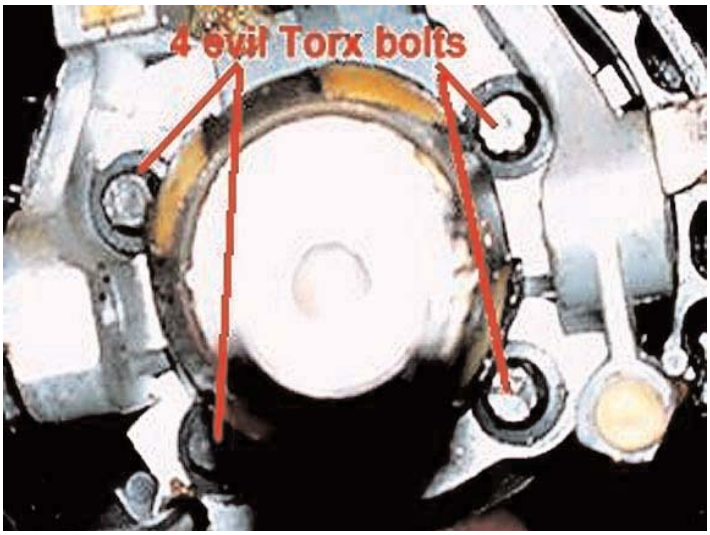
Fixing GM 3rd Gen tilt steering column

Thanks to www.Thirdgen.org and Vader for this info compiled by Duck, Hawaii

My steering column can move up and down a bit and now it its so loose the key doesnt want to come out and when i make turns the horn is beeping by itself. The bolts under the dash are tight, it looks like the play is coming from where the steering column tilts.

The 4 inverted torx bolts have came loose. its a pretty big job if you have never been in a column before. if you fix it yourself, remember to use locktight on the 4 bolts shown below.



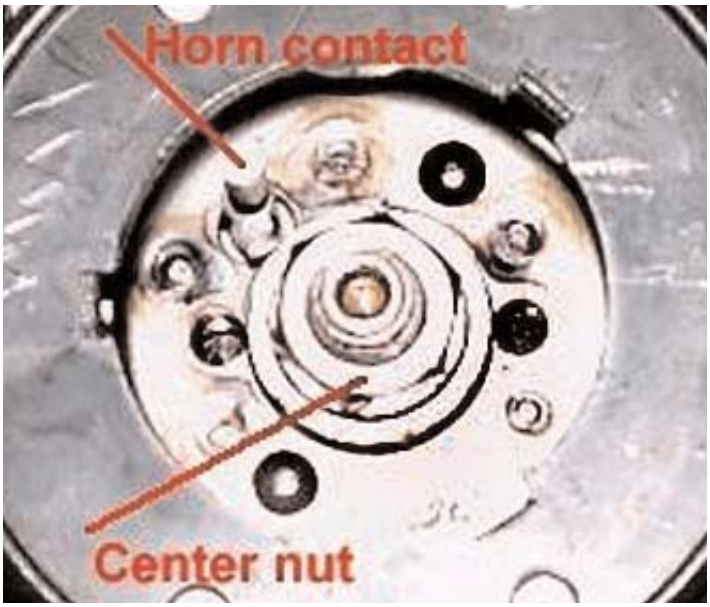
Your car will be a little easier if there is no VATS wiring and SIR coil/wiring/gas bag. If you have VATS, there are only two more wires that need to be handled. With SIR, you have an entire additional procedure to remove and reassemble the system. You really should have a service manual in hand for that procedure.

Start by disconnecting the battery.

Then center the steering wheel, so that the wheel can be replaced in exactly the same position on the shaft easily. The steering shaft is both marked and keyed, but centering the wheel makes the job easier to "eyeball", and keeps the turn signal cancelling cam out of the way in later steps.

Next, remove the hazard flasher knob on the lower right side of the steering column. There should be a small (#0) Phillips screw holding the knob in place.

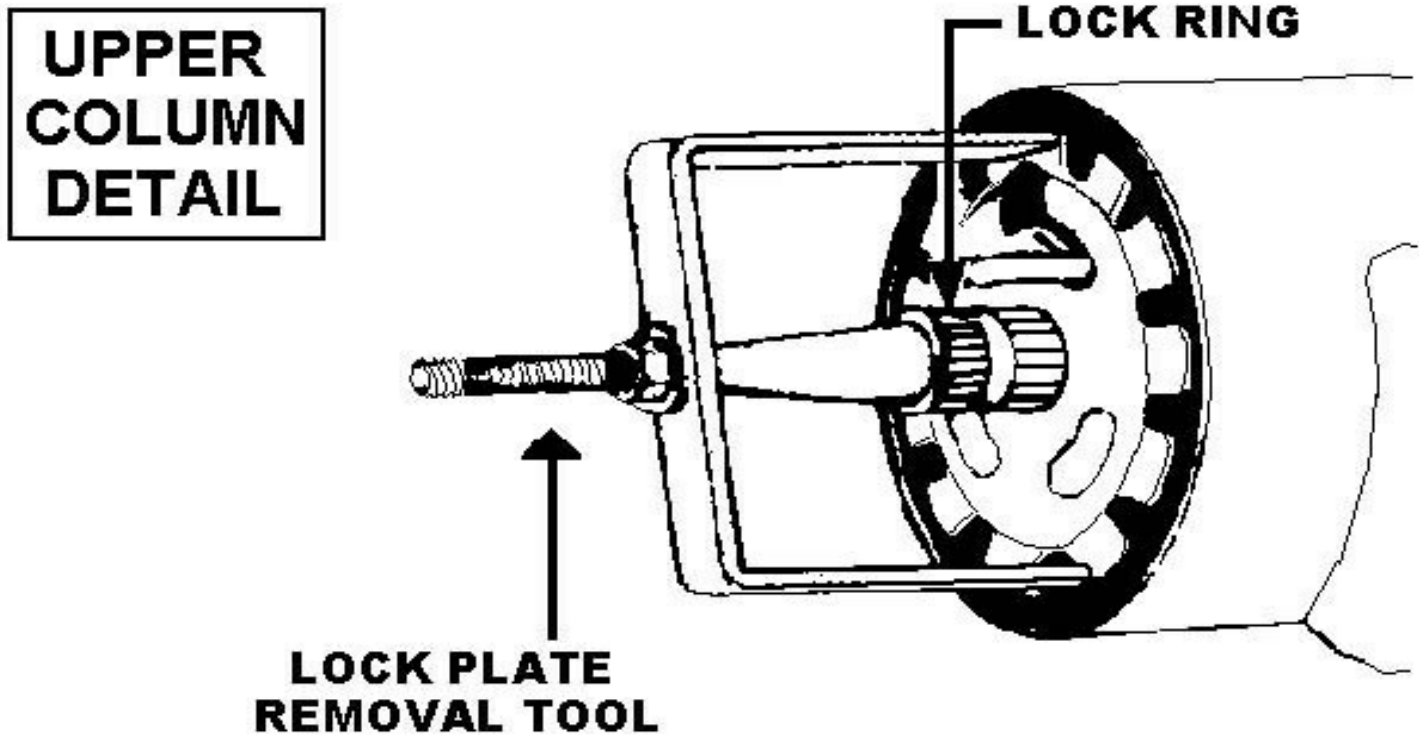
Find the release clip or bolts for the horn sounder pad and remove it. As the pad is removed from the wheel, unplug the horn wire from the connector on the pad. Remove the horn sounder wire and the insulator that guides the wire through the steering wheel. The insulating sleeve needs to be pushed inward slightly, twisted ¼ turn anticlockwise, and removed from the wheel. There is a light spring in the sleeve, so make sure all the parts are removed together.

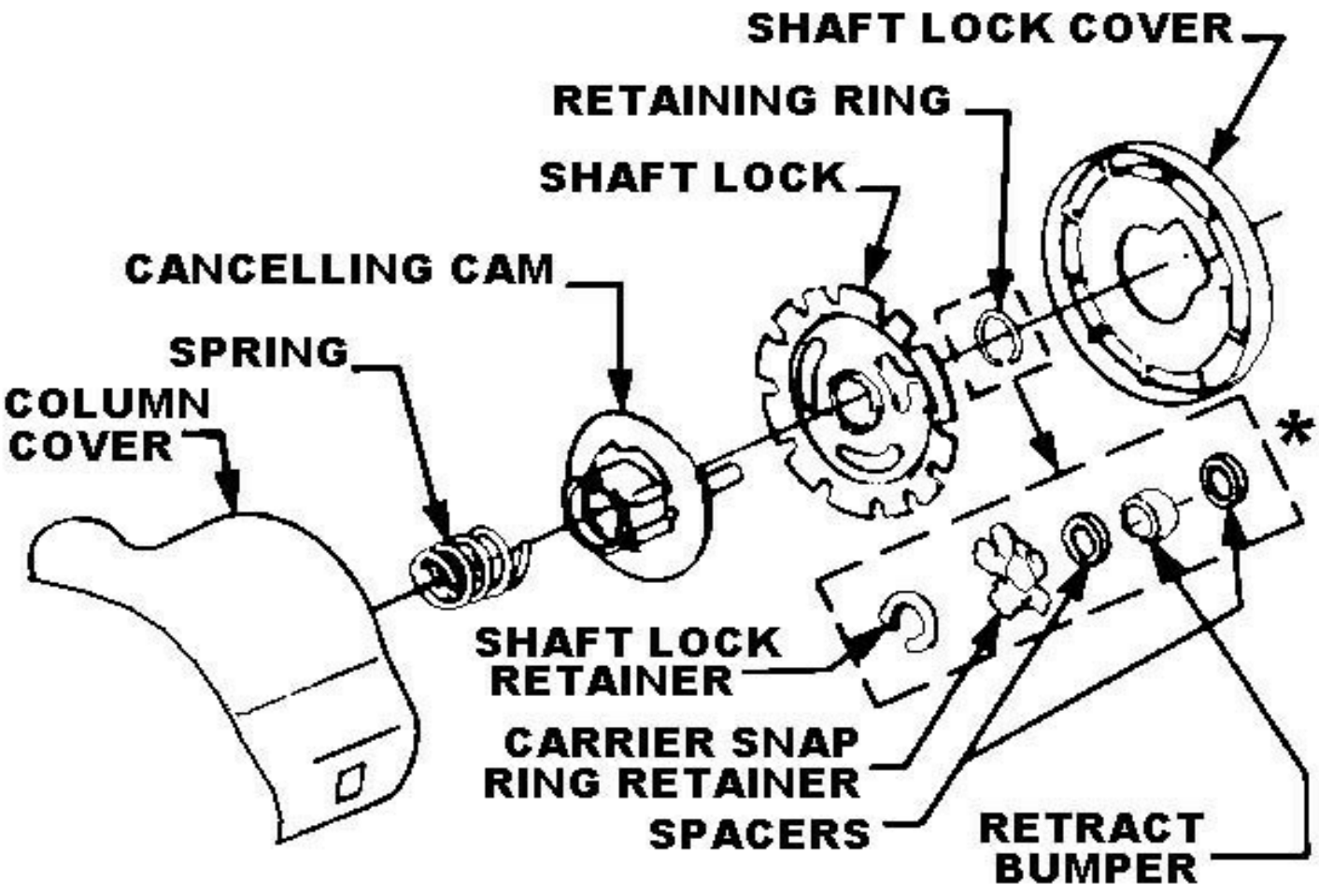


Remove the safety clip from the steering shaft, then remove the nut. You might have to have an assistant help hold the wheel while you turn the nut loose. Install the bolts from your steering wheel puller into the tapped holes in the wheel, and turn the puller screw to release the wheel from the steering shaft.

Depress the notched wheel locking plate and remove the locking ring located at the center of the plate. There is a special tool for holding the wheel locking plate while the snap ring is removed, and it will be worth the $15.00 you'll pay for it. It can be done without the tool, but it is

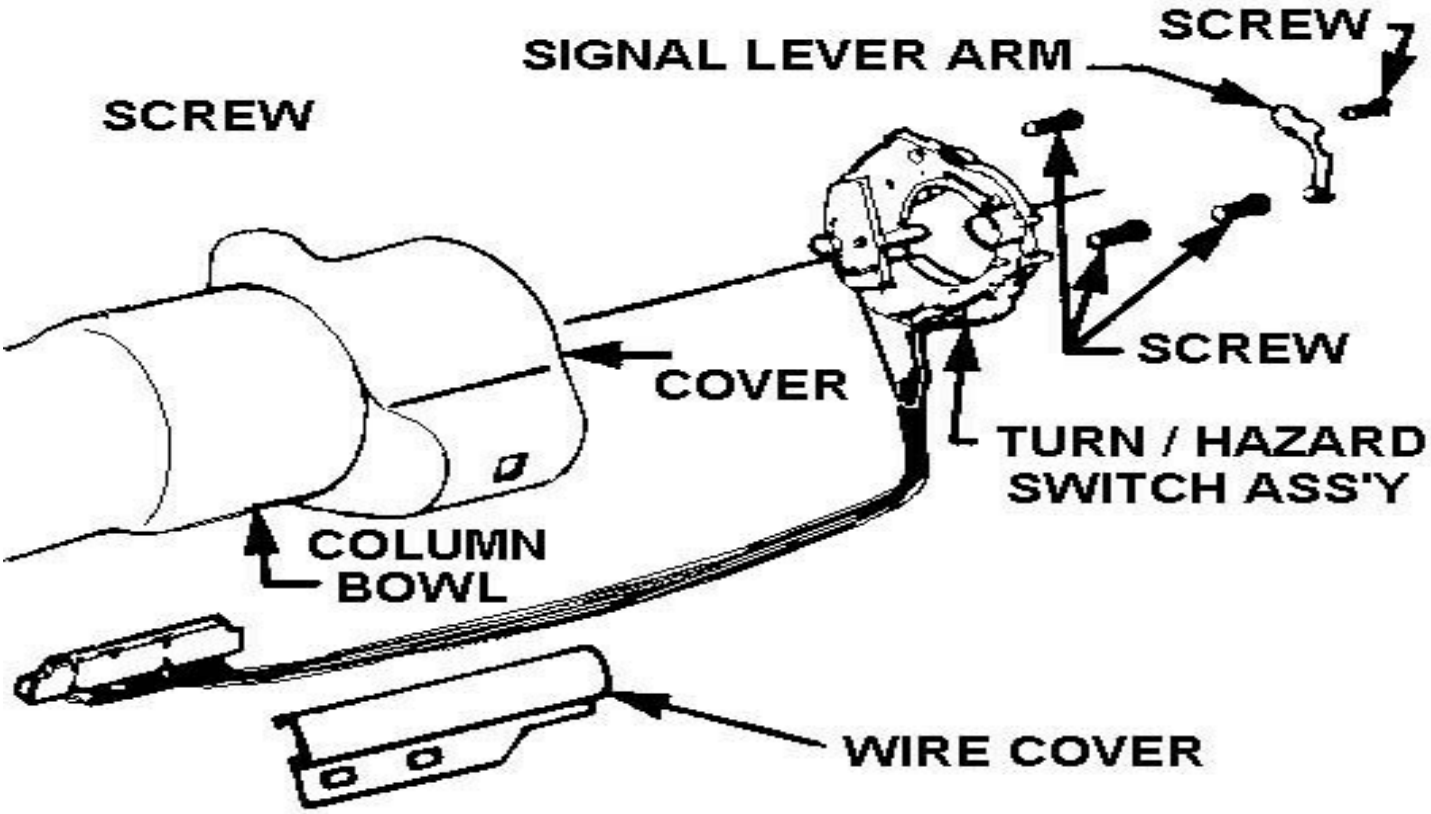
an exercise in frustration unless you are an octopus. I've done it several times using the "Armstrong" method, now I have the tool and use the "Brainstrong" method instead.



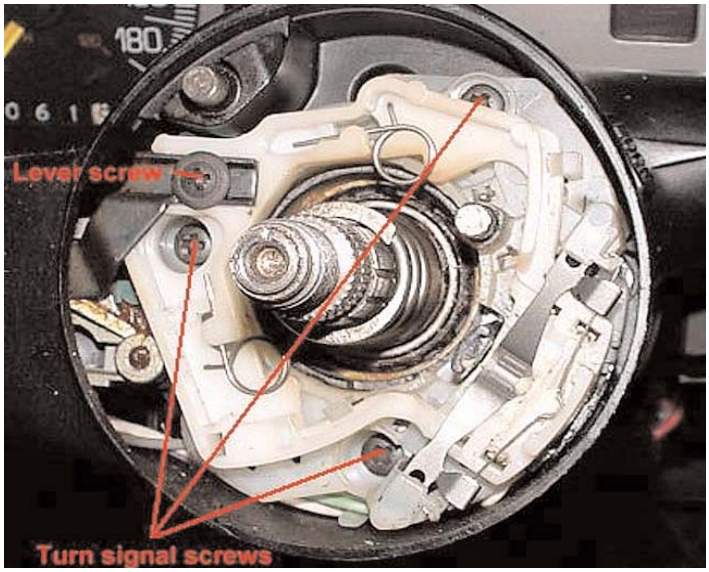


right side of the column holds the lock cylinder in place. Before removing the lock cylinder, make sure to hold the plastic/metal foil contact assembly in place so it's not lost down the column when the lock is removed. This switch assembly is actuates the key warning buzzer/chime.

If reinstallation is difficult, check to see if a small contact has dropped down inside, blocking reinsertion and push it back up. If you have VATS, there should be an additional pair of wires to unplug and feed down along the column.

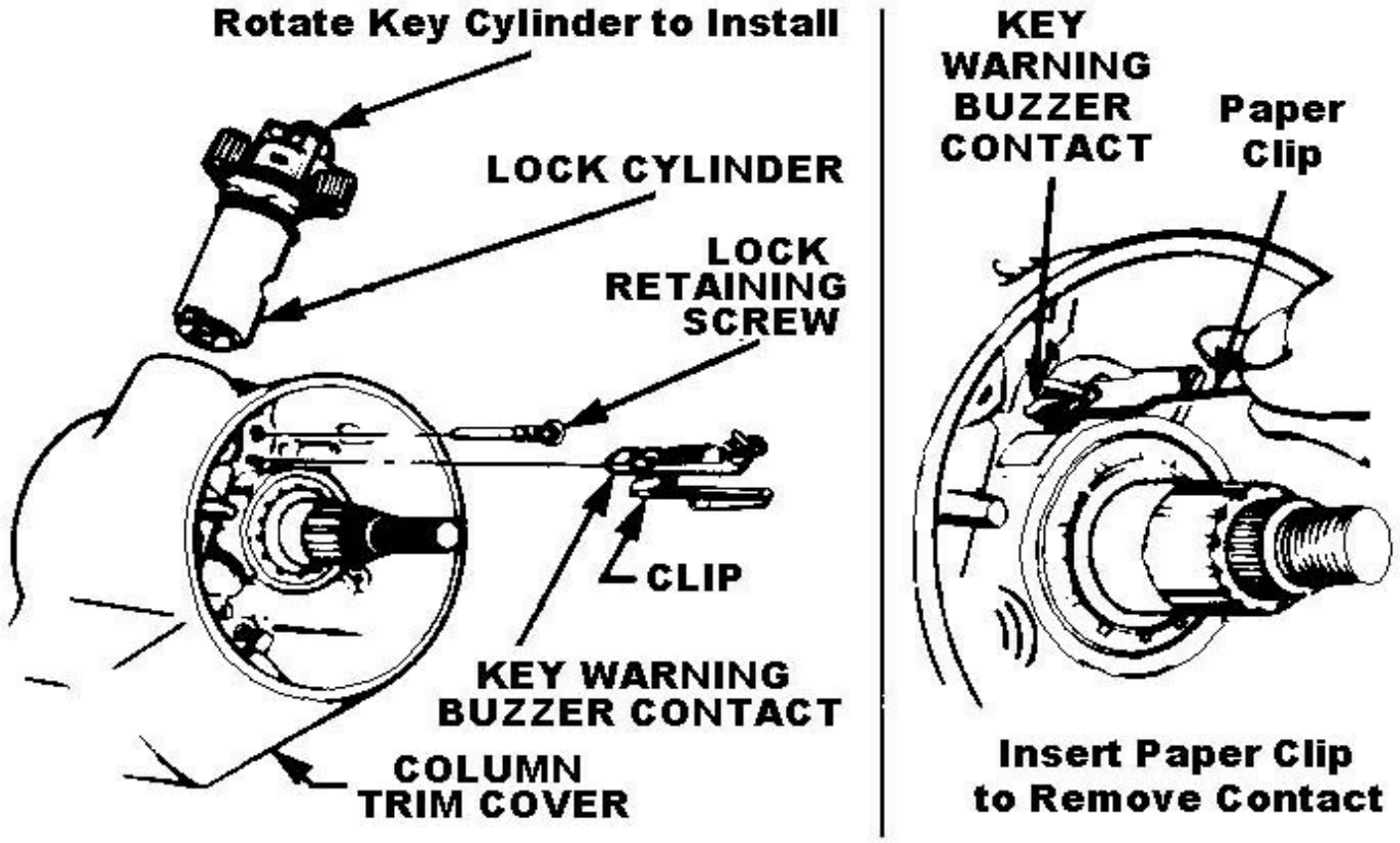


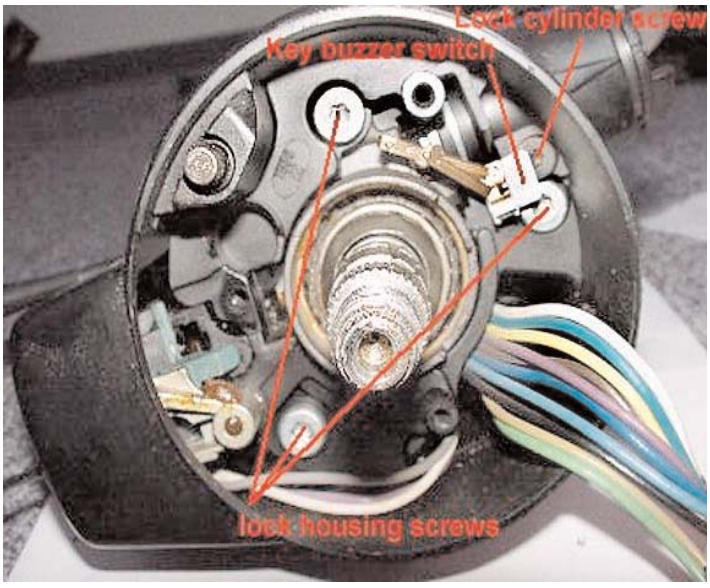
When the wheel locking plate is removed, you can look at the left lower side of the turn signal switch and see a pan head Phillips screw that holds the turn signal lever in place. Remove this screw and plate, then move the lever out of the way. There are three more pan head screws that hold the turn signal/hazard lamp switch to the upper column. Remove those and lift the turn signal switch out of the way. You may need to feed some extra wire from under the column to allow the switch to clear the steering shaft and move out of the way completely.



Once the turn signal/hazard switch base is out of the way, another pan head screw on the upper

IGNITION LOCK CYLINDER AND WARNING BUZZER





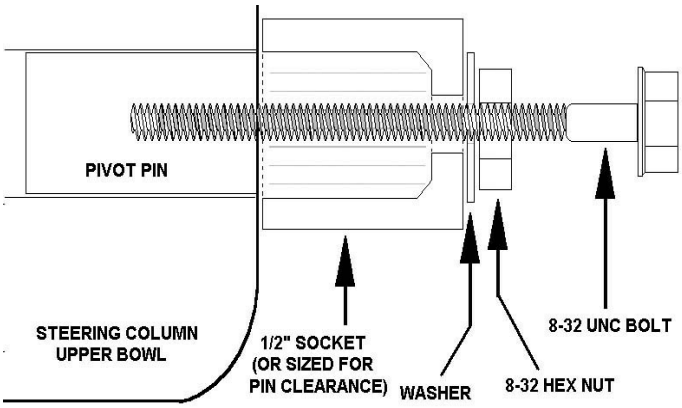
Remove the column tilt release lever by unscrewing it. Set it nearby since you will need to reinstall it after the upper bowl trim jacket is removed.

Remove the turn signal/multifunction lever shaft by carefully pulling it out of the switch. Unplug the cruise control wire harness (if equipped).

Remove the remaining upper bowl trim screws and lift the upper bowl off the column. Find the column tilt release lever and thread it back in hand tight for now.
Remove the upper steering shaft bearing nut and retainer clip. Remove the upper bearing set.
Remove the actuator rod link from the rack/sector that operates with the lock cylinder.
Disconnect the link from the clip in the lower column.

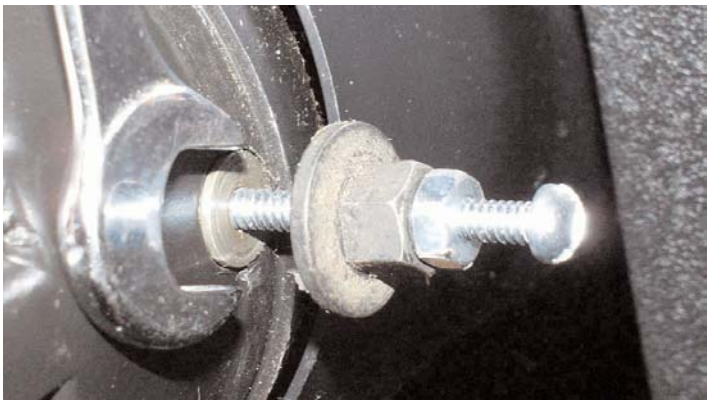
Remove the balance spring cap with a #2 or larger Phillips driver or larger square drive. This will allow the upper column fall to the lowest tilt position.

Remove the pivot pins from either side of the upper column using an 8-32 screw and nuts as a puller. I used a screw, nut, a ½" 12-point socket with ¼" drive, and a washer or two to jack the pins out without damaging anything. If your car happens to have a metric thread in the pivot pins, you'll just have to find the right bolt and nut



combination. My '94 still has an 8-32, however.

Assemble the parts as shown, fully bottoming the screw by hand (to get the maximum thread bearing strength), then back it off a turn or two in case the bolt snaps later. Once the screw thread is set, run the nut down with a wrench to jack the pivot pin out of the column die casting. It the screw snaps, there should be adequate material to back it out by hand (which is why you didn't bottom it out to begin with). Usually, the pin will pull easily once it starts moving and deforms the stakes that were retaining it.



Once the pins are removed, operate the column tilt release lever and remove the upper column half. Note the routing of the ignition switch linkage rod(s) when you remove the upper column half. Tilt the upper stub shaft and universal joint to allow the joint to be separated.

At this point, you should be viewing the top of the lower column half and four Torx cap screws. Remove these screws one at a time, clean the threads, and apply a light coating of LocTite 242 or an equivalent medium strength removable thread locker. Tighten the bolts by hand until all four are reinstalled. Torque them to 180 in/lb.

Reassemble the upper column half in reverse order. Take time to clean and grease all the moving parts so you can have another ten years of reliable operation. Every moving part, including the turn signal switch and cancelling cam, should be cleaned and lubricated with white lithium grease.
It's a lot easier to install the upper column housing if the spring is removed from the tilt mechanism. Installing the spring is easy once you have the upper column in place, as long as you have a large Phillips screwdriver to compress/turn the retaining cap. I did it with the spring installed (until I realized you could take the retaining cap off) and it wasn't too bad, just had to engage the cogs for the tilt steering mechanism and using the leverage of the tilt part of the steering wheel, you can compress the spring. I agree however, that removing the cap and the spring will make the job a lot easier and you won't have to worry about getting the spring centered on the pin.

When assembly is complete, torque the steering wheel nut to 35 ft/lb. There are already enough loose nuts behind steering wheels on our roadways....
There is a possibility that some of the pan head screws are Torx instead of Phillips. I believe this was more common on 1985 and later cars, but yours may have them as well.

There is also a very remote possibility that your car has an inflatable restraint, in which case you'll need to disconnect the battery and insulate all connections before you start. You should also have a service manual to detail the proper procedure for removing and re-centering the triggering coil and pickup for the SIR. You don't want to have that done incorrectly. Come to think of it, a manual is a good idea, anyway.

One thing you probably won't have to deal with is the SIR coil and wiring. That should save you some time. Two supplies you'll need are a medium strength threadlocker (like LocTite 242) and white lithium grease (like Lubriplate 107). A small torque wrench would be helpful, but if you can guess at 15 ft/lb, you should be O.K.

The lock plate depressor and wheel puller are almost a necessity. Just clean and grease everything when you reassemble. You'll appreciate it later when the column operates smoothly for a long time. This should keep you busy this weekend.

If you are having difficulty locating the pivot pins, they are shown in this diagram (Item #39):

Some personal experiences

Well, I was only able to tighten 1 torx bolt because i couldn't get the tilt section off the column, but that one bolt was enough to really tighten things up. It should hold for a few more days so I can make some time to do this right. Once I get the parts it should be easy as pie.

Both You and Vader were right, assuming you take your time and clean/degrease/locktite the parts that need it it should only take about 2 to 3 hours.

It took us around 4 1/2 hours because we didn't have the pin puller, and we still didn't get to the other 3. I'll really have to fix it sometime this week. Honestly though, Both Vader, and Bruce provided excellent directions and with the 3 right tools this job is easy as can be. Unfortunately if you don't have the right tools you'll spend days on this project.

Since I pulled it apart twice in one day I expect that it'll only take about 1 to 2 hours if I'm lazy when I fix it permanantly next time.

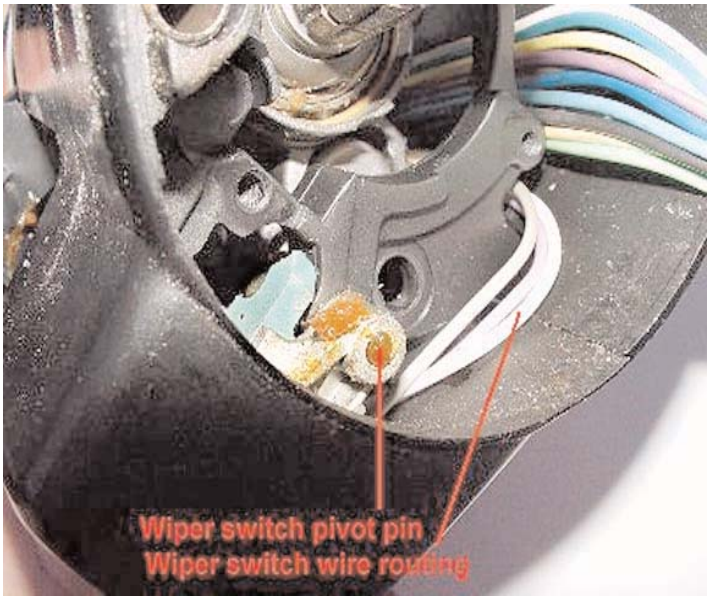
I have successfully fixed my tilt column!! And even come up with a small, cheap and easy way to get the locking plate retainer clip off! I used some nice strong thread and tied it into a slip knot. Then I looped it on the ring. Using a small flathead screwdriver I pulled on the string so I could get the flat head underneath the ring. Once it was under the ring it was easy as pie.

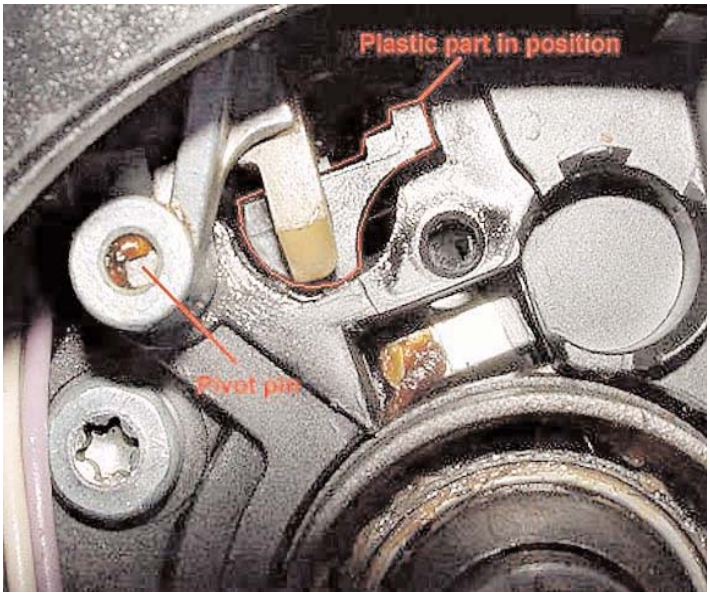
If anybody wants to try this.Ive done it myself for removing/installing the lock ring.First you will need 2 sockets a 1/2 & 9/16,a large dia washer(not too thick)w/a hole big enough for the steering shaft.Put the 2 sockets side by side,but seperated by the steering shaft.Put the washer on the shaft over the 2 sockets.Then use the steering shaft nut to push the washer/sockets/lock ring plate down.This will give you room to remove the lock ring using to small flat head screwdrivers or ?..Its a little tricky,but its worked for me many times over. Installation is in reversal of removal.

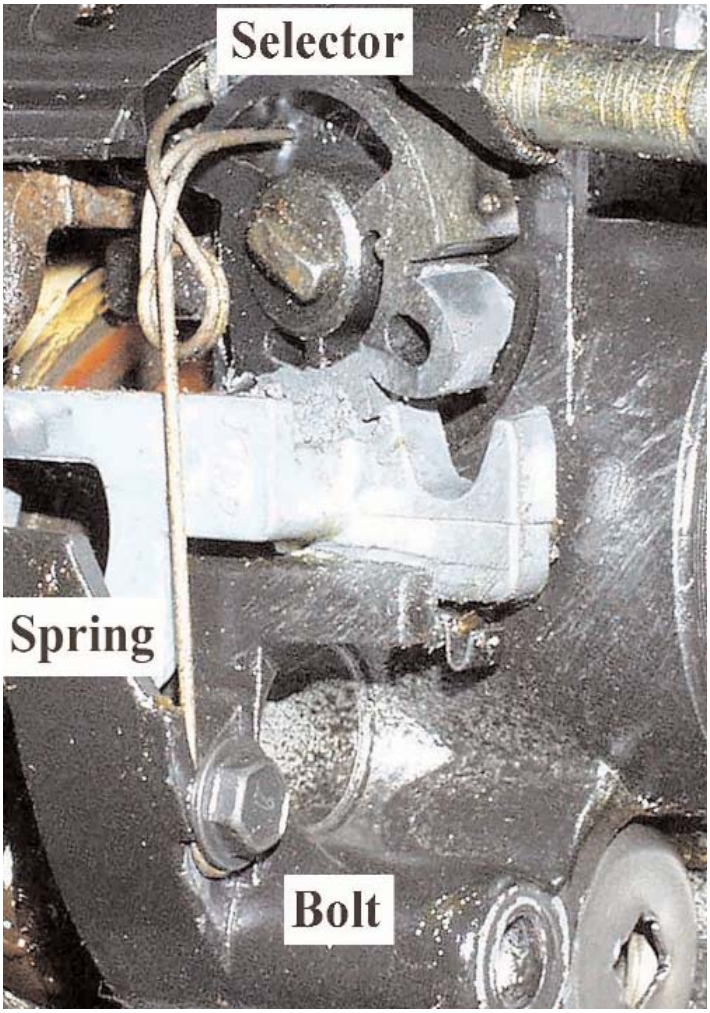
I bought a snap on pivot pin puller for $50 (canadian) and broke it! The pin was in so tight it mushroomed the collar on the tool and stripped out all of its threads! I did finally get it out with wd40,prying at the pin with a screwdriver from the inside of the column and using the first ghetto rigged tool! It was coated in loc tight! thats why it wouldnt come out.

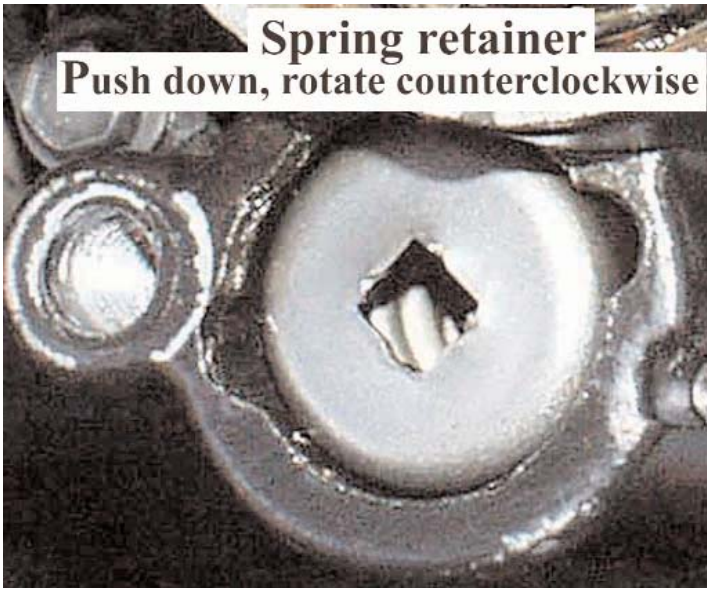
One thing I found difficult about reasembling the column was getting the hi-beam switch set correctly. It just didn't want to stay in place while I put it back together. Took me a few tries but I got it eventually.

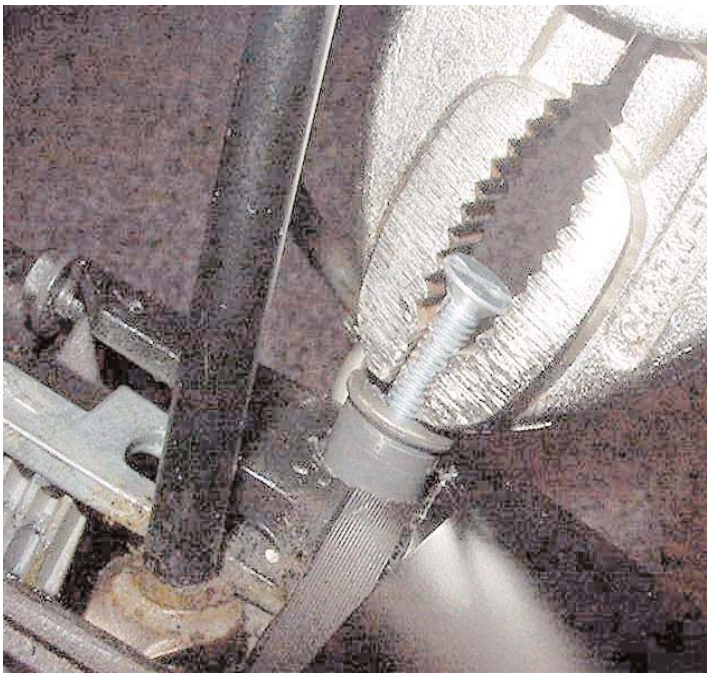
Duck July04 -- Hardest part was the unusual shapes in a puzzle-matrix, just follow the directions. Reinstalling the left side column cover was easier when moving the large column cover to enable the fit. This is really awkward due to the high-beam plastic piece constantly moving around and falling off. Afterwards check the high beam rod ‘cause it probably fell off the lower switch too. I found it possible to remove, clean and Locktite all four torx bolts without dissembling the steering column joint. The improvement in tightness and steering response was fantastic, just like new.

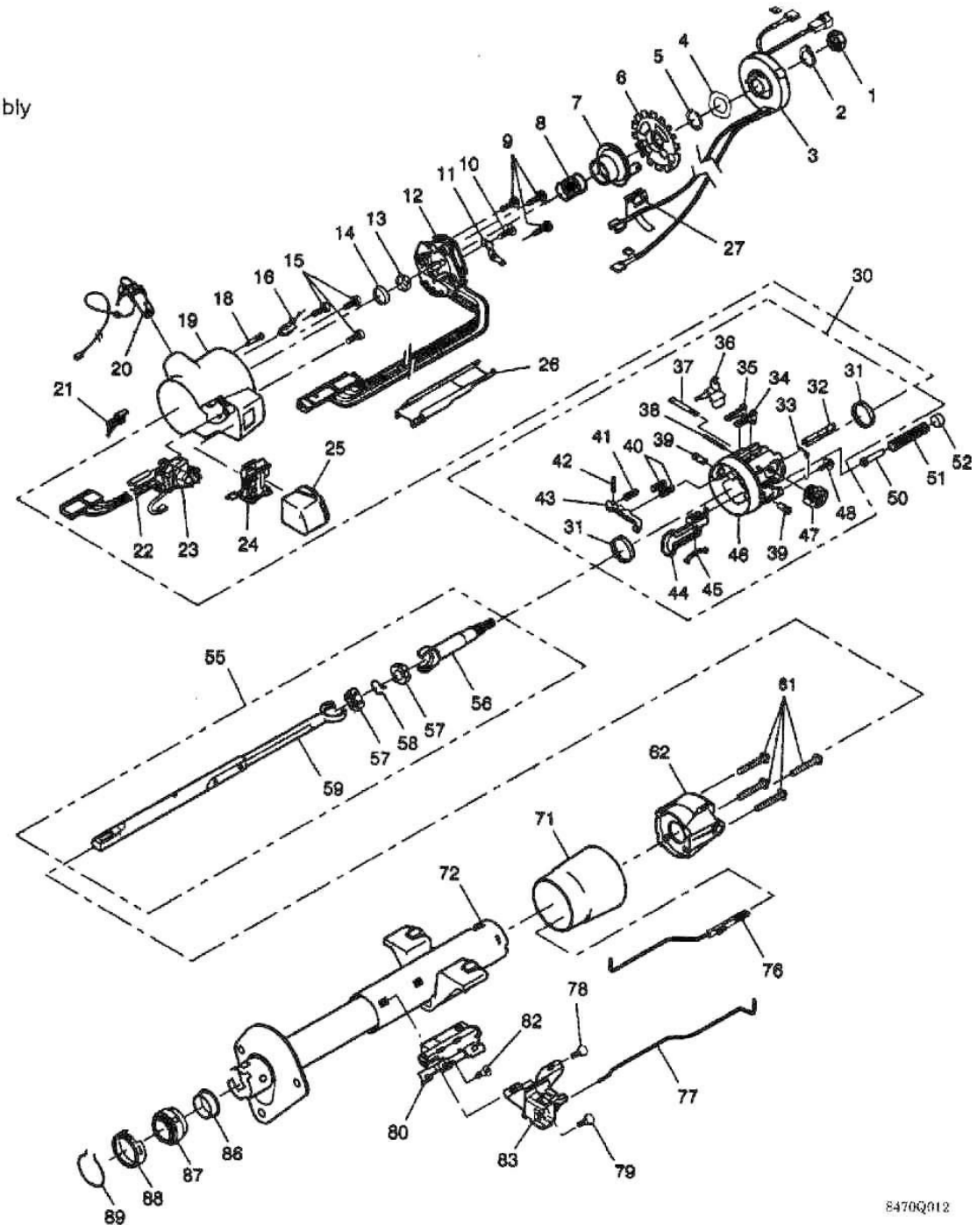

Wiper switch pivot pin
Wiper switch wire routing


Plastic part in position
Pivot pin


Selector
Spring
Bolt


Spring retainer
Push down, rotate counterclockwise





1. Hex locking nut
2. Retaining ring
3. Infl. restraint coil assembly
4. Wave washer
5. Retaining ring
6. Shaft lock
7. Turn signal cancel cam assembly
8. Upper bearing spring
9. Screw
10. Screw
11. Signal switch arm assembly
12. Turn signal switch assembly
13. Upper bearing inner race seat
14. Inner race
15. Screw
16. Buzzer switch assembly
18. Lock retaining screw
19. Lock housing cover assembly
20. Lock cylinder set
21. Dimmer switch rod actuator
22. Switch acuator pivot pin
23. Wiper switch assembly
24. Base plate
25. Cap
26. Wiring protector
27. Connector shroud
30. Steering column housing assembly
31. Bearing assembly
32. Lock bolt
33. Lock bolt spring
34. Steering wheel lock shoe
35. Steering wheel lock shoe
36. Wire protector shield
37. Drive shaft
38. Dowel pin
39. Pivot pin
40. Shoe spring
41. Release lever spring
42. Release lever pin
43. Shoe release lever
44. Switch actuator rack
45. Rack preload spring
46. Steering column housing
47. Switch actuator sector
48. Screw
50. Spring guide
51. Wheel tilt spring
52. Spring retainer
55. Steering column shaft assembly
56. Race & upper shaft assembly
57. Centering sphere
58. Joint preload spring
59. Lower steering shaft assembly
61. Support Screw
62. Support
71. Steering column housing shroud
72. Steering column jacket assembly
76. Ignition switch actuator assembly
77. Dimmer switch rod
78. Screw
79. Screw
80. Ignition switch assembly
82. Screw
83. Dimmer switch assembly
86. Lower bearing adapter
87. Bearing assembly
88. Bearing adapter retainer
89. Lower bearing adapter clip

Illustrated tilt steering column disassembly
by Oliver Scholz

The tilt steering column disassembly seems to be one of the last great mysteries of our time. Nobody likes to do it, but when you do'it's really not all that bad. At least it seems that way to me. Most people don't know how to disassemble it, and the description in the Factory Service Manual is sketchy at best. So I have decided to document the process of tearing into the column, when it was time for me to do so.

This procedure should be useful if you're trying to do one of these repairs:

Turn signal switch
Key buzzer switch
Ignition lock
Ignition lock housing
Wiper switch
Loose tilt mechanism

Some of the things described here can be done without removing the column from the car, however the deeper you have to go, the easier things get with the column out of the car. Plus, it's really simple to remove the column and put it back in. It's so much easier to do everything on a desk instead of crammed under the dash! So, I'd recommend to remove the steering wheel and locking plate while the column is in the car, and then remove the column from the car.

Start off by disconnecting the negative (-) battery connection. This is important, since you'll be fiddling around with the ignition switch, and you don't want to cause any shorts. Next remove the center cap/horn button (depending on your steering wheel). Remove the horn switch contact by pushing it in and turning it 1/4 turn counterclockwise.

Remove the clip (if present), center nut (22mm), and pull off the steering wheel. You will/b> need a steering wheel puller for this. You can get it e.g. at Sears. or just about any automotive supplier. Do not attempt to remove the wheel without this tool! Some wheels are loose enough on the shaft to be pulled manually, but don't use any brute force approach!

Next remove the plastic lock plate cover by unlocking the tabs with a screwdriver.

Once that's out of the way, you should use a lock plate compressor to push and hold down the lock plate. This allows you to slide the c-clip retainer onto the tool and

release the spring pressure (you can see this in the pictures). Remove the lock plate and cancelling cam. Be careful not to lose the spring located in the cancelling cam tower! Remove the Hazard warning switch with a philips screw driver. The switch consists of two parts, plus a spring and a screw. Don't lose them either.

Remove the lock plate spring from the shaft. Next remove the three screws from the turn signal switch. You must move the turn signal switch in each direction to gain access to all screws. Now remove the philips screw from the turn signal lever. Pull the turn signal stalk from the column with the wiper in the off position.

This is where I took the column out of the car. Remove the 11mm bolt attaching the column to the U-joint, and remove the two 15mm nuts and the two 15mm bolts holding the column in the car. Carefully lower the column. Disconnect the turn signal connector, the wiper switch connector and the cruise connector, if equipped. Remove the ignition switch connector. This is a two part connector, consisting of a black and a white part, both of which have two locking tabs, so don't force the connectors off. Remove the high beam switch connector (locking tabs!). If you have an automatic transmission, remove the park lock cable by removing the two tiny philips screws from the ignition switch. The column should now be free and you can carefully remove it from the vehicle.

Put the ignition lock in the RUN position and carefully remove the key warning buzzer switch with a paper clip. Remove the TX20 bolt holding the ignition lock cylinder. Remove the lock cylinder.

Remove the three TX30 screws attaching the ignition lock housing to the column. When you pull the lock housing off, the high beam actuator may fall out. Getting it back in place can be fun if you're putting things back together. So beware!

If you're going to remove/replace either the turn signal switch or the wiper switch, remove the four bolts shown in the picture below, and the harness protector. You can fiddle connector and harness through the column even if it doesn't seem like it will fit. It will. When you reassemble, these bolts have to be put back in in the right order, and torqued to spec. Check the Helms manual for the recommended torque values for your vehicle.

To remove the wiper switch, push the pivot pin out of the housing, and remove the switch.

Remove the sector and spring by punching the shaft that goes to the lock cylinder through the sector with a screwdriver. The spring is held with a small bolt. Put the bolt back in place so you don't lose it.

Next you have to remove the tilt mechanism spring retainer. This is the silver cap with the small rectangular hole. Insert a screwdriver, push down and make 1/4 turn counterclockwise to disengage the retainer. Remove the spring and retainer and set aside.

Next is the trickiest part: removal of the pivot pins. GM has a special tool for this (J21854-01), but you probably don't. Neither did I. So I screwed in a screw and pulled on it with vise grips, wiggling back and forth. Worked great. But be careful not to break off the screw, or you'll have to drill it out.

Now the hard part is over. Pull on the tilt lever and put the column up as far as you can, then turn it right. You want to remove this part (see picture). This one actuates the rod that goes to the actual ignition switch.

Just pull the upper part of the tilt housing off. By now you will see a few balls falling from the column. These are part of the lower bearing, don't lose any one of them!

Now you can see the objects of our desire: the four infamous Torx head bolts. Tighten them well, and a drop of threadlocker may be a good idea. I didn't have a proper size Torx socket, so I used a 6mm Hex socket instead. Worked great.

Reassembly is basically the reverse of the above. When reassembling, use a torque wrench to torque everything back to specs. You don't want the column to come apart when you're going 65 mph in heavy traffic! About the only tricky part when putting the column back together is the high beam switch actuator. Make sure the actuator is engaging the switch, and hold the column upright. The grease will "stick" the plastic part to the lower column shroud. Install the lock housing from above, and try to keep the plastic part in place. The picture shows what it should look like if you did it right. Install the turn signal stalk now to check if the high beam actuator works.

Grease is a great helper to keep the balls inside a ball bearing.