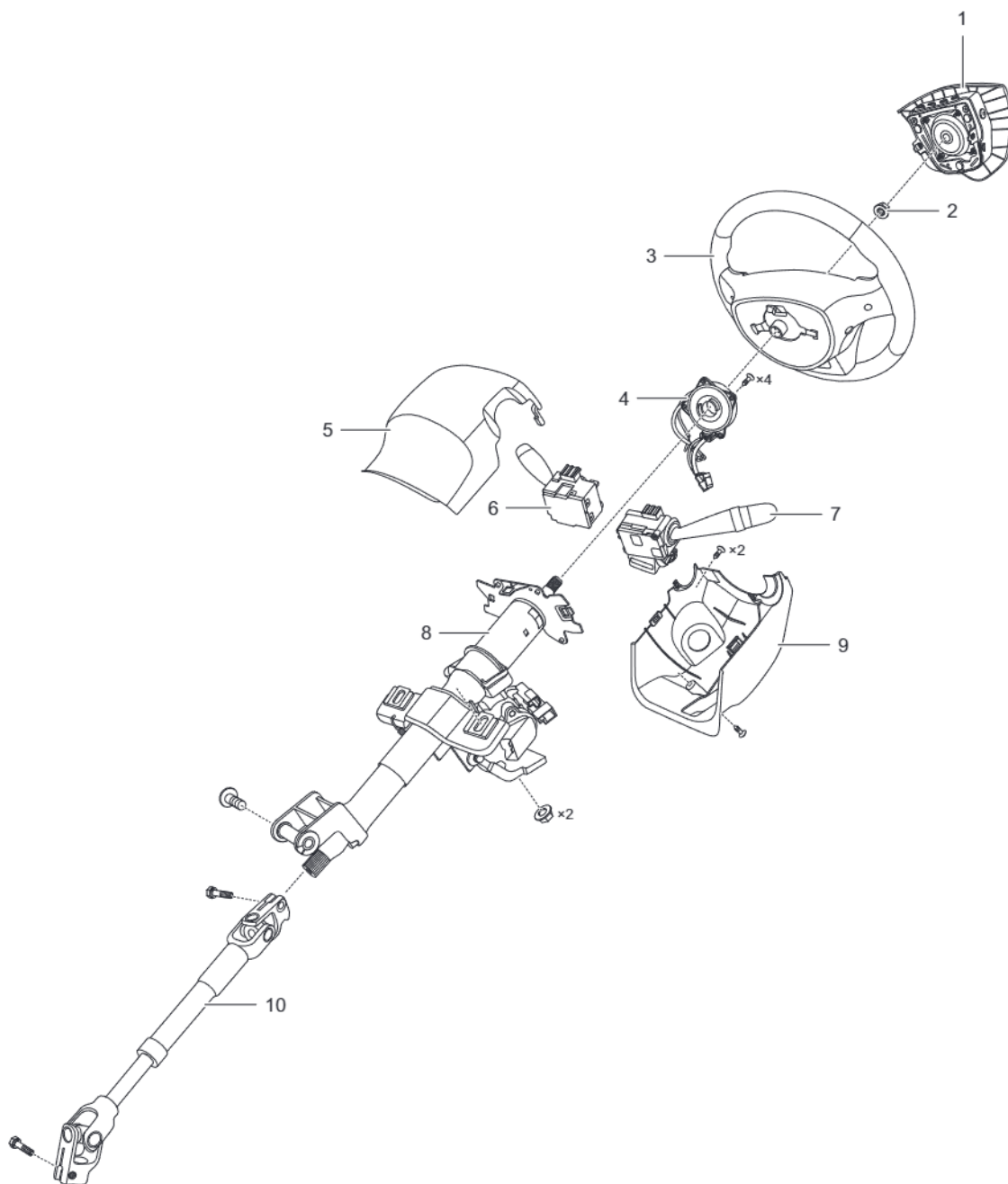

STEERING COLUMN

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GENERAL INFORMATION

Description



RA19270010

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

Specifications

Torque Specifications

Description	Tightening Torque (N·m)
Steering Wheel Assembly Fixing Nut	35 ± 3.5
Combination Switch Cover Fixing Screw	1.5 ± 0.5
Steering Column Upper Bracket Fixing Nut	23 ± 2.5
Steering Column Assembly Lower Bracket Fixing Bolt	25 ± 3
Coupling Bolt Between Steering Column Assembly and Intermediate Shaft with Universal Joint Assembly	23 ± 2.5
Ignition Starting Switch Fixing Screw	13 ± 2
Coupling Bolt Between Intermediate Shaft with Universal Joint Assembly and Steering Gear Input Shaft	30 ± 3
Ignition Switch Illumination Light Fixing Screw	2 ± 2.5

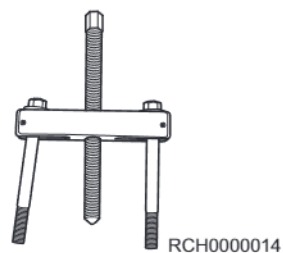
Data Specifications

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

Tools

Special Tool

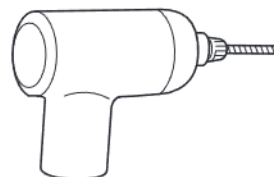
Steering Wheel Remover



RCH0000014

General Tool

Electric Drill



RCH0000013

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

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

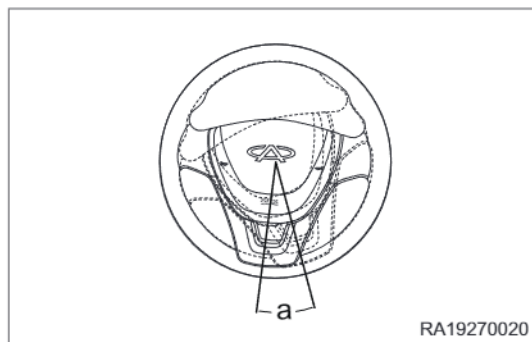
Symptom	Suspected Area	See page
Steering wheel assembly cannot lock or unlock	Ignition key cylinder	27-16
	Ignition switch lock body	27-16
Steering wheel assembly has no free play or is too large	Front axle hub bearing (seriously worn)	21-12
	Intermediate shaft with universal joint assembly (seriously worn)	27-19
	Ball pin assembly (worn or loosen)	28-20
	Steering tie rod assembly	28-22
	Steering gear assembly (improper engagement gap of rack and pinion)	28-24
Hard steering	Front tire (improperly inflated or unevenly worn)	23-8
	Front wheel alignment (wrong)	22-40
	Front sub frame welding assembly	21-16
	Intermediate shaft with universal joint assembly (insufficiently lubricated)	27-19
	Ball pin assembly (insufficiently lubricated)	28-20
	Steering tie rod assembly	28-22
	Steering column assembly	27-14
	Steering gear assembly	28-24
Poor returnability	Front tire (improperly inflated or unevenly worn)	23-8
	Front wheel alignment (wrong)	22-40
	Front suspension	22-11
	Ball pin assembly (loosen, insufficiently lubricated)	28-20
	Steering tie rod assembly	28-22
	Intermediate shaft with universal joint assembly (loosen, insufficiently lubricated)	27-19
	Steering column assembly (stuck)	27-14
	Steering gear assembly (stuck)	28-24

Symptom	Suspected Area	See page
Knocking (or clunking) sound occurs when turning the steering wheel while steering system is in operation	Intermediate shaft with universal joint assembly	27-19
	Control arm ball pin	22-23
	Control arm	22-21
	Steering gear assembly	28-24

Steering Wheel Free Play Inspection

1. Stop the vehicle and position the front wheels straight ahead.
2. Gently turn the steering wheel left and right, and check the rotation angle of steering wheel when the wheels start to rotate.

Standard value of free play (rotation angle): $a \leq 15^\circ$.

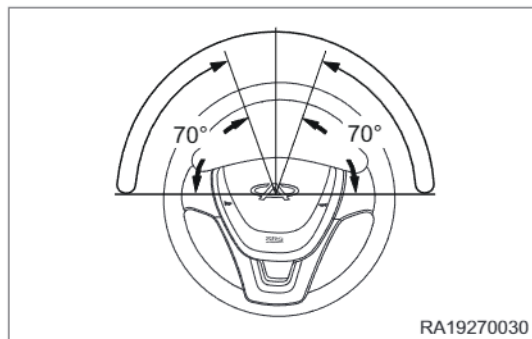


3. If the measured value exceeds the standard value, check the steering system.

Steering Wheel Centering/Returnability Inspection

The steering wheel centering/returnability inspection should be performed during the road test.

1. Perform the slow turn and sharp turn test.
Check for the deviation of steering wheel steering force required during left/right turn and centering/returnability.
2. When the vehicle speed is between 20 and 30 km/h, turn the steering wheel either to left or right by 90° and keep it for 1 or 2 seconds, and then release the steering wheel. If the steering wheel turns more than 70° , it is determined that the steering wheel centering/returnability is in good condition.
3. If the steering wheel returning angle is not as specified, check the tire pressure, steering system and suspension system.



ON-VEHICLE SERVICE

Steering Wheel Assembly

Removal

WARNING

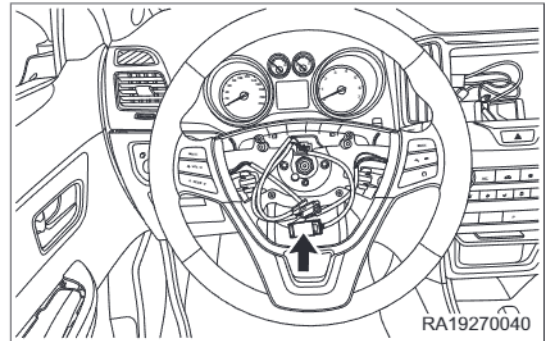
- Be sure to read the precautions for SRS airbag before removing the steering wheel (See page 30-3).

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

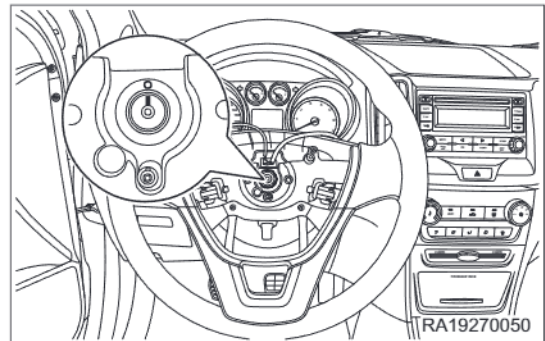
CAUTION

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

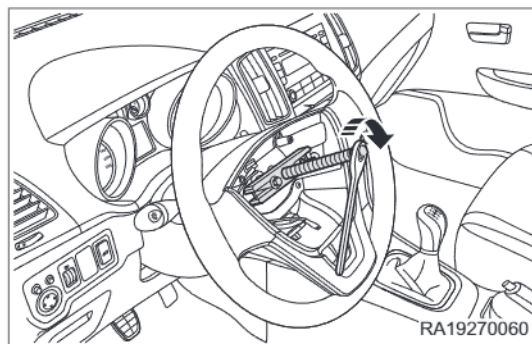
- Remove the driver airbag (See page 30-41).
- Remove the steering wheel assembly.
 - Disconnect the steering wheel quick button connector (arrow) (if equipped).



- Secure the steering wheel assembly, and put matchmarks on the steering wheel assembly and steering column assembly, then remove the steering wheel assembly fixing nut with a wrench. (Tightening torque: 35 ± 3.5 N·m)



- c. As shown in the illustration, install the steering wheel remover, and then tighten the steering wheel remover with a wrench to loosen the steering wheel assembly from the steering column assembly.



CAUTION

- When taking out the steering wheel assembly, be careful to avoid damaging the airbag connector, horn connector and quick button connector on the spiral cable.

- d. Remove the steering wheel assembly.

Inspection

- Check the steering wheel assembly body for damage or deformation. Replace the steering wheel assembly if necessary.
- Check the spline in the steering wheel assembly for damage. Replace the steering wheel assembly if necessary.

Installation

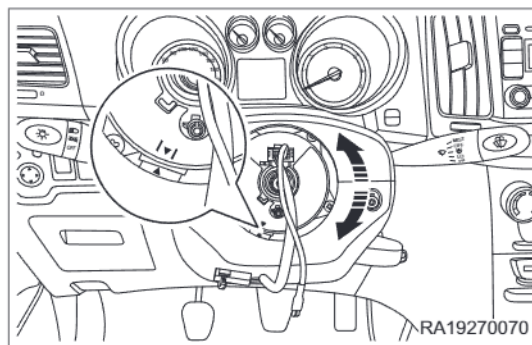
CAUTION

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

- Adjust the spiral cable to the correct position.

HINT:

Fully turn the spiral cable inner circle clockwise, and turn it 3.2 rotations counterclockwise to align the arrow marks.



- Pass the airbag connector, horn connector and quick button connector through the hole of steering wheel assembly, and then align the matchmarks on the steering wheel assembly and the steering column assembly to install the steering wheel assembly.
- Other installation procedures are in the reverse order of removal.

 CAUTION

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

Combination Switch Cover

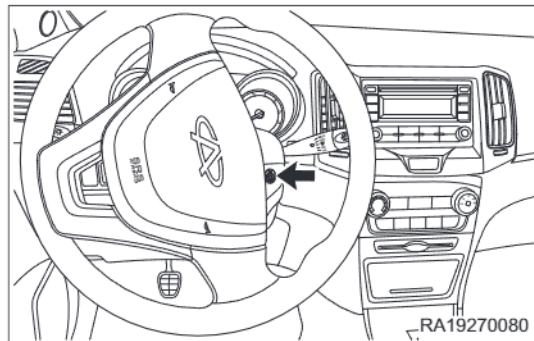
Removal

1. Set the steering wheel to the straight-ahead position.
2. Turn off all the electrical equipment and ignition switch.
3. Remove the combination switch cover.

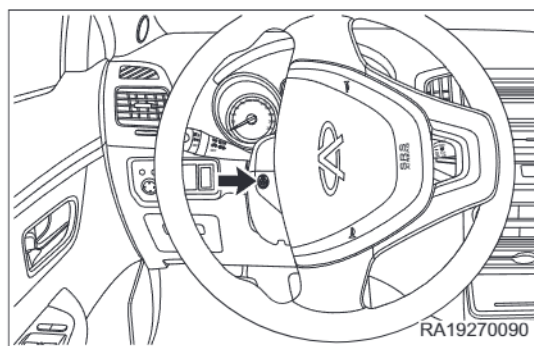
HINT:

Remove the steering wheel assembly first, and then remove the combination switch cover if necessary.

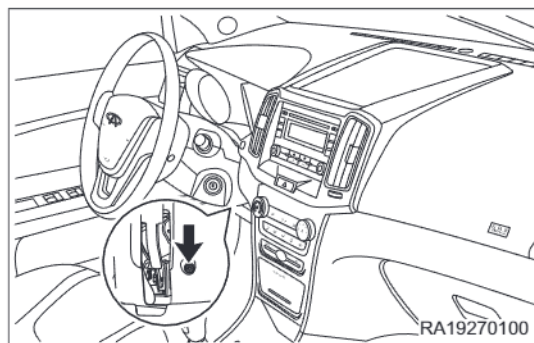
- a. Turn the steering wheel to the right, and remove the right side fixing screw (arrow) from the combination switch cover.
(Tightening torque: 1.5 ± 0.5 N·m)



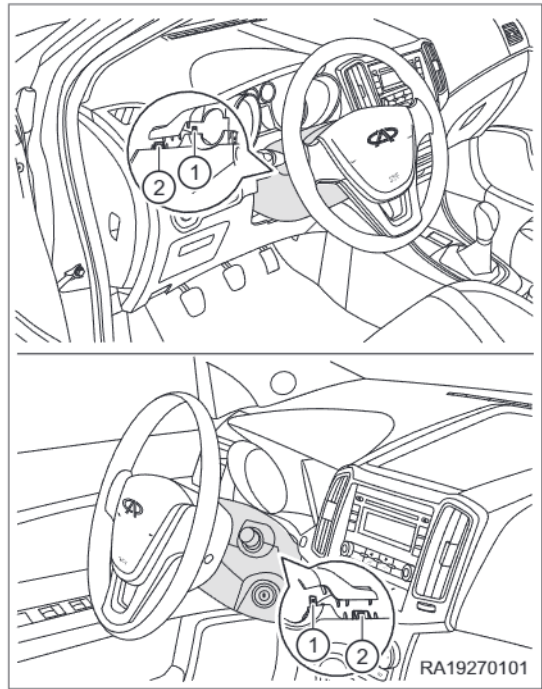
- b. Turn the steering wheel to the left, and remove the left side fixing screw (arrow) from the combination switch cover.
(Tightening torque: 1.5 ± 0.5 N·m)



- c. Remove the lower fixing screw (arrow) from the combination switch cover.
(Tightening torque: 1.5 ± 0.5 N·m)



- d. First disengage the connecting clamps (1) on the top of upper cover and lower cover, and then disengage the connecting clamps (2) on both sides of upper cover and lower cover.



CAUTION

- Operate carefully to prevent damage to the components during removal.

- e. Remove the upper cover and lower cover.

Inspection

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

Installation

1. Loosen the steering wheel adjusting handle, and adjust the steering column assembly to the uppermost position, then tighten the adjusting handle to the uppermost position.
2. Insert the steering column lower cover from the right side of ignition switch at an angle, and then install the adjusting handle into the cover hole.
3. After adjusting the lower cover, install the upper cover and fix the upper and lower cover clamps in place, then install the tapping screws.

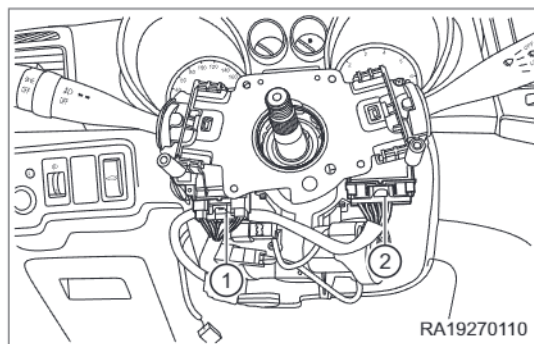
CAUTION

- Operate carefully to avoid damaging components during installation.
- Tighten the cover tapping screws in place.

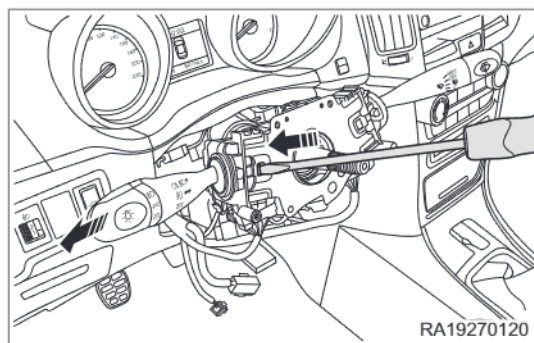
Steering Column Assembly

Removal

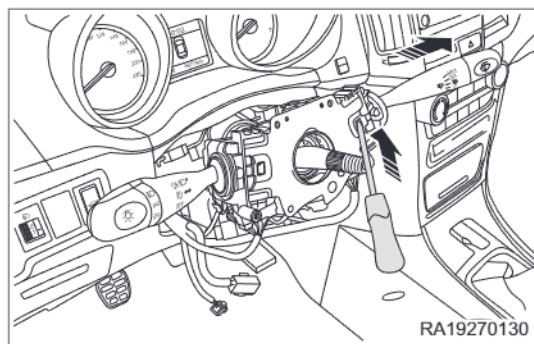
1. Set the steering wheel to the straight-ahead position.
2. Turn off all the electrical equipment and ignition switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag ([See page 30-41](#)).
5. Remove the steering wheel assembly ([See page 27-9](#)).
6. Remove the combination switch cover ([See page 27-12](#)).
7. Remove the spiral cable ([See page 30-44](#)).
8. Remove the combination switch assembly.
 - a. Disconnect the connector (1) from the light combination switch and the connector (2) from the wiper and washer combination switch.



- b. Remove the light combination switch in the direction of arrow as shown in the illustration.

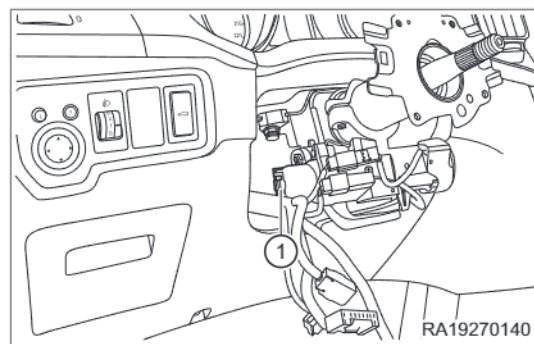


- c. Remove the wiper and washer combination switch in the direction of arrow as shown in the illustration.

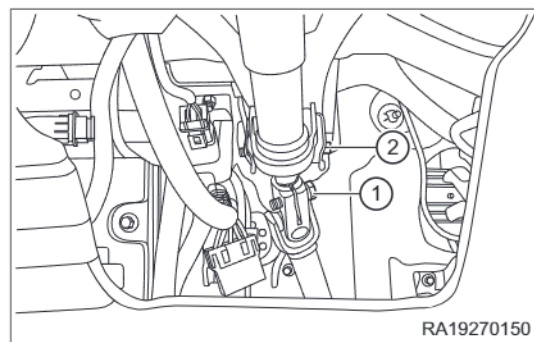


9. Remove the steering column with ignition switch assembly.

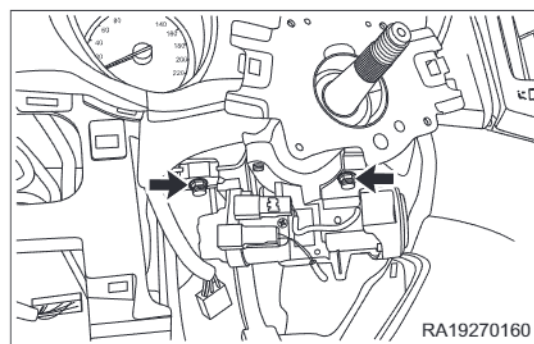
- a. Disconnect the ignition starting switch connector (1).



- b. Remove the coupling bolt (1) between steering column assembly and intermediate shaft with universal joint assembly.
(Tightening torque: $23 \pm 2.5 \text{ N}\cdot\text{m}$)
- c. Remove the fixing bolt (2) from the steering column assembly.
(Tightening torque: $25 \pm 3 \text{ N}\cdot\text{m}$)



- d. Remove 2 fixing nuts (arrow) from the steering column assembly upper bracket, and remove the steering column with ignition switch assembly.
(Tightening torque: $23 \pm 2.5 \text{ N}\cdot\text{m}$)

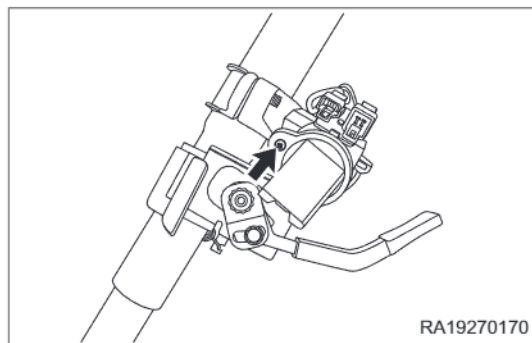


 CAUTION

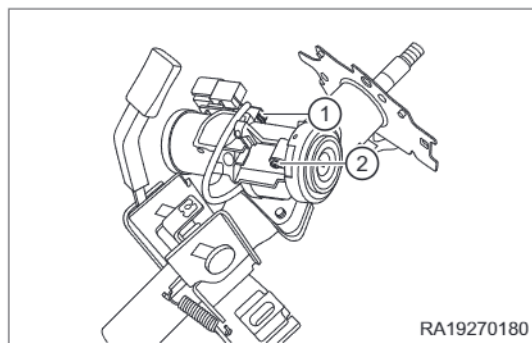
- DO NOT touch the interior ornament when taking out the steering column with ignition switch assembly to avoid scratching the interior ornament.

Disassembly

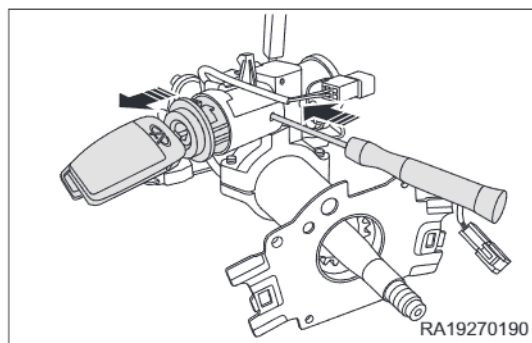
1. Remove the ignition starting switch.
 - a. Remove the fixing screw (arrow) of ignition starting switch, and then remove the ignition starting switch.
(Tightening torque: 13 ± 2 N·m)



2. Remove the ignition switch illumination light.
 - a. Remove the ignition switch illumination light connector (1) from the ignition switch lock body.
 - b. Remove the fixing screw (2) from the ignition switch illumination light, and then remove the ignition switch illumination light.
(Tightening torque: 2 ± 0.5 N·m)



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

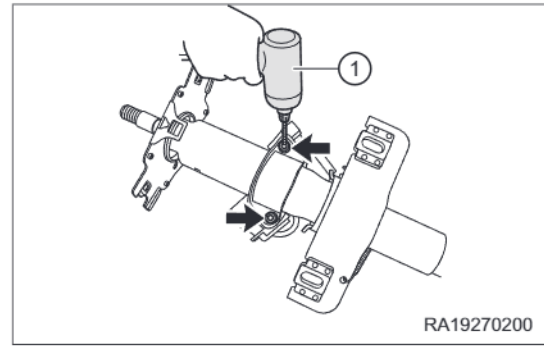


4. Remove the ignition switch lock body.
 - a. Set the steering column assembly onto a vise.

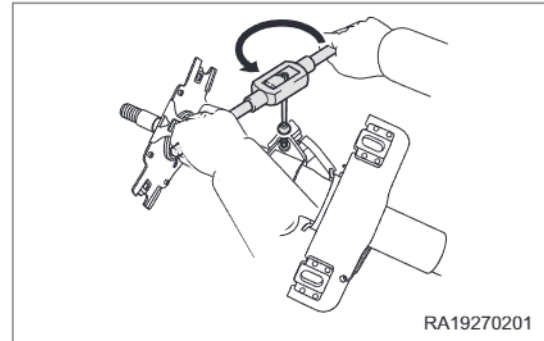
CAUTION

- DO NOT tighten the vise excessively.

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



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



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

Inspection

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

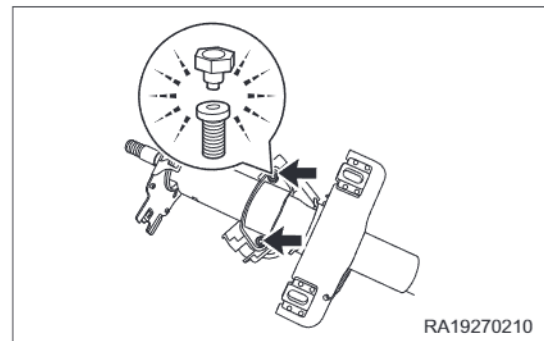
Assembly

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

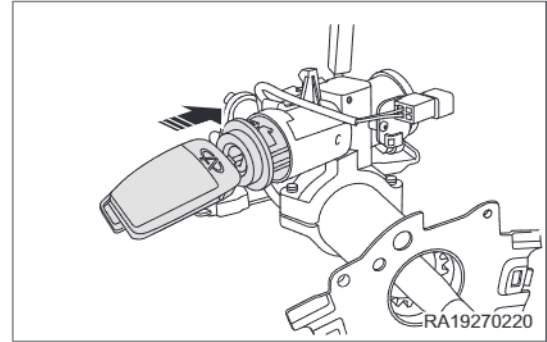
CAUTION

- DO NOT tighten the vise excessively.

- b. Install the ignition switch assembly to the steering column assembly with new ignition switch lock anti-theft bolts, and then tighten the anti-theft bolts until the heads are disengaged.



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



- b. Check if the ignition key cylinder operates normally. When the key is removed, the steering lock is locked; when the key is inserted and the ignition switch is turned to "ACC" or "ON" position, the steering lock is unlocked.

Installation

Installation is in the reverse order of removal.

CAUTION

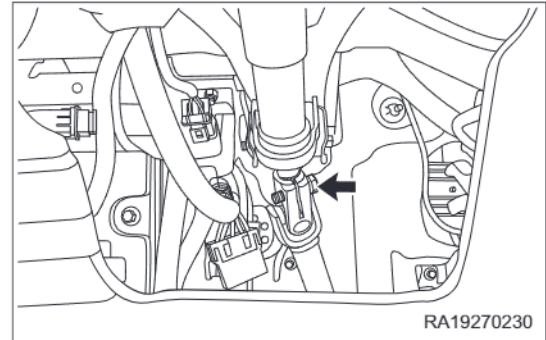
- Before installing the steering column assembly, slide the spline at the lower part of steering column assembly onto the intermediate shaft upper universal joint first.
- Tighten the fixing nuts, bolts and screws in place.
- Install each connector in place.

Intermediate Shaft with Universal Joint Assembly

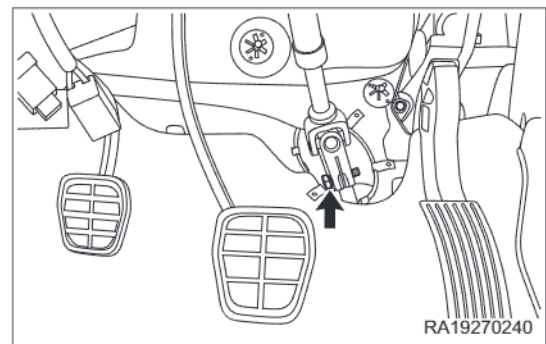
Removal

1. Set the steering wheel to the straight-ahead position.
2. Turn off all the electrical equipment and ignition switch.
3. Remove the intermediate shaft with universal joint assembly.

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



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



- c. Move the intermediate shaft with universal joint assembly upward to detach the lower universal joint from the steering gear input shaft, and then move it downward to remove it.

Inspection

1. Check the intermediate shaft with universal joint assembly for rust, wear or deformation and the universal joint spline for damage or insufficient lubrication. Apply grease or replace the intermediate shaft with universal joint assembly if necessary.
2. Check the universal joint for wear or insufficient lubrication, and the welding part for breakage. Replace the intermediate shaft with universal joint assembly if necessary.
3. Check if the intermediate shaft retracts smoothly, if it is stuck or cannot retract, replace the intermediate shaft with universal joint assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

- Tighten each fixing bolt in place.

