

# SR21

# Steering Column

**Uniform  
Procedures For  
Collision Repair  
UPCR**



## 1. Description

This procedure describes repair, replacement, and inspection requirements for steering columns.



## 2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality repair of steering columns. This procedure is intended for use by professionals who are qualified through training and experience.



## 3. Referenced Documents

The following documents are considered part of this procedure by reference.

### 3.1 Procedures

PS01 Personnel Safety  
RE21 Airbag Systems

### 3.2 Other Information

Equipment-specific information  
Recycled parts information  
Vehicle-specific repair information



## 4. Equipment And Material Requirements

### 4.1 Equipment

The use of this equipment is included in this procedure:

- steering-wheel puller
- vehicle-specific airbag disabling tools



## 5. Damage Analysis

### 5.1 General Damage

Inspect a steering column for these conditions:

- visible damage
- corrosion on wear, sealing, or bearing surfaces
- incorrect steering column length
- improper previous repairs
- loose mounting
- steering wheel wobble or runout
- noise while turning the steering wheel
- abnormal steering effort
- worn or damaged U-joint or steering-shaft assembly
- out of position, as indicated by damage to the mounting bracket
- damaged electrical wiring and connectors
- splitting of the airbag module trim cover, or a deployed airbag module (see **RE21**)

Follow vehicle-specific information for damage assessment, and replacement of mounting brackets and fasteners. Plan to replace worn or damaged parts.

Any sign of damage to the airbag module will require replacement of the airbag module. Some vehicle makers consider the steering column part of the airbag system, and require its replacement if it is damaged or the airbag is deployed. Follow the vehicle maker's recommendations.

### 5.2 Ignition Lock Cylinder

Inspect an ignition lock cylinder for these conditions:

- failure to operate in any position
- abnormal turning effort
- sticking in any position
- abnormal key insertion or removal

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## 5. Damage Analysis (cont'd)

Follow vehicle-specific information for replacing ignition lock cylinders. Plan to replace worn or damaged parts.

### 5.3 Column Shift Lever

Operate the column shift lever, if equipped, and inspect for these conditions:

- abnormal shifting effort, or cannot move
- loose mounting
- misaligned PRNDL indicator
- movement into or out of PARK, or into REVERSE, without raising the shift lever
- in-gear engine starting (automatic transmission)
- vehicle movement while in PARK
- movement out of PARK without depressing the brake pedal, if interlock equipped

Follow vehicle-specific information for replacing column shift levers. Plan to replace worn or damaged parts.

### 5.4 Levers And Switches

Inspect a turn-signal lever and other column levers and switches for these conditions:

- visible damage
- out-of-position
- loose mounting
- improper operation

A non-operating system may not mean a faulty switch. Follow basic electrical troubleshooting procedures. Use vehicle-specific repair information for replacing levers and switches. Plan to replace worn or damaged parts.

### 5.5 Tilt Steering Column

Inspect a tilt steering column for these conditions:

- noise when tilting
- binding or slipping
- loose mounting
- loose pivot
- not locking in any position
- not returning to the top tilt position

Follow vehicle-specific repair information for replacing tilt column parts. Plan to replace worn or damaged parts.



## 6. Personnel Safety

### 6.1 General Safety

General safety information is in **PS01**.

### 6.2 Safety With Steering Columns

To prevent injury when working with steering columns:

- Take care to prevent accidental deployment of a non-deployed airbag, even if the system is disarmed. See **RE21**.
- Use the proper tools, and follow the equipment and vehicle makers' recommendations.



## 7. Environmental Safety

### 7.1 Undeployed Airbag

A deployed airbag can be disposed of like any other part. An undeployed airbag that is being replaced must be manually deployed, or returned to the vehicle maker. See **RE21**.



## 8. Vehicle Protection

### 8.1 Electronic Parts

To protect computers and other sensitive parts from damage:

- Follow the vehicle maker's recommendations for recording and resetting electronic memories.
- Ensure that the ignition switch is in the LOCK position, and the key is removed. Center the steering wheel before locking the ignition switch.
- Disconnect and isolate the negative battery cable, and disarm the passive restraint system. Follow the vehicle maker's recommendations.
- Protect modules, connectors, and wiring from dirt, heat, static electricity, and moisture.
- Loosen or remove any wiring harnesses or electrical parts that could be damaged during the repair process.

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## 8. Vehicle Protection (cont'd)

### 8.2 Airbag System Parts

Follow the vehicle-specific information for disarming an undeployed airbag system. For general information, and for information on handling an undeployed airbag module, see **RE21**.

To protect airbag diagnostic modules:

- Avoid touching electrical terminals.
- Use an electro-static discharge (ESD) strap when handling the module.
- Do not store modules near electric welders or other high-energy electrical equipment.
- Do not perform electrical tests unless directed by a service manual.
- Do not open the package of the replacement module until it is to be installed on the vehicle.
- Inspect replacement modules for proper part number and visible damage before installation.

### 8.3 Steering Column

To prevent damage to a column that has been removed from the vehicle:

- Do not drop the column.
- Do not lean on, or put force on, the shift tube, steering shaft, or column housing.
- Avoid clamping any column parts tightly in a vise when servicing.
- Do not weld or apply heat to any steering system part.
- Replace any one-time fasteners, as required.
- Torque fasteners to the vehicle maker's recommendations.
- Avoid turning the steering wheel, to prevent damaging the clock spring.

### 8.4 Vehicle Interior

Cover or protect seats and vehicle interior surfaces before disassembling the steering column.



## 9. Repair Procedure

### 9.1 Steering Column Replacement

To replace a steering column:

- 1. Ensure that the vehicle structure is aligned to the vehicle maker's dimension specifications, and all steering- and suspension-system mounting points are properly located.
- 2. Follow the vehicle maker's recommendations for disabling the airbag system, if applicable. For retrofit airbag systems, follow the product maker's recommendations.
- 3. Make sure the front wheels are in the straight-ahead position, then lock the steering column.
- 4. Remove the airbag module, if required. Follow the vehicle maker's recommendations.
- 5. Remove the steering wheel.
- 6. Make sure the clock spring is centered, if applicable. Follow the vehicle maker's recommendations.
- 7. Remove the cover under the steering column, and the lower finish panel if applicable.
- 8. Disconnect all electrical connectors to the steering column.
- 9. If there is a column-mounted shift lever, disconnect the gearshift linkage. If there is a floor-mounted automatic transmission shift lever, disconnect the interlock cable.
- 10. Remove the steering column-to-floorpan trim plates and fasteners, if applicable.
- 11. Remove the steering column-to-instrument-panel mounting fasteners.
- 12. Remove the fasteners in the lower U-joint, or flexible coupling.
- 13. Remove the steering column from the vehicle.
- 14. Install the replacement steering column under the dash panel, and insert the steering shaft into the lower U-joint or flexible coupling. Reapply thread-locking material to the fasteners, if applicable.
- 15. Install the steering column-to-instrument-panel and floorpan mounting fasteners. Make sure the steering column is properly positioned, and torque the fasteners to the vehicle maker's recommendations.
- 16. Install the retaining fasteners in the lower U-joint, or flexible coupling, and torque the fasteners to the vehicle maker's recommendations.
- 17. Reconnect the gearshift and interlock linkage, if applicable.
- 18. Install and center the clock spring, if applicable. Follow the vehicle maker's recommendations.
- 19. Transfer the ignition lock cylinder, or rekey the door locks, if required.
- 20. Transfer or replace any column-mounted switches.
- 21. Install the steering wheel.
- 22. Install the airbag module, if required. Follow the vehicle maker's recommendations.
- 23. Reconnect the electrical connectors to the steering column.
- 24. Adjust the shift linkage and PRNDL indicator.
- 25. Refinish the replacement lower finish panel, if required, before installation. Reinstall the steering column cover and the lower finish panel.
- 26. Reactivate the airbag system. Verify that the system is operating properly. Follow the vehicle maker's recommendations.

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## 9. Repair Procedure (cont'd)

- 27. Continue vehicle reassembly.
- 28. Road-test the vehicle to check for proper steering column and accessory operation. See **11.2**.

### 9.2 Steering Wheel Replacement

To replace a steering wheel:

- 1. Follow the vehicle maker's recommendations for disabling the airbag system, if applicable. For retrofit airbag systems, follow the product maker's recommendations.
- 2. Make sure the front wheels are in the straight-ahead position, then lock the steering column.
- 3. Remove the airbag module, if required. Follow the vehicle maker's recommendations.
- 4. Remove accessory switches, if required. Follow the vehicle maker's recommendations.
- 5. Remove the steering wheel using the vehicle maker's recommended puller and removal tools.
- 6. Disconnect all electrical connectors to the steering wheel.
- 7. Reconnect all electrical connectors to the replacement steering wheel.
- 8. Install the replacement steering wheel in the centered position, and torque the fasteners to the vehicle maker's recommendations.
- 9. Reinstall any accessory switches. Follow the vehicle maker's recommendations.
- 10. Reinstall the airbag module. Follow the vehicle maker's recommendations.
- 11. Reactivate the airbag system. Verify that the system is operating properly. Follow the vehicle maker's recommendations.
- 12. Continue vehicle reassembly.
- 13. Road-test the vehicle to check for proper steering column and accessory operation. See **11.2**.



## 10. Use Of Recycled (Salvage) Parts

### 10.1 Condition Of Salvage Parts

Use care in selecting and using salvage steering column parts. Salvage airbag modules should not be used. Some vehicle makers may not recommend the use of salvage steering columns containing airbag wiring. Follow the vehicle maker's recommendations. Whenever possible, compare salvage parts to the original parts.

Do not install salvage steering column parts with these defects:

- unrepairable damage
- flood or water damage
- incorrect steering column length
- evidence of having been heated, welded, damaged, or straightened

Do not install salvage bushings or fasteners. Transfer any undamaged parts such as the original ignition lock cylinder, airbag module, steering wheel, etc.





## 11. Inspection And Testing

### 11.1 Steering Column Replacement Inspection

When repairs are completed, inspect a replacement steering column for these conditions:

- proper installation of all fasteners, brackets, clamps, and retaining clips
- proper tilting operation, if applicable
- proper operation of the ignition lock-cylinder
- proper operation of all switches and levers
- proper operation of the airbag dash lamp
- fasteners torqued to the vehicle maker's recommendations
- proper finish appearance
- steering wheel centered
- proper operation of the brake, turn-signal, backup, and daylight running lamps
- proper operation of any transmission or starter interlocks
- proper operation of the telescoping mechanism, if applicable
- proper position of the shift lever and PRNDL indicator

Correct any defects.

### 11.2 Road Test

Road-test the vehicle after repairs to inspect for these conditions:

- poor steering control
- steering wheel free-play exceeding 6 mm ( $\frac{1}{4}$ " )
- proper operation of the turn signals and speed control system
- proper operation of the transmission
- proper airbag dash lamp operation

Correct any defects.