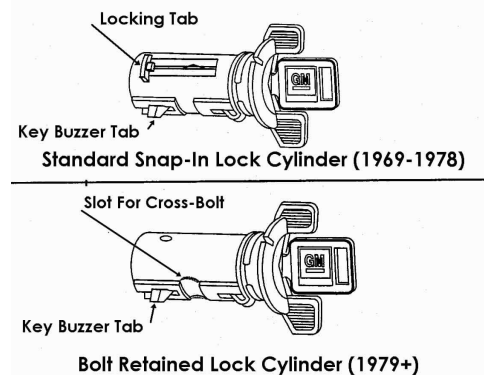
Starting at the aluminum capsule mounts (where the two vertical bolts attach the column up into the dash structure), the 77-82 steering columns from that point forward (toward the engine) are dimensionally the same as the older columns. From the capsules rearward to where the steering wheel attaches, the 77-82 column is about 2 inches shorter. There is slightly more telescope adjustment in the earlier T&T columns (2.1 inches) versus the newer columns (1.3 inches.)

### Ignition Switches

All Corvette standard columns (1969-79) use a common ignition switch. All T&T columns have their own common ignition switch for model years 1969 to 1982. However, the standard column and the T&T column ignition switches are different and are **not** interchangeable. The common wiring harness in the car fits either one. You merely have to twist the vehicle wiring harness connectors so that they rotate 180 degrees in order to connect from one type steering column switch to the other.

### Ignition Lock Cylinders

Steering column lock cylinders can be interchanged between all steering columns from 1969 thru early 1979 production. That lock cylinder has a spring loaded, hardened wedge that engages a rectangular slot in the column housing. Introduced during the 1979 model year and included in all later steering columns, security was improved by retaining the lock cylinder with a cross bolt. So if you are going to install a 1979 or later column in an older C3, be sure that the lock cylinder and the keys are included with the column.



### Steering Column/Transmission Shift Interlock System

With the introduction of the function locking steering column in 1969, General Motors decided that from a safety standpoint, they did not want the driver to be able to lock the steering wheel while the car was being driven forward. So GM and Saginaw Steering Gear Division designed a system whereby the ignition can be turned to the OFF position, but the key cannot be rotated to the OFF-LOCK position unless the shifter is in PARK (automatic transmissions) or in REVERSE (manual transmissions.) In the Corvette this was accomplished by a back drive system where a cable from the transmission moves a lever on the lower end of the steering column when the manual transmission was shifted into REVERSE or when the automatic transmission was placed in the PARK.

### Steering Column/Transmission Shift Interlock System (Continued)

The steering column lever can be seen by opening the hood and looking down under the brake master cylinder. The cable end of the lever is pointing toward the engine. The lever is attached to a tube inside the steering column that rotates with the movement of the lever. With the lever positioned all the way UP, (about the one o'clock position if you could view the lever from the driver position), a gate is opened inside the steering column head that allows the lock cylinder and key to rotate all the way to the OFF-LOCK position. All 1969 through 1976 Corvettes had this system.

### Key Inhibitor Lever

The 1977 thru 82 Corvette columns have what is called a key inhibitor lever next to the ignition key that replaces the trouble prone back drive system. A driver can turn the ignition OFF but cannot continue to the OFF-LOCK ignition position until the driver trips the inhibitor lever with his/her finger. There is no lever on the lower end of the column and the back drive cable from the transmission is not necessary. Note that this system locks the steering wheel but does not lock the shifter.

### Windshield Wash/Wipe Switch (1977 Steering Column Only)

The 1977 model year C3 is the only one where a wash/wipe switch was built into the column. The switch is actuated by a twisting motion of the turn signal lever. This same wash/wipe switch was also used on Chevette steering columns. The basic steering column housing is the same from 1977 to 1982, so the 1977 column with the integral dimmer pivot and wash/wipe switch can be installed in any of the older model C3s. Since this was a "one year only" design for the Corvette, if you obtain a 1977 column be sure to get the turn signal lever as well. Even if you don't want to use the wash/wipe feature, the lever is unique for that one year.

The following information is only important if you are interested in switching the wash/wipe switch from your instrument panel to the one integral to the 1977 steering column.

The wash wipe/switch in the 1977 column is called a three wire switch. The switch on the Corvette dash is also a three wire switch so I believe that they are compatible.

Wiring: Dark Blue 18 gage to washer pump; Light Blue 18 gage to wiper motor – low speed; Black/White 18 gage to wiper motor – high speed.

### Early C3s (1969 thru 1972) with Hidden Wipers

I reviewed the electrical circuit diagrams on the early C3 wiper systems with the vacuum operated wiper doors. The windshield wiper/washer switch has three wires very similar to the later switch wiring. The wire colors to the switch are very close to the later year wire colors as well: Dark Blue 18 gage terminates at a device that the Chassis Service Manual leaves unnamed, (which I am quite sure is a washer pump); Light Blue 18 gage to a windshield wiper solenoid and then to the wiper motor; Black 18 gage to the windshield wiper door relay. Therefore, I conclude that if you were to rewire your early wiper system to work from the wash/wipe switch built into the 1977 column it will most likely work correctly.

### Cruise Control Switch Location

Cruise control became available as an option on the 1977 Corvette. For that first year only, the cruise control was actuated by a button on the end of the tilt lever. This special tilt lever screws into the column and is very rare.

1978 thru 1982 Corvettes had the cruise control switch as part of the turn signal lever. The lever “plugs-in” to the dimmer pivot in the steering column head. This type lever will not fit the 1977 or any of the older C3 columns.

### Turn Signal Switch Harmonica Connector

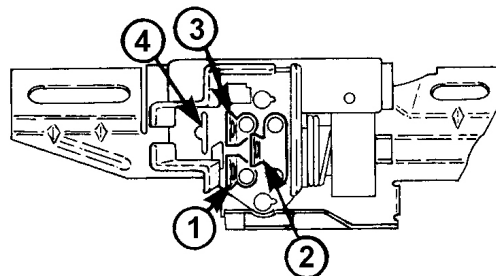
The turn signal switch connector on the later steering columns may not snap into the body wiring harness connector in the older C3s (even though they look very much the same!) If this is the case with your steering column, swap the connector from the old column to the new one. Use a thin bladed screwdriver to reach in from the contact side to depress the metal tangs (one on each side) and release each wire with its contact. Be sure to insert the switch wires into the old connector in the same order as the original. One other hint, when you are done, the turn signal switch wire colors should fairly closely match the wire colors of the body wiring harness.

A final note, 1980 through 1982 Corvettes had front end cornering lights. The turn signal switch wiring for those year Corvettes will have three extra wires in the A, B, and C connector positions. Just neglect them.

### Headlamp Dimmer Switch

You can continue to use the dimmer switch on the floor or you can extend the wiring and use the dimmer switch that is part of your new steering column. I think the electrical connector to the floor mounted dimmer switch will also plug into the column mounted dimmer switches from 1977 to 1982. Just in case it doesn't, the Packard part number for the connector is 8917693.

Looking at the switch as it is installed on the side of the steering column you will see three blades clustered in a triangle. If the dimmer switch has a fourth blade (4) neglect it. It is for a “flash to pass” feature (with hidden headlights, you don't need it). The blade at the 3 o'clock position (2) is the feed from the light switch (Light Blue 14 gage wire). The blade at the 7 o'clock position (1) is the low beam (Tan 18 gage wire). The blade at the 10 o'clock position (3) is for high beams (Light Green 16 gage wire).



## **Column Removal Procedure**

Disconnect the battery ground cable. Remove the steering wheel.

Go out under the hood and remove the two 11/16 nuts and lock washers that hold the flexible coupling to the steering column flange. Disconnect the back drive cable from the steering column lever. Place the lever in the full UP position.

Go back inside the car and disconnect the steering column turn signal “harmonica” wiring connector from the body wiring harness. Remove the floor pan trim cover if so equipped. Remove the two nuts securing the steering column lower bracket to the floor. Remove the instrument panel trim cover screws and remove the cover.

Remove the two vertical screws that secure the steering column up into the dash structure. Now carefully rotate and lower the steering column. Disconnect the wiring harness from the ignition switch (there are actually two connectors in the vehicle body harness.) Now, pull the column rearward in the car, being careful to guide the lower steering column lever as it passes through the clearance slot in the floor opening.

## **Flexible Coupling Removal and Installation Tips**

Inspect the condition of the flexible coupling assembly in your car. With the steering column out of the car, now would be a good time to replace or refurbish it if required. Here are a few tips on replacing and reinstalling the flexible coupling assembly.

Early 1969 Corvette

If you are working on an early 1969 C3 it is probable that you have a steering gear with 30 serrations all the way around the input shaft. The mating flexible coupling will have full serrations as well. Since there are 30 serrations on the input shaft, there will be 30 possible locations for the flex coupling to be assembled. However, there is only one location on the gear input shaft that is correct.

Here is how to do it: You will need to place the steering gear right on center. You do this by counting the exact number of rotations of the steering gear input shaft when turning from full lock to full lock. Now with the gear at full lock, rotate back exactly 1/2 the number of total revolutions. This will place your steering gear exactly on center. Now, orient the flexible coupling flange with respect to the gear input shaft so that the stop pins are aligned vertically (at the 6 and 12 o'clock positions) and the pinch bolt that attaches to the gear input shaft is passing through the 9 o'clock position.

Now, slide the flexible coupling onto the gear input shaft until it bottoms out. Install the pinch bolt into the flexible coupling flange. The head of that bolt will be pointing straight up at you when you are bending over your fender and looking down at the steering gear. Tighten the special pinch bolt to 25-30 ft lbs.

## Flexible Coupling Installation Tips (Continued)

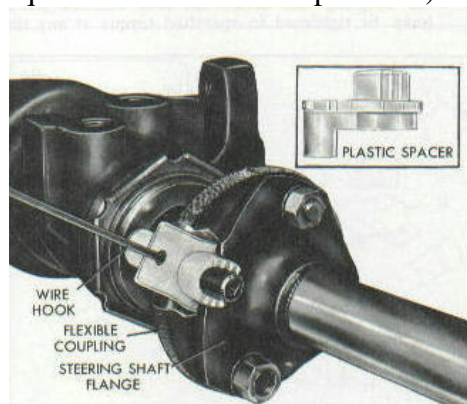
All Late 1969 and Later C3s

On all the later C3 Vettes the assembly of the flex coupling is much easier. There are serrations and a section that is milled flat on the steering gear input shaft. The flexible coupling has matching serrations and a flat section. This insures that the flexible coupling assembly will only assemble to the gear input shaft in one location. Align the flats and slide the flex coupling on the gear shaft until it bottoms out. With the gear exactly on center, the stop pins on the flex coupling should be at the 6 and 12 o'clock positions and the pinch bolt head should be pointing straight up. Install and tighten the pinch bolt to 25–30 ft lbs.

## MANDATORY STEERING COLUMN INSTALLATION SEQUENCE

To install a new steering column or to reinstall an original column into your Corvette it is necessary to make sure that the column is aligned to the steering gear. The flexible coupling assembly that is located between the steering column and the steering gear can wear out very quickly if the column is improperly installed. That is why Chevrolet engineering specified a mandatory steering column installation sequence in the AIM for the assembly plant and this is why they continue to specify a very similar sequence in the Chevrolet Chassis Service Manual for steering column installation in the field.

As part of the steering column assembly sequence, the flexible coupling stop pins **must** be central in the window openings of the steering column flange with about 1/8 inch clearance on all sides when the steering column and steering gear are installed and secured in the car. Please note that sometime after completing the steering column installation process you will need to rotate your steering wheel one quarter turn and again verify that the flex coupling stop pins are central to the column flange openings and the same 1/8 inch clearance exists regardless of steering wheel position. (It is possible to have correct stop pin clearances in one steering wheel position and incorrect clearance or actual interference just one quarter turn to another position.)



When your Corvette was originally assembled in St. Louis (or Bowling Green) there was an assembly aid to help align the steering column to the steering gear. The flexible coupling stop pins had plastic spacers on them. These spacers forced the stop pins to be central in the steering column flange openings. This insured that the steering column was aligned to the steering gear when the column was assembled to the Corvette body. The plastic spacers were molded with a split in them so that they could be hooked with a tool, pulled off, and thrown away after the column assembly sequence was complete.

### Preparing the Flexible Coupling for Installation

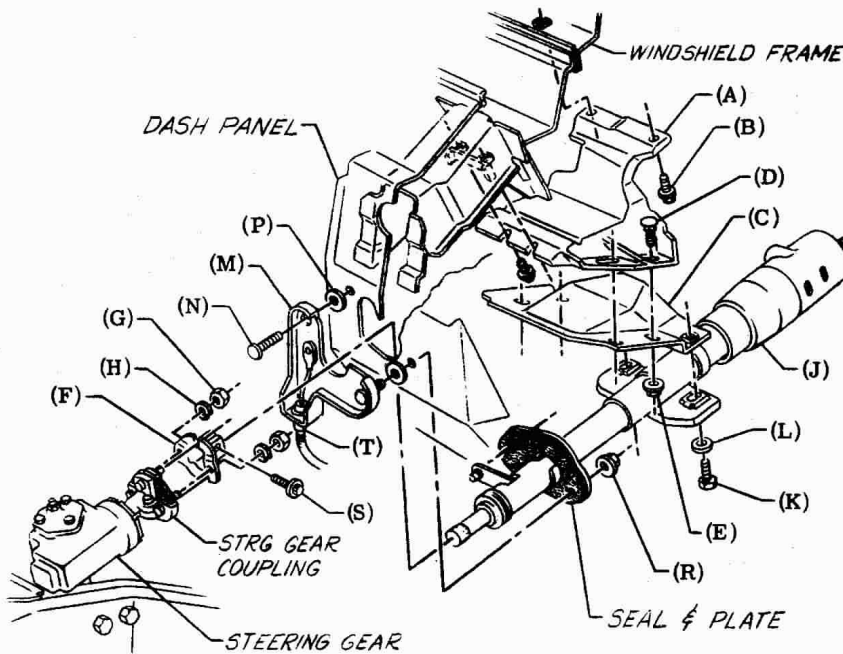
If you have purchased a new flexible coupling it may come with the orange plastic spacers installed on the stop pins. However, if you are reusing your original flexible coupling or your replacement part did not come with spacers you can use the following directions to align your column to the gear. If the assembly plant needed the spacers to insure a good assembly, it follows that it might be helpful for you to create your own spacers if needed to help in the alignment process.

I suggest that you use a roll of 1/2 inch wide masking tape and wrap each of the stop pins until you have about a 9/16 inch diameter roll of tape (about 1/8 inch thick on a side). Now as you bolt the column flange to the rest of the coupling, the pins are held rigidly central in the window slots in the column flange. You can dig the masking tape off the pins when your installation is complete.

Assemble the steering column flange (F) to the steering column steering shaft and loosely install the pinch bolt (S). The pinch bolt must pass through a notch in the steering column steering shaft. You want the flange to be able to easily slide within the machined 1/2 inch long slot in the steering shaft.

### Aligning the Steering Column To The Instrument Panel

The vehicle should be on its wheels for the following steps.



**C3 CORVETTE STEERING COLUMN INSTALLATION DRAWING**

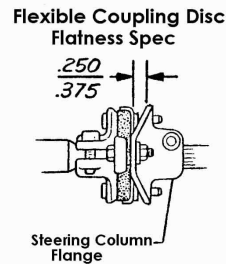
There is a large intermediate bracket (C) up under the dash that is held in place by four nuts (E). Its purpose is to allow side to side adjustment of the steering column as it passes through the instrument panel and some fore and aft adjustment as well. It can be loosened and shifted around to adjust the position of the steering column. Assuming that the original column was aligned correctly this bracket should not need to be loosened as part of installing the steering column.

### Aligning the Steering Column To The Instrument Panel (Continued)

Slide the lower end of the column onto the bolt (N) and the stud that is part of bracket (M) that are sticking through the floor. At the same time slide the steering column flange onto the two shoulder bolts extending from the flexible coupling (the bolts are different sizes so they will only assemble to the flange one way.) Assemble the two nuts (G) and lockwashers (H) and tighten them to 20 ft lbs. Do **not** tighten the steering column flange pinch bolt (S) at this time. Make all the electrical connections to the column. Lift the steering column up into the dash and insert the two vertical steering column bolts (K) and washers (L) through the aluminum capsules and into the intermediate bracket. Tighten them to 15 ft lbs. Loosely install the two nuts (R) that hold the lower end of the column in place.

### Aligning the Steering Column to the Flexible Coupling

You can now move the lower end of the column around to align the flexible coupling. Look at the coupling disc, it should remain relatively flat.



Look at the stop pins in the flange windows, they should be central. Tighten the column flange pinch bolt to 25-30 ft lbs. Tighten the two nuts holding the column to the floor to 10 ft lbs.

Remove the masking tape from the stop pins. Inspect both stop pins again and insure that they are central in the flange slots. Turn the steering wheel one quarter turn (90 degrees). Inspect both pins again, insuring that they are central. If they are not central, you will need to go back and readjust the lower end of the steering column to align it properly.

Install the steering wheel. Reattach panels under the steering column. Reattach the battery cable. You should be ready to go!

### **A DISCLAIMER**

I have (to the best of my ability) gathered this information from engineering drawings, Chevrolet shop manuals, AIM books, and by speaking to people that worked on the various steering components used in the C3 Corvette. Also, you should always supplement these instructions with additional information from certified shop manuals.

One request, if you find a problem, would you please get back to me so I can update the information in this paper and keep it as current and as accurate as possible.

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