
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 B unless otherwise noted.*

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DESCRIPTION AND OPERATION

STEERING WHEEL AND COLUMN

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

Caution: To ensure energy-absorbing action, it is important to use only the specified screws, bolts, and nuts, tightened to the specified torque.

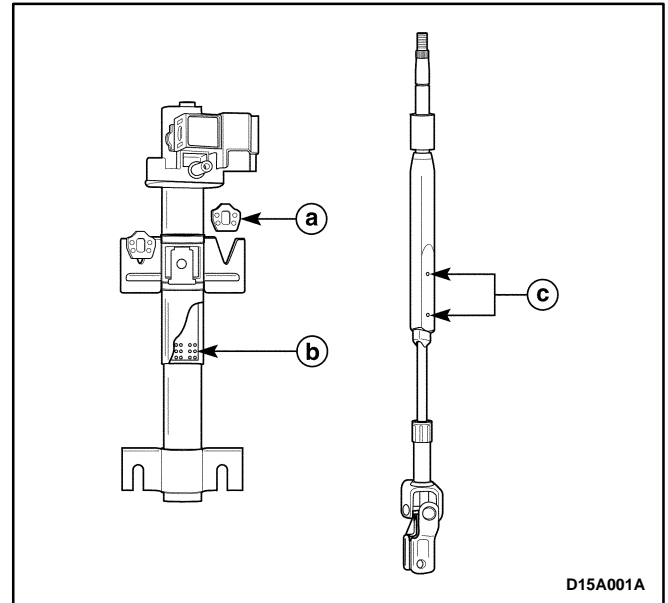
The energy-absorbing column is designed to compress in a front-end collision to lessen the chance of driver injury.

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.

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

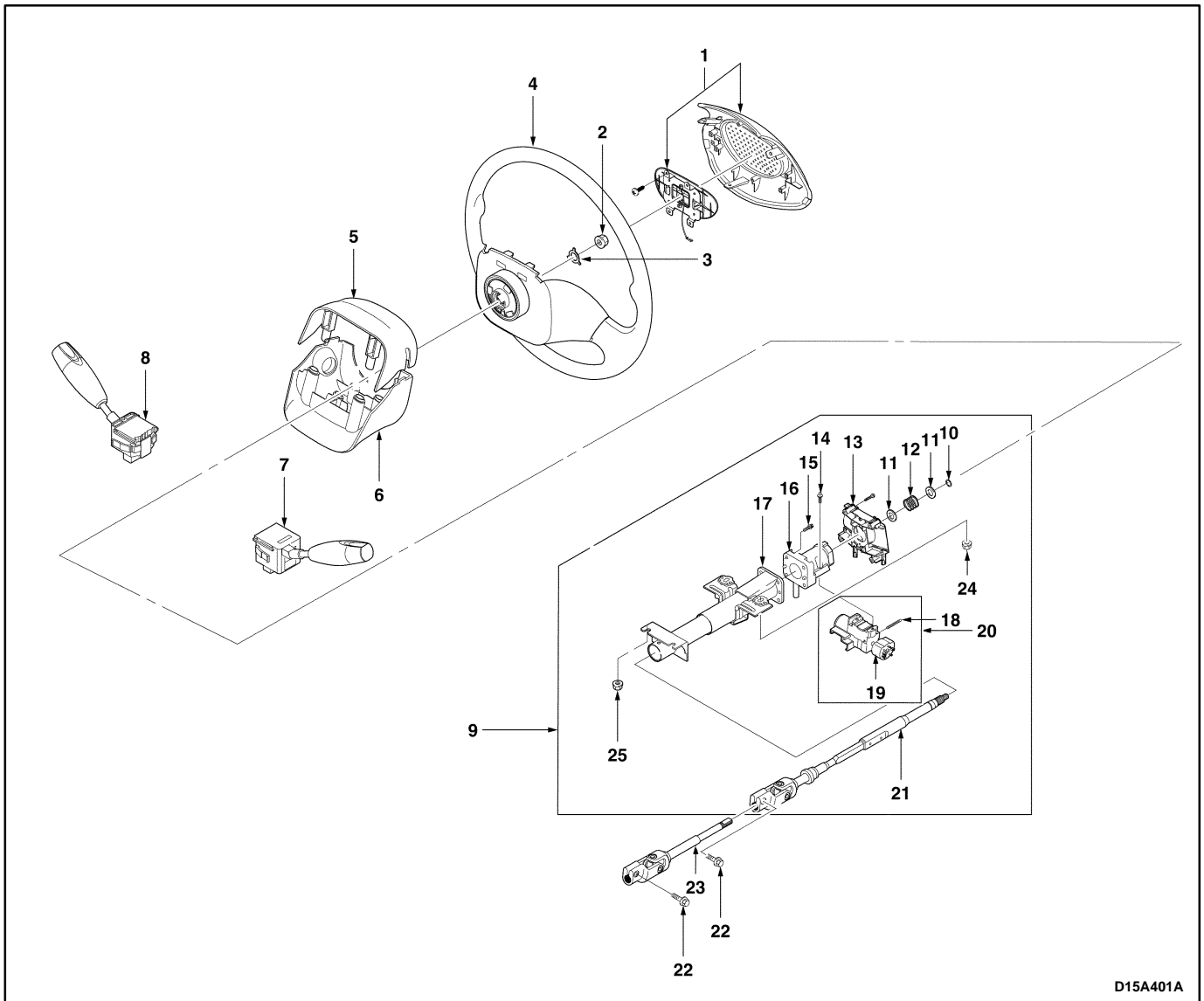
The column may be easily disassembled and assembled.



- Safety Device
 - A. Steering Column Upper Bracket.
 - B. Steering Column.
 - C. Steering Column Shaft.

COMPONENT LOCATOR

STEERING WHEEL AND COLUMN



D15A401A

- | | |
|--------------------------------|-------------------------------------|
| 1. Horn Cover (Airbag Module) | 15. Support Bolt |
| 2. Steering Wheel Nut | 16. Steering Column Housing |
| 3. Locking Plate | 17. Steering Column Jacket |
| 4. Steering Wheel | 18. Ignition Switch Retaining Screw |
| 5. Steering Column Upper Cover | 19. Ignition Switch |
| 6. Steering Column Lower Cover | 20. Steering Lock Housing Assembly |
| 7. Turn Signal Switch | 21. Steering Column Shaft |
| 8. Windshield Wiper Switch | 22. Pinch Bolt |
| 9. Steering Column Assembly | 23. Intermediate Shaft |
| 10. Retaining Ring | 24. Steering Column Upper Nut |
| 11. Washer | 25. Steering Column Lower Nut |
| 12. Spring | |
| 13. Switch Housing | |
| 14. Bolt | |

DIAGNOSTIC INFORMATION AND PROCEDURES

STEERING COLUMN DIAGNOSIS

Lock System

Condition	Probable Cause	Correction
Lock System Will Not Unlock	<ul style="list-style-type: none"> ● Damaged lock cylinder. 	<ul style="list-style-type: none"> ● Replace the lock cylinder.
	<ul style="list-style-type: none"> ● The lack of free movement for the ignition switch. 	<ul style="list-style-type: none"> ● Lubricate the ignition switch.
	<ul style="list-style-type: none"> ● Improper binding or damaged steering column housing. 	<ul style="list-style-type: none"> ● Remove the steering shaft and clear the steering column housing. ● Replace the steering column housing as needed.
Lock System Will Not Lock	<ul style="list-style-type: none"> ● Damaged lock cylinder. 	<ul style="list-style-type: none"> ● Replace the lock cylinder.
	<ul style="list-style-type: none"> ● The lack of free movement for the ignition switch. 	<ul style="list-style-type: none"> ● Lubricate the ignition switch.
	<ul style="list-style-type: none"> ● Improper binding or damaged steering column housing. 	<ul style="list-style-type: none"> ● Remove the steering shaft and clear the steering column housing. ● Replace the steering column housing as needed.
High Lock Effort	<ul style="list-style-type: none"> ● Damaged lock cylinder. 	<ul style="list-style-type: none"> ● Replace the lock cylinder.
	<ul style="list-style-type: none"> ● The lack of free movement for the ignition switch. 	<ul style="list-style-type: none"> ● Lubricate the ignition switch.
	<ul style="list-style-type: none"> ● Extreme misalignment of the housing to the cover. 	<ul style="list-style-type: none"> ● Realign the cover on the housing. ● Replace the cover as needed.
Key Cannot Be Removed in the B Position	<ul style="list-style-type: none"> ● The ignition switch to be set incorrectly. 	<ul style="list-style-type: none"> ● Reset the ignition switch.
	<ul style="list-style-type: none"> ● Damaged lock cylinder. 	<ul style="list-style-type: none"> ● Replace the lock cylinder.

Column

Condition	Probable Cause	Correction
Noise in the Column	<ul style="list-style-type: none"> ● Improperly installed intermediate shaft-to-column joints. 	<ul style="list-style-type: none"> ● Tighten the coupling pinch bolts. ● Replace the intermediate shaft as needed.
	<ul style="list-style-type: none"> ● Column misalignment. 	<ul style="list-style-type: none"> ● Replace the alignment spacer.
	<ul style="list-style-type: none"> ● The lack of lubrication for the joint. 	<ul style="list-style-type: none"> ● Lubricate the joint.
	<ul style="list-style-type: none"> ● The lack of lubrication for the steering shaft. 	<ul style="list-style-type: none"> ● Lubricate the steering shaft bearing.
	<ul style="list-style-type: none"> ● Improperly seated shaft lock snap ring. 	<ul style="list-style-type: none"> ● Adjust the shaft lock snap ring. ● Replace the shaft lock snap ring as needed.
	<ul style="list-style-type: none"> ● Improperly installed intermediate shaft pinch bolt. 	<ul style="list-style-type: none"> ● Tighten the pinch bolt.
High Steering Shaft Effort	<ul style="list-style-type: none"> ● Column misalignment. 	<ul style="list-style-type: none"> ● Replace the alignment spacer.
	<ul style="list-style-type: none"> ● A damaged bearing. 	<ul style="list-style-type: none"> ● Replace the steering column housing.
	<ul style="list-style-type: none"> ● The lack of free movement for the steering shaft universal joint. 	<ul style="list-style-type: none"> ● Lubricate the steering shaft universal joint. ● Replace the steering column shaft as needed.

Column (Cont'd)

Condition	Probable Cause	Correction
Lash in the Steering Column	<ul style="list-style-type: none"> ● Improperly installed steering column bracket mounting nuts. 	<ul style="list-style-type: none"> ● Tighten the steering column bracket mounting nuts.
	<ul style="list-style-type: none"> ● Loose steering column housing-to-steering column jacket support bolts. 	<ul style="list-style-type: none"> ● Tighten the support bolts.
Loose Steering Wheel	<ul style="list-style-type: none"> ● The bearing to be seated incorrectly in the housing. 	<ul style="list-style-type: none"> ● Correctly seat the bearing. ● Replace the column housing as needed.
	<ul style="list-style-type: none"> ● Loose steering column housing support bolts. 	<ul style="list-style-type: none"> ● Tighten the steering column housing support bolts.

Turn Signal / Dimmer Switch

Condition	Probable Cause	Correction
Turn Signal Will Not Stay in the Turn Position	<ul style="list-style-type: none"> ● An improperly installed turn signal switch. 	<ul style="list-style-type: none"> ● Remove and inspect the turn signal switch. ● Reinstall the switch.
	<ul style="list-style-type: none"> ● The broken or missing components for the cancelling mechanism. 	<ul style="list-style-type: none"> ● Replace the turn signal switch.
	<ul style="list-style-type: none"> ● Foreign material in the turn signal switch housing. 	<ul style="list-style-type: none"> ● Remove any foreign material.
Turn Signal Will Not Cancel	<ul style="list-style-type: none"> ● Broken or missing components for the cancelling mechanism. 	<ul style="list-style-type: none"> ● Replace the turn signal switch.
Turn Signal/Dimmer Switch Difficult to Operate	<ul style="list-style-type: none"> ● Improperly installed turn signal/dimmer switch and turn signal/dimmer switch lever. 	<ul style="list-style-type: none"> ● Remove and inspect the turn signal/dimmer switch and signal/dimmer switch lever. ● Reinstall the signal/dimmer switch and signal/dimmer switch lever.
	<ul style="list-style-type: none"> ● Foreign material in the signal/dimmer switch housing. 	<ul style="list-style-type: none"> ● Remove any foreign material.
Turn Signal Will Not Indicate Lane Change	<ul style="list-style-type: none"> ● A broken lane change pressure pad or a broken spring hanger. 	<ul style="list-style-type: none"> ● Replace the turn signal switch.
	<ul style="list-style-type: none"> ● The improper functioning of the lane change spring. 	<ul style="list-style-type: none"> ● Replace the turn signal switch.
	<ul style="list-style-type: none"> ● Improperly installed turn signal switch. 	<ul style="list-style-type: none"> ● Replace the turn signal switch.
No Turn Signal Lamps	<ul style="list-style-type: none"> ● An inoperative turn signal flasher. 	<ul style="list-style-type: none"> ● Replace the blinker unit.
	<ul style="list-style-type: none"> ● A faulty turn signal switch. 	<ul style="list-style-type: none"> ● Replace the turn signal switch.
	<ul style="list-style-type: none"> ● Improperly connected chassis-to-column connector. 	<ul style="list-style-type: none"> ● Reconnect the chassis-to-column connector.
Turn Indicator Lamps On, But Not Flashing	<ul style="list-style-type: none"> ● An inoperative blinker unit. 	<ul style="list-style-type: none"> ● Replace the blinker unit.
Front or Rear Turn Signal Lamps Not Flashing	<ul style="list-style-type: none"> ● An inoperative blinker unit. 	<ul style="list-style-type: none"> ● Replace the blinker unit.
Turn Signal Lamps Flash Very Slowly	<ul style="list-style-type: none"> ● An inoperative blinker unit. 	<ul style="list-style-type: none"> ● Replace the blinker unit.

Ignition Switch

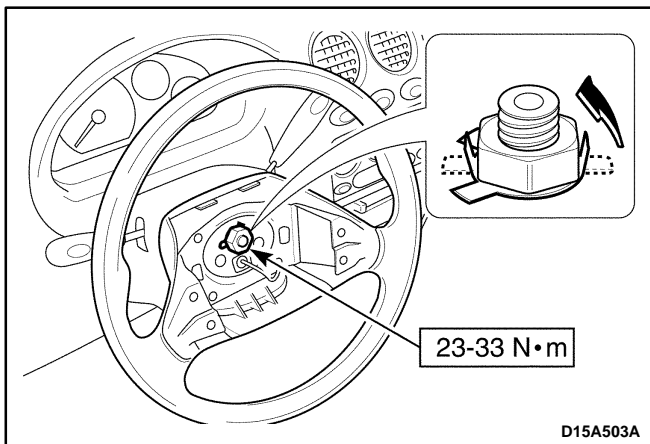
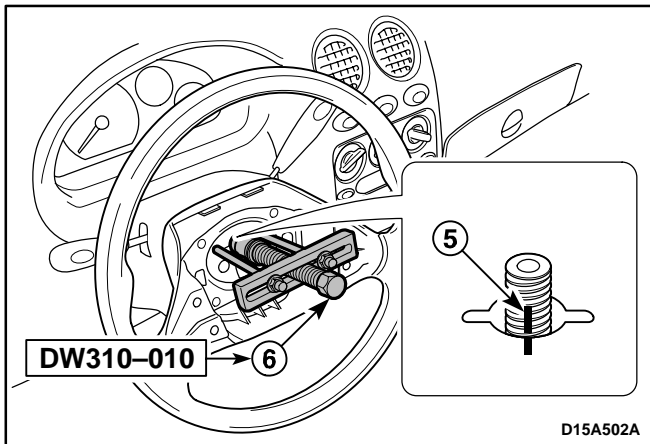
Condition	Probable Cause	Correction
Electrical System Will Not Function	<ul style="list-style-type: none"> ● Damaged ignition switch. 	<ul style="list-style-type: none"> ● Replace the ignition switch.
	<ul style="list-style-type: none"> ● Improperly installed ignition switch. 	<ul style="list-style-type: none"> ● Remove and inspect the ignition switch. ● Reinstall the ignition switch.
	<ul style="list-style-type: none"> ● Improperly installed ignition switch electrical connector. 	<ul style="list-style-type: none"> ● Reconnect the ignition switch electrical connector. ● Replace the ignition switch electrical connector.
Ignition Switch Will Not Turn	<ul style="list-style-type: none"> ● Damaged ignition switch. 	<ul style="list-style-type: none"> ● Replace the ignition switch.
	<ul style="list-style-type: none"> ● Improperly installed ignition switch. 	<ul style="list-style-type: none"> ● Remove and inspect the ignition switch. ● Reinstall the ignition switch.

Wiper Switch Lever

Condition	Probable Cause	Correction
Switch Inoperative : No I, Low, High, Int or Wash	<ul style="list-style-type: none"> ● Damaged wiper switch. 	<ul style="list-style-type: none"> ● Replace the wiper switch.
	<ul style="list-style-type: none"> ● Improperly installed wiper switch. 	<ul style="list-style-type: none"> ● Remove and inspect the wiper switch. ● Reinstall the wiper switch.

REPAIR INSTRUCTIONS

ON-VEHICLE SERVICE



STEERING WHEEL

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

Tools Required

DW310-010, Steering Wheel Puller

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the SIR module. Refer to *Section 8B, Supplemental Inflatable Restraints*. (For vehicle with SIR)
3. Remove the steering wheel.
4. Remove the steering wheel horn cover (For vehicle without SIR) (1).
 - Straighten the bending locking plate (2).
 - Remove the nut (3).
 - Remove the locking plate (4).
 - In order to install the steering wheel correctly, match-mark the steering column shaft to the steering wheel (5).
 - Remove the steering wheel using the steering wheel puller DW310-010 (6).

Important: Be careful not to hit the top of steering column shaft with hammer during repair work.

Installation Procedure

1. Install the SIR module. Refer to *Section 8B, Supplemental Inflatable Restraints* (For vehicle with SIR).

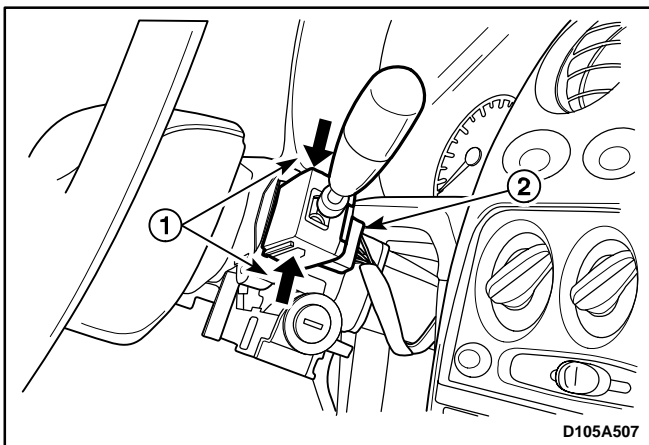
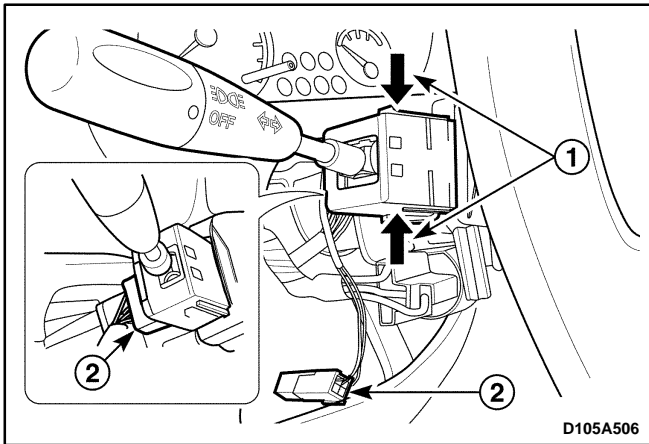
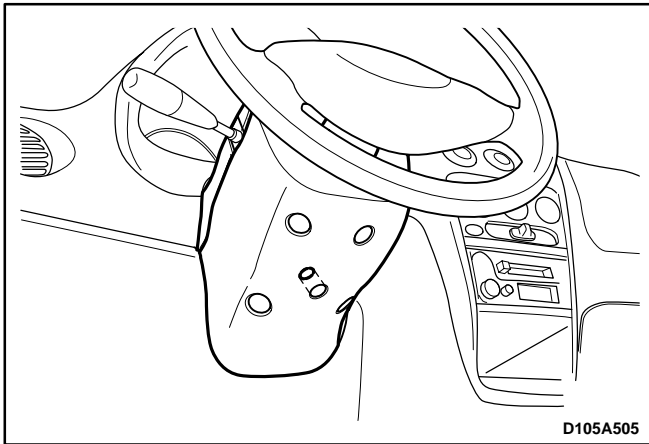
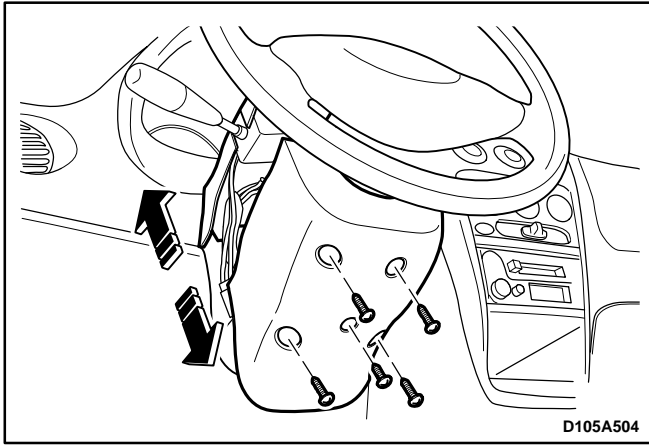
Important: Align the match marks on the steering wheel and the steering column shaft.

2. Install the steering wheel with the nut and the locking plate.

Tighten

Tighten the steering wheel nut to 23-33 N•m (17-24 lb-ft).

3. Bend the tabs to secure the locking plate.
4. Install the steering wheel horn cover (For vehicle without SIR).
5. Connect the negative battery cable.



STEERING COLUMN COVER
(Left-Hand Drive Shown, Right-Hand Drive Similar)
Removal Procedure

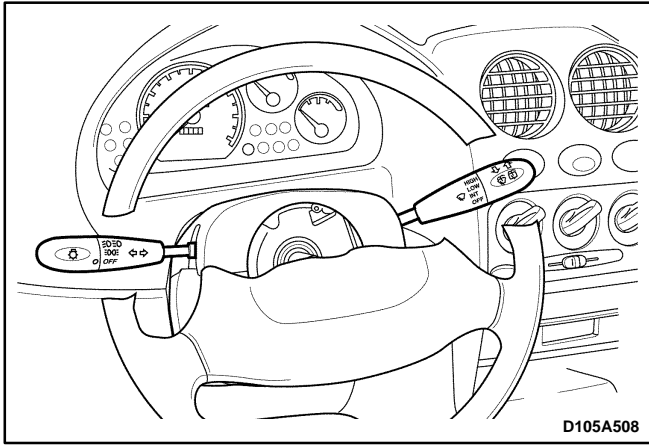
1. Remove the screws.
2. Remove the steering column lower and upper cover.

Installation Procedure

1. Install the steering column lower and upper cover with the screws.

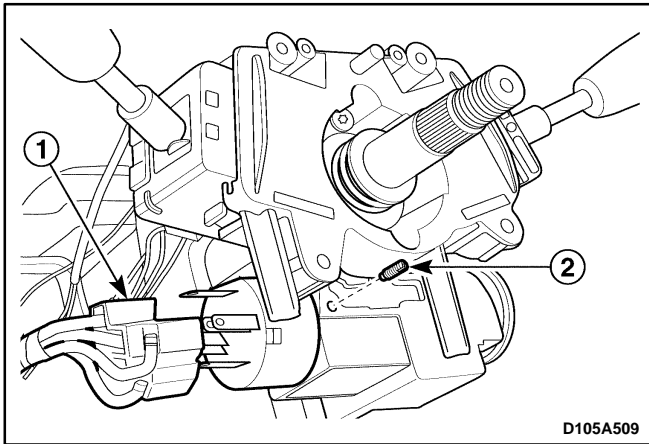
TURN SIGNAL SWITCH AND LEVER/ WIPER SWITCH AND LEVER
(Left-Hand Drive Shown, Right-Hand Drive Similar)
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the steering column cover. Refer to “Steering Column Cover” in this section.
3. Remove the turn signal switch.
 - Disconnect the turn signal switch by pushing the locking from the switch housing (1).
 - Disconnect the connector (2).
4. Remove the wiper switch.
 - Disconnect the wiper switch by pushing the locking from the switch housing (1).
 - Disconnect the connector (2).



Installation Procedure

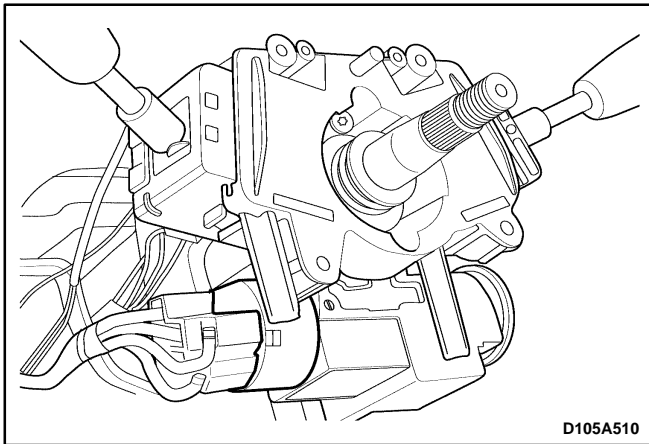
1. Install the wiper switch.
2. Install the turn signal switch.
3. Install the steering column cover. Refer to "Steering Column Cover" in this section.
4. Connect the negative battery cable.



IGNITION SWITCH

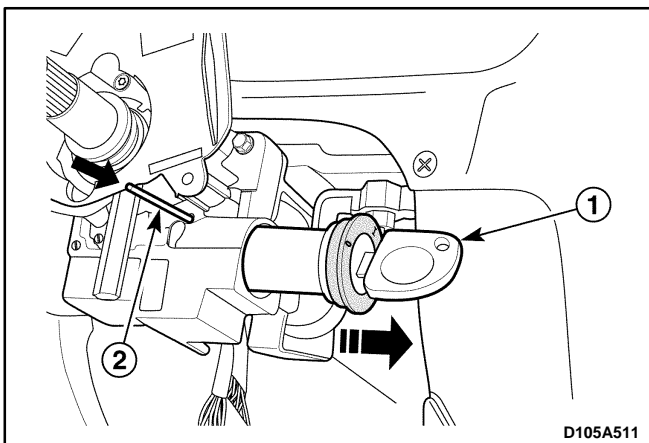
Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the steering wheel. Refer to "Steering Wheel" in this section.
3. Remove the ignition switch.
 - Disconnect the electrical connector (1).
 - Remove the screw (2).



Installation Procedure

1. Connect the electrical connector.
2. Install the ignition switch with the screw.
3. Install the steering wheel. Refer to "Steering Wheel" in this section.
4. Connect the negative battery cable.

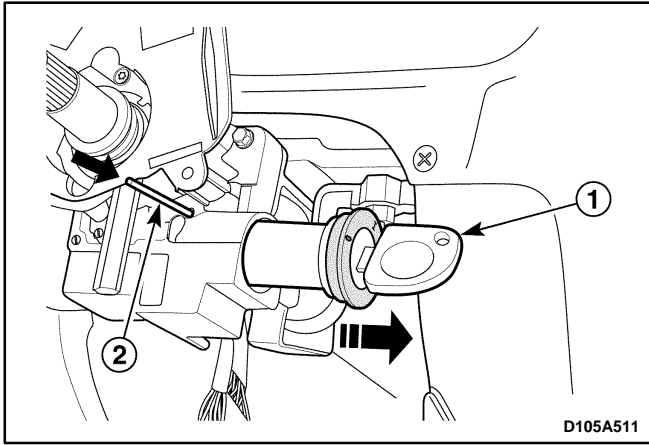


IGNITION LOCK CYLINDER WITH IMMOBILIZER

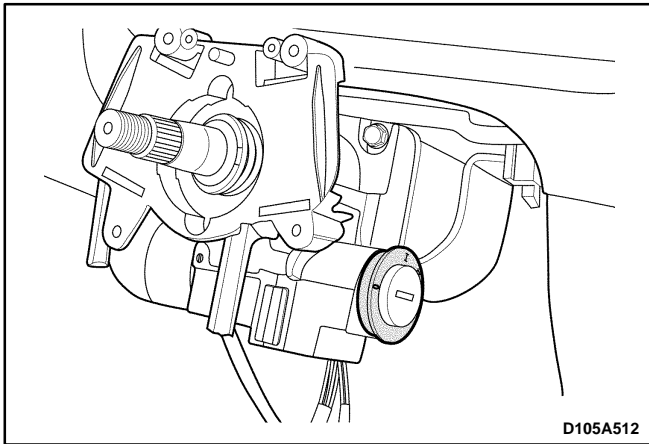
(Left-Hand Drive Shown, Right-Hand Drive Similar)

Removal Procedure

1. Remove the steering wheel. Refer to "Steering Wheel" in this section.
2. Disconnect the electrical connector for the immobilizer detection coil.
3. Remove the lock cylinder.
 - With the key in the ignition, turn to the position designated I (1).



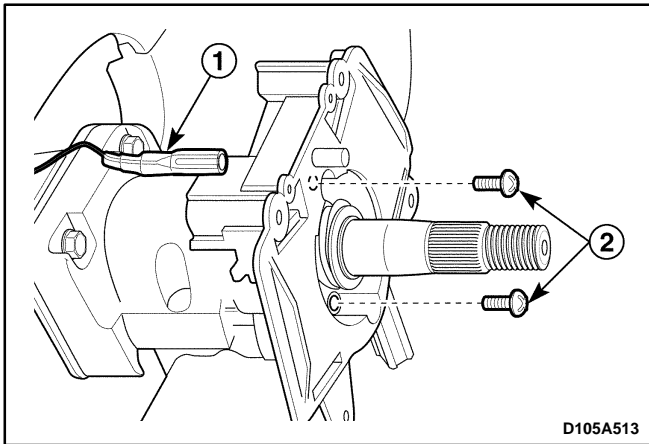
- Remove the lock cylinder by pressing down the detent spring with a 2.5MM allen wrench, or other suitable tool, and pulling the lock cylinder out of the switch cylinder housing (2).



Installation Procedure

Important: To install the ignition lock cylinder the ignition position should be designated I.

1. Install the ignition lock cylinder.
2. Connect the electrical connector for the immobilizer detection coil.
3. Install the steering wheel. Refer to "Steering Wheel" in this section.

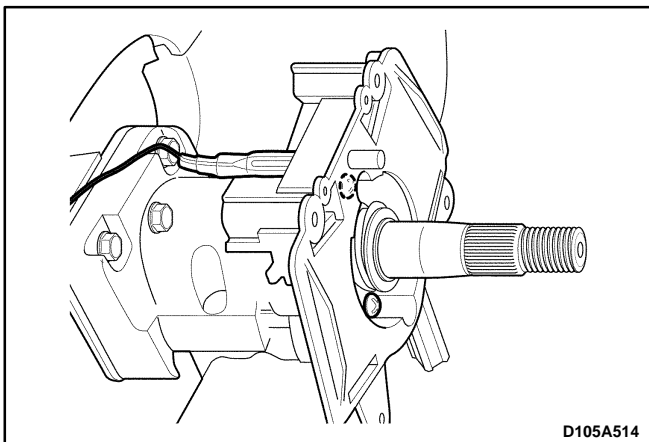


SWITCH HOUSING

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

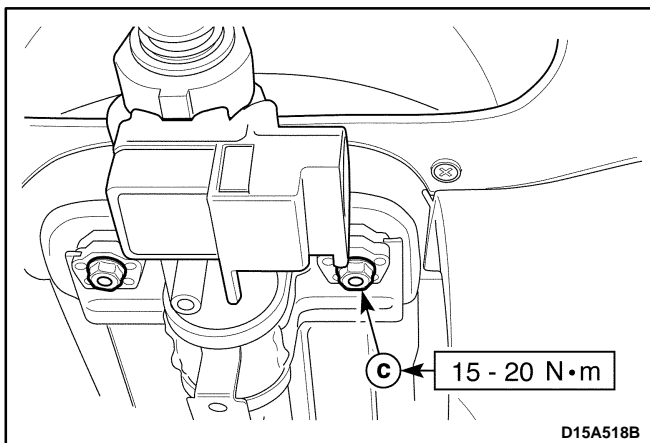
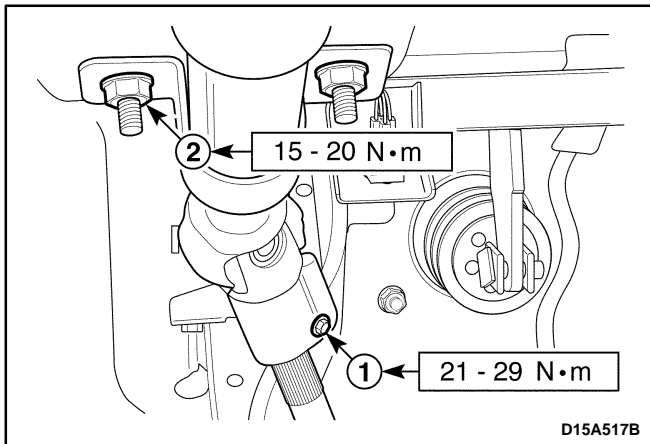
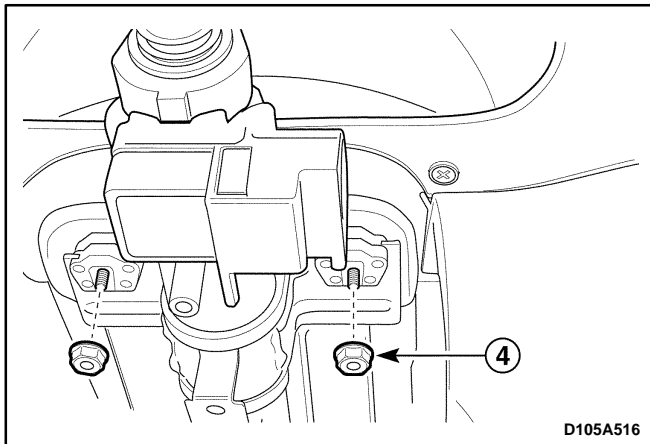
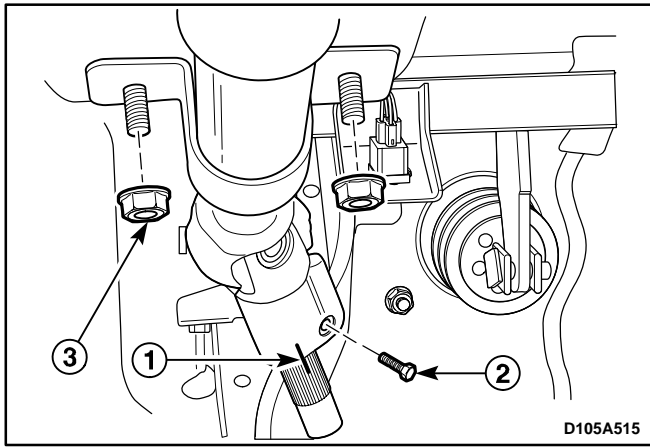
Removal Procedure

1. Remove the steering wheel. Refer to "Steering Wheel" in this section.
2. Remove the turn signal switch and windshield wiper switch. Refer to "Turn Signal Switch and Lever/Wiper Switch and Lever" in this section.
3. Remove the switch housing.
 - Disconnect the horn electrical connector (1).
 - Remove the screws retaining the switch housing (2).



Installation Procedure

1. Install the switch housing with the screws.
2. Connect the horn electrical connector.
3. Install the turn signal switch and windshield wiper switch. Refer to "Turn Signal Switch and Lever/Wiper switch and Lever" in this section.
4. Install the steering wheel. Refer to "Steering Wheel" in this section.



STEERING COLUMN

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

Removal Procedure

1. Remove the steering wheel. Refer to “Steering Wheel” in this section.

Caution: *Disconnect the negative battery cable and let the vehicle sit for 1 minute to deactivate the air-bag (For vehicle with SIR)*

2. Remove the turn signal switch and wiper switch. Refer to “Turn Signal Switch and Lever/Wiper Switch and Lever” in this section.

3. Remove the switch housing. Refer to “Switch Housing” in this section.

4. Remove the ignition switch. Refer to “Ignition Switch” in this section.

5. Remove the ignition lock cylinder. Refer to “Ignition Lock Cylinder” in this section.

6. Remove the steering column.

- Match-mark on the intermediate shaft and the steering column shaft (1).
- Remove the intermediate shaft upper pinch bolt (2).
- Remove the steering column lower nuts (3).
- Remove the steering column upper nuts (4).

Installation Procedure

Important: Align the match-mark on the intermediate shaft and the steering column shaft.

1. Install the steering column.

- Install the intermediate shaft upper pinch bolt (1).

Tighten

Tighten the pinch bolt to 21–29 N·m (16–22 lb-ft).

- Install the steering column lower nuts (2).

Tighten

Tighten the nuts to 15–20 N·m (11–15 lb-ft).

- Install the steering column upper nuts (3).

Tighten

Tighten the nuts to 15–20 N·m (11–15 lb-ft).

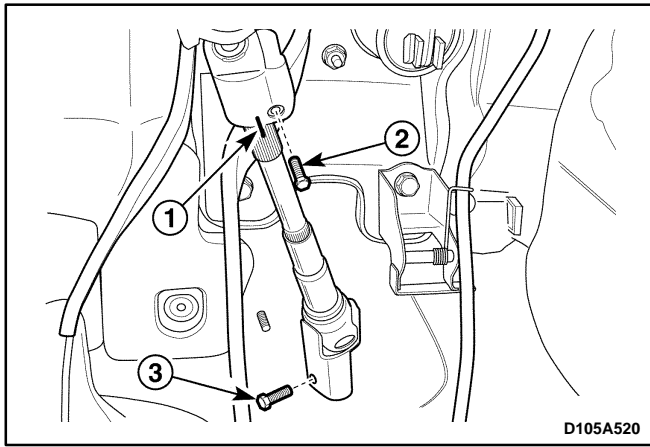
2. Install the ignition lock cylinder. Refer to “Ignition Lock Cylinder” in this section.

3. Install the ignition switch. Refer to “Ignition Switch” in this section.

4. Install the switch housing. Refer to “Switch Housing” in this section.

5. Install the turn signal switch and wiper switch. Refer to “Turn Signal Switch and Lever/Wiper Switch and Lever” in this section.

6. Install the steering wheel. Refer to “Steering Wheel” in this section.

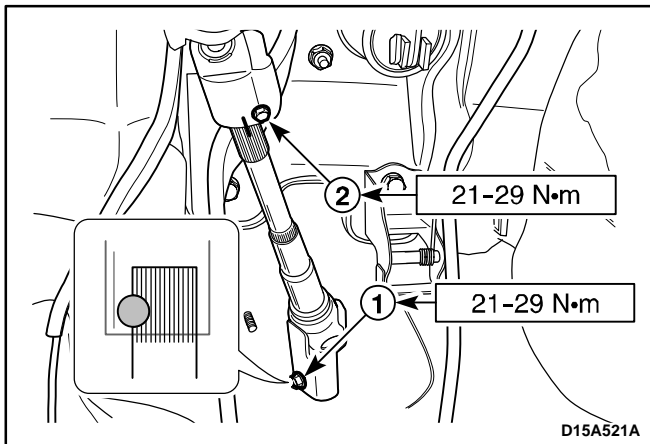


INTERMEDIATE SHAFT COVER AND INTERMEDIATE SHAFT

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

Removal Procedure

1. Remove the intermediate shaft.
 - In order to install the intermediate shaft correctly, match-mark the intermediate shaft to the steering column. (1).
 - Remove the intermediate shaft upper pinch bolt (2).
 - Remove the intermediate shaft lower pinch bolt (3).



Installation Procedure

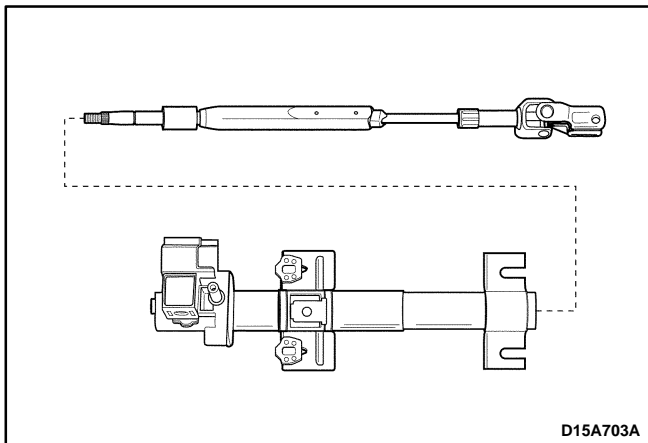
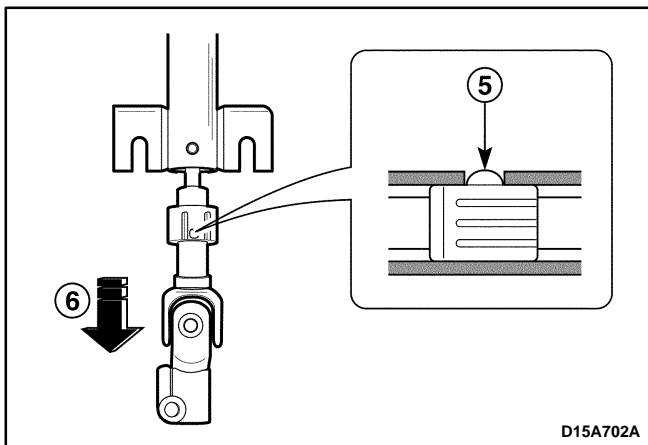
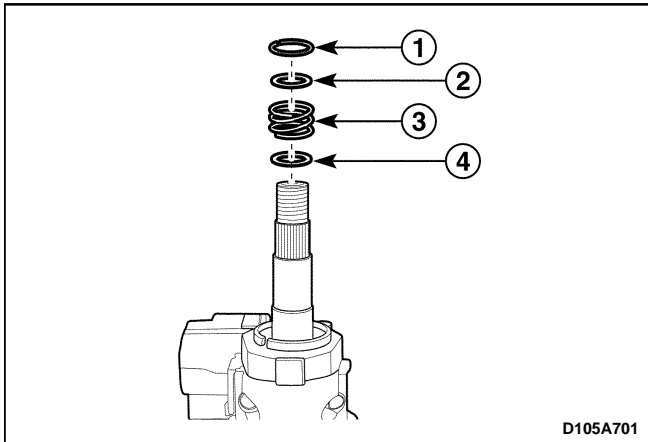
1. Install the intermediate shaft with the bolts.

Tighten

- Tighten the intermediate shaft lower pinch bolt to 21–29 N•m (16–22 lb-ft) (1).
- Tighten the intermediate shaft upper pinch bolt to 21–29 N•m (16–22 lb-ft) (2).

Notice: Check the lower pinch bolt position correctly.

UNIT REPAIR



STANDARD STEERING COLUMN

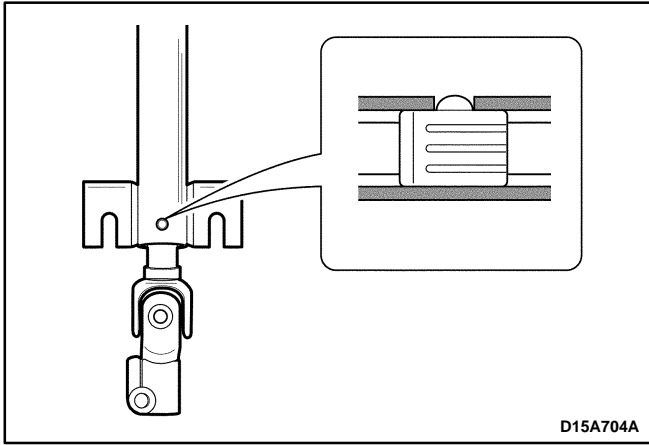
Disassembly Procedure

1. Remove the steering column from the vehicle. Refer to "Steering Column" in this section.

Caution: *Be careful not to impact on the steering column shaft. Plastic sleeve may be broken that is installed to secure the driver at the accident.*

2. Remove the steering column shaft from the steering column.

- Remove the retaining ring (1).
- Remove the washer (2).
- Remove the spring (3).
- Remove the washer (4).
- Remove the locking of the alignment spacer (5).
- Push strongly the steering column shaft downward (6).



Assembly Procedure

Important: Position the alignment spacer on the lower column shaft to install the spacer in the steering column jacket easily.

1. Install the steering column shaft to the steering column.
 - Position the locking of the alignment spacer on the groove of the steering column.
 - Install the washer.
 - Install the spring.
 - Install the washer.
 - Install the retaining ring.
2. Install the steering column to the vehicle. Refer to "Steering Wheel" in this section.

SPECIFICATIONS

GENERAL SPECIFICATIONS

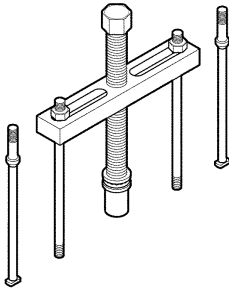
Application		Unit	Description
Steering Wheel	Diameter	With Airbag	mm (in.)
		Without Airbag	mm (in.)
	Free Play (Engine Stop)		mm (in.)

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb-Ft	Lb-In
Steering Wheel Nut	23 – 33	17 – 24	–
Steering Column Upper Nuts	15 – 20	11 – 15	–
Steering Column Lower Nuts	15 – 20	11 – 15	–
Intermediate Shaft Upper Pinch Bolt	21 – 29	16 – 22	–
Intermediate Shaft Lower Pinch Bolt	21 – 29	16 – 22	–

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS TABLE

 <p>D105A101</p>	<p>DW310-010 Steering Wheel Puller</p>
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