

SECTION : 6E

STEERING WHEEL AND COLUMN

CAUTION : Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.

TABLE OF CONTENTS

SPECIFICATIONS	6E-1	Steering Wheel Rotation Sensor	6E-10
Fastener Tightening Specifications	6E-1	Steering Wheel Without SIR	6E-11
SPECIAL TOOLS	6E-2	Steering Wheel With SIR	6E-13
Special Tools Table	6E-2	Ignition Lock Cylinder and Switch	6E-13
DIAGNOSIS	6E-2	Steering Column	6E-15
Steering Column Diagnosis	6E-2	UNIT REPAIR	6E-19
MAINTENANCE AND REPAIR	6E-8	Tilt Steering Column	6E-19
ON-VEHICLE SERVICE	6E-8	GENERAL DESCRIPTION AND SYSTEM	
Headlamp/Turn Signal Switch and Lever	6E-8	OPERATION	6E-20
Wiper Switch and Lever	6E-9	Steering Wheel and Column	6E-20
		Ignition Key Reminder	6E-20

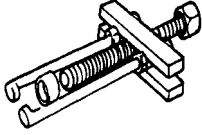
SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb-Ft	Lb-In
Ignition Switch Housing Shear Bolts	11	–	97
Ignition Switch Retaining Screw	2.5	–	22
Steering Column Jacket Assembly Front Bracket Bolts	22	16	–
Steering Column Jacket Assembly Rear Bracket Nuts	22	16	–
Steering Shaft Universal Joint Pinch Bolt	25	18	–
Steering Wheel Horn Cap Screws	4.5	–	40
Steering Wheel Nut	38	28	–
Steering Wheel Rotation Sensor Retaining Screw	2	–	18
Support Housing Screws	16	12	–
Turn Signal Switch Housing Screws	3	–	27
Upper and Lower Steering Column Cover Panel Screws	2.5	–	22

SPECIAL TOOLS

SPECIAL TOOLS TABLE

 <p style="text-align: center;">KM210A</p>	<p style="text-align: center;">KM-210-A Steering Wheel Puller</p>
---	---

DIAGNOSIS

STEERING COLUMN DIAGNOSIS

Lock System

Lock System Will Not Unlock

Checks	Action
Check the lock cylinder for damage.	Replace the lock cylinder.
Check the ignition switch for lack of free movement.	Lubricate the ignition switch.
Check the steering column housing for binding or damage.	Remove the steering shaft and clear the steering column housing. Replace the steering column housing as needed.

Lock System Will Not Lock

Checks	Action
Check the lock cylinder for damage.	Replace the lock cylinder.
Check the ignition switch for a lack of free movement.	Lubricate the ignition switch.
Check the steering column housing for binding or damage.	Remove the steering shaft and clear the steering column housing. Replace the steering column housing as needed.

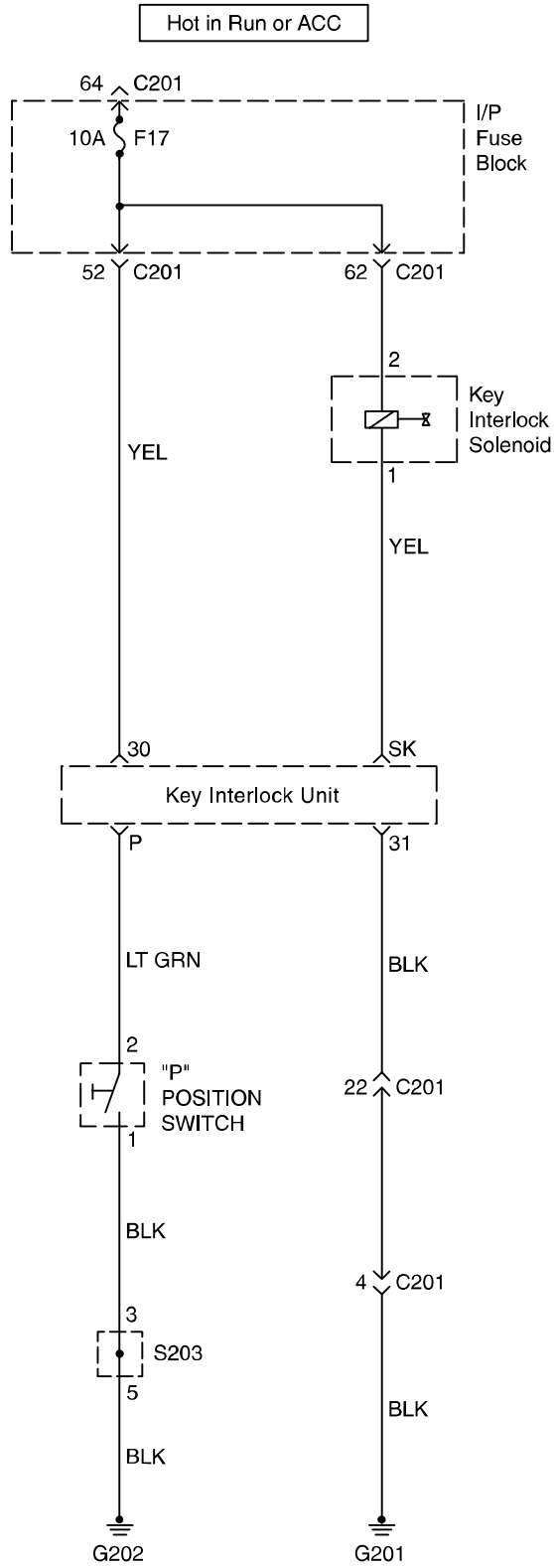
High Lock Effort

Checks	Action
Check the lock cylinder for damage.	Replace the lock cylinder.
Check the ignition switch for lack of free movement.	Lubricate the ignition switch.
Check for extreme misalignment of the housing to the cover.	Realign the cover on the housing. Replace the cover as needed.
Check for a bent ignition switch mounting bracket.	Replace the ignition switch mounting bracket.

Key Cannot Be Removed in the LOCK Position

Checks	Action
Check to see that the ignition switch is set correctly.	Reset the ignition switch.
Check the lock cylinder for damage.	Replace the lock cylinder.
Check the fuse F17 from the I/P fuse block.	Replace the fuse F17
Check for an open or short in the circuit between terminal 2 of key interlock solenoid and the I/P fuse block.	Replace the fuse F17
Select the gear shift lever to "P" position. Check the resistance between the terminal 2 and 1 of the "P" position switch.	Replace the "P" position switch.
Check for an open or short in the circuit between the ground G202 and terminal 1 of the key interlock unit.	Replace the open or short from the circuit.
Turn the ignition ON. Select the gear shift lever to "P" position. Check the resistance between the terminal 1 and 2 of the key interlock solenoid.	Replace the key interlock solenoid.

6E – 4 STEERING WHEEL AND COLUMN



Column Noise in the Column

Checks	Action
Check the steering gear-to-column joints for improper installation.	Tighten the steering shaft universal joint pinch bolts. Replace the steering shaft joints as needed.
Check the steering shaft bearing for wear or damage.	Replace the steering shaft bearing.
Check the spherical joint for lack of lubrication.	Lubricate the spherical joint.
Check the steering shaft for lack of lubrication.	Lubricate the steering shaft bearing.
Check the shaft lock snap ring for improper seating.	Adjust the shaft lock snap ring. Replace the shaft lock snap ring as needed.

High Steering Shaft Effort

Checks	Action
Check the steering shaft bearing for wear or damage.	Replace the steering shaft bearing.
Check for an improperly installed or deformed dust seal.	Replace the dust seal.
Check for a damaged upper or lower bearing.	Replace the upper or the lower bearing.
Check the steering shaft universal joints for a lack of free movement.	Lubricate the steering shaft universal joints. Replace the steering shaft universal joints as needed.

Lash in the Steering Column

Checks	Action
Check the steering column bracket mounting bolts for improper installation.	Tighten the steering column bracket mounting bolts.
Check for broken weld nuts on the steering column jacket.	Replace the steering column jacket.
Check for loose steering column housing-to-steering column jacket support screws.	Tighten the support screws.

Loose Steering Wheel

Checks	Action
Check for excessive clearance between the holes in the steering wheel support or the housing and the pivot-pin diameters.	Replace the pivot pins with pivot pins of the correct size.
Check to see if the upper bearing is seated correctly in the housing.	Correctly seat the upper bearing. Replace the upper bearing as needed.
Check for loose steering column housing support screws.	Tighten the steering column housing support screws.

Noise When Tilting the Column

Checks	Action
Check for worn upper tilt bumpers.	Replace the upper tilt bumpers.
Check for tilt spring binding.	Adjust the tilt spring. Replace the tilt spring as needed.

Turn Signal/Dimmer Switch**Turn Signal Will Not Stay in the Turn Position**

Checks	Action
Check the turn signal switch for an improper installation.	Remove and inspect the turn signal switch. Reinstall the switch.
Check the cancelling mechanism for broken or missing components.	Replace the cancelling mechanism.
Check the turn signal switch housing for foreign material.	Remove any foreign material.

Turn Signal Will Not Cancel

Checks	Action
Check the cancelling mechanism for broken or missing components.	Replace the cancelling mechanism.

Turn Signal/Dimmer Switch Difficult to Operate

Checks	Action
Check the turn signal/dimmer switch and turn signal/dimmer switch lever for improper installation.	Remove and inspect the turn signal/dimmer switch and signal/dimmer switch lever. Reinstall the signal/dimmer switch and signal/dimmer switch lever.
Check the signal/dimmer switch housing for foreign material.	Remove any foreign material.

Turn Signal Will Not Indicate Lane Change

Checks	Action
Check for a broken lane change pressure pad or a broken spring hanger.	Replace the lane change pressure pad or the spring hanger.
Check for improper functioning of the lane change spring.	Replace the lane change spring.
Check the turn signal switch for improper installation.	Replace the turn signal switch.

No Turn Signal Lights

Checks	Action
Check for an inoperative turn signal flasher.	Replace the turn signal flasher.
Check for a faulty turn signal switch.	Replace the turn signal switch.
Check the chassis-to-column connector for an improper connection.	Reconnect the chassis-to-column connector.

Turn Indicator Lights On, but Not Flashing

Checks	Action
Check for an inoperative turn signal flasher.	Replace the turn signal flasher.
Check for a faulty turn signal switch.	Replace the turn signal switch.
Check the chassis-to-column connector for an improper connection.	Reconnect the chassis-to-column connector.

Front or Rear Turn Signal Lights Not Flashing

Checks	Action
Check for a faulty turn signal switch.	Replace the turn signal switch.
Check the chassis-to-column connector for an improper connection.	Reconnect the chassis-to-column connector.

Turn Signal Lights Flash Very Slowly

Checks	Action
Check the chassis-to-column connector for an improper connection.	Reconnect the chassis-to-column connector.

Ignition Switch**Electrical System Will Not Function**

Checks	Action
Check the ignition switch for damage.	Replace the ignition switch.
Check the ignition switch for improper installation.	Remove and inspect the ignition switch. Reinstall the ignition switch.
Check the ignition switch electrical connector for improper installation.	Reconnect the ignition switch electrical connector. Replace the ignition switch electrical connector.

Ignition Switch Will Not Turn

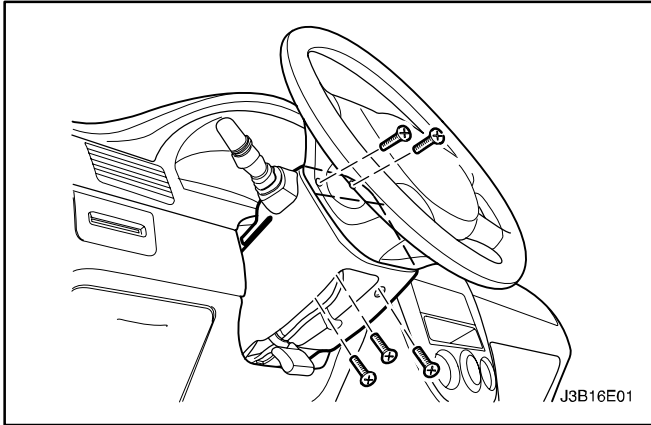
Checks	Action
Check the ignition switch for damage.	Replace the ignition switch.
Check the ignition switch for improper installation.	Remove and inspect the ignition switch. Reinstall the ignition switch.

Wiper Lever and Switch**Switch Inoperative: No LOW, HIGH, INTERMITTENT or WASH**

Checks	Action
Check the wiper lever and switch for damage.	Replace the wiper lever and switch.
Check the wiper lever and switch for improper installation.	Remove and inspect the wiper lever and switch. Reinstall the wiper lever and switch.

MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

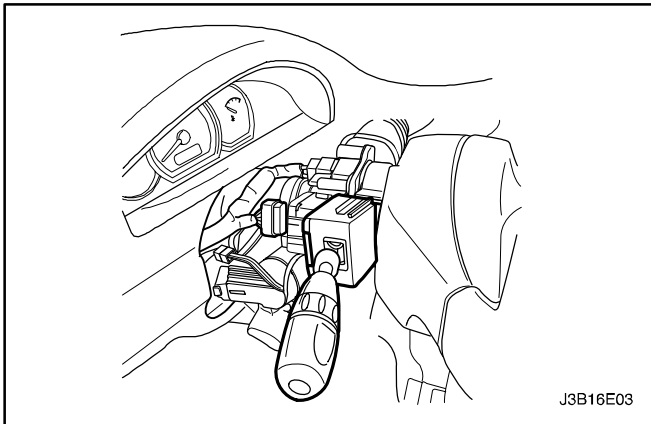
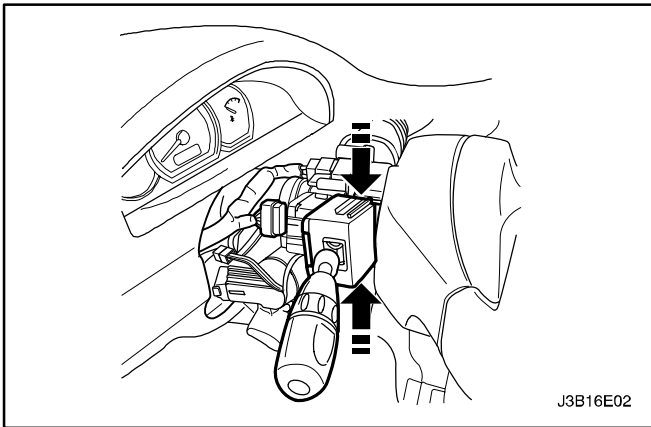


HEADLAMP/TURN SIGNAL SWITCH AND LEVER

(Left-Hand Drive Shown, Right-Hand Drive Similar)

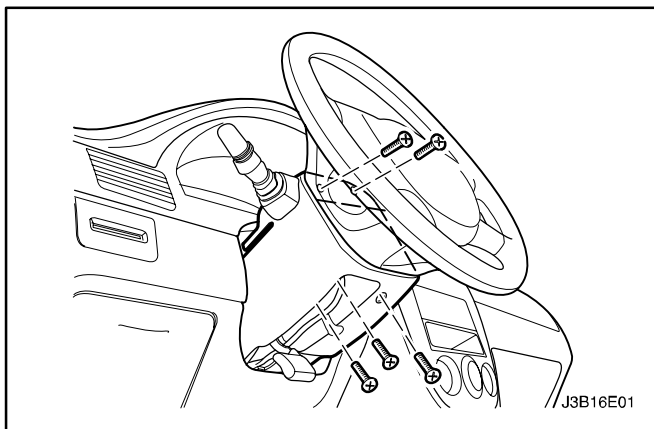
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the upper and the lower steering column cover panel screws.
3. Remove the upper and the lower steering column cover panels.
4. Remove the turn signal switch by pushing the tabs on the top and the bottom of the switch housing.
5. Disconnect the electrical connections from the turn signal switch.



Installation Procedure

1. Connect the electrical connections to the turn signal switch.
2. Install the turn signal switch by snapping it into the switch housing.

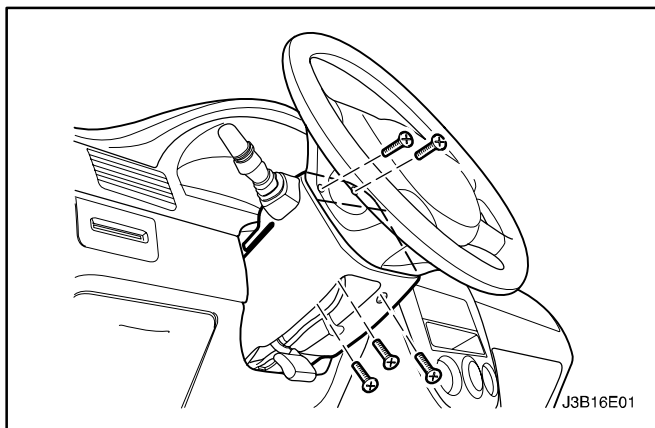


3. Install the upper and the lower steering column cover panels. Install the upper and the lower steering column cover panel screws.

Tighten

Tighten the upper and the lower steering column cover panel screws to 2.5 N•m (22 lb-in).

4. Connect the negative battery cable.

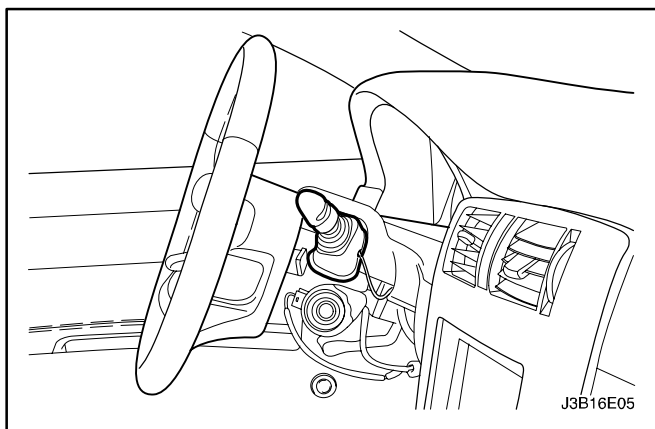
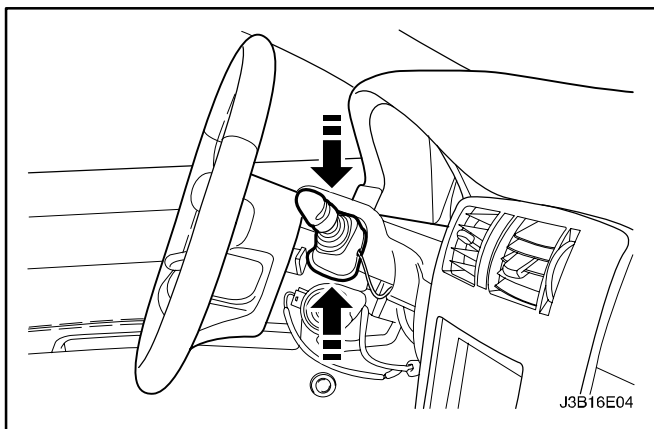


WIPER SWITCH AND LEVER

(Left-Hand Drive Shown, Right-Hand Drive Similar)

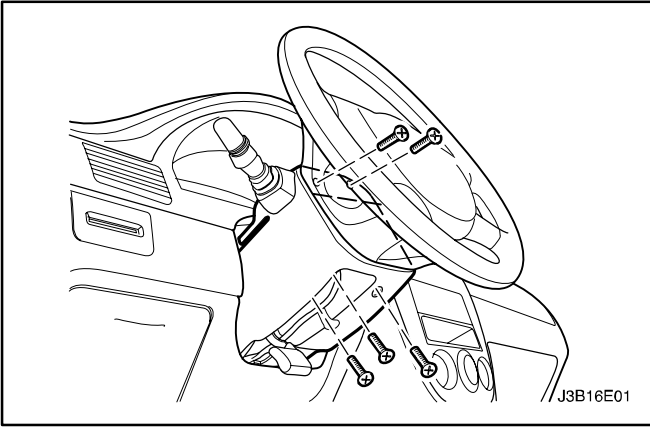
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the upper and the lower steering column cover panel screws.
3. Remove the upper and the lower steering column cover panels.
4. Remove the wiper switch by pushing the tabs on the top and the bottom of the switch housing.
5. Disconnect the electrical connector from the wiper switch. Disconnect the cruise control connector, if equipped.



Installation Procedure

1. Connect the electrical connector to the wiper switch. Connect the cruise control connector, if equipped.
2. Install the wiper switch by snapping it into the switch housing.

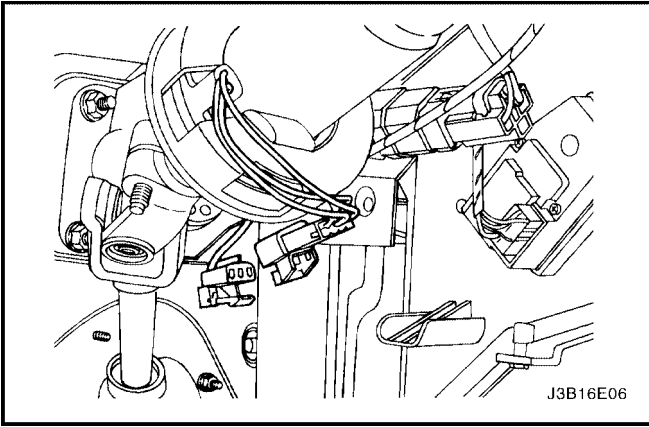


3. Install the upper and the lower steering column cover panels. Install the upper and the lower steering column cover panel screws.

Tighten

Tighten the upper and the lower steering column cover panel screws to 2.5 N•m (22 lb-in).

4. Connect the negative battery cable.

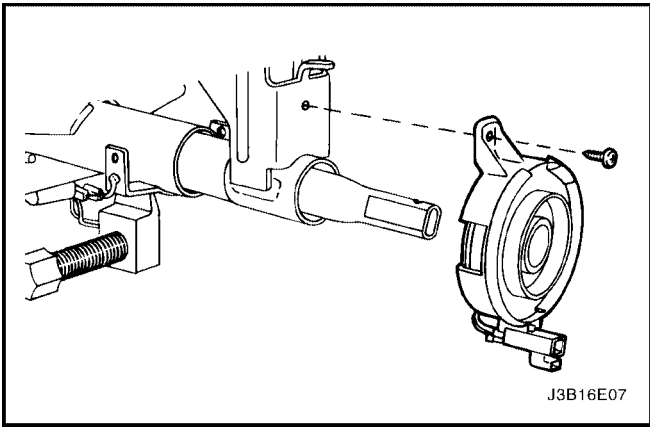


STEERING WHEEL ROTATION SENSOR

(Left-Hand Drive Shown, Right-Hand Drive Similar)

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the upper and the lower instrument trim panels. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Disconnect the steering wheel rotation sensor electrical connector.
4. Remove the intermediate shaft from the steering column to allow removal of the steering wheel rotation sensor. Refer to "Steering Column" in this section.
5. Remove the retaining screw from the steering wheel rotation sensor.
6. Remove the steering wheel rotation sensor.

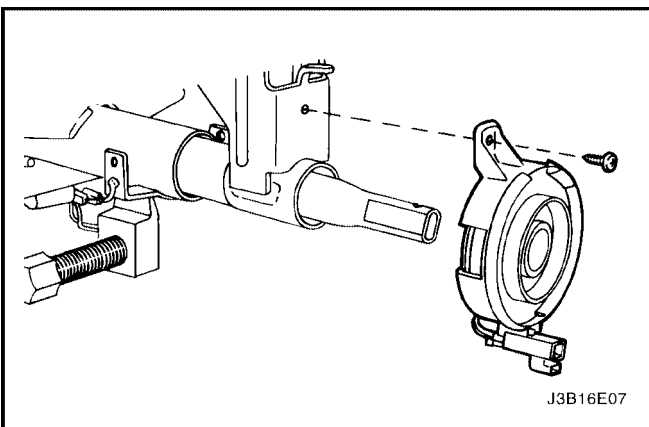


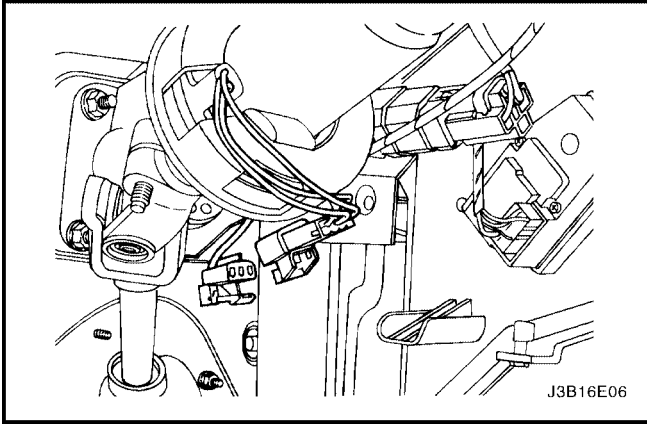
Installation Procedure

1. Install the steering wheel rotation sensor with the retaining screw.

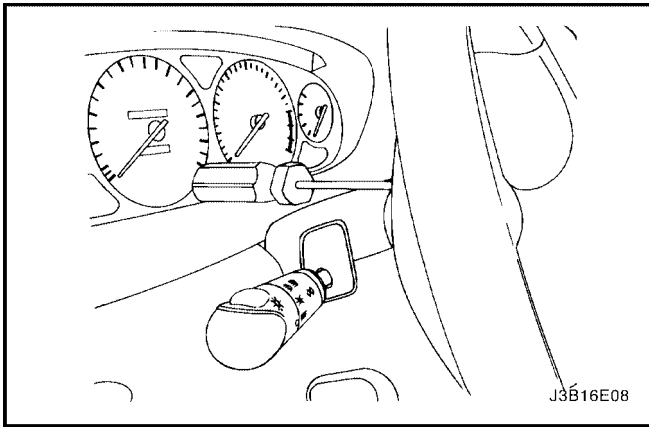
Tighten

Tighten the steering wheel rotation sensor retaining screw to 2 N•m (18 lb-in).





2. Install the intermediate shaft onto the steering column. Refer to "Steering Column" in this section.
3. Connect the steering wheel rotation sensor electrical connector.
4. Install the upper and the lower instrument trim panels. Refer to *Section 9E, Instrumentation/Driver Information*.
5. Connect the negative battery cable.



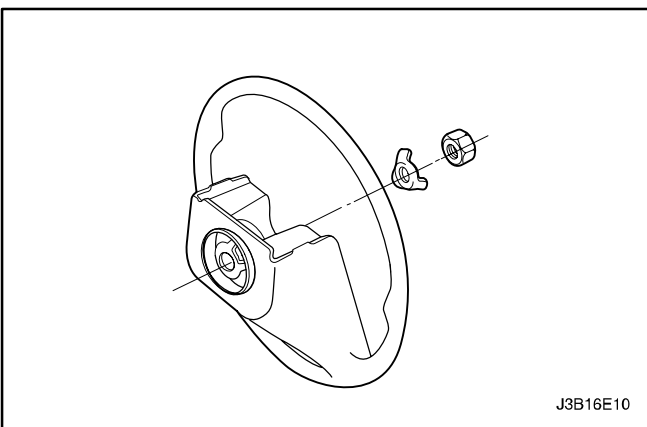
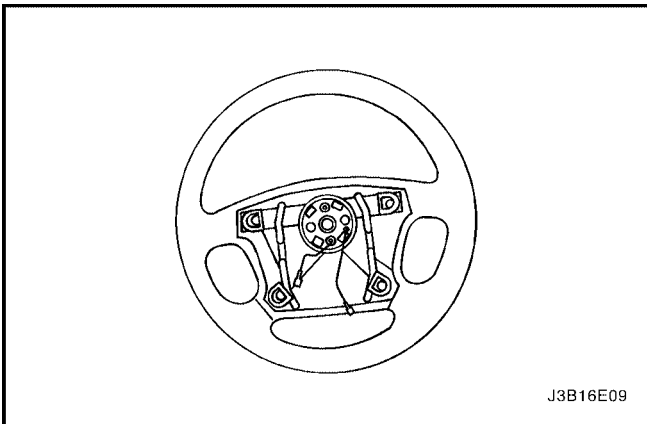
STEERING WHEEL WITHOUT SIR

Tools Required

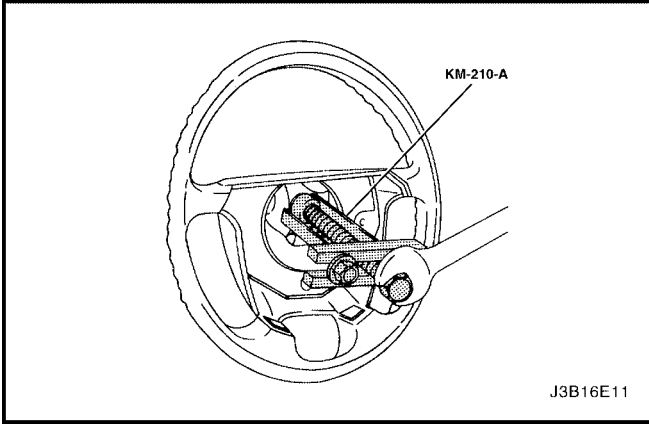
KM-210-A Steering Wheel Puller

Removal Procedure

1. Disconnect the negative battery cable.
2. Rotate the steering wheel to allow access to the steering wheel horn cap screw. Remove the horn cap screw.
3. Rotate the steering wheel to allow access to the other steering wheel horn cap screw. Remove the horn cap screw.
4. Remove the steering wheel horn cap and disconnect the horn leads.

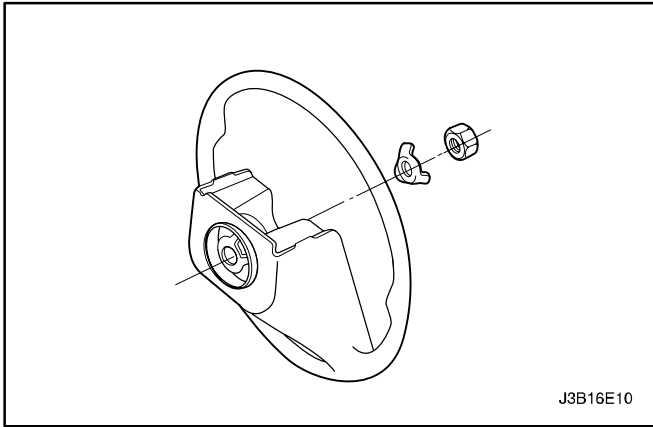


5. Remove the steering wheel nut and the retaining clip.



Important : In order to install the steering wheel correctly, match-mark the steering column shaft to the steering wheel.

6. Remove the steering wheel using the steering wheel puller KM-210-A.
7. Unclip the contact ring from the steering wheel, if necessary.

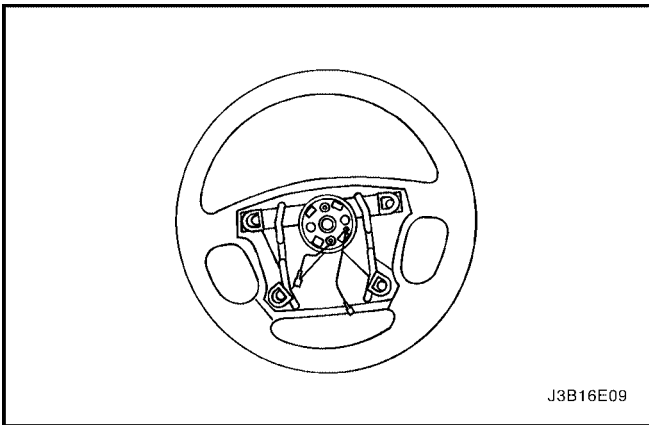


Installation Procedure

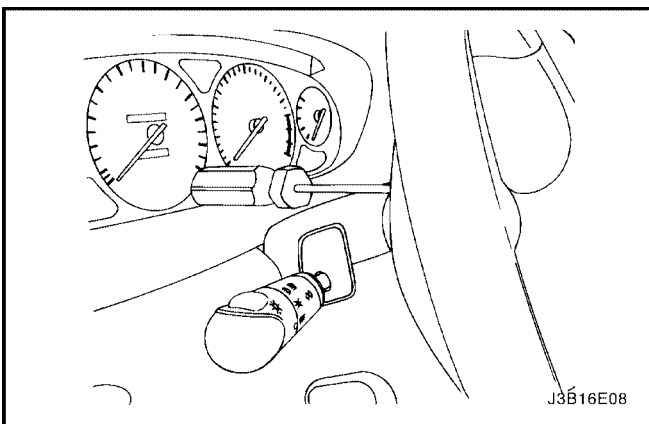
1. Clip the contact ring on the steering wheel, if necessary.
2. Align the match marks on the steering wheel and the steering column shaft.
3. Install the retaining clip and a new steering wheel nut.

Tighten

Tighten the steering wheel nut to 38 N•m (28 lb-ft).



4. Bend the tabs to secure the retaining clip.
5. Connect the horn leads and install the steering wheel horn cap.

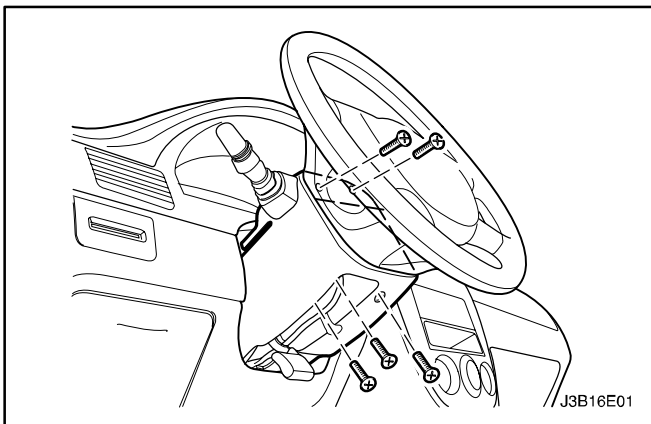
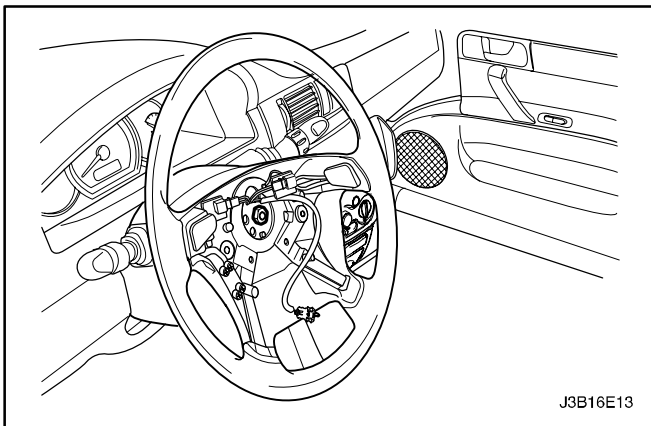
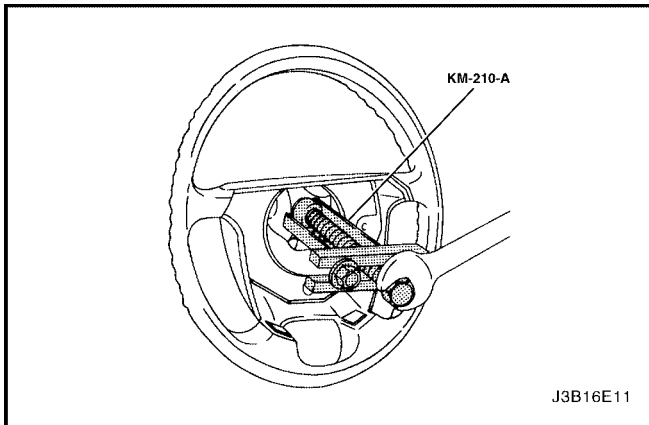
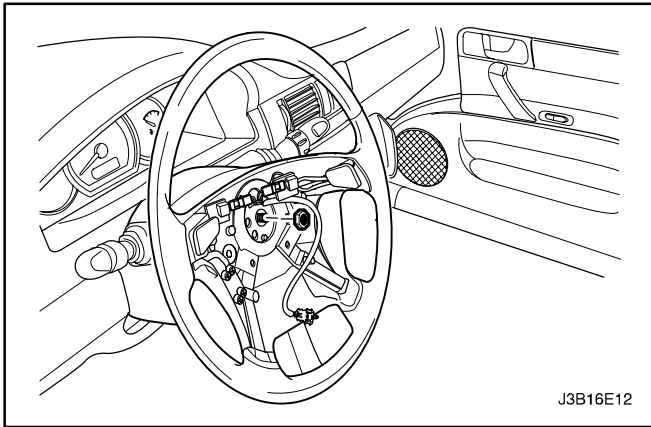


6. Rotate the steering wheel to allow access to the steering wheel horn cap screw. Install the horn cap screw.
7. Rotate the steering wheel to allow access to the other steering wheel horn cap screw. Install the horn cap screw.

Tighten

Tighten both steering wheel horn cap screws to 4.5 N•m (40 lb-in).

8. Connect the negative battery cable.



STEERING WHEEL WITH SIR

Tools Required

KM-210-A Steering Wheel Puller

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the SIR module. Refer to *Section 8B, Supplemental Inflatable Restraints*.
3. Remove the steering wheel nut and the retaining clip.

Important : In order to install the steering wheel correctly, match-mark the steering column shaft to the steering wheel.

4. Remove the steering wheel using the steering wheel puller KM-210-A.
5. Unclip the contact ring from the steering wheel, if necessary.

Installation Procedure

1. Clip the contact ring on the steering wheel, if necessary.

Important : In order to correctly install the steering wheel, match-mark the steering column shaft to the steering wheel.

2. Align the match marks on the steering wheel and the steering column shaft. Turn the signal canceling cam on the wheel to the left.
3. Install the retaining clip and the steering wheel nut.

Tighten

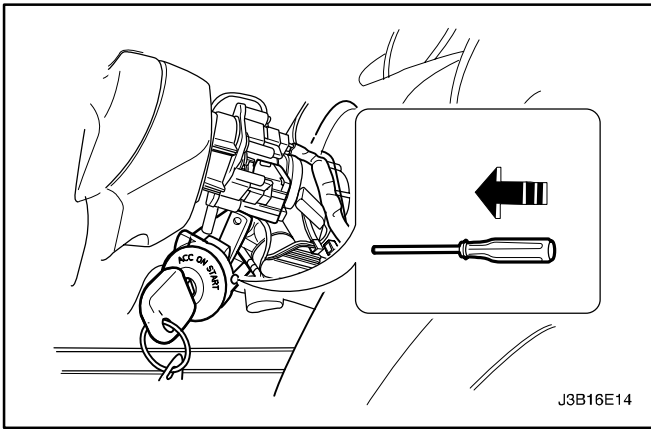
Tighten the steering wheel nut to 38 N•m (28 lb-ft).

4. Bend the tabs to secure the retaining clip.
5. Install the SIR Module. Refer to *Section 8B, Supplemental Inflatable Restraints*.
6. Connect the negative battery cable.

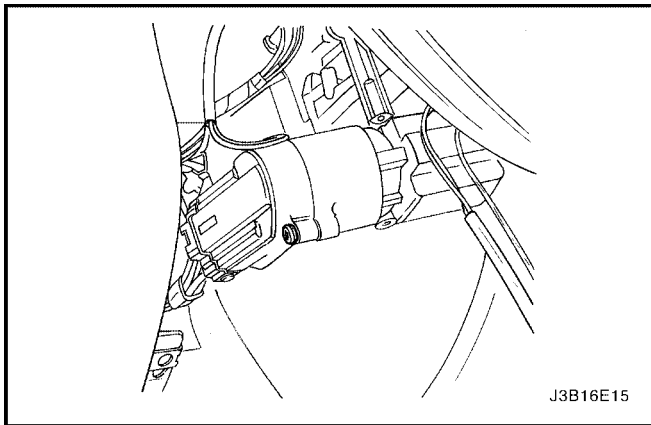
IGNITION LOCK CYLINDER AND SWITCH

Removal Procedure

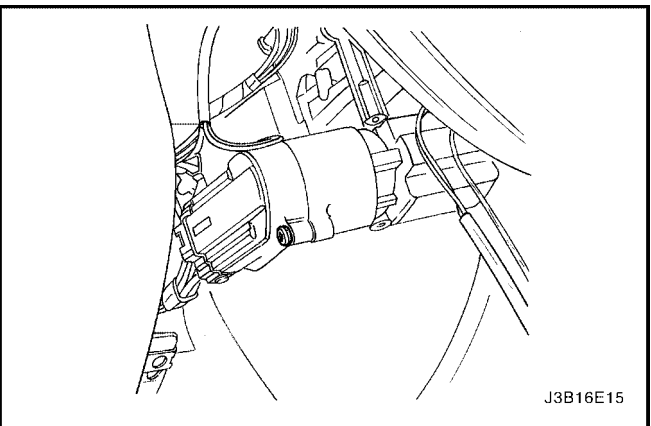
1. Disconnect the negative battery cable.
2. Remove the upper and the lower steering column cover panel by removing the screws.
3. Disconnect the electrical connector for the immobilizer detection coil.



4. With the key in the ignition turned to the position designated ACC, remove the lock cylinder by pressing down the detent spring and pulling the lock cylinder out of the switch cylinder housing.



5. Remove the ignition switch retaining screw.
6. Disconnect the wiring and remove the ignition switch.



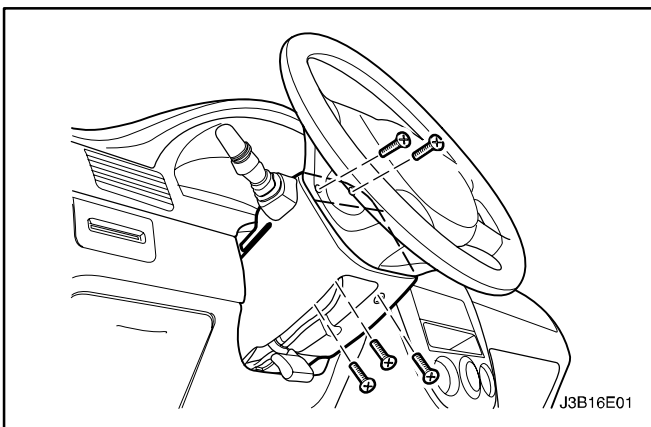
Installation Procedure

1. Install the ignition switch with the ignition switch retaining screw.

Tighten

Tighten the ignition switch retaining screw to 2.5 N•m (22 lb-in).

2. Connect the wiring to the ignition switch.



3. Install the lock cylinder.
4. Connect the electrical connector for the immobilizer detection unit.
5. Install the upper and the lower steering column cover panel with the screws.

Tighten

Tighten the upper and the lower steering column cover panel screws to 2.5 N•m (22 lb-in).

6. Connect the negative battery cable.

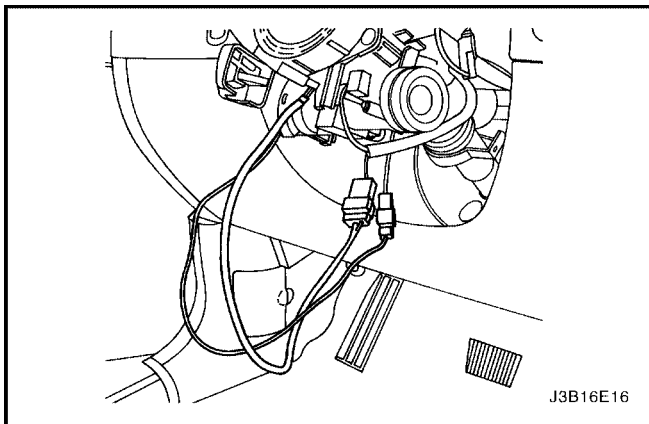
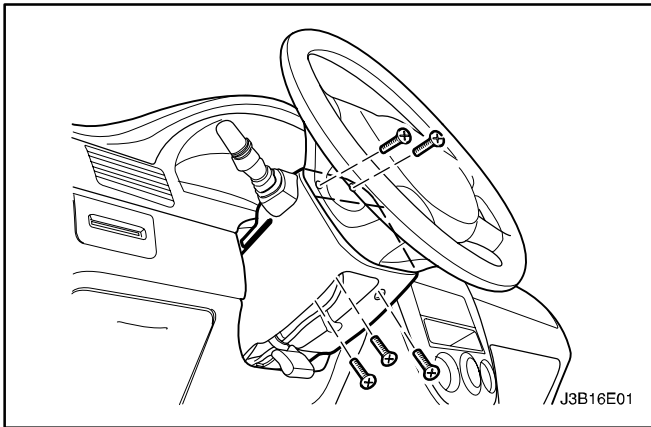
STEERING COLUMN

(Left-Hand Drive Shown, Right-Hand Drive Similar)

Important : Remove the steering column only if the following conditions exist:

- The steering column requires replacement.
- The steering and the ignition lock housing require replacement.
- Another operation requires the removal of the steering column.

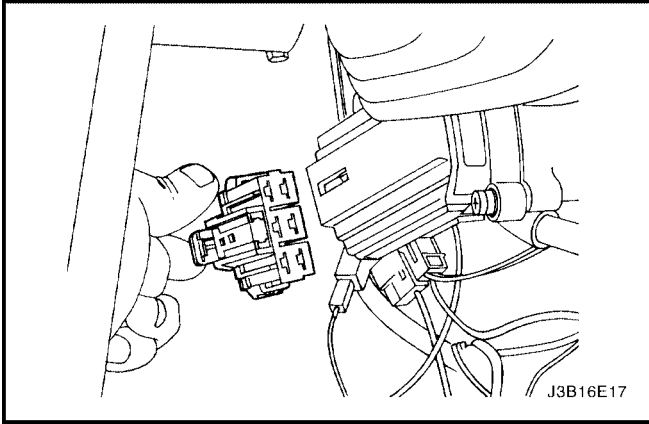
Notice : The steering column is extremely susceptible to damage after it has been removed from the vehicle. Dropping the column assembly on its end or hammering the end of the steering shaft can collapse the steering shaft or loosen the plastic injections which maintain column rigidity. Leaning on the column can cause it to bend or deform. Any of the above damage can impair the column's collapsible design. If it is necessary to remove the steering wheel, use only the specified steering wheel puller.



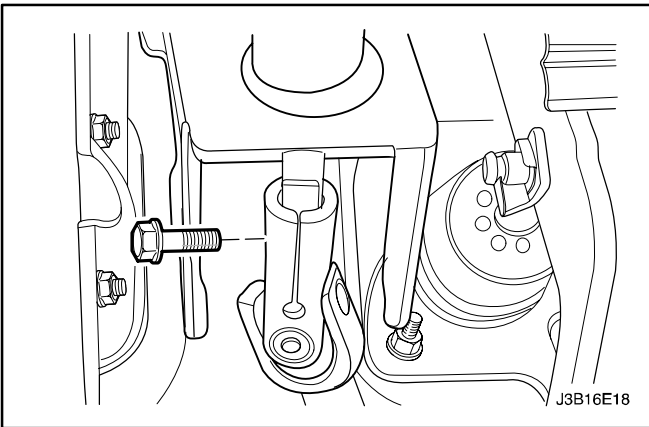
Removal Procedure

1. Disconnect the negative battery cable and let the vehicle sit for 1 minute to deactivate the airbag.
2. Remove the the lower instrument trim panels. Refer to *Section 9E, Instrumentation/Driver Information*.
3. Remove the upper and the lower steering column cover panel by removing the screws.
4. Remove the switch levers. Refer to "Turn Signal Switch and Lever" and "Wiper Switch and Lever" in this section.
5. Remove the immobilizer module. Refer to *Section 9T, Remote Keyless Entry and Anti-theft System*.
6. Disconnect the airbag electrical connections.

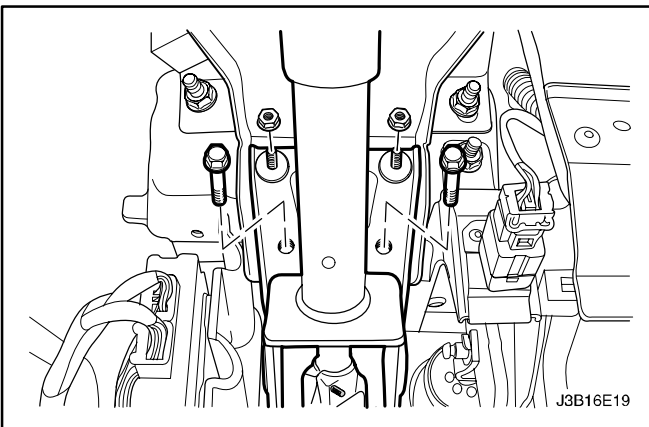
6E – 16 STEERING WHEEL AND COLUMN



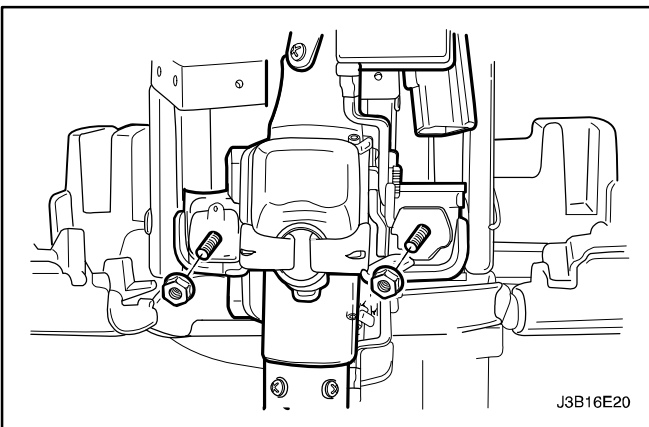
7. Disconnect the ignition switch electrical connection.



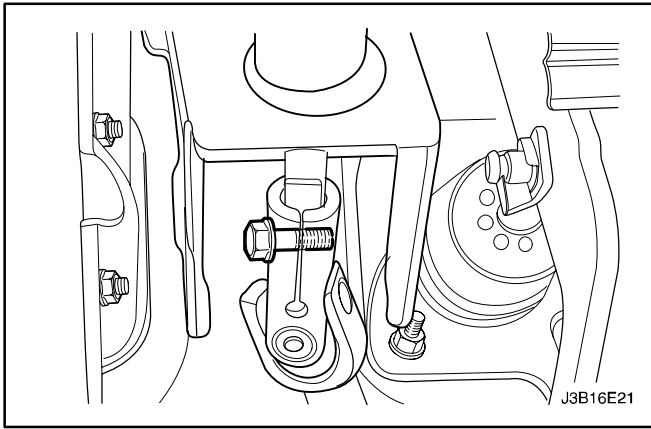
8. Adjust the steering to the straight-ahead position.
9. Remove the pinch bolt from the intermediate shaft universal joint.
10. Disconnect the speed sensitive steering electrical connector.



11. Remove the bolts and nuts holding the front bracket of the steering column jacket assembly.



12. Remove the nuts holding the rear bracket of the steering column jacket assembly.
13. Guide the steering column assembly out of steering shaft flange and carefully lay down the assembly.



Installation Procedure

Important : For proper installation of the steering column, be sure the steering wheel spokes are centered diagonally and pointed downward and the front wheels are positioned in the straight-ahead position.

1. Carefully guide the steering shaft into the intermediate shaft universal joint.

Important : Provide support for the steering column assembly until the mounting nuts are fastened. Do not let the steering column assembly hang unsupported.

2. Install the pinch bolt into the non-threaded hole of the flange.

Tighten

Tighten the steering shaft universal joint pinch bolt to 25 N•m (18 lb–ft).

3. Install the bolts and nuts for the front bracket of the steering column jacket assembly.

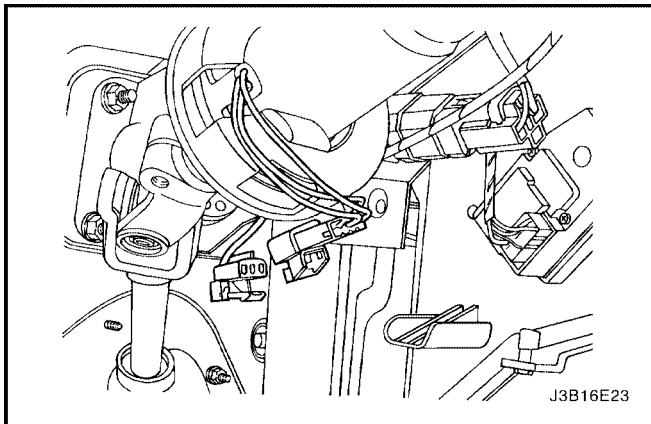
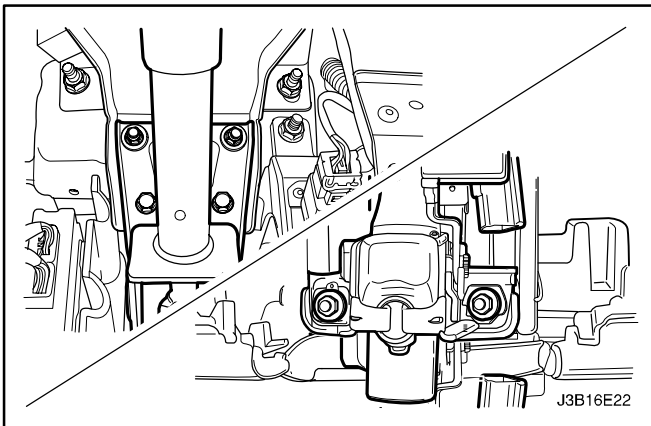
Tighten

Tighten the steering column jacket assembly front bracket bolts to 22 N•m (16 lb–ft).

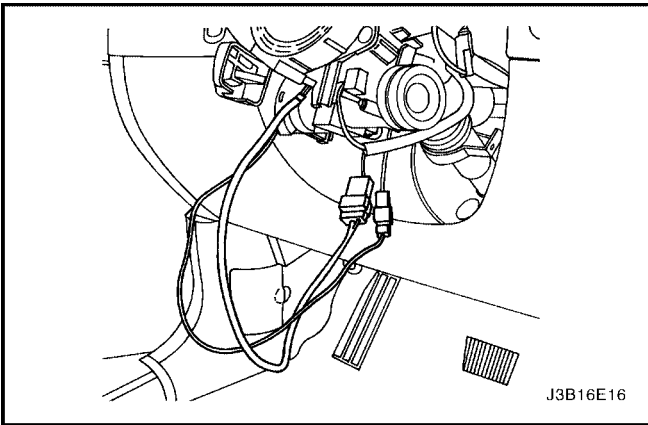
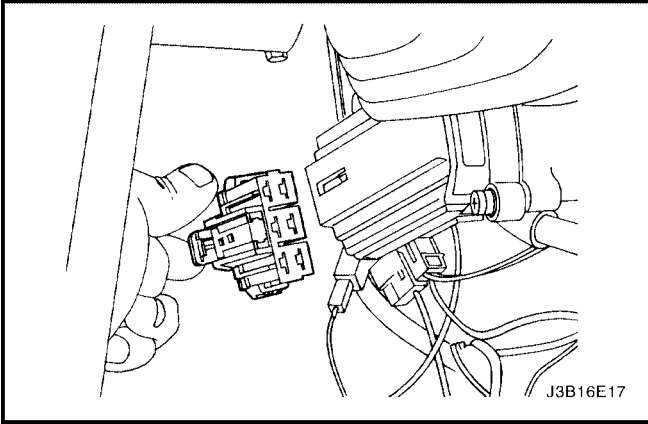
4. Install the nuts for the rear bracket of the steering column jacket assembly.

Tighten

Tighten the steering column jacket assembly rear bracket nuts to 22 N•m (16 lb–ft).



5. Connect the speed sensitive steering electrical connector.



6. Connect the ignition switch electrical connection.

- 7. Connect the airbag electrical connections.
- 8. Install the switch levers. Refer to "Turn Signal Switch and Lever" and "Wiper Switch and Lever" in this section.
- 9. Install the immobilizer module. Refer to *Section 9T, Remote Keyless Entry and Anti-theft System*.
- 10. Install the lower instrument trim panels. Refer to *Section 9E, Instrumentation/Driver Information*.
- 11. Install the upper and the lower steering column cover panel with the screws..

Tighten

Tighten the upper and the lower steering column panel screws to 2.5 N•m (22 lb-in).

- 12. Inspect the steering wheel in a straight-ahead position. Refer to *Section 6C, Power Steering Gear*.
- 13. Connect the negative battery cable.

UNIT REPAIR

TILT STEERING COLUMN

The(tilt) steering column is not unit repair serviceable. If the(tilt) steering column is defective, the(tilt) steering column assembly should be replaced.

GENERAL DESCRIPTION AND SYSTEM OPERATION

STEERING WHEEL AND COLUMN

CAUTION : *To ensure the energy-absorbing action of the steering column, it is important to use only the specified screws, bolts, and nuts, tightened to the specified torque.*

In addition to the steering function, the steering column provides safety and security.

The energy-absorbing column is designed to compress in a front-end collision to lessen the chance of driver injury.

The ignition switch and the lock are mounted on the column, allowing the ignition and steering operations to be locked to inhibit theft of the car.

The column levers trigger the turn signals, the headlight beams, and the windshield washer and wipers.

The tilt steering column uses telescopic function to allow the steering wheel to tilt up and down in and out. This enables the driver to adjust the steering wheel to a comfortable position.

Notice : Apply a thin coat of lithium grease to all friction points when reassembling.

The column may be disassembled and reassembled easily.

IGNITION KEY REMINDER

The ignition key reminder alerts the driver that the key is still in the ignition when the driver attempts to exit the vehicle.

An internal switch in the ignition lock cylinder supplies battery voltage to the reminder chime module when all of the following conditions are true:

- The key is in the ignition switch.
- The ignition is OFF.
- The driver's door is open.

For information on removal and installation of the reminder chime module, refer to *Section 9E, Instrumentation/Driver Information*.