

STEERING COLUMN

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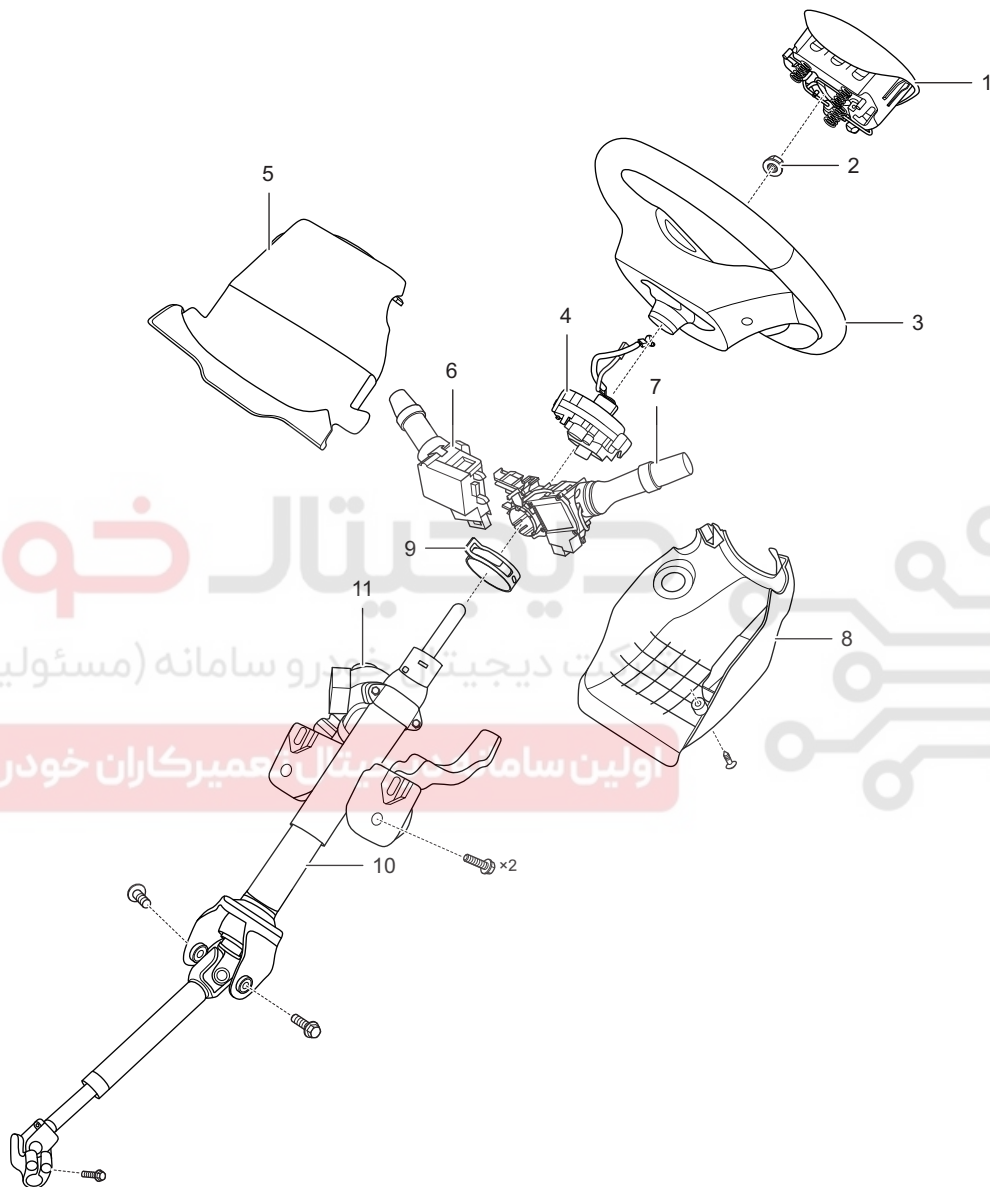


GENERAL INFORMATION

Description

Steering Column

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RM1A280010

28 - STEERING COLUMN

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1 - Driver Airbag	2 - Steering Wheel Assembly Fixing Nut
3 - Steering Wheel Assembly	4 - Spiral Cable
5 - Combination Switch Upper Cover	6 - Wiper Switch
7 - Combination Light Switch	8 - Combination Switch Lower Cover
9 - Clamp	10 - Steering Column with Intermediate Shaft Assembly
11 - Ignition Switch	

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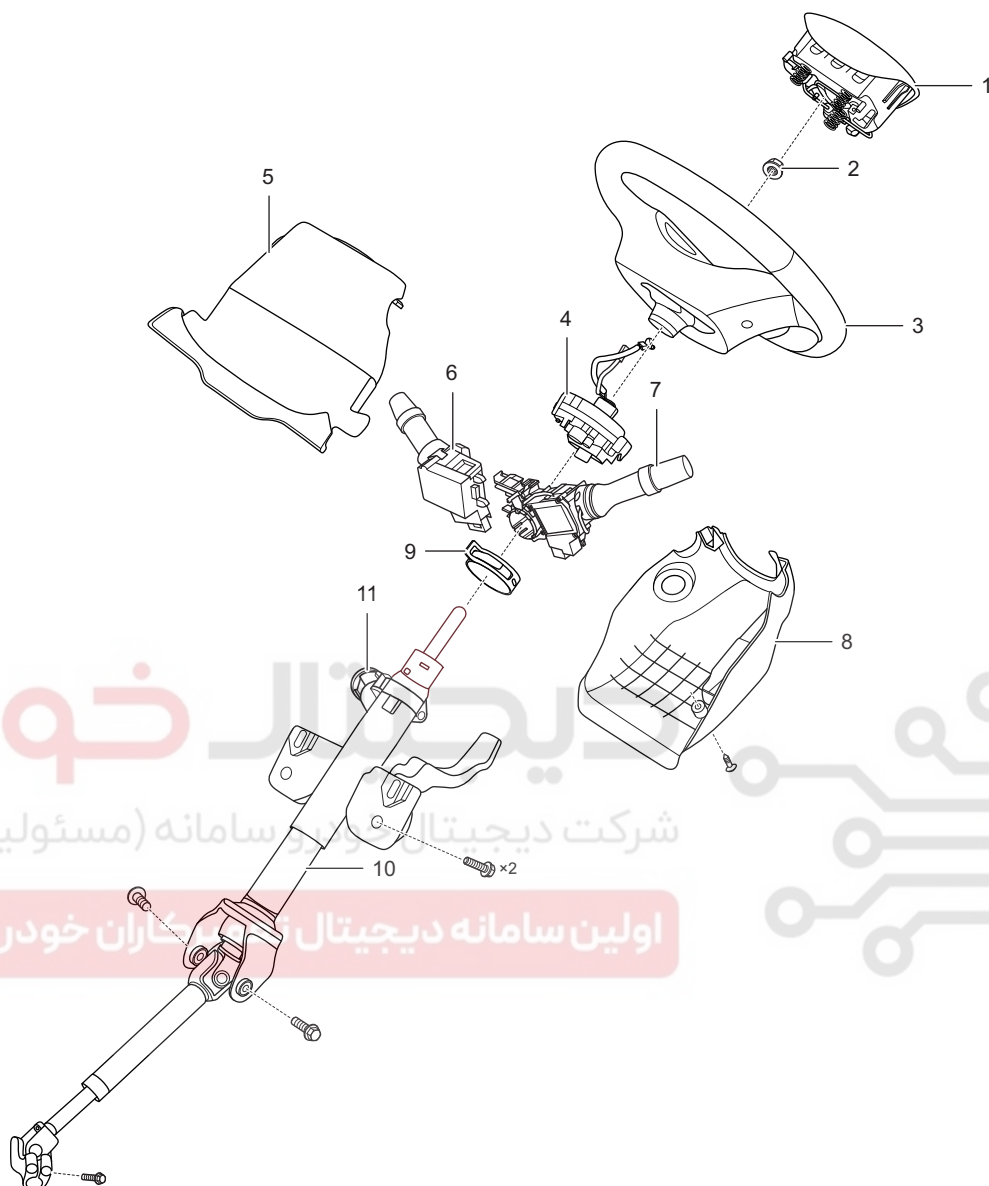
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W/ Electronic Steering Column Lock (for MT Model)

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RM1A280015

1 - Driver Airbag	2 - Steering Wheel Assembly Fixing Nut
3 - Steering Wheel Assembly	4 - Coil Spring
5 - Combination Switch Upper Cover	6 - Wiper Switch
7 - Combination Light Switch	8 - Combination Switch Lower Cover
9 - Clamp	10 - Steering Column with Intermediate Shaft Assembly
11 - Electronic Steering Column Lock	

28 - STEERING COLUMN

Specifications

Torque Specifications

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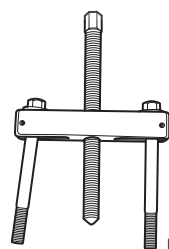
Description	Torque (N·m)
Steering Wheel Assembly Fixing Nut	30 ± 3
Combination Switch Cover Fixing Screw	1.5 ± 0.5
Steering Column Assembly Upper Bracket Fixing Bolt	25 ± 3
Steering Column Assembly Lower Bracket Fixing Bolt	25 ± 3
Coupling Bolt Between Steering Column with Intermediate Shaft Assembly and Steering Gear Input Shaft	30 ± 3
Ignition Starting Switch Fixing Screw	13 ± 2
Coupling Bolt Between Electronic Power Steering Column and Intermediate Shaft	50

Data Specifications

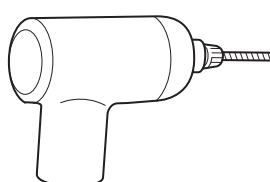
Description	Standard Value
Steering Wheel Free Play (Rotation Angle)	$\leq 15^\circ$
Steering Wheel Centering/Returnability (Rotation Angle)	$> 70^\circ$

Tools

Special Tool

Steering Wheel Remover	 RCH0000014
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General Tool

Electric Drill	 RCH0000013
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DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

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Steering System

Symptom	Suspected Area	See page
Steering wheel assembly cannot lock or unlock	Ignition key cylinder	28-17
	Ignition switch lock body	28-17
Steering wheel assembly has no or excessive free play	Front axle hub bearing (seriously worn)	22-14
	Intermediate shaft with universal joint assembly (seriously worn)	28-15
	Ball pin assembly (worn or loosen)	29-17
	Steering tie rod assembly	29-19
	Steering gear assembly (improper engagement gap of rack and pinion)	29-21
Hard steering	Front tire (improperly inflated or unevenly worn)	24-7
	Front wheel alignment (incorrect)	23-33
	Front sub frame welding assembly	22-17
	Intermediate shaft with universal joint assembly (insufficiently lubricated)	28-15
	Ball pin assembly (insufficiently lubricated)	29-17
	Steering tie rod assembly	29-19
	Steering column assembly	28-15
	Steering gear assembly	29-21
Poor returnability	Front tire (improperly inflated or unevenly worn)	24-7
	Front wheel alignment (incorrect)	23-33
	Front suspension	23-10
	Ball pin assembly (loosen, insufficiently lubricated)	29-17
	Steering tie rod assembly	29-19
	Intermediate shaft with universal joint assembly (loosen, insufficiently lubricated)	28-15
	Steering column assembly (stuck)	28-15
	Steering gear assembly (stuck)	29-21

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Symptom	Suspected Area	See page
Knocking (or clunking) sound occurs when steering wheel is turned while steering system is in operation	Intermediate shaft with universal joint assembly	28-15
	Control arm ball pin	23-20
	Control arm	23-18
	Front strut upper connecting plate assembly (w/ insulator)	23-13
	Steering gear assembly	29-21
Friction sound occurs when steering wheel is turned during low speed driving	Steering column assembly	28-15
	Front strut upper connecting plate assembly (w/ insulator)	-
Steering wheel vibrates and noise occurs when steering wheel is turned with vehicle stopped	Steering column assembly	28-15
	Front strut upper connecting plate assembly (w/ insulator)	-

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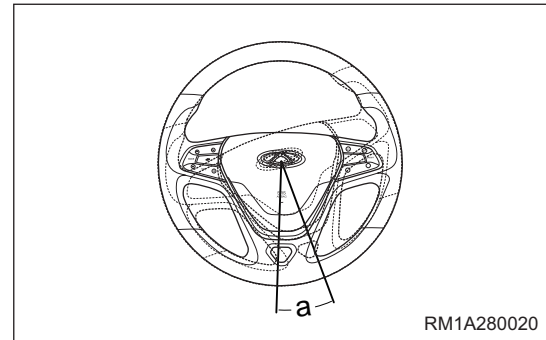
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Steering Wheel Free Play Inspection

1. Stop vehicle and position front wheels straight ahead.
2. Slightly turn steering wheel to left and right, and check rotation angle of steering wheel when wheels start to rotate.
Standard value of free play (rotation angle): $a \leq 15^\circ$.



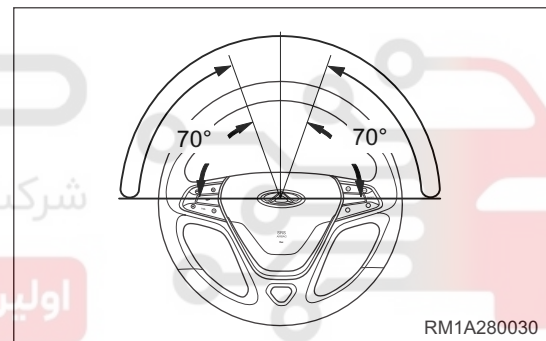
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3. If measured value exceeds standard value, check steering system.

Steering Wheel Centering/Returnability Inspection

Steering wheel centering/returnability inspection should be performed during road test.

1. Perform slow turn and sharp turn tests.
Check for steering effect required for steering wheel and deviation of centering/returnability during left/right turn.
2. When vehicle speed is between 20 and 30 km/h, turn steering wheel to left or right by 90° and hold it for 1 or 2 seconds, and then release the steering wheel. If steering wheel turns back more than 70° , it is determined that steering wheel centering/returnability is in good condition.



3. If steering wheel return angle is not as specified, check tire pressure, steering system and suspension system.

ON-VEHICLE SERVICE

Steering Wheel Assembly

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Removal

WARNING

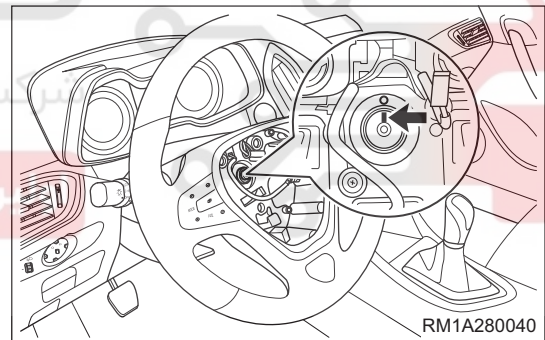
- Be sure to read precautions for SRS airbag before removing steering wheel (See page 31-89).

1. Set steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.

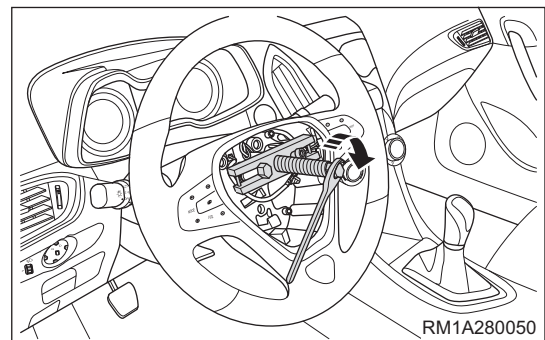
CAUTION

- Wait at least 90 seconds after disconnecting the negative battery cable to prevent airbag and belt pretensioner from being activated.

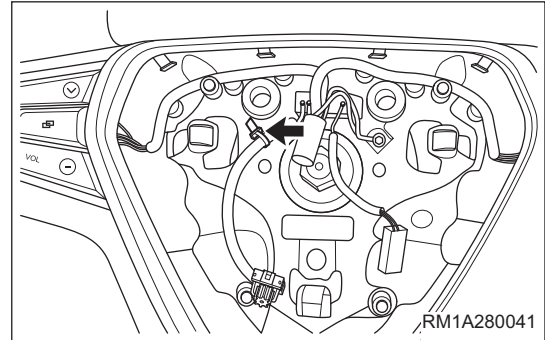
4. Remove the driver airbag assembly (See page 31-89).
5. Remove the steering wheel assembly.
 - a. Secure steering wheel assembly, and put matchmarks on steering wheel assembly and steering column assembly, then remove steering wheel assembly fixing nut.
(Tightening torque: $30 \pm 3 \text{ N}\cdot\text{m}$)



- b. As shown in illustration, install steering wheel remover, and then tighten it with a wrench to disconnect steering wheel assembly from steering column assembly.

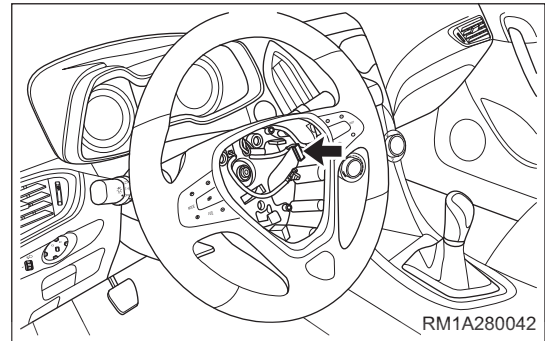


c. Cut the wire harness band (arrow).



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d. Disconnect the steering wheel shortcut connector (arrow).



e. Remove the steering wheel assembly.

CAUTION

- Be careful when removing steering wheel assembly to prevent damage to airbag connector and horn connector on spiral cable.

Inspection

1. Check steering wheel assembly body for damage or deformation. Replace steering wheel assembly if necessary.
2. Check spline inside steering wheel assembly for damage. Replace steering wheel assembly if necessary.

Installation

CAUTION

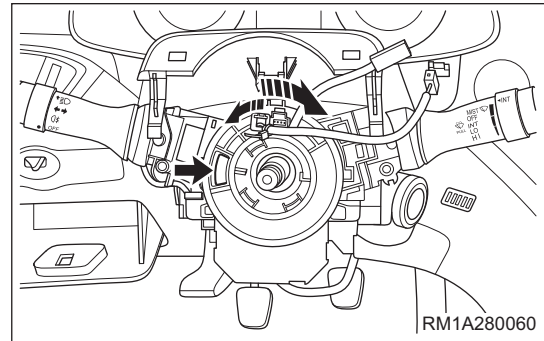
- Check that front wheels are in straight-ahead position before installing steering wheel assembly.

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1. Adjust spiral cable to correct position.

HINT:

Fully turn spiral cable inner circle clockwise when realigning the center, and then turn it counterclockwise to align with ►◄ while yellow ball (arrow) occurs in the clear vertical window. Failure to follow these instructions may affect normal function of airbag system and cause injury to driver.



2. Pass airbag connector and horn connector through the hole of steering wheel assembly, and connect steering wheel shortcut connector. Then align matchmarks on steering wheel assembly and steering column assembly to install steering wheel assembly.
3. Other installation procedures are in the reverse order of removal.

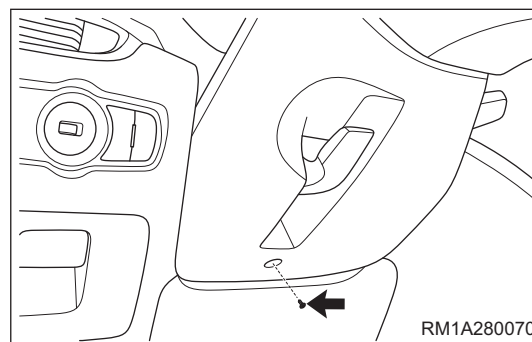
CAUTION

- Tighten steering wheel assembly fixing nut to specified torque.
- Install each connector in place.
- After repair, check that airbag system operates normally.

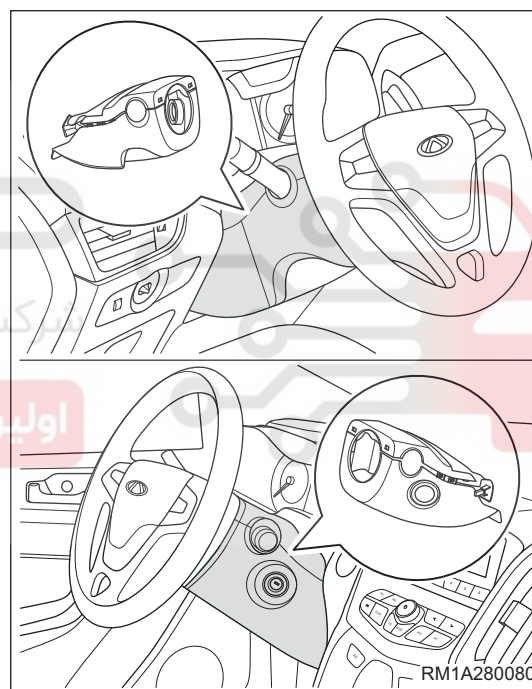
Combination Switch Cover

Removal

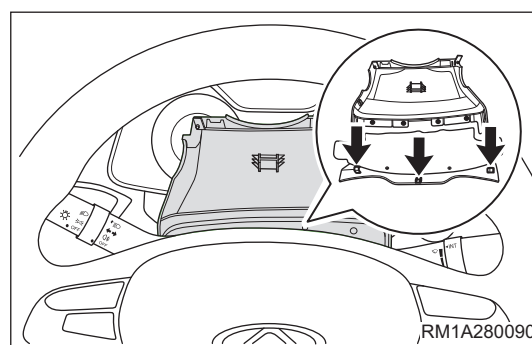
1. Set steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the ignition switch.
3. Remove the combination switch cover.
 - a. Remove lower fixing screw (arrow) from combination switch cover.
(Tightening torque: $2 \pm 0.5 \text{ N}\cdot\text{m}$)



- b. Disengage connecting clip between upper and lower covers, and then separate upper and lower covers to remove lower cover.



- c. Separate 3 clips between upper cover and steering column dust gasket, and then remove upper cover.



CAUTION

- Operate carefully to prevent damage to components during removal.

28 Inspection

1. Check combination switch upper and lower covers for damage or deformation. Replace upper and lower covers if necessary.
2. Check if upper and lower cover clips are normal. Replace upper and lower covers if necessary.

Installation

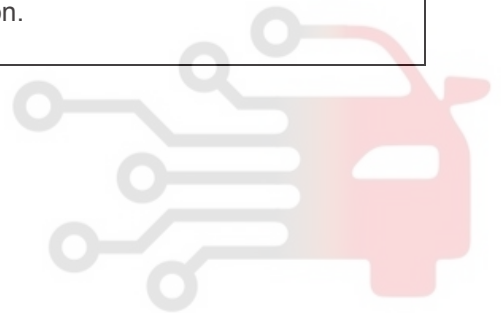
1. Release steering wheel adjusting handle, and adjust steering column assembly to uppermost position, then secure adjusting handle to uppermost position.
2. Insert steering column lower cover at an angle from right side of ignition switch, and then install adjusting handle into cover hole.
3. After adjusting lower cover, install upper cover and attach upper and lower cover clips in place, then install self-tapping screws.

CAUTION

- Tighten self-tapping screws in place.
- Operate carefully to prevent damage to components during installation.

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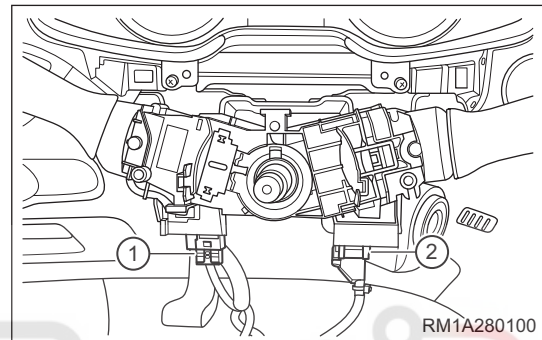
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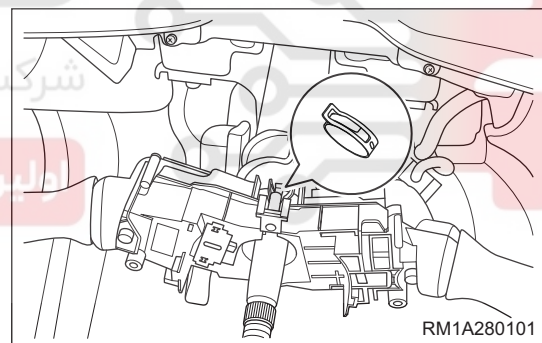
Steering Column with Intermediate Shaft Assembly

Removal

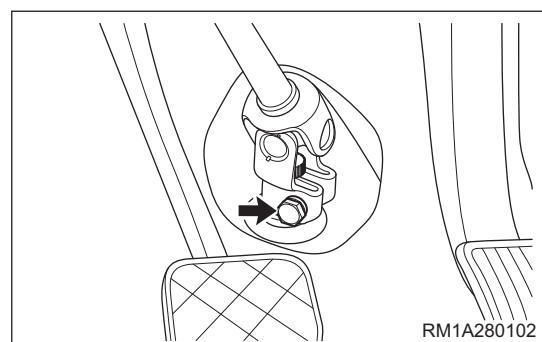
1. Set steering wheel to straight-ahead position.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag assembly (See page 31-89).
5. Remove the steering wheel assembly (See page 28-10).
6. Remove the combination switch cover (See page 28-13).
7. Remove the spiral cable (See page 31-92).
8. Remove the lower left protector assembly (See page 46-15).
9. Remove the combination switch assembly.
 - a. Disconnect combination light switch connector (1) and wiper switch connector (2).



- b. Loosen combination switch clamp and pull combination switch outward, then disconnect combination switch from steering column to remove combination switch.



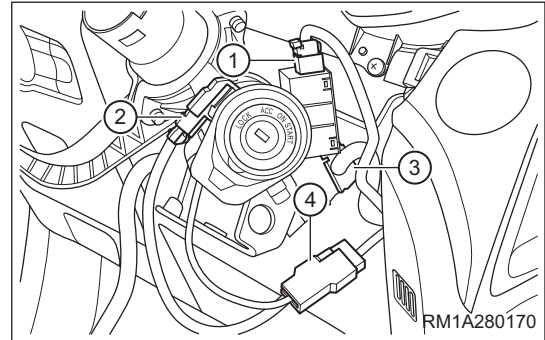
10. Remove the steering column with intermediate shaft assembly.
 - a. Remove coupling bolt between steering column with intermediate shaft assembly and steering gear input shaft.
(Tightening torque: $30 \pm 3 \text{ N}\cdot\text{m}$)



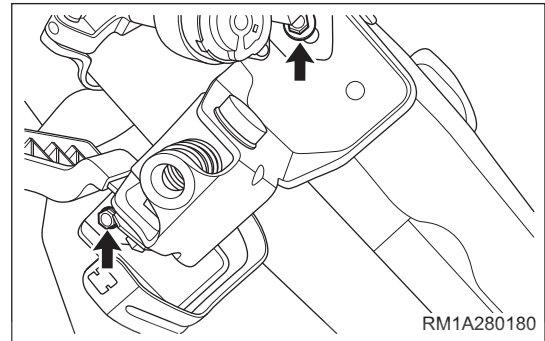
28 - STEERING COLUMN

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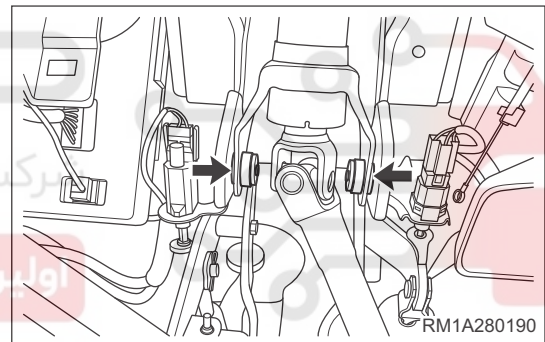
- b. Disconnect anti-theft module connector (1), ignition key connector (2), ignition switch connector (3) and ignition switch illumination light connector (4).



- c. Remove 2 fixing bolts (arrow) from steering column upper bracket.
(Tightening torque: 25 ± 3 N·m)



- d. Remove 2 fixing bolts (arrow) from steering column lower bracket.
(Tightening torque: 25 ± 3 N·m)



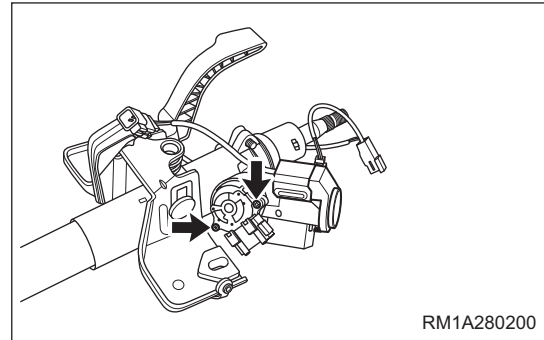
- e. Remove the steering column with intermediate shaft assembly.

 CAUTION

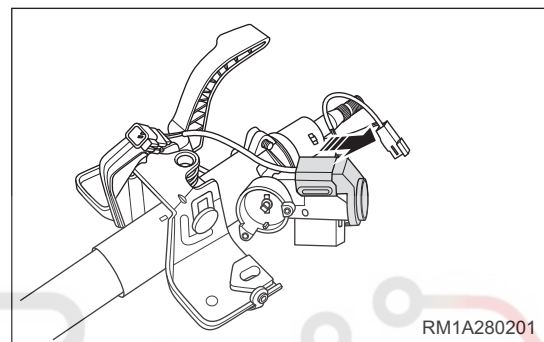
- DO NOT touch interior ornaments when removing steering column with intermediate shaft assembly to avoid scratching interior ornaments.

Disassembly

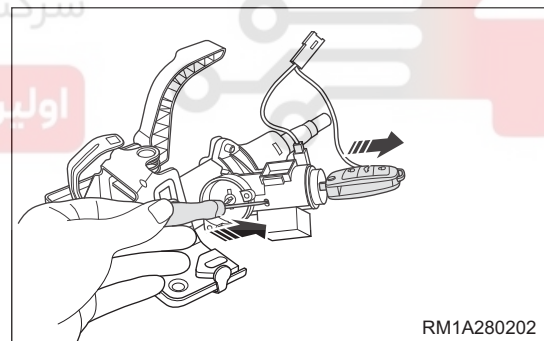
1. Remove the ignition starting switch.
 - a. Remove fixing screws (arrow) from ignition starting switch, and remove ignition starting switch. (Tightening torque: 13 ± 2 N·m)



2. Remove the ignition switch illumination light.
 - a. Remove ignition switch illumination light from ignition switch lock body in direction of arrow.



3. Remove the ignition key cylinder.
 - a. Turn ignition switch key cylinder to ACC with key, and insert a small screwdriver or similar tool into ignition switch lock body hole, then pull out ignition key cylinder.



4. Remove the ignition switch lock body.
 - a. Set steering column assembly onto a vise.

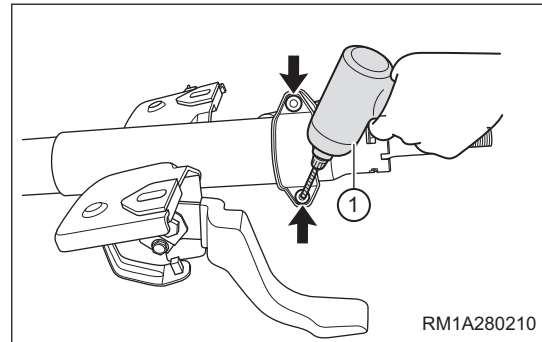
CAUTION

- DO NOT tighten vise excessively.

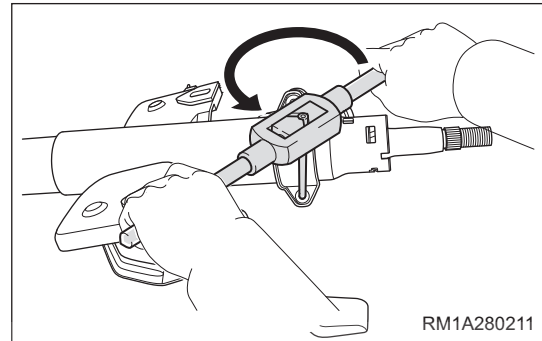
28 - STEERING COLUMN

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- b. Using an electric drill (1), drill a hole on each anti-theft bolt (arrow) of ignition switch lock body.



- c. Using a screw remover, remove anti-theft bolts of ignition switch lock body.



- d. Remove ignition switch lock body and ignition switch fixing clamp.

Inspection

1. Check if ignition switch lock body and key cylinder are normal. Replace ignition switch lock body and key cylinder if necessary.
2. Check steering column assembly for wear, crack or deformation. As welding or correction is not allowed, replace steering column assembly if necessary.
3. Check steering column bearing for looseness, wear or sticking. Replace steering column assembly if necessary.

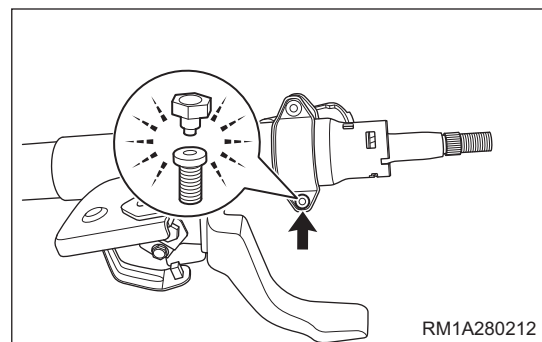
Assembly

1. Install the ignition switch assembly.
 - a. Set steering column assembly onto a vise.

CAUTION

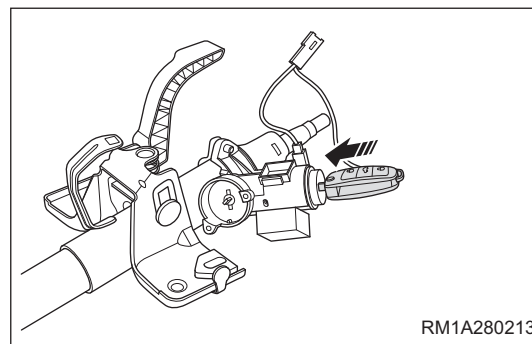
- DO NOT tighten vise excessively.

- b. Install ignition switch assembly to steering column assembly with new anti-theft bolts of ignition switch lock body, and then tighten anti-theft bolts until bolt heads break off.



2. Install the ignition key cylinder.

- a. Push ignition key cylinder into ignition switch lock body until ignition key cylinder fixing block locks in place.



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- b. Check ignition key cylinder for proper operation:

When key is removed, steering lock is locked; when key is inserted and ignition switch is turned to ACC or ON, steering lock is unlocked.

Installation

Installation is in the reverse order of removal.

CAUTION

- Before installing steering column assembly, slide spline at lower part of steering column assembly onto intermediate shaft upper universal joint first.
- Tighten each fixing nut, bolt and screw in place.
- Install each connector in place.

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