SUSPENSION SYSTEM

4411-00

INDEX

GENERAL INFORMATION

OVERVIEW AND OPERATING PROCESS

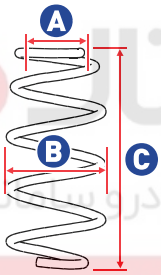
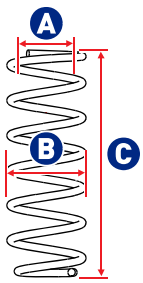
CONFIGURATION AND FUNCTIONS

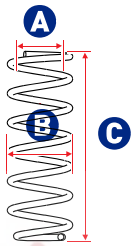
REMOVAL AND INSTALLATION

SUSPENSION SYSTEM 4411-00

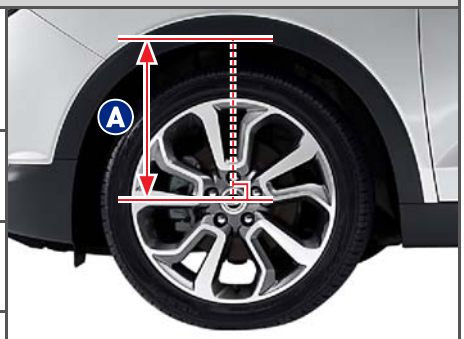
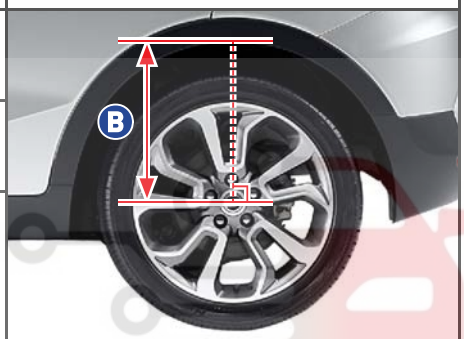
GENERAL INFORMATION

1. SPECIFICATIONS

Item			Specifications
Front suspension	Suspension type		Macpherson Strut
	Spring type		Coil spring
	Stabilizer bar type		Torsion bar
	Shock absorber	Maximum length when extended	Approx. 526 mm
		Minimum length when compressed	Approx. 358 mm
	Coil spring 	Inner diameter (A)	Upper: Approx. 90.5 mm Lower: Approx. 96.0 mm
		Outer diameter (B)	Approx. 146 mm
		Free height (C)	Approx. 295 mm
		Number of windings (effective windings)	4.75(3.6)
		Winding direction	Rightward
Rear suspension (2WD)	Suspension type		Torsion beam
	Spring type		Coil spring
	Shock absorber	Maximum length when extended	Approx. 409 mm
		Minimum length when compressed	Approx. 284 mm
	Coil spring 	Inner diameter (A)	Upper: Approx. 97.5 mm Lower: Approx. 70.6 mm
		Outer diameter (B)	Approx. 119.5 mm
		Free height (C)	Approx. 308.5 mm
		Number of windings (effective windings)	6.01(4.87)
		Winding direction	Rightward

Item			Specifications
Rear suspension (AWD)	Suspension type		Multi-link
	Spring type		Coil spring
	Shock absorber	Maximum length when extended	Approx. 237.2 mm
		Minimum length when compressed	Approx. 117.0 mm
	Coil spring 	Inner diameter (A)	Approx. 88.0 mm
		Outer diameter (B)	Approx. 112.2 mm
		Free height (C)	Approx. 260.0 mm
		Number of windings (effective windings)	6.2 (4.7)
		Winding direction	Rightward

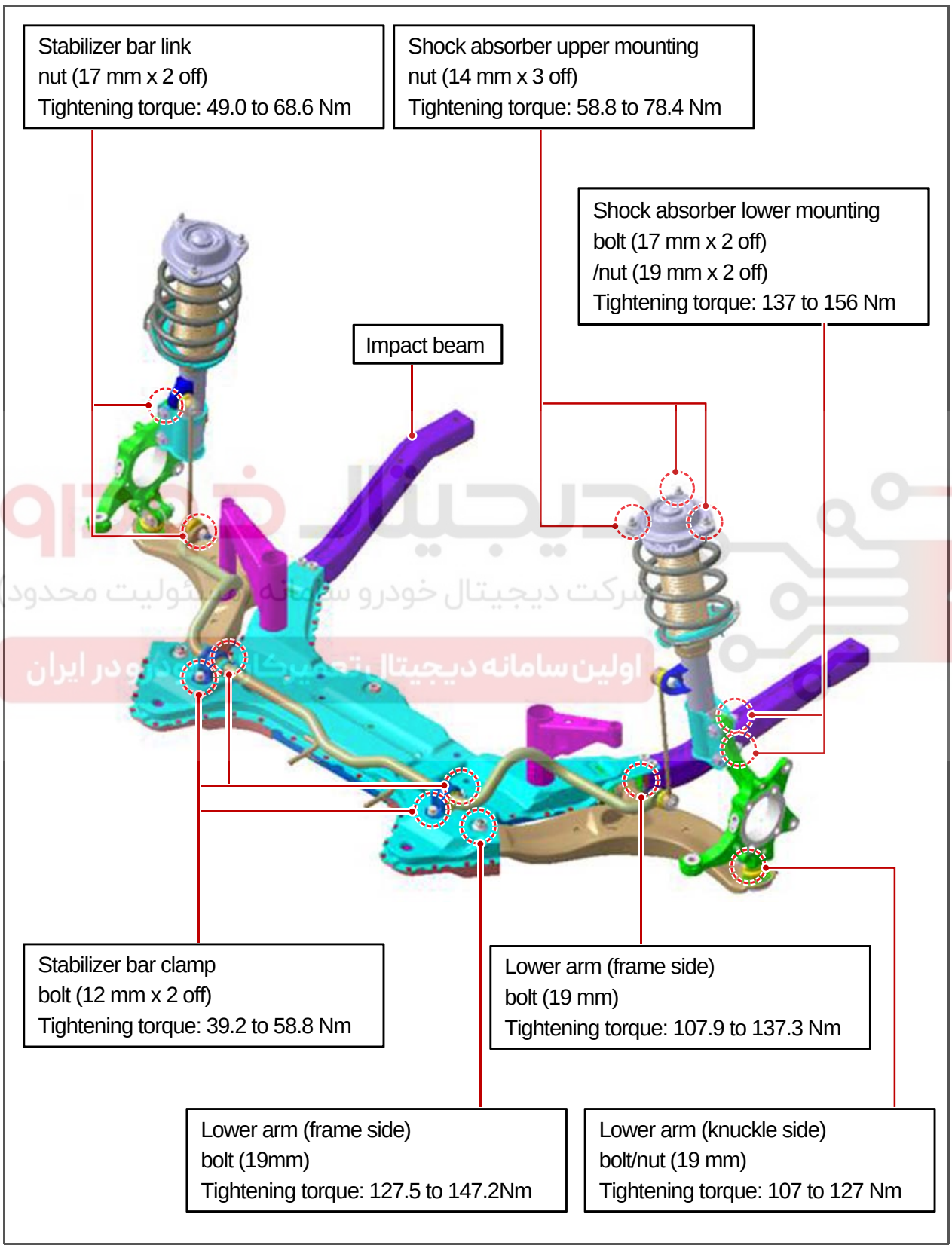
2. WHEEL ALIGNMENT SPECIFICATIONS

Item		Specifications	
Front Suspension	Trim Height (A)	412 mm (from wheel center to bottom of wheel arch)	
	Camber (adjustment-free)	−0.42° ± 0.5°	
	Caster (adjustment-free)	2.96° ± 0.5°	
	Toe (Tie rod adjustment)	0° ± 0.1° (0 mm ± 1.2 mm) Sum of left and right: 0° ± 0.2° (0 mm ± 2.4 mm)	
Rear suspension (2WD)	Trim Height (B)	404mm	
	Camber (adjustment-free)	−1.25° ± 0.5°	
	Toe (adjustment-free)	0.23° ± 0.1° (2.8 mm ± 1.2 mm) Sum of left and right: 0.46° ± 0.2° (5.5 mm ± 2.4 mm)	
Rear suspension (AWD)	Trim Height (B)	409mm	
	Camber (adjustment-free)	−1.25° ± 0.5°	
	Toe (adjustment)	0.15° ± 0.1° (1.8 mm ± 1.2 mm) Left/right total: 0.30° ± 0.2° 3.6 mm ± 2.4 mm	

Modification basis	
Application basis	
Affected VIN	

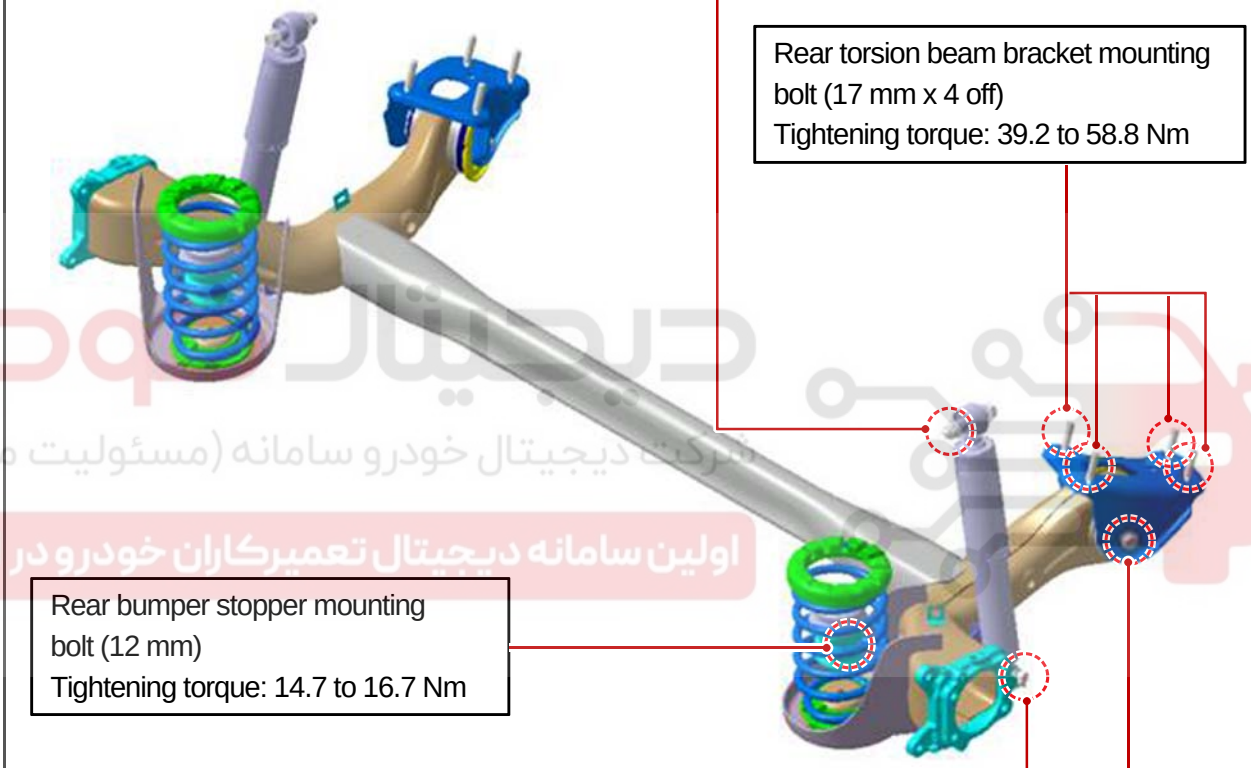
3. SUSPENSION COMPONENTS AND TIGHTENING TORQUE

▶ **Front suspension assembly**



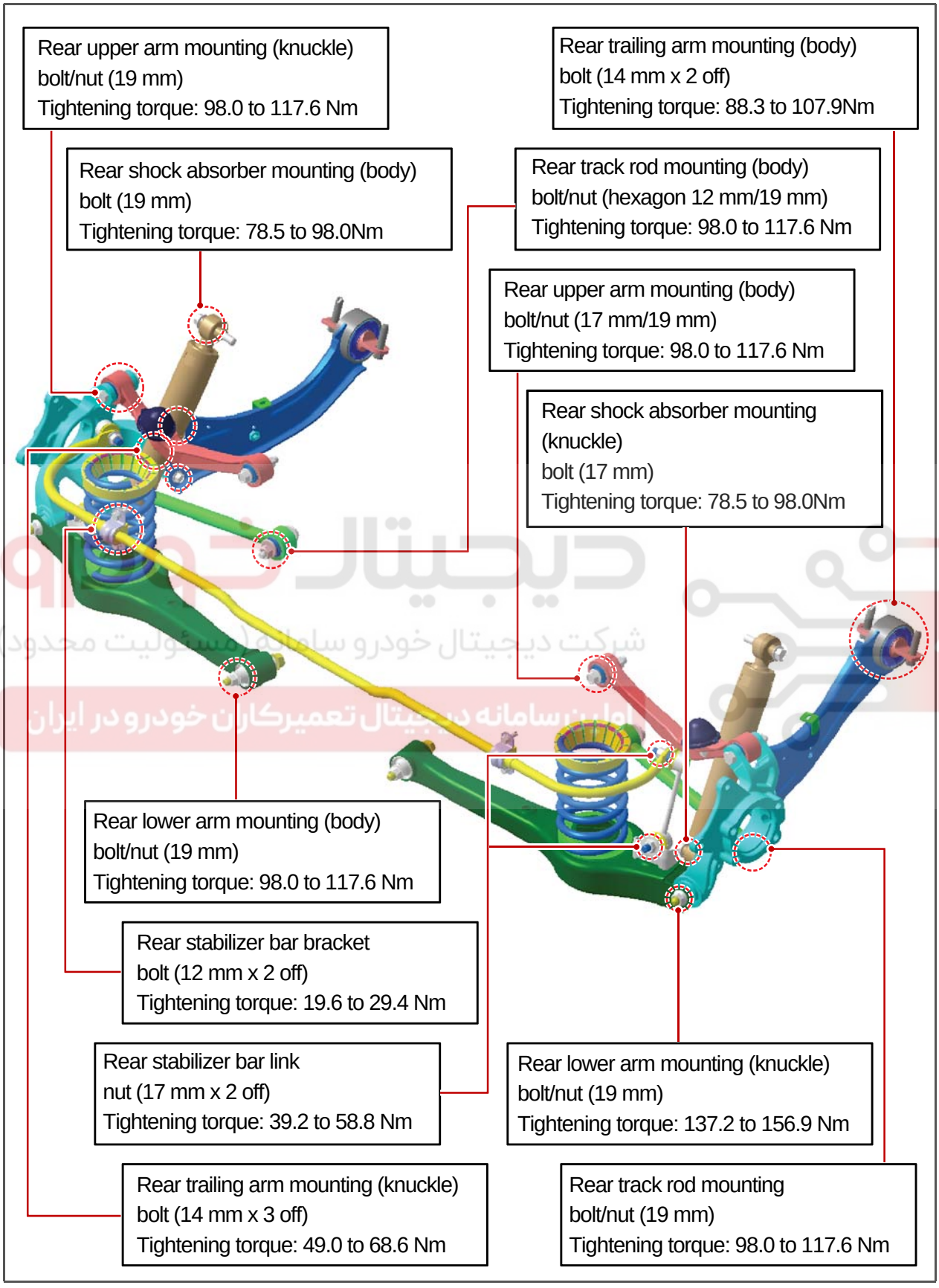
Modification basis	
Application basis	
Affected VIN	

▶ Rear suspension assembly (2WD)



Modification basis	
Application basis	
Affected VIN	

▶ Rear suspension assembly (AWD)



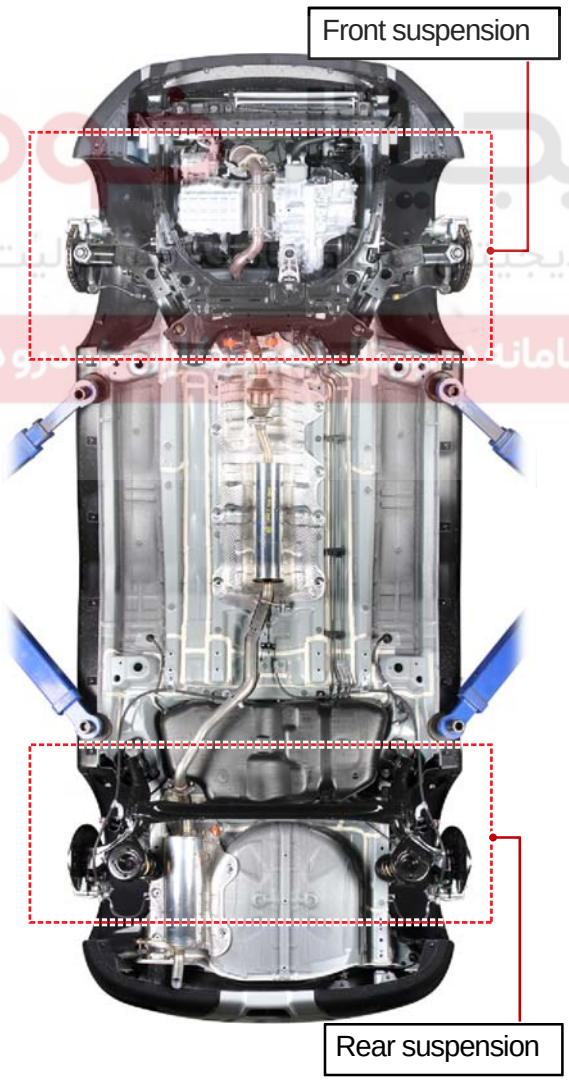
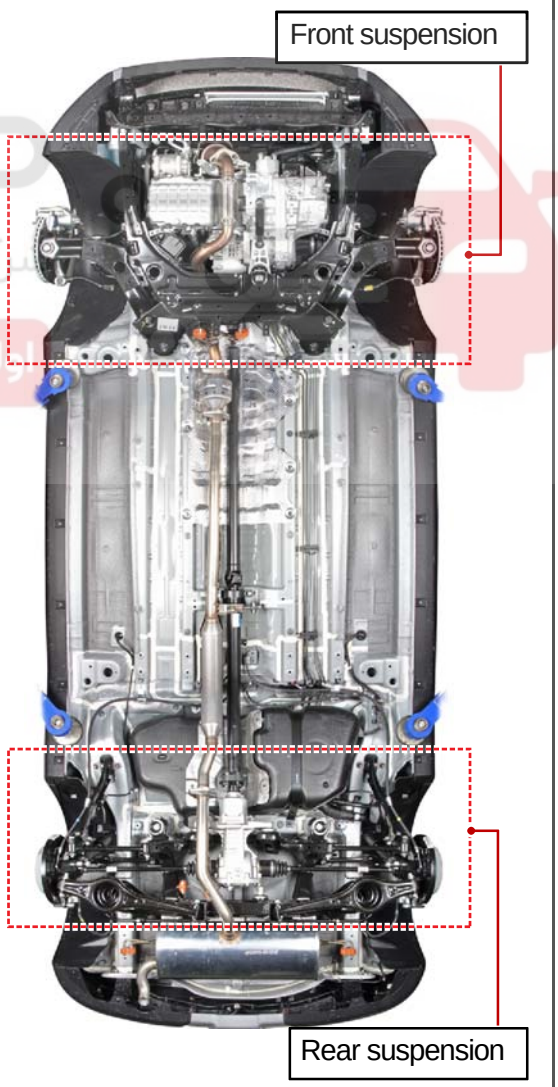
Modification basis	
Application basis	
Affected VIN	

OVERVIEW AND OPERATING PROCESS

1. OVERVIEW

The suspension system connects the axles to the body to: (a) support the vehicle weight; (b) relieve the impact from the road while driving; (c) prevent the vehicle from swaying from side to side while driving; and (d) maximize the ride comfort by utilizing the good handling. The driving stability refers to a well-balanced driveability and stability. The driving stability and ride comfort are significantly affected by the components of the suspension system, along with the vehicle weight, vehicle speed, road conditions, tire and the wheel alignment. It is called "front suspension" or "rear suspension" depending on the mounting position.

2. MOUNTING LOCATION

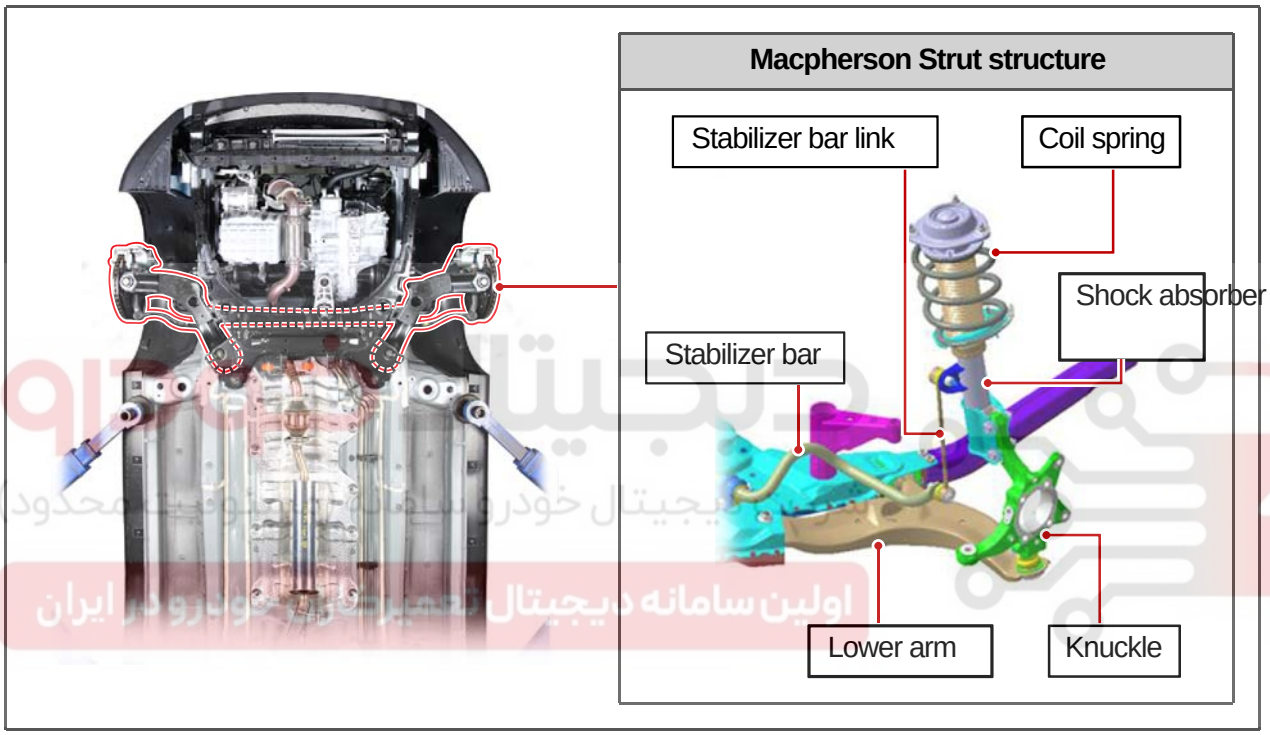
2WD	AWD
	

Modification basis	
Application basis	
Affected VIN	

3. FRONT SUSPENSION ASSEMBLY

1) MacPherson Strut Type

The Macpherson Strut suspension is an independent suspension which has a spring on the strut with a built-in shock absorber. The lower arm is installed on the sub frame and large strut damper is installed on the knuckle to support the wheel.
This suspension is mostly used for the monocoque (unitary) light weight body construction, especially for the FWD models. The upper part with a spring is fitted to the body mounting and the strut with integrated shock absorber is mounted on top of the knuckle.



▶ Advantages

1. Because the spring and the shock absorber are integrated,
2. this suspension provides major advantage in package space,
3. and its whole assembly is very simple with fewer parts than other systems. This suspension is widely used for the FWD models with constant velocity joint.
4. In addition to its simple structure, the vibration of the vehicle can be controlled directly with no need for the vibration to travel through initial members.
5. This leads to better ride comfort.

▶ Disadvantages

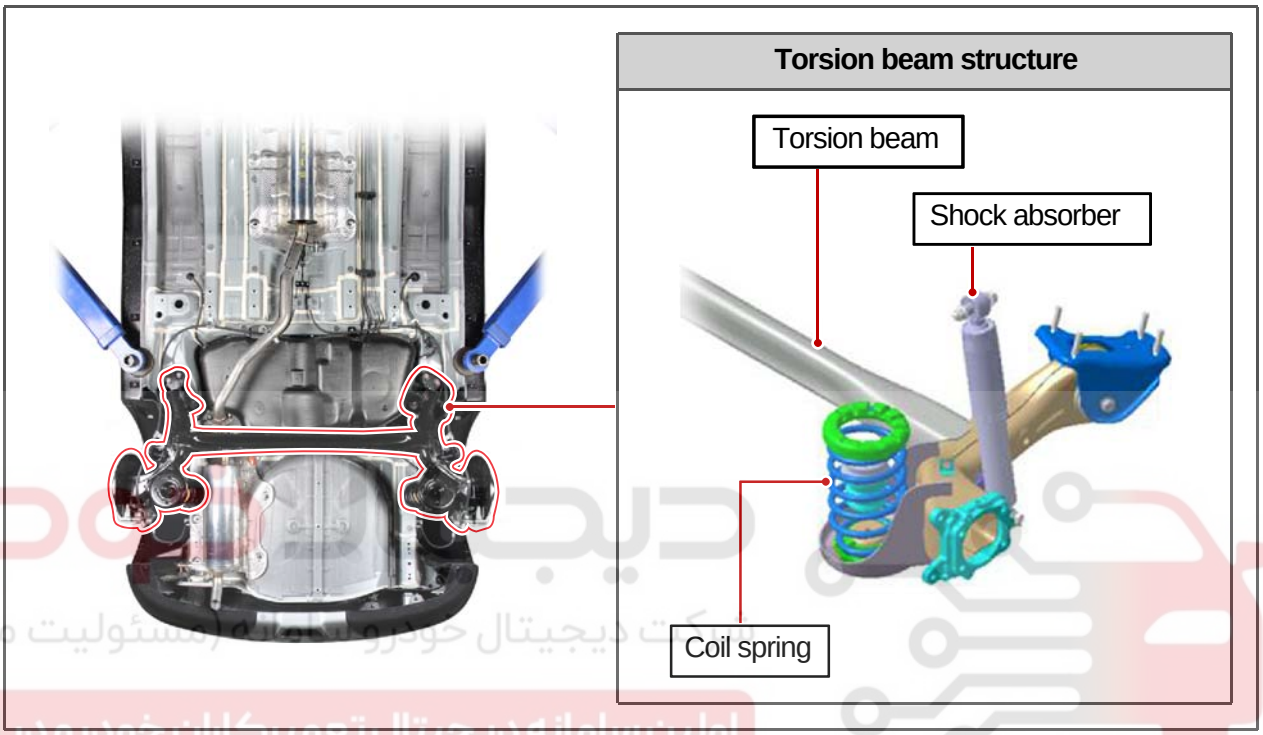
1. The macpherson strut suspension is an independent suspension which has a spring on the strut with a built-in shock absorber. But it needs higher hood because the vertical length of the strut is long, and is very susceptible to external impact because there is only one swing arm which holds the wheel axle.

Modification basis	
Application basis	
Affected VIN	

4. REAR SUSPENSION ASSEMBLY

1) Torsion Beam Type (2WD)

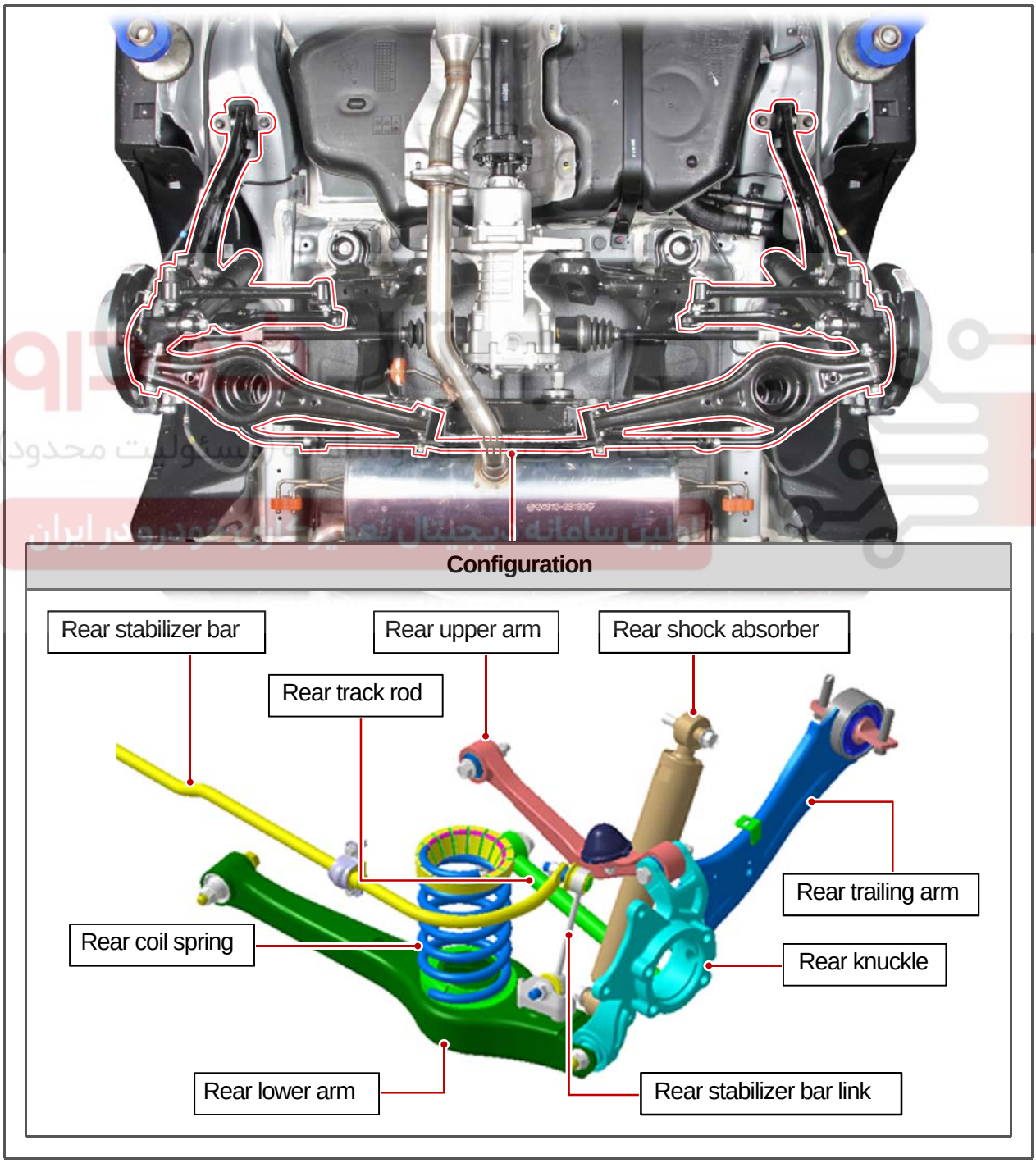
The rear suspension maintains the ride comfort and the safety of the vehicle with the front suspension. The rear suspension installed to this vehicle is a torsion beam type with an integrated axle, and consists of torsion beam, shock absorber, and coil spring.



Modification basis	
Application basis	
Affected VIN	

2) Multi-link Type (AWD)

Multi-link type suspension is equipped with several arms which are controlled independently of each other. This type of suspension allows precise design and flexible layout, and is mostly used for rear suspension. Internal force applied to the links are distributed and the optimal layout of the links allows flexible adaptation to camber and toe changes and has the effect of a good road surface adherence. The multi-link rear suspension of this vehicle consists of knuckle, upper arm, track rod, trailing arm, stabilizer bar, stabilizer bar link, coil spring, shock absorber, and lower arm.



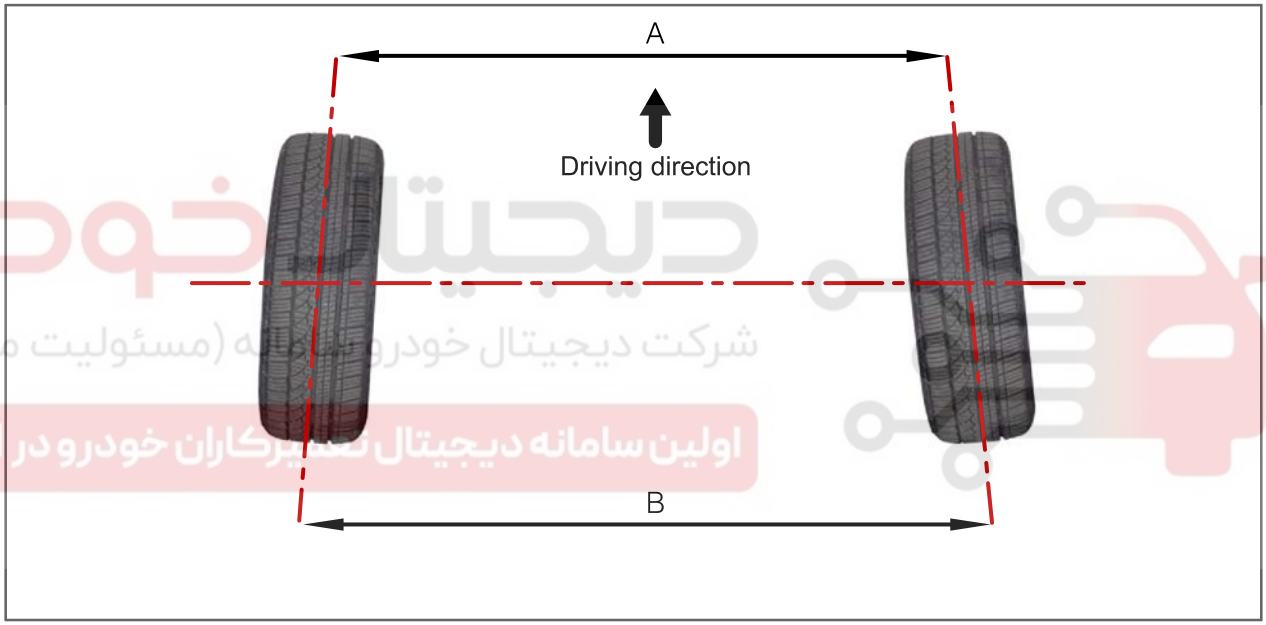
Modification basis	
Application basis	
Affected VIN	

5. WHEEL ALIGNMENT

The wheel alignment deals with geometric angles and basic measurements (camber, caster, and toe) to achieve steering stability and improved ride comfort.

1) Toe-In

Toe-in refers to the front portion of the tires pointing in toward the centerline from a straight ahead position, while the term toe-out refers to the front portion of the tires pointing outward. In the figure shown below, the toe value is "B-A". Toe keeps the front wheels running parallel and reduces the reaction force when the vehicle moves forward.
Incorrect toe causes tire wear and excessive fuel consumption. Any changes due to worn steering components and suspension components because of excessive driving distance need to be compensated by adjusting toe. Adjusting toe should be carried out at the last step.



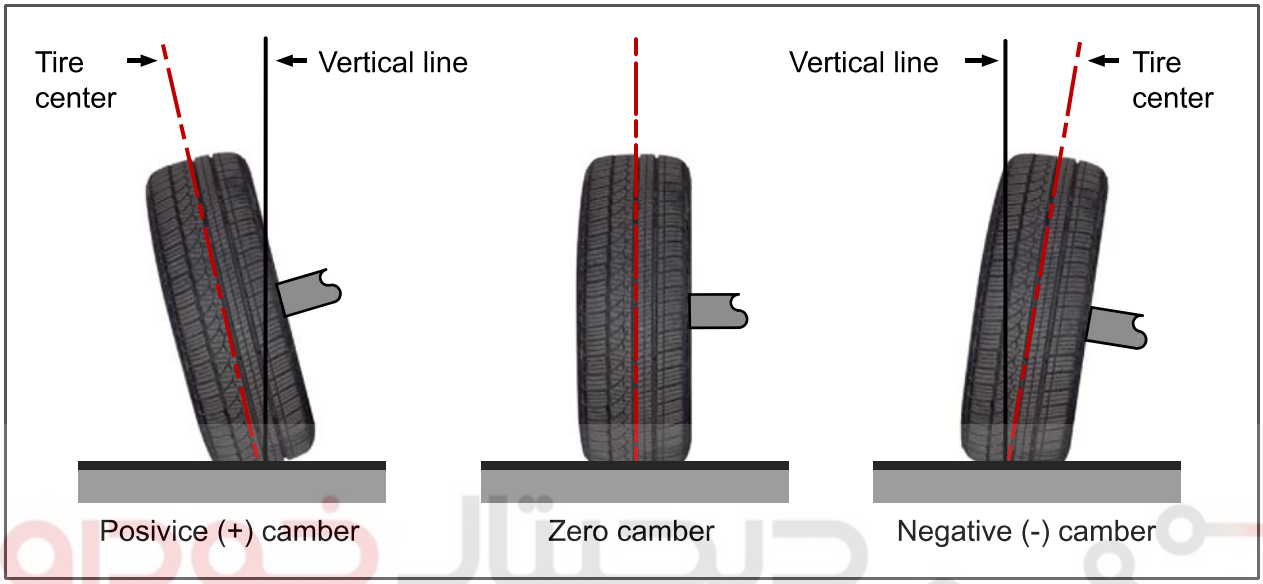
Item		LH/RH	Total	Adjustment
Wheel alignment specification (Toe-in)	Front	0° ± 0.1° (0 mm ± 1.2 mm)	0° ± 0.2° (0 mm ± 2.4 mm)	Adjustment (Tie rod end)
	Rear (2WD)	0.23° ± 0.1° (2.8 mm ± 1.2 mm)	0.46° ± 0.2° (5.5 mm ± 2.4 mm)	Adjustment-free
	Rear (AWD	0.15° ± 0.1° (1.8 mm ± 1.2 mm)	0.30° ± 0.2° (3.6 mm ± 2.4 mm)	Adjustment

▶ **Function**

1. Prevents uneven tire wear
2. Compensates side slip due to camber
3. Compensates for steering linkage wear or free play

2) Camber

Camber is the angle made by the wheels of a vehicle; specifically, it is the angle between the centerlines of the wheel used for steering and a true vertical axis when viewed from the front of the vehicle. In general, positive camber is required to counteract the force, which causes negative camber, due to curved roads, occupant load, road surfaces, or certain alignment condition.



Item		LH/RH	Cross camber	Adjustment
Wheel alignment specification (Camber)	Front	−0.42° ± 0.5°	0° ± 0.5°	Adjustment-free
	Rear	−1.25° ± 0.5°	0° ± 0.5°	Adjustment-free

▶ **Positive camber: Top of the tire points outward**

Advantages:
- The axle is not bent when it is loaded.
- The force required to operate the steering wheel is reduced because of smaller contact area (or load area) of the tire.
- Restoring force of the steering wheel is gained (when turning the steering wheel, the circular movement of the tire generates the force to lift the frame rather than the force to pull down the tire to the ground. In this case, the shock absorber contracts and the restoring force is applied to the steering wheel.)

Disadvantages:
- Cornering force decreases as the positive camber increases when the vehicle makes turn.
- The hub bearing is worn unevenly if camber is excessive.

▶ **Zero camber: Centerline of tire is perpendicular to road surface**

Modification basis	
Application basis	
Affected VIN	

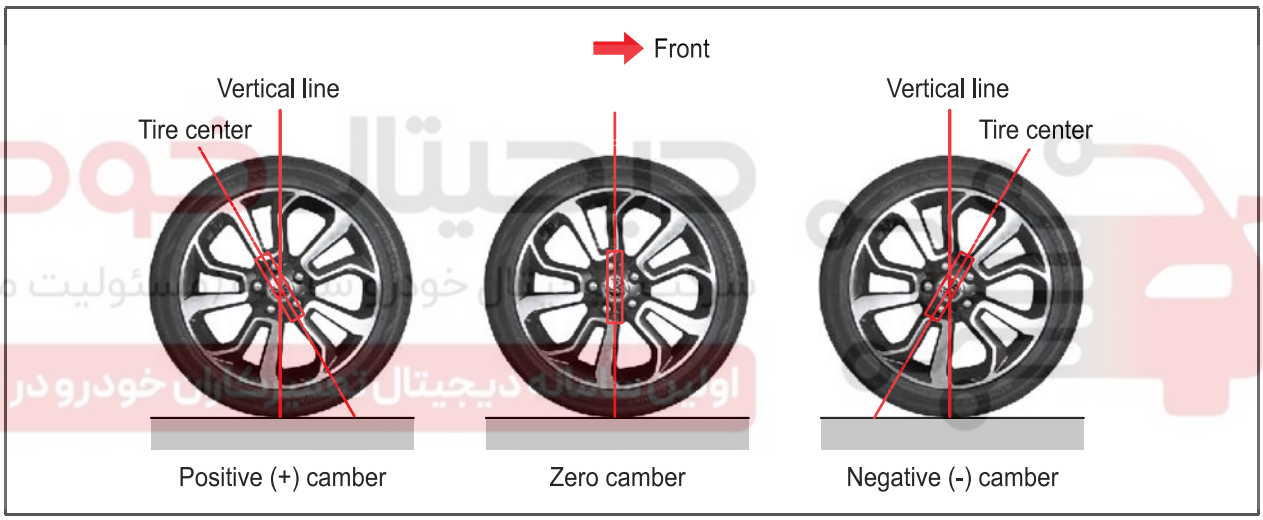
▶ **Negative camber: Top of the tire points inward**

Advantages:
- Better traction force due to wide load area (applicable for off-road vehicle)
- Better corner driving when the vehicle makes turn since the cornering force increases (applicable for high-speed F1 vehicle)

Disadvantages:
- The axle is easier to be bent and deviated in the negative camber than it is in the positive camber when load is applied on the axle.
- Difficult to control due to wide load area.

3) Caster

Caster is the angle between the steering axis tilted forward and a true vertical axis, when viewed from the side of the vehicle. Caster improves stability (straight ahead run) of the vehicle at high speed and does not affect the tire wear. Factors including reduced stiffness of the springs and excessive load influence caster. If the difference between the left and right caster values is great, drag of the steering wheel or vehicle can occur.



Item		LH/RH	Total	Adjustment
Wheel alignment specification (Caster)	Front	2.96° ± 0.5°	0° ± 0.5°	Adjustment-free
	Rear	-	-	-

▶ **Positive caster:**

Advantages:
- Directional force to go straight (following control)
- Restoring force of the wheel (restored to the straight ahead direction)
- Prevention of wheel shimmy (wheels sway from side to side)

▶ **Negative caster:**

Advantages:
- Smaller turning radius

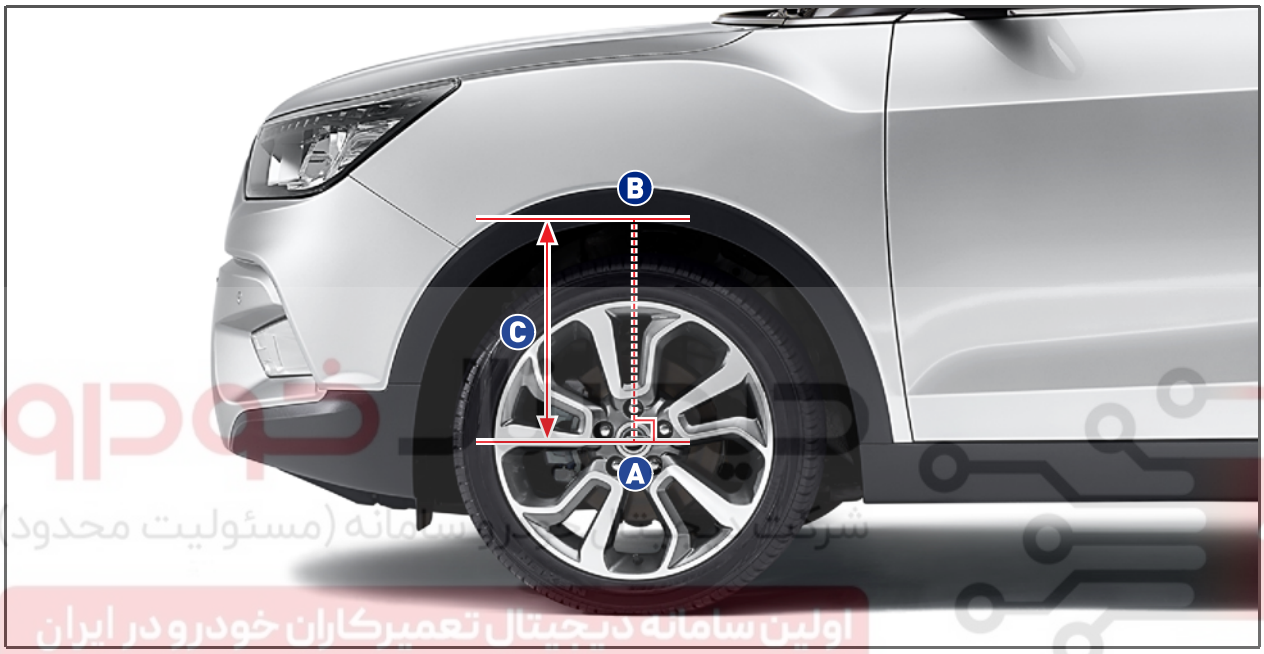
Disadvantages:
- Impact from the road is transferred to the steering wheel (steering wheel turns)
- Poor straight ahead run

4) Trim Height

Incorrect trim height may damage the suspension components or cause problems related to wheel alignment. Therefore, check the trim height before checking wheel alignment when troubleshooting the suspension.

NOTE

Trim height: Distance (C) from the wheel center (A) to the point where an imaginary vertical line from the wheel center meets the bottom of the wheel arch (B) with the vehicle unladen.



Position	2WD	AWD
Front	412 mm	
Rear	404 mm	409 mm

Modification basis	
Application basis	
Affected VIN	

CONFIGURATION AND FUNCTIONS

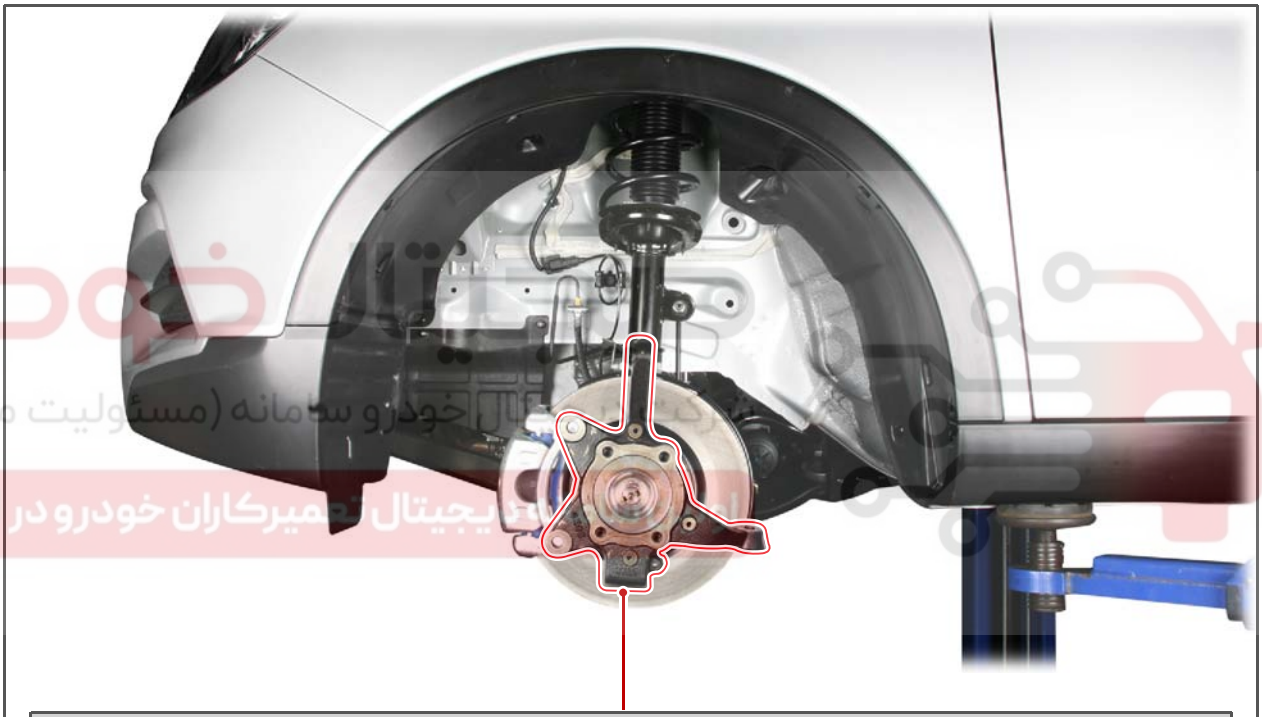
S.G.N. 4115-01

FRONT KNUCKLE ASSEMBLY

1) Overview

The front knuckle assembly has the lower arm, shock absorber, tie rod end for the steering gearbox and the wheel speed sensor. It absorbs the road shock from the wheels together with the coil spring in order to maintain stable ride comfort. In addition, it helps to ensure the driveability based on the steering wheel angle.

2) Mounting Location



Front knuckle assembly	
Front view	**Side view**
	

Modification basis	
Application basis	
Affected VIN	

S.G.N. 4410-01

FRONT LOWER ARM ASSEMBLY

1) Overview

The front lower arm assembly is mounted to the sub frame and the base of the knuckle.
It supports the load transmitted from the tire to the knuckle, relieves the impact from the road conditions, and ensures driving stability.

2) Mounting Location

Modification basis	
Application basis	
Affected VIN	

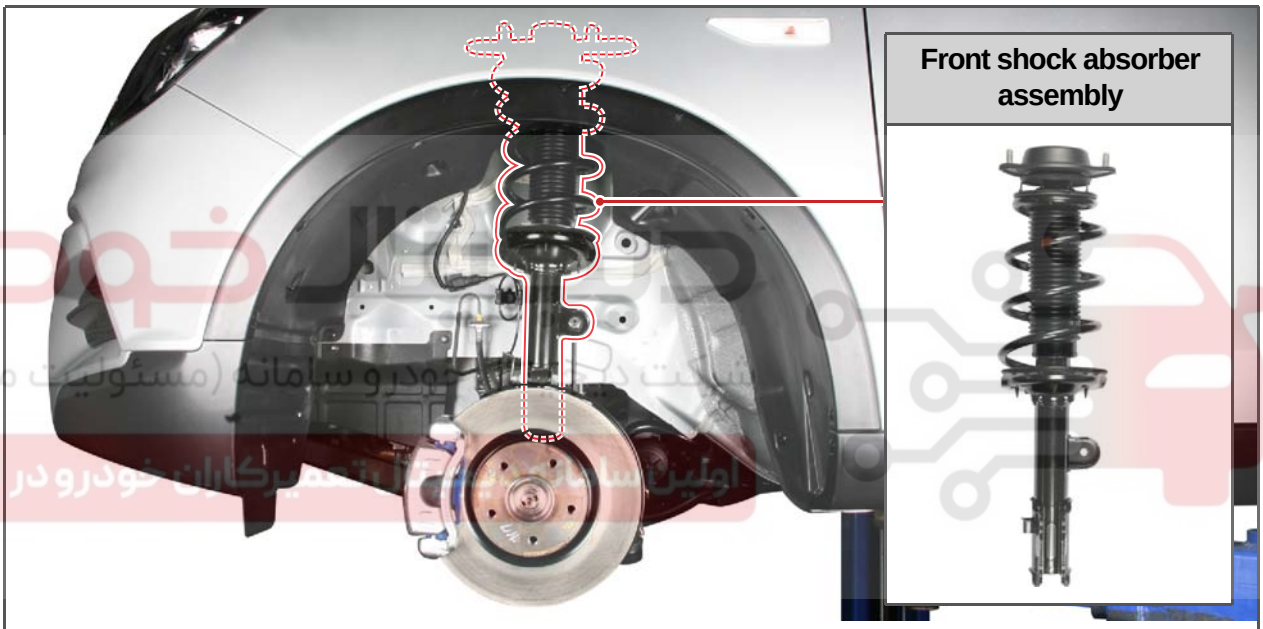
S.G.N. 4411-02

FRONT SHOCK ABSORBER ASSEMBLY

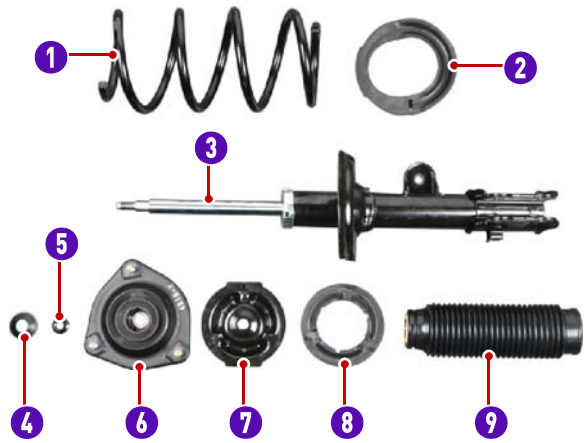
1) Overview

The coil spring is made by winding solid steel rod to form the coil shape. Its energy absorption rate per weight is higher than that of the leaf spring and it allows to absorb small vibrations and provides good ride comfort. However there is no friction between the coils to allow vibration damping effect. And its structure is complicated because the link mechanism or shock absorber is required to support the system. The front shock absorber assembly is installed between the knuckle assembly and body frame. It reduces the vibrations and impacts transmitted from the wheels to vehicle body.

2) Mounting Location



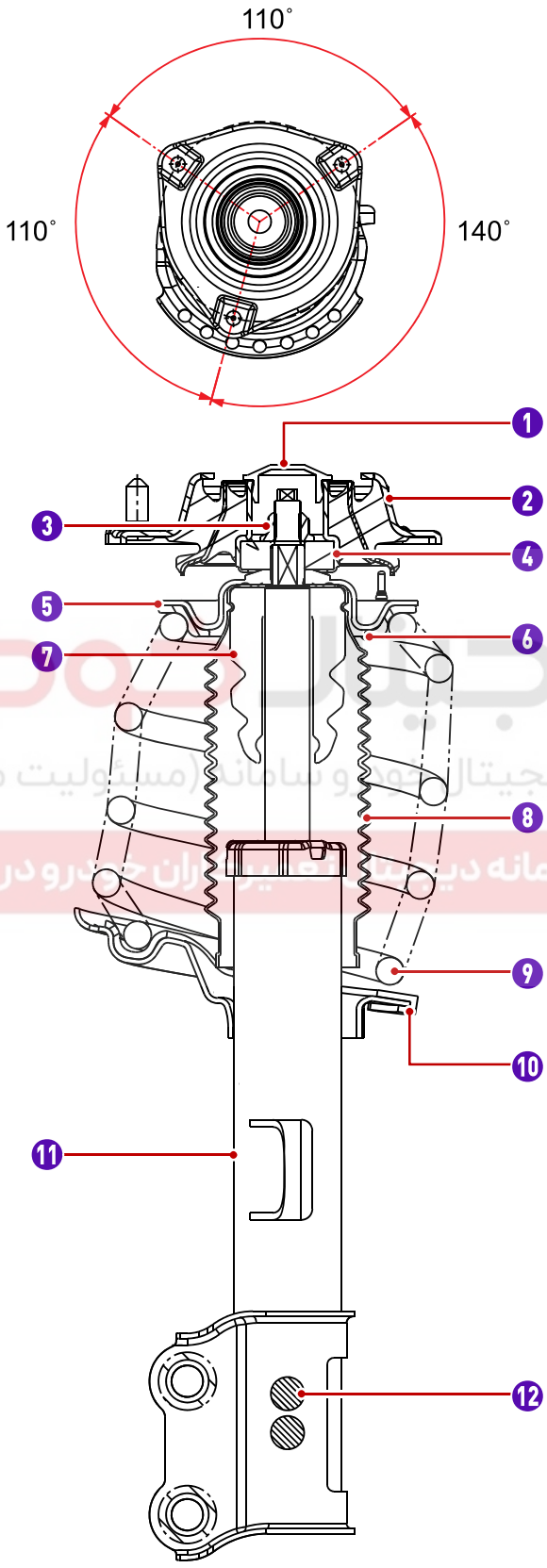
Components



1. Front coil spring
2. Front shock absorber lower rubber
3. Front shock absorber
4. Upper insulator cap
5. Nut
6. Front shock absorber upper insulator
7. Front shock absorber upper seat
8. Front shock absorber upper rubber
9. Front shock absorber dust cover

Modification basis	
Application basis	
Affected VIN	

3) Sectional View



1. Upper insulator cap
2. Insulator assembly
3. Nut
4. Bearing
5. Shock absorber upper seat
6. Shock absorber upper rubber
7. Bumper rubber
8. Shock absorber dust cover
9. Coil spring
10. Shock absorber lower rubber
11. Shock absorber
12. LH/RH ID color
    (1 color: LH / 2 colors: RH)

Modification basis	
Application basis	
Affected VIN	

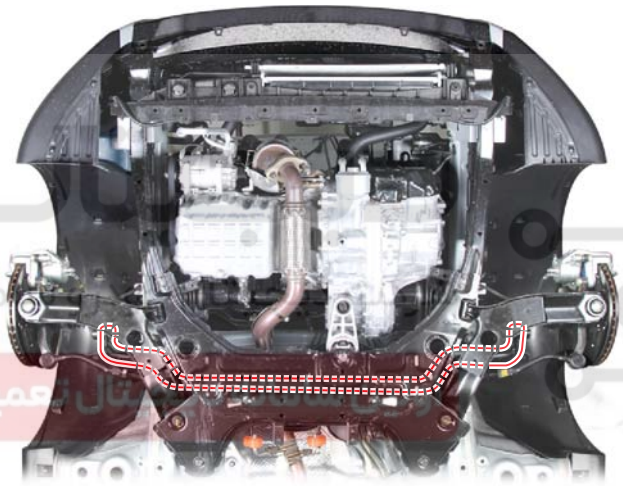
S.G.N. 4420-01

FRONT STABILIZER BAR ASSEMBLY

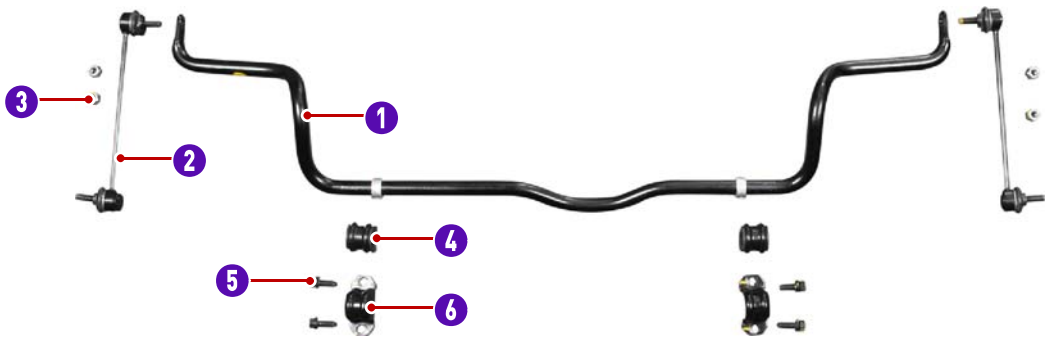
1) Overview

The front stabilizer bar assembly is a supplementary spring using a torsion of the torsion bar. It maintains the balance of the vehicle. The thicker the cross-sectional thickness of the stabilizer bar is, the harder the stabilizer bar is. The stabilizer prevents the wheel from being lifted up as much as possible during cornering to stabilize the vehicle. The stabilizer does not affect the straight ahead running at all. It only affects the ride comfort and vehicle stability during cornering. The effect of the stabilizer bar is not available when the left/right wheels move up/down simultaneously. But the stabilizer bar minimizes the tilting of the vehicle body when the wheels on both sides move up/down differently.

2) Mounting Location



Front stabilizer bar assembly



1. Front stabilizer bar
2. Front stabilizer bar link
3. Nut
4. Front stabilizer bar bushing
5. Bolt
6. Front stabilizer bar mounting bracket

Modification basis	
Application basis	
Affected VIN	

S.G.N. 4511-01

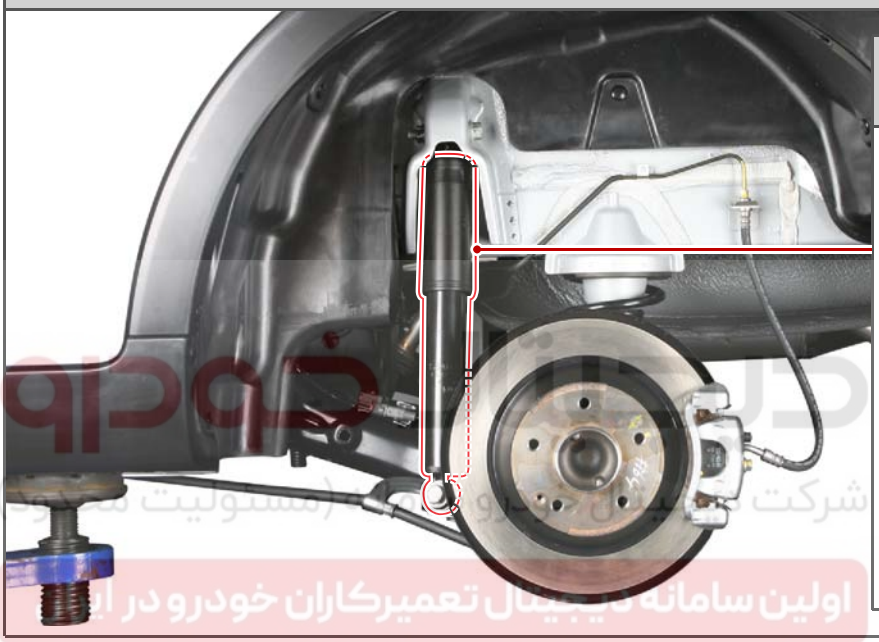
REAR SHOCK ABSORBER

1) Overview

The rear shock absorber, mounted to the vehicle body and rear knuckle, absorbs up-down vibrations of the vehicle to improve ride comfort and reduces the fatigue of the coil spring to prevent it from being broken.

2) Mounting Location

2WD



Rear shock absorber assembly

AWD

Rear shock absorber assembly

Modification basis	
Application basis	
Affected VIN	

S.G.N. 4511-02

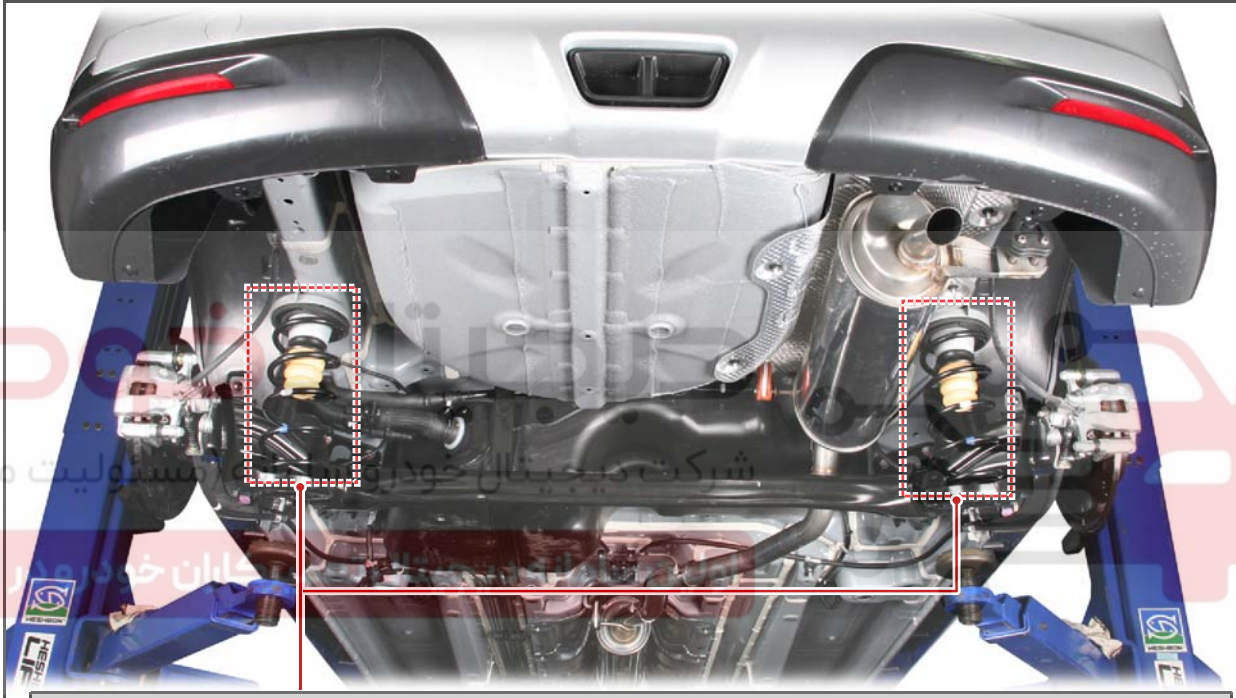
REAR COIL SPRING

1) Overview

The rear coil spring reduces the vibrations and shocks transmitted from the wheels to vehicle body. It is connected to the body frame and rear torsion beam or rear sub frame and rear lower arm for a 2WD vehicle or AWD vehicle, respectively.

2) Mounting Location

2WD

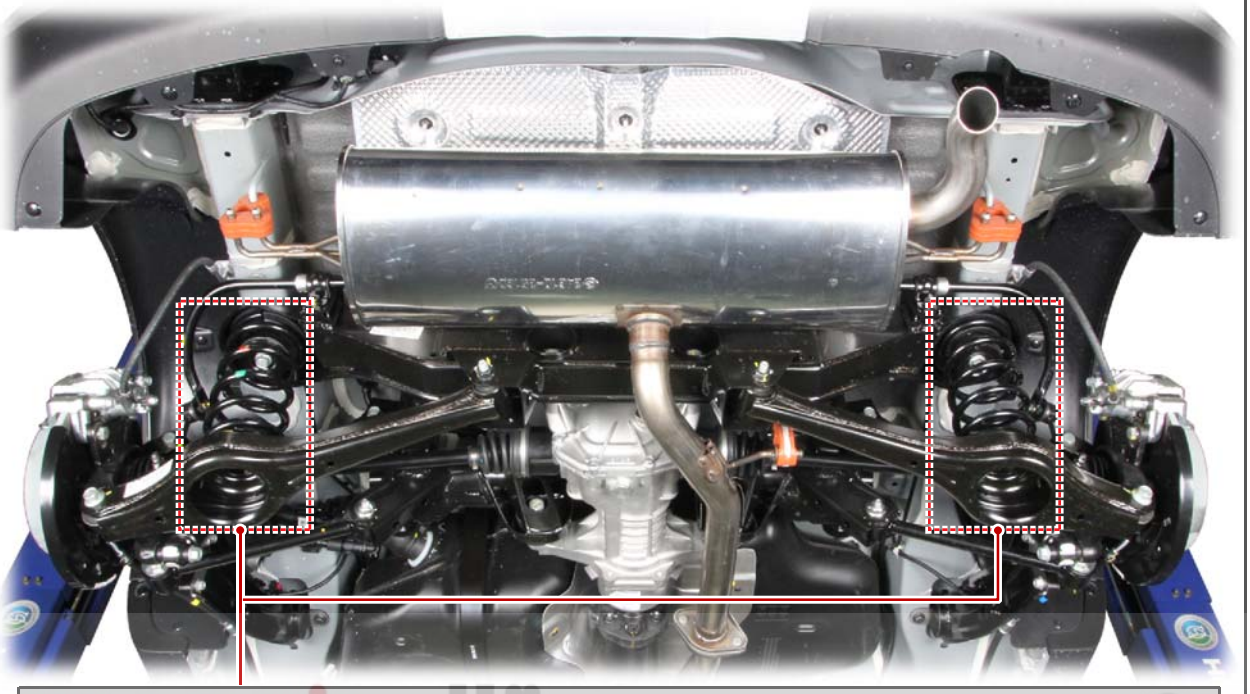


Rear coil spring

1. Rear coil spring
2. Rear coil spring upper rubber
3. Rear coil spring lower rubber
4. Bumper stopper mount
5. Bumper stopper
6. Bolt

Modification basis	
Application basis	
Affected VIN	

AWD



Rear coil spring

1. Rear coil spring
2. Rear coil spring upper pad
3. Rear coil spring lower pad

Modification basis	
Application basis	
Affected VIN	

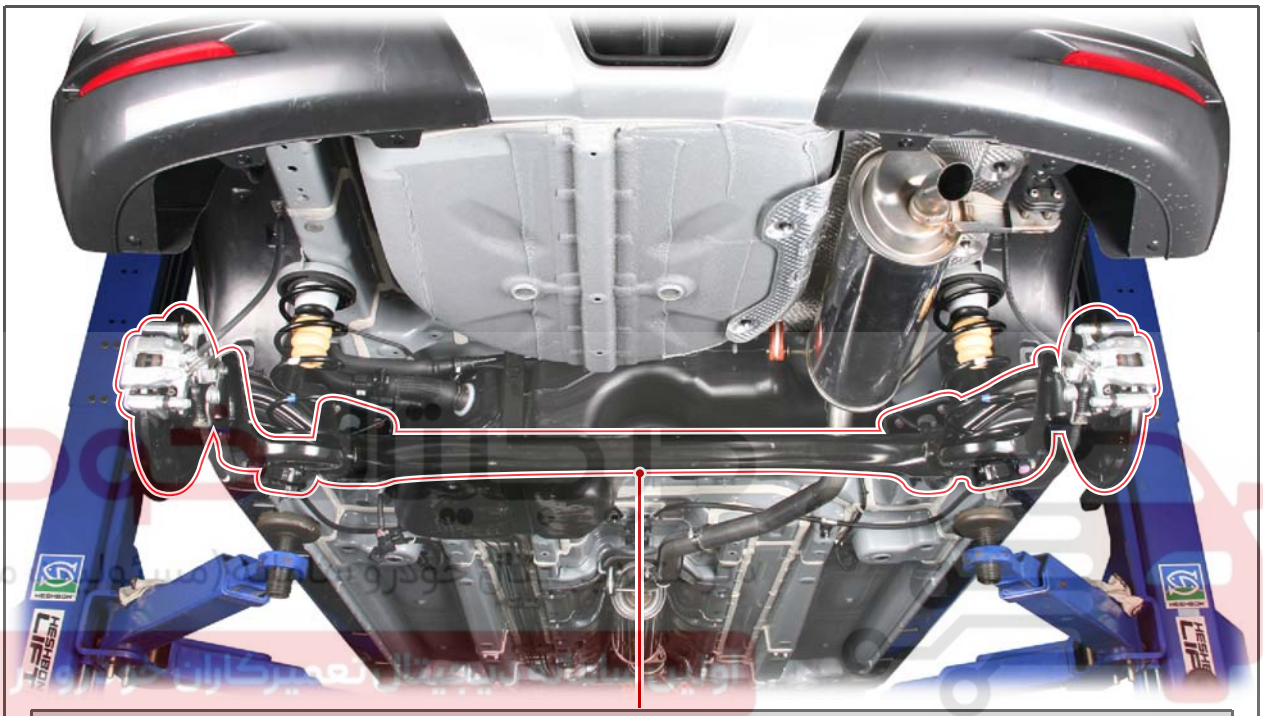
S.G.N. 4510-01

REAR TORSION BEAM ASSEMBLY (2WD)

1) Overview

The rear torsion beam is integrated with axle, and consists of shock absorber, rear hub assembly, and coil spring.

2) Mounting Location



Rear torsion beam assembly

Modification basis	
Application basis	
Affected VIN	

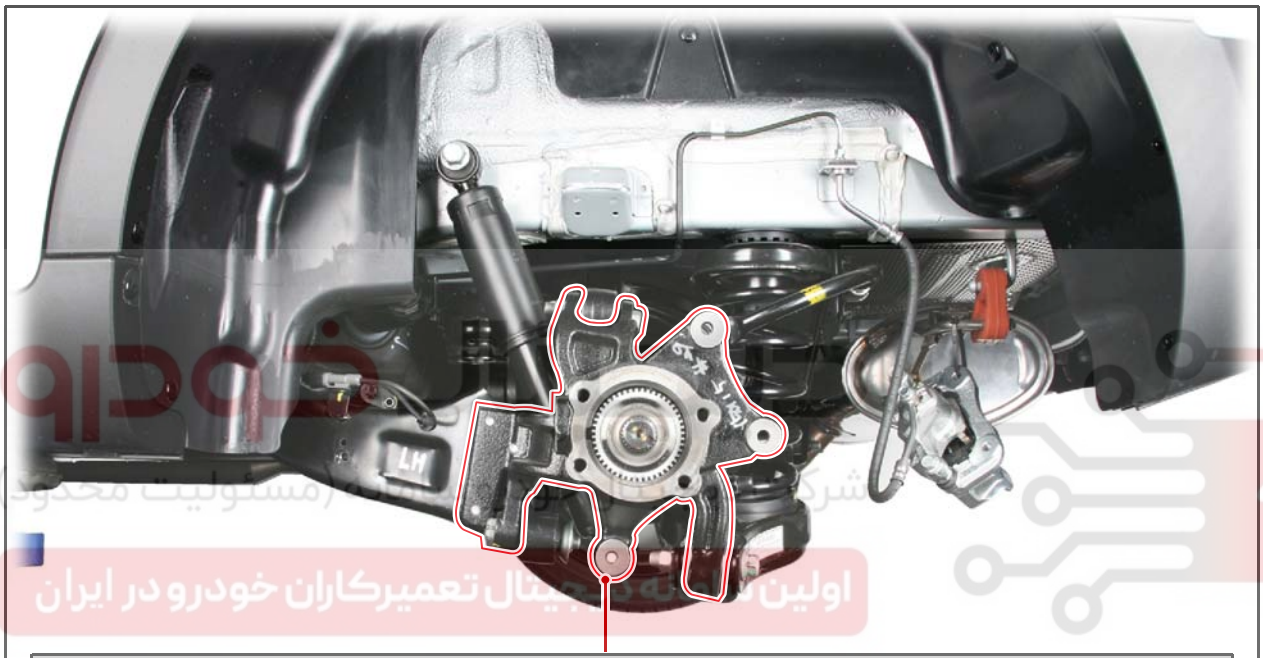
S.G.N. 4520-24

REAR KNUCKLE ASSEMBLY (AWD)

1) Overview

The rear knuckle assembly consists of the rear brake caliper, rear hub, rear upper arm, trailing arm, track rod, rear shock absorber, rear lower arm, and rear wheel speed sensor. It absorbs the road shock and vibration from the wheels together with the track rod, rear upper arm, and rear shock absorber in order to maintain stable ride comfort.

2) Mounting Location and Components



Rear knuckle assembly	
Front view	**Side view**
	

Modification basis	
Application basis	
Affected VIN	

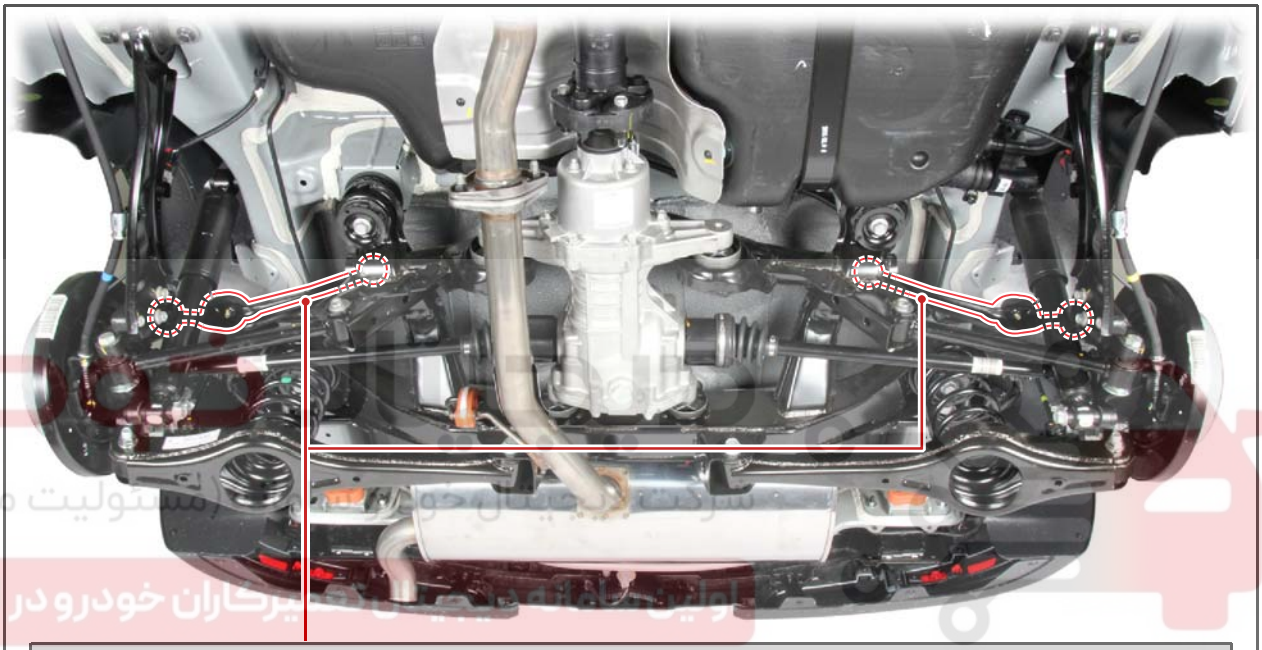
S.G.N. 4520-01

REAR UPPER ARM ASSEMBLY (AWD)

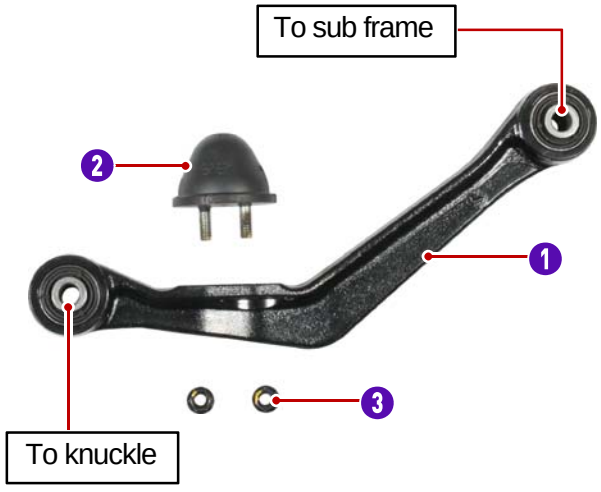
1) Overview

The rear upper arm assembly is mounted to the rear sub frame and the top of the rear knuckle. It supports the load transmitted from the tire to the knuckle, relieves the impact from the road conditions, and ensures driving stability. There is a bumper stopper on the assembly to prevent it from contacting the vehicle body at the time of shock absorption.

2) Mounting Location and Components



Rear upper arm assembly



1. Rear upper arm
2. Bumper stopper
3. Bumper stopper mounting nut

Modification basis	
Application basis	
Affected VIN	

S.G.N. 4520-07

REAR TRACK ROD ASSEMBLY (AWD)

1) Overview

The rear track rod is mounted to the rear sub frame and the base of the rear knuckle. It adjusts the load in the left and right direction. Rotating the eccentric bolt mounted to the sub frame side changes the angle of the rear knuckle, which then changes the rear wheel alignment.

2) Mounting Location and Components

Modification basis	
Application basis	
Affected VIN	

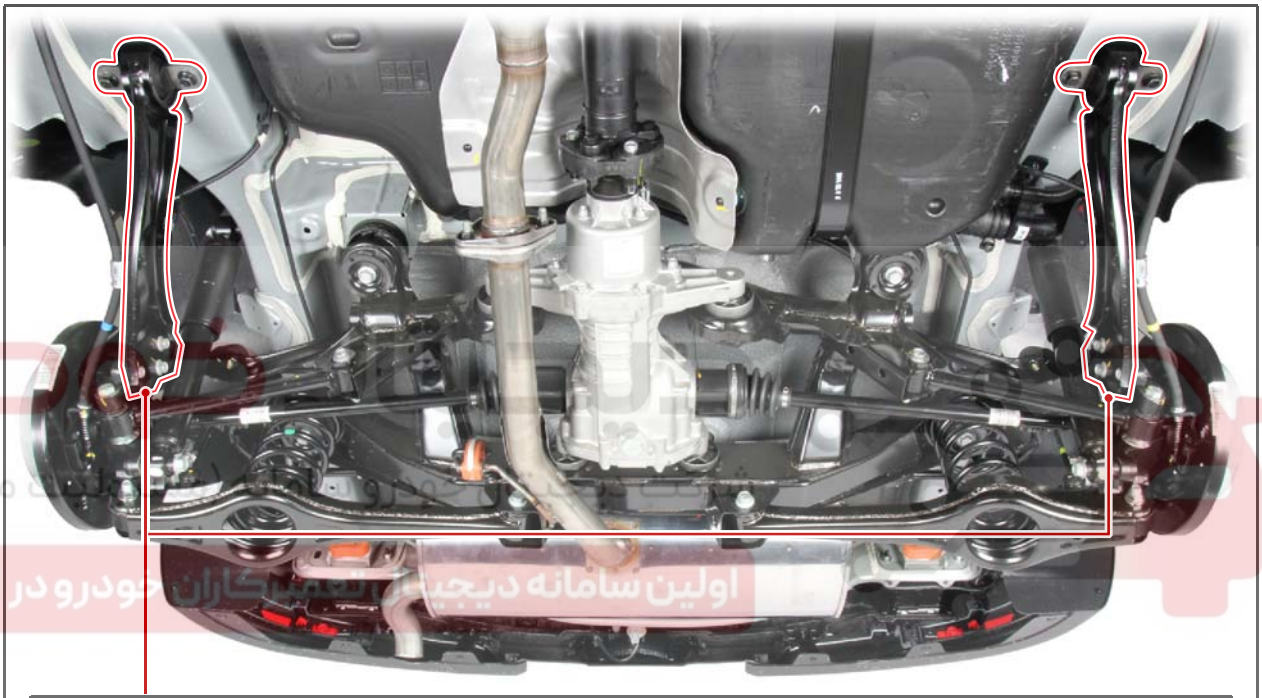
S.G.N. 4520-04

REAR TRAILING ARM ASSEMBLY (AWD)

1) Overview

The rear trailing arm assembly is mounted to the vehicle body and the rear knuckle. It adjusts the load in the fore and aft direction and allows smaller wheel house and creates more interior room. The trailing arm of this vehicle also serves as a retainer to hold the rear wheel speed sensor wiring and rear parking brake cable.

2) Mounting Location and Components



Rear trailing arm assembly

Modification basis	
Application basis	
Affected VIN	

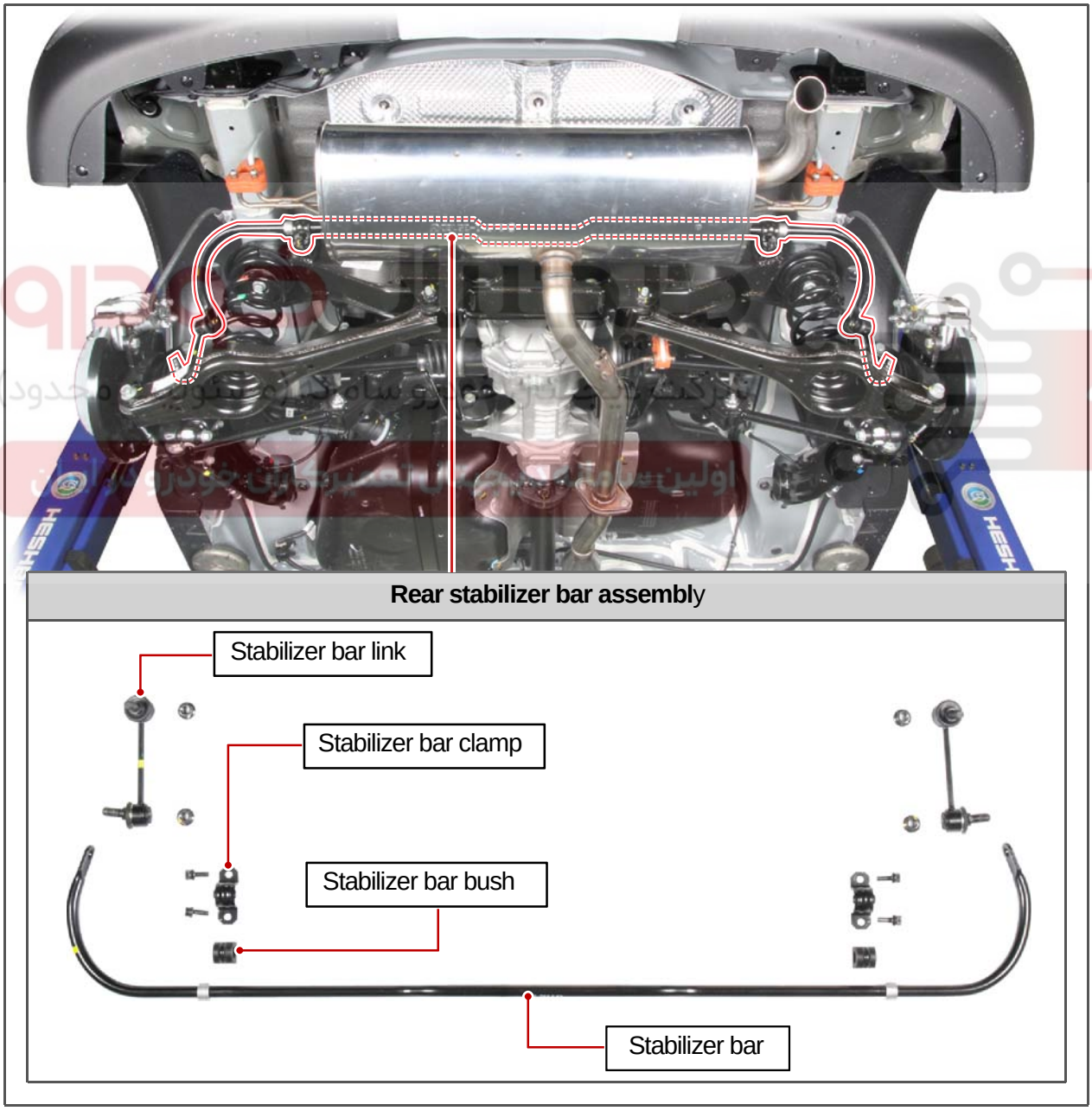
S.G.N. 4520-11

REAR STABILIZER BAR ASSEMBLY (AWD)

1) Overview

The rear stabilizer bar assembly is a supplementary spring which uses the twist of the torsion bar. The stabilizer prevents the wheel from being lifted up as much as possible during cornering to stabilize the vehicle. The effect of the stabilizer bar is not available when the left/right wheels move up/down simultaneously. But the stabilizer bar minimizes the tilting of the vehicle body when the wheels on both sides move up/down differently.

2) Mounting Location and Components



Modification basis	
Application basis	
Affected VIN	

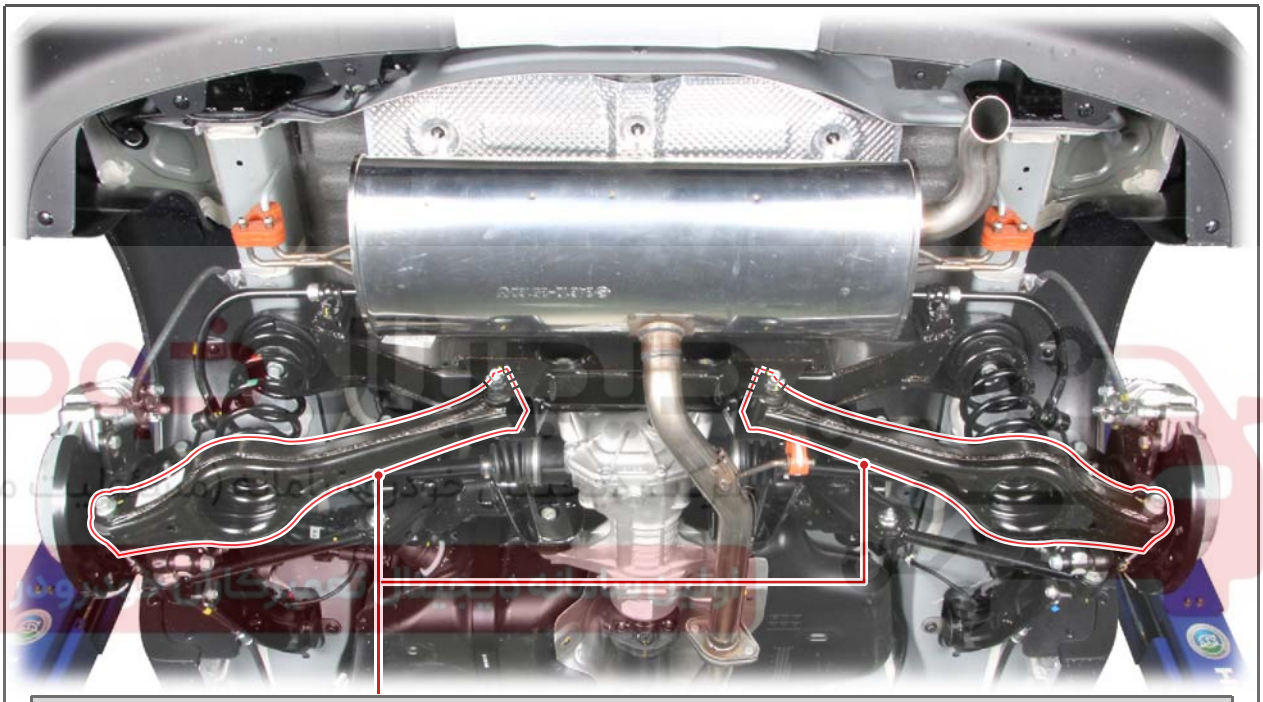
S.G.N. 4520-17

REAR LOWER ARM ASSEMBLY (AWD)

1) Overview

The rear lower arm assembly is mounted to the rear sub frame and the base of the rear knuckle. It serves as a mounting for the rear coil spring with the rear sub frame, and a mounting for the rear stabilizer bar link. It also supports the load transmitted from the tire to the knuckle, and ensures driving stability.

2) Mounting Location and Components



Lower arm assembly

Modification basis	
Application basis	
Affected VIN	

REMOVAL AND INSTALLATION

S.G.N. 0000-00 TROUBLESHOOTING

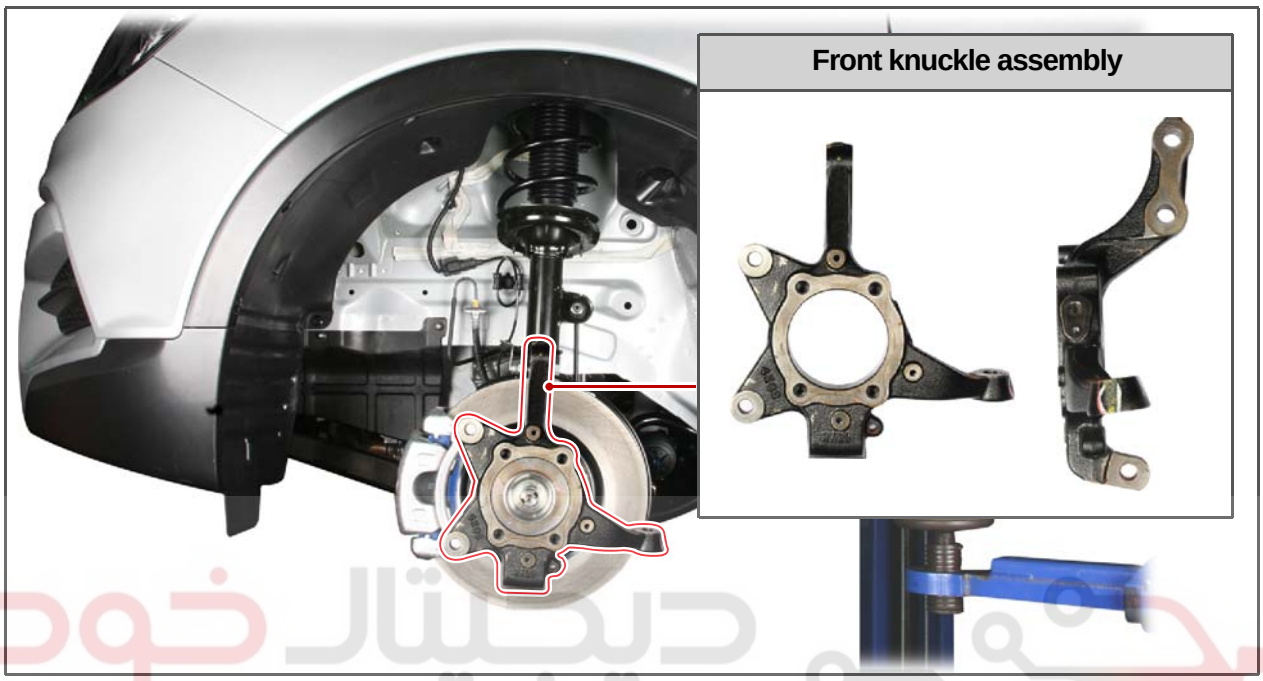
Symptom	Cause	Action
Vehicle rolling	Broken stabilizer bar	Replace
	Faulty shock absorber	Replace
Abnormal noises	Loosened mountings	Retighten
	Damaged or worn wheel bearing	Replace
	Faulty shock absorber	Replace
	Damaged tire	Replace
Poor ride comfort	Excessive tire pressure	Adjust pressure
	Faulty shock absorber	Replace
	Loosened wheel nut	Tighten to specified torque
	Bent or broken coil spring	Replace
	Damaged tire	Replace
	Worn bushing	Replace
Vehicle pulls to one side	Deformed arm assembly	Replace
	Worn bushing	Replace
	Bent or broken coil spring	Replace
Hard steering	Excessive resistance to rotation of lower arm ball joint	Replace
	Low tire pressure	Replace
	EPS malfunction	Replace
unstable steering	Worn or loosened lower arm bushing	Re-tighten or replace
Vehicle squatting dow	Worn or broken coil spring	Replace

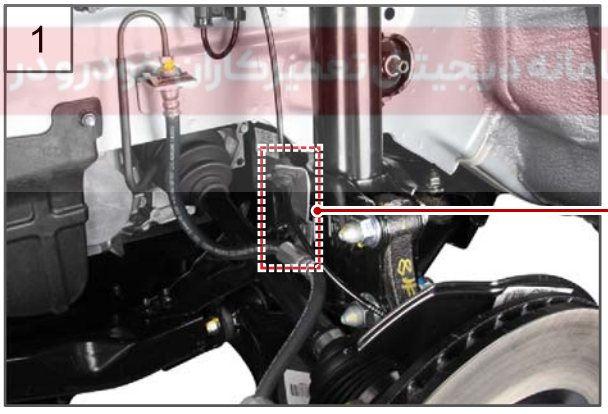
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4115-01

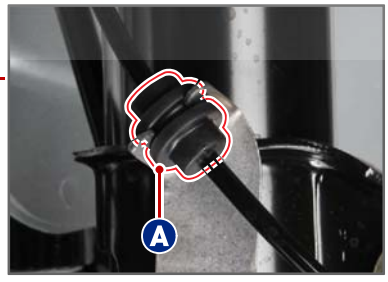
FRONT KNUCKLE ASSEMBLY

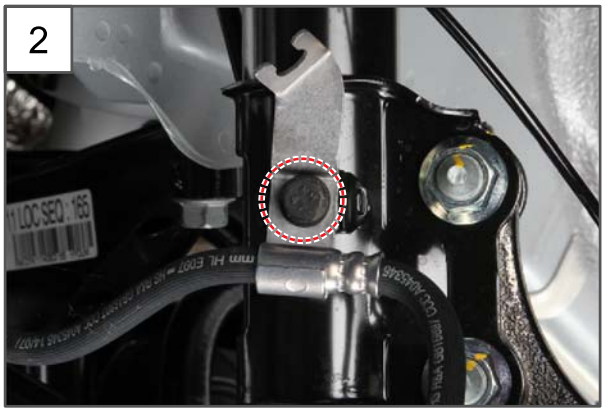
Preceding work
- Disconnect the negative battery cable.
- Remove the front wheel.





1. Free the mounting for the front wheel speed sensor (A).





2. Unscrew the mounting bolt (12 mm) for the brake hose bracket.

Tightening torque 9.8 to 12.7 Nm

Modification basis	
Application basis	
Affected VIN	

3

3. Unscrew the 2 mounting bolts (19 mm) on the front brake caliper.

Tightening torque 83.3 to 102.9 Nm

4

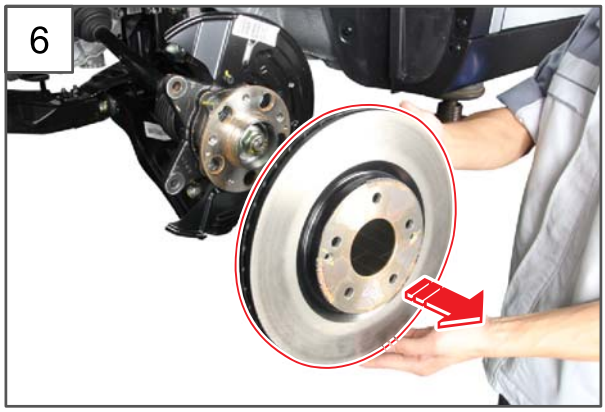
4. Remove the front caliper assembly.

5

5. Unscrew the 2 front brake disc mounting screws.

Tightening torque 4.9 to 6.8 Nm

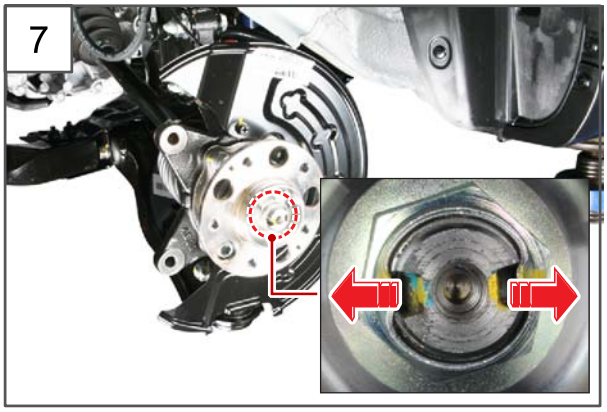
6



6. Remove the front brake disc from the hub assembly.

Modification basis	
Application basis	
Affected VIN	

7



7. Release the caulking of the front hub nut in the direction of the arrow shown in the picture.

8

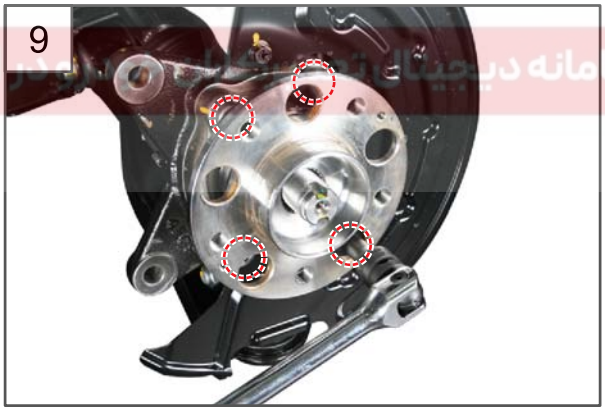
8. Unscrew the front hub nut (30 mm) to remove the hub assembly.

Tightening torque 245 to 343 Nm

CAUTION

Replace the hub nut with a new one when installing.

9



9. Unscrew the 4 front hub hexagon mounting bolts (10 mm).

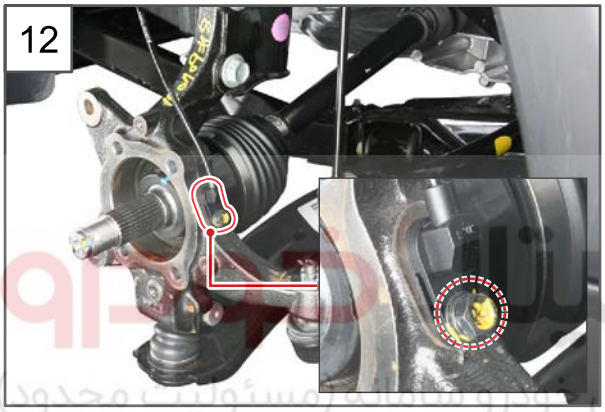
Tightening torque 107 to 127 Nm

10

10. Remove the front hub assembly.

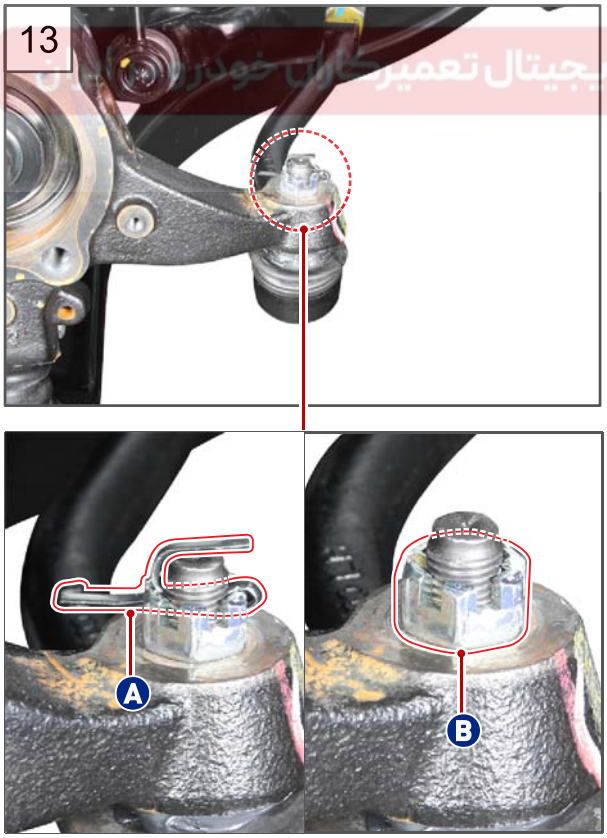
11. Unscrew the 3 mounting bolts (10 mm) for the front brake dust shield.

Tightening torque 4.9 to 6.8 Nm



12. Unscrew the mounting bolt (10 mm) for the front wheel speed sensor to remove the sensor from the knuckle.

Tightening torque 3.9 to 7.8 Nm



13. Unscrew the castle nut (B, 17 mm) after removing the split pin (A) on the tie rod end.

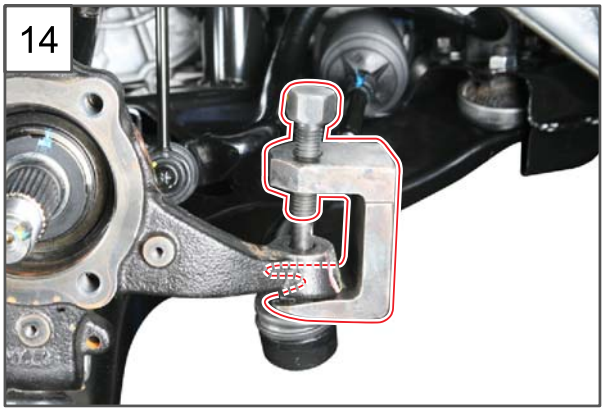
CAUTION

Make sure to replace the split pin (A) with a new one when fitting.

Tightening torque 44.1 to 83.3 Nm

Modification basis	
Application basis	
Affected VIN	

14

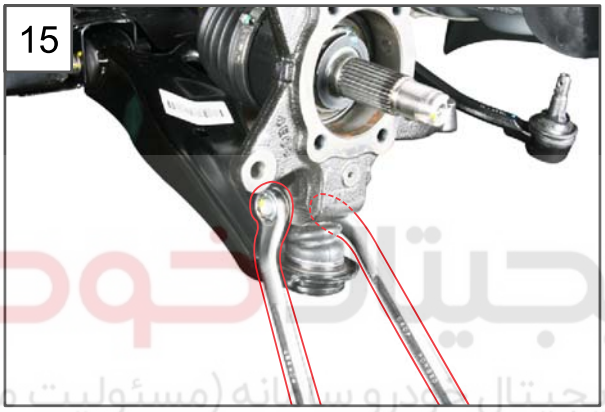


14.Remove the tie rod end from the knuckle with a special service tool.

CAUTION

Be careful not to damage the boot installed to the tie rod end.
If there are fuel leaks or damage, replace the tie rod end.

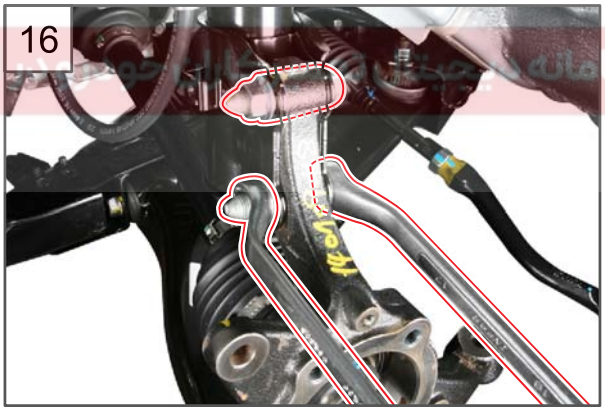
15



15.Unscrew the mounting bolt/nut (19 mm) fitted to the lower part of the knuckle assembly.

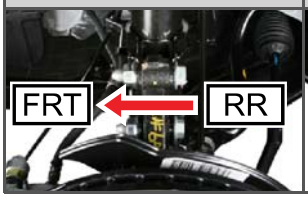
Tightening torque 107 to 127 Nm

16

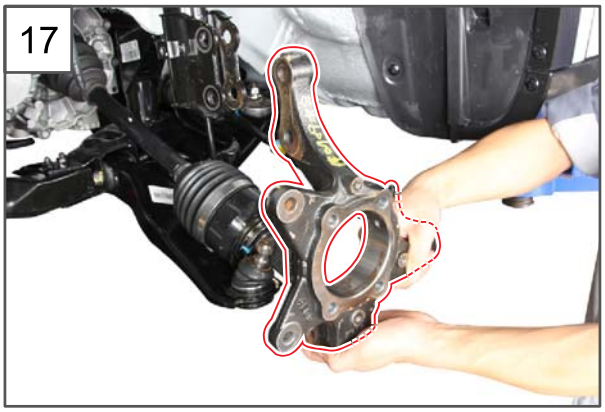


16.Unscrew the 2 mounting bolts (17 mm) and 2 mounting nuts (19 mm) for the front shock absorber.

Tightening torque 137 to 156 Nm

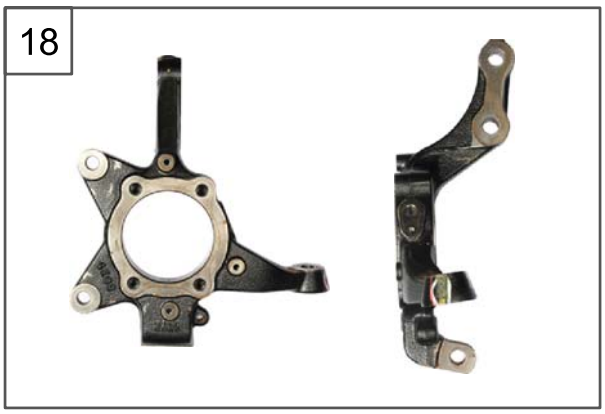
LH bolt tightening direction	RH bolt tightening direction
	

17



17.Remove the front knuckle.

Modification basis	
Application basis	
Affected VIN	



18.Install in the reverse order of removal.

CAUTION

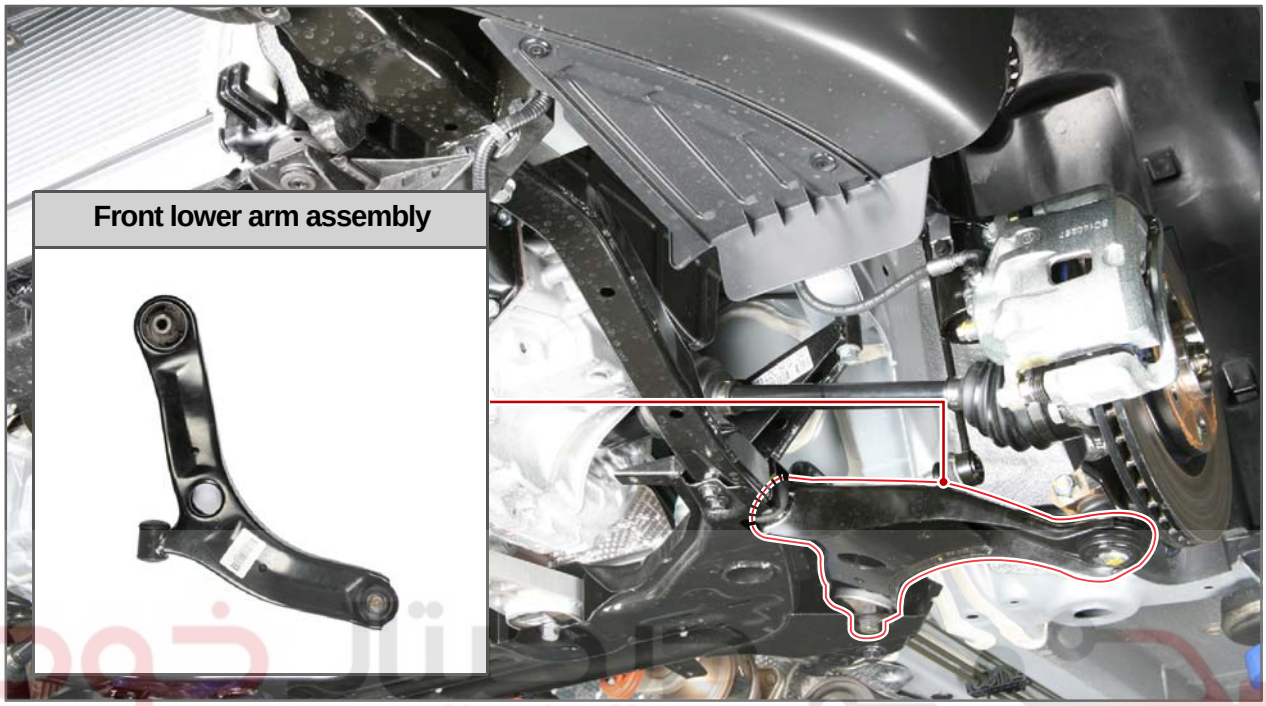
Check the removed components for any defect and clean those components thoroughly. Install them by tightening the bolts and nuts to the specified torque.

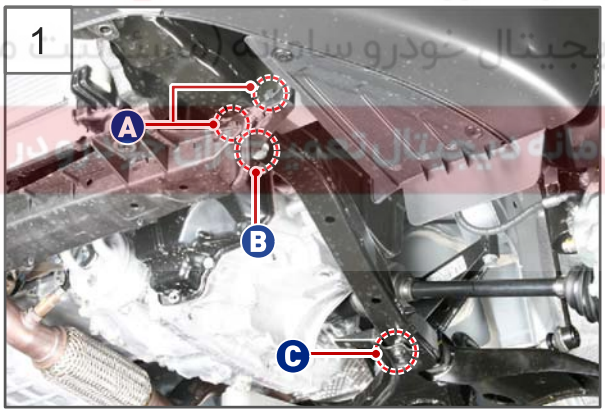
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4410-01

FRONT LOWER ARM ASSEMBLY

Preceding work - Remove the front wheel.

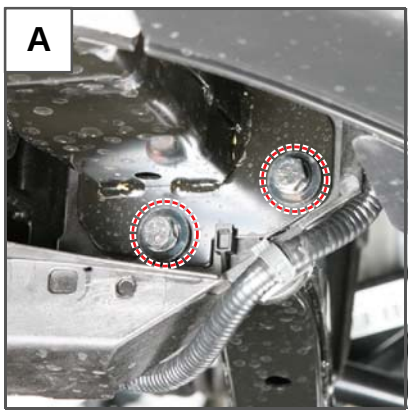


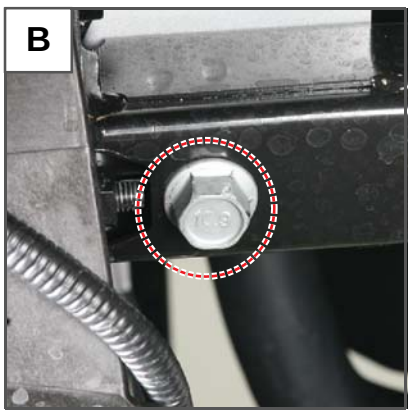


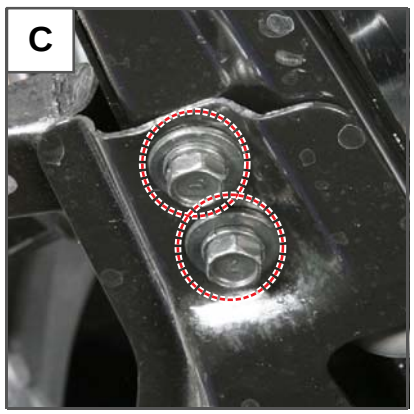
1. Unscrew the 2 mounting bolts (A, 12 mm), mounting bolt (B, 17 mm), and mounting bolt (C, 12 mm) for the front impact beam. (same for both sides)

Tightening torque
A: 29.4 to 34.3 Nm
B: 88.2 to 107.8 Nm
C: 29.4 to 34.3 Nm

NOTE
Front impact beam mounting bolt tightening order: A → B → C

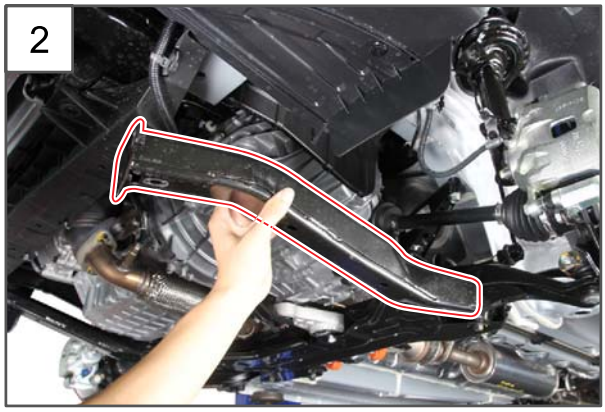






Modification basis	
Application basis	
Affected VIN	

2

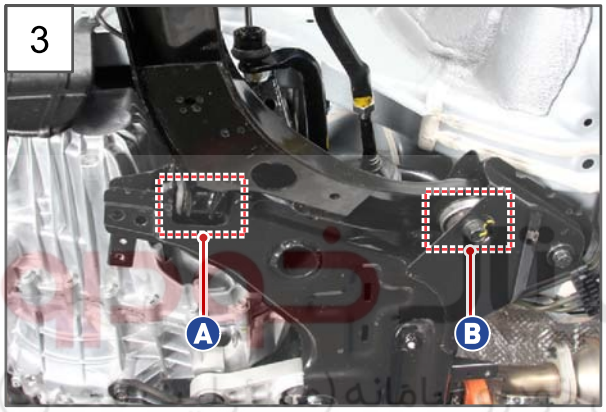


2. Remove the front impact beam.

CAUTION

Pay close attention to the tightening order when fitting the front impact beam bolt.

3

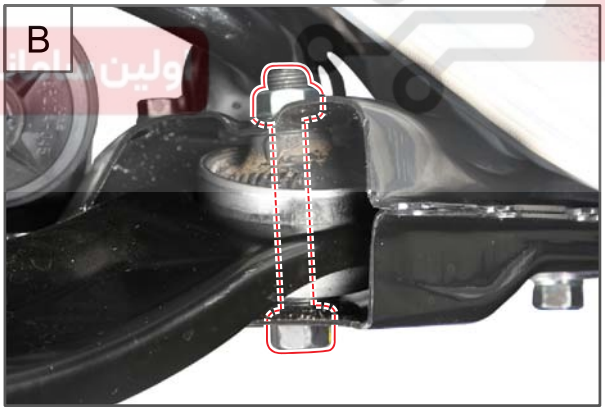


3. Unscrew the mounting bolt (A, 19 mm) and bolt/nut (B, 19 mm) securing the front lower arm to the sub frame.

Tightening torque **(A) 107.9 to 137.3 Nm**
(B) 127.5 to 147.2 Nm

A

B



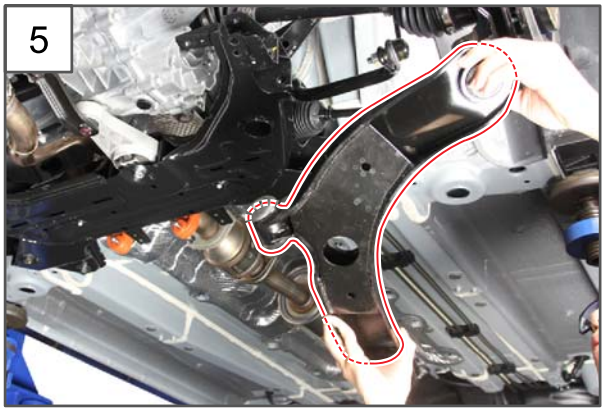
4

4. Unscrew the mounting bolt/nut (19 mm) fitted to the lower part of the knuckle assembly.

Tightening torque **107 to 127 Nm**

Modification basis	
Application basis	
Affected VIN	

5



5. Remove the front lower arm assembly.

6

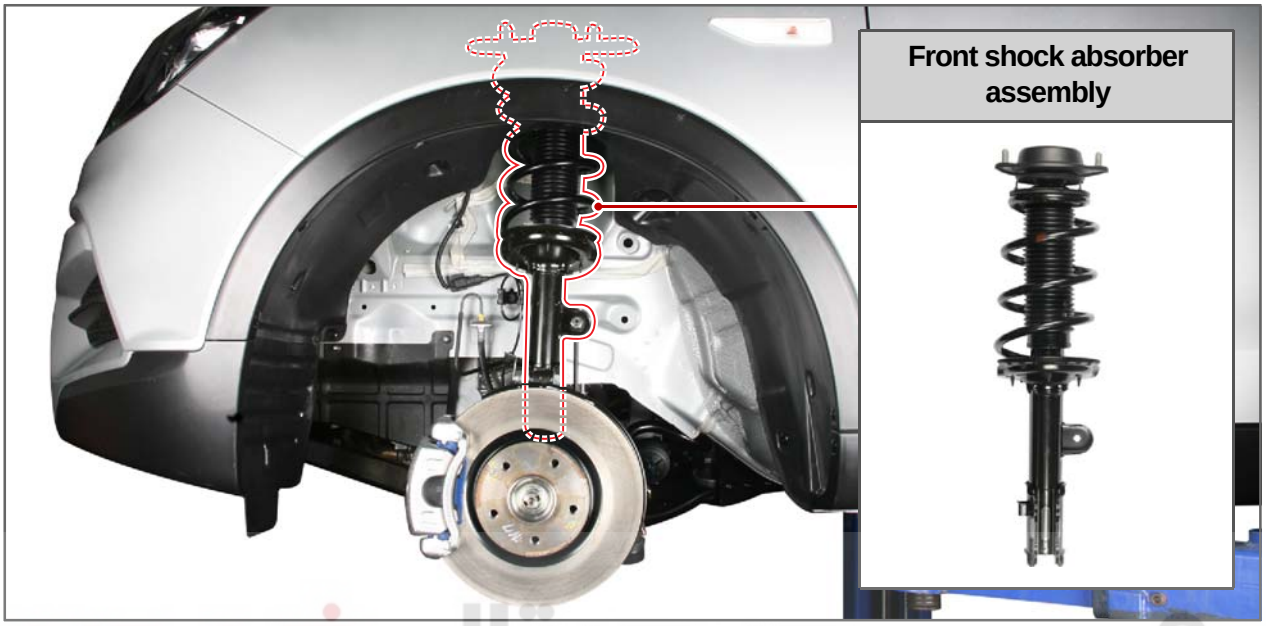
6. Install in the reverse order of removal.

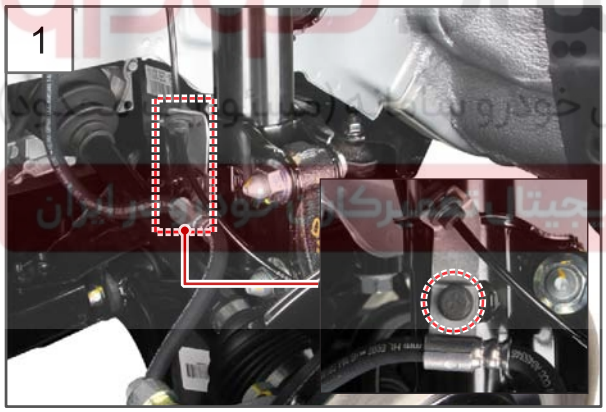
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4411-02

FRONT SHOCK ABSORBER ASSEMBLY

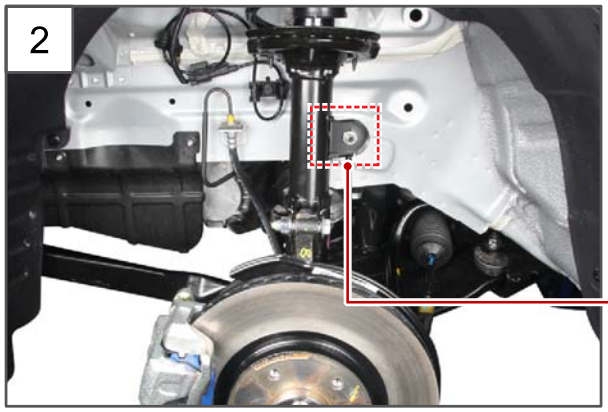
Preceding work - Remove the front wheel.





1. Unscrew the mounting bolt (12 mm) for the brake hose bracket.

Tightening torque 9.8 to 12.7 Nm



2. Unscrew the upper mounting nut (17 mm) on the font stabilizer bar link.

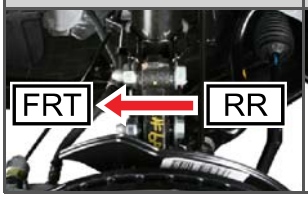
Tightening torque 49.0 to 68.6 Nm

Modification basis	
Application basis	
Affected VIN	

4

4. Unscrew the 2 lower mounting bolts (17 mm) and 2 mounting nuts (19 mm) for the front shock absorber.

Tightening torque 137 to 156 Nm

LH bolt tightening direction	RH bolt tightening direction
	

5

5. Remove the wiper cover from the top of the vehicle.

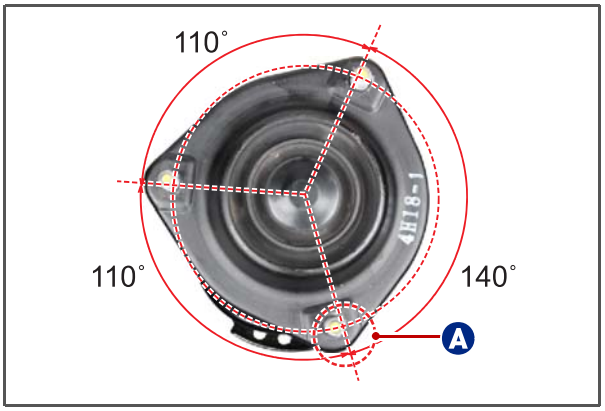
NOTE

Refer to "FRONT WIPER MOTOR" under "REMOVAL AND INSTALLATION" subsection of "WIPER SYSTEM" section in "ELECTRICS" chapter.

6

6. Unscrew the 3 shock absorber upper mounting nuts (14 mm).

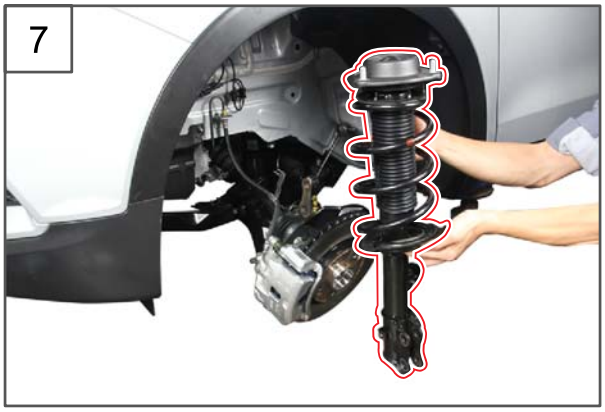
Tightening torque 58.8 to 78.4 Nm



- Make a mark on the point (A) before removing the shock absorber upper mounting nut.

Modification basis	
Application basis	
Affected VIN	

7



7. Remove the front shock absorber.

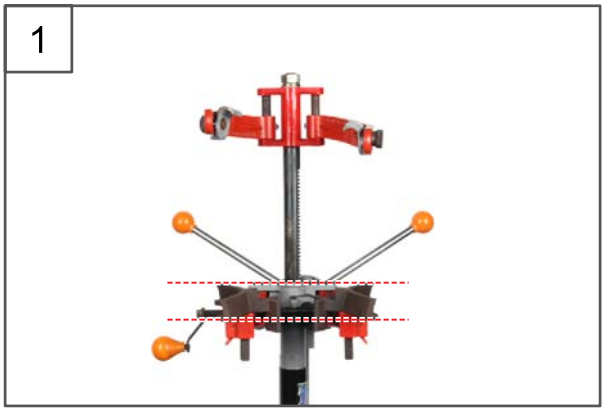
8

8. Install in the reverse order of removal.

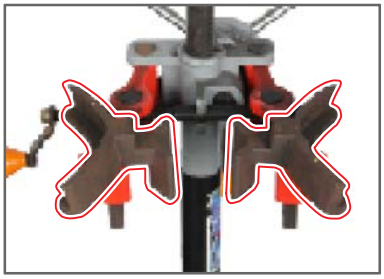
Modification basis	
Application basis	
Affected VIN	

▶ Disassembling shock absorber

1



1. Make sure that the left and right surfaces are even with each other at the lower part of the coil spring compressor.



2

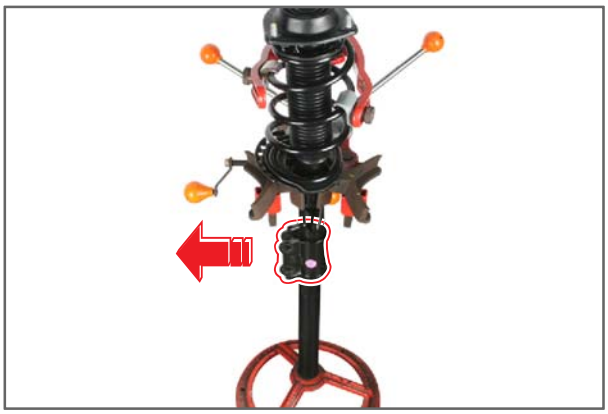
2. Install the shock absorber assembly to the coil spring compressor.

3

3. Place the shock absorber assembly so that the bottom of the assembly is seated on the clamp of the lower part of the spring compressor, and turn the handle (A) clockwise (arrow direction) to secure the assembly.

CAUTION

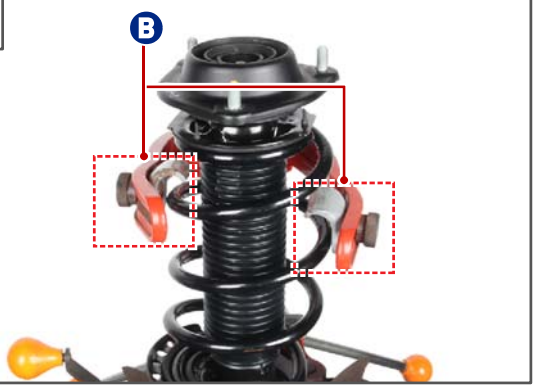
- Make sure that the shock absorber assembly and coil spring compressor are parallel.
- Fit the assembly to the coil spring compressor securely and tie the it with a string to prevent displacement.



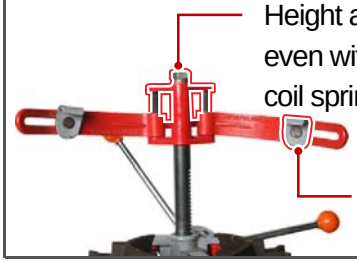
CAUTION

Place the bottom (knuckle connection) of the shock absorber assembly facing the arrow direction (90° away from the front face) to minimize the torsion when compressing the coil spring.

4



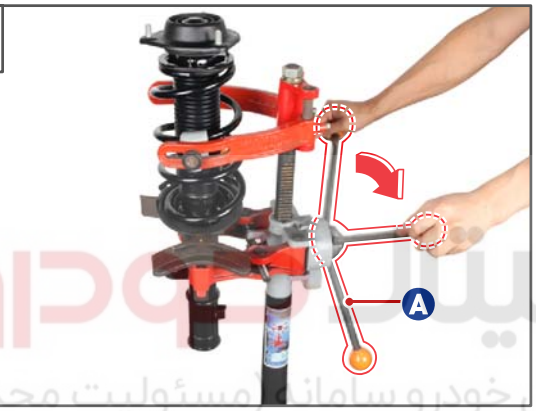
4. The height of the upper clamp (B) is adjustable. Make sure that the top surfaces of the clamp and shock absorber spring are flush with each other.



Height adjustable (must be even with the top surface of coil spring)

Hook shape to fit over the coil spring

5



5. Turn the handle (A) of the coil spring compressor clockwise (arrow direction) to compress the spring.

CAUTION

When compressing the coil spring fitted to the special tool, be cautious since it can pop up because of its tension.

6

6. Remove the upper insulator cap.

7

7. Unscrew the shock absorber mounting nut (17 mm).

Tightening torque 49.0 to 68.6 Nm

Modification basis	
Application basis	
Affected VIN	

8

8. Remove the upper insulator assembly from the shock absorber.

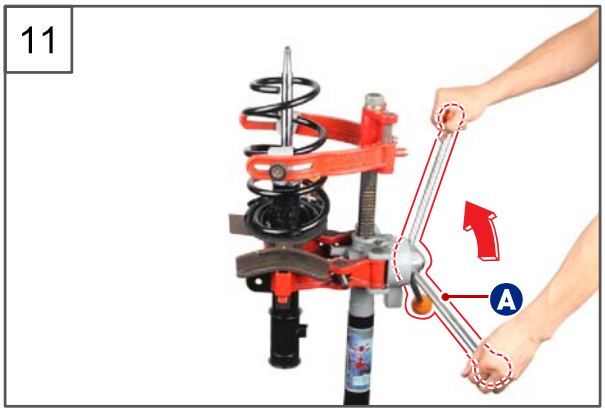
9

9. Remove the upper seat from the shock absorber.

10

10. Remove the dust cover from the shock absorber.

11



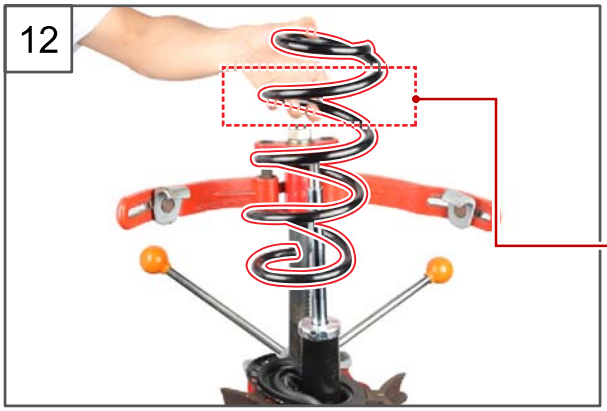
11. Turn the handle (A) of the coil spring compressor counterclockwise (arrow direction) to release the coil spring.

CAUTION

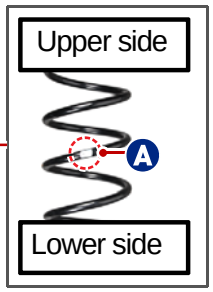
When releasing the coil spring fitted to the special tool, be cautious since it can pop up because of its tension.

Modification basis	
Application basis	
Affected VIN	

12



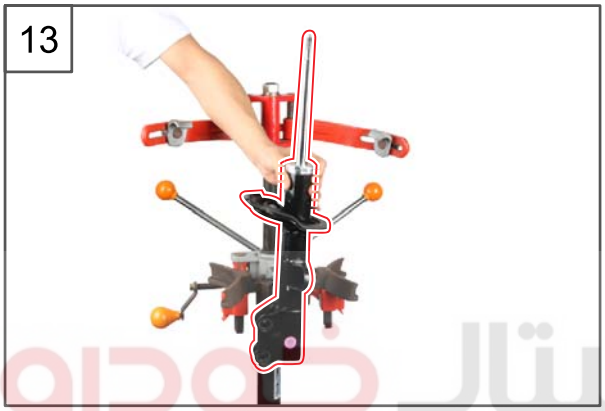
12.Remove the coil spring after separating the coil spring compressor.



CAUTION

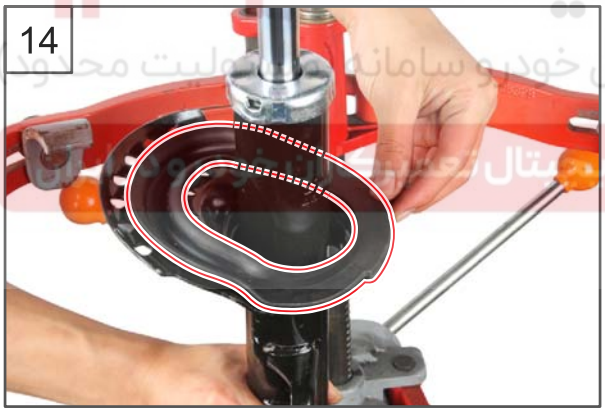
Make a mark (A) on the second winding so that the installation direction will not be changed when installing the coil spring.

13



13.Remove the shock absorber assembly from the coil spring compressor.

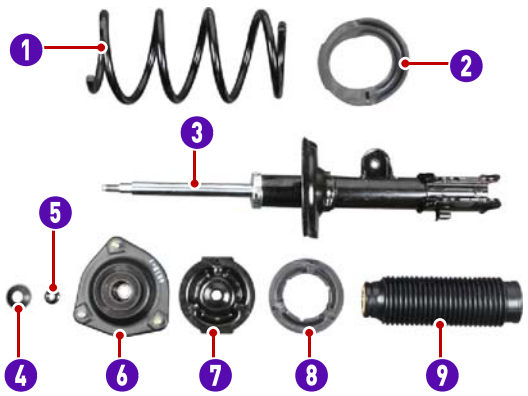
14



14.Remove the lower rubber from the shock absorber.

15.Install in the reverse order of removal.

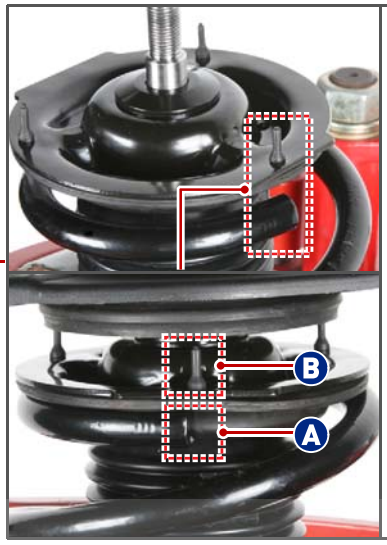
Front shock absorber assembly



1. Front coil spring
2. Front shock absorber lower rubber
3. Front shock absorber
4. Upper insulator cap
5. Nut
6. Front shock absorber upper insulator
7. Front shock absorber seat
8. Front shock absorber upper rubber
9. Front shock absorber dust cover

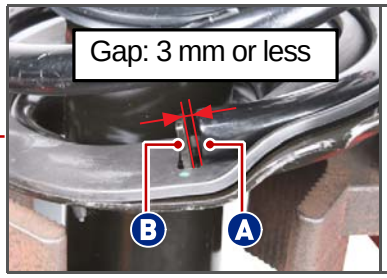
Modification basis	
Application basis	
Affected VIN	

Cautions for installation



Make sure that the top end (A) of the coil spring aligns with the protrusion (B) of the upper rubber.

Make a mark (A) on the second winding so that the installation direction will not be changed when installing the coil spring.

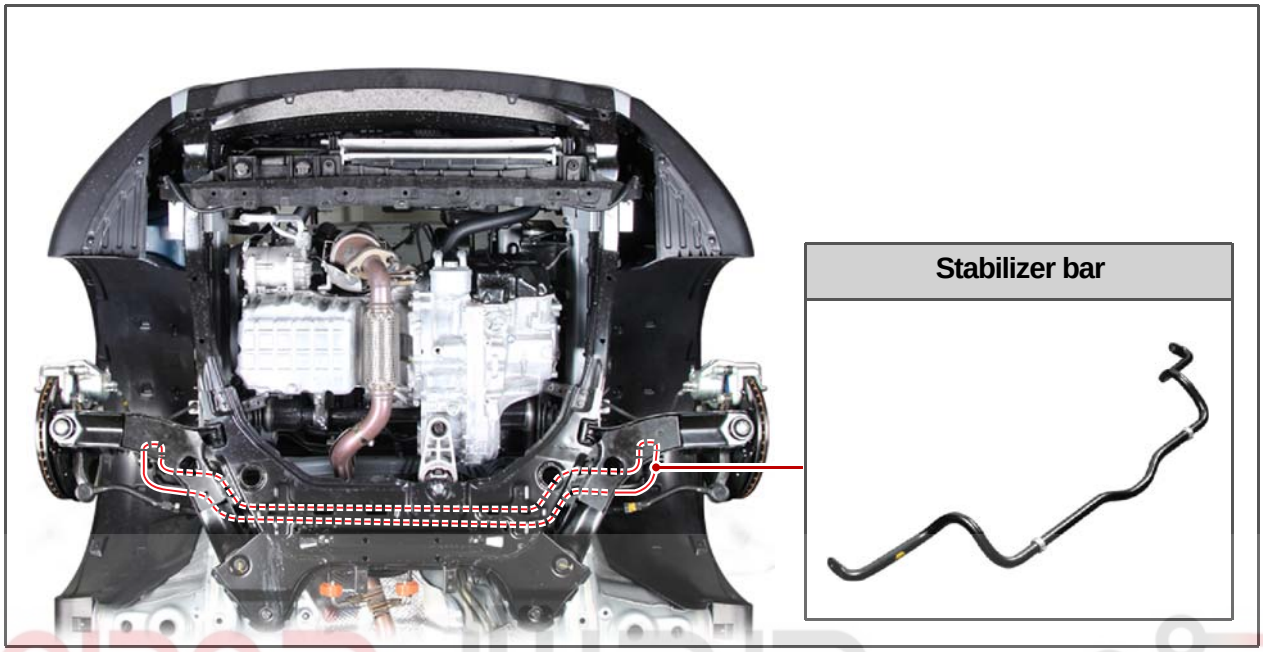


Make sure that the bottom end (A) of the coil spring contacts with the stopper (B) of the lower seat. The gap between these two surfaces should be 3 mm or less.

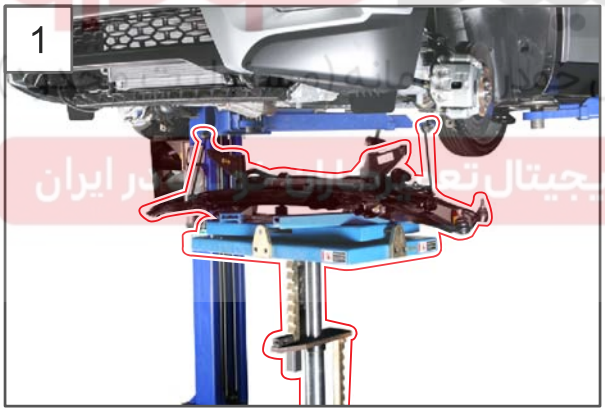
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4420-01 FRONT STABILIZER BAR ASSEMBLY

Preceding work - Disconnect the negative battery cable.



1

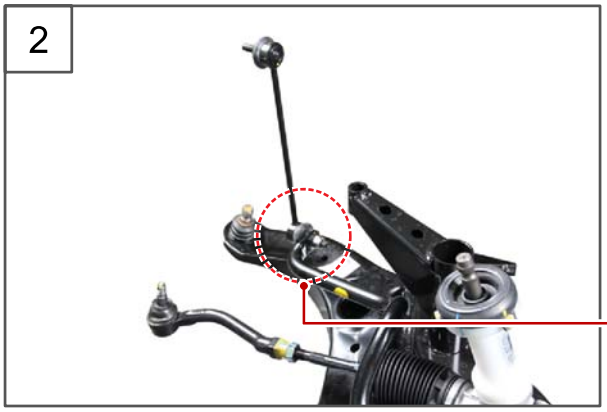


1. Remove the front sub frame assembly.

NOTE

Refer to "FRONT SUB FRAM ASSEMBLY" under "REMOVAL AND INSTALLATION" subsection of "SUB FRAME ASSEMBLY" section in "CHASSIS" chapter.

2

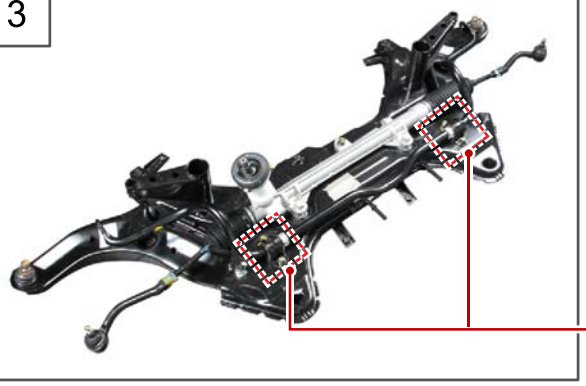


2. Unscrew the lower mounting nut (17 mm) on the font stabilizer bar link.

Tightening torque 49.0 to 68.6 Nm

Modification basis	
Application basis	
Affected VIN	

3



3. Unscrew the 2 mounting bolts (14 mm) for the stabilizer bar brackets on both sides to remove the stabilizer bar assembly.

Tightening torque 39.2 to 58.8 Nm

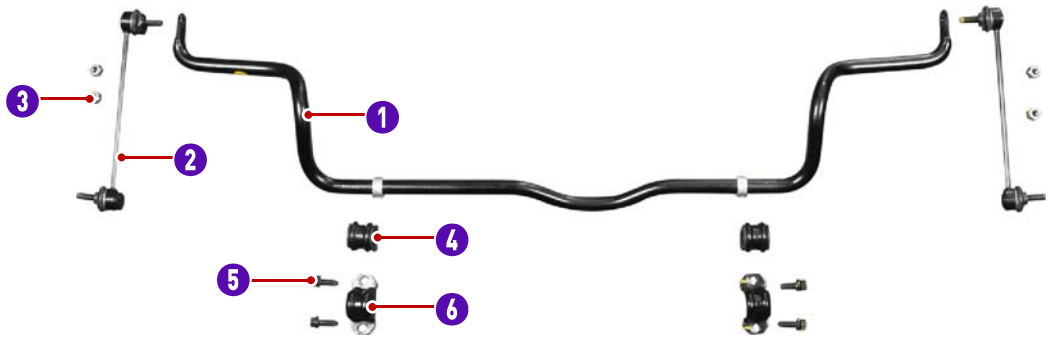
4

4. Install in the reverse order of removal.

NOTE

Make sure that the yellow mark (A) on the stabilizer bar faces the left side when installing it.

Front stabilizer bar assembly



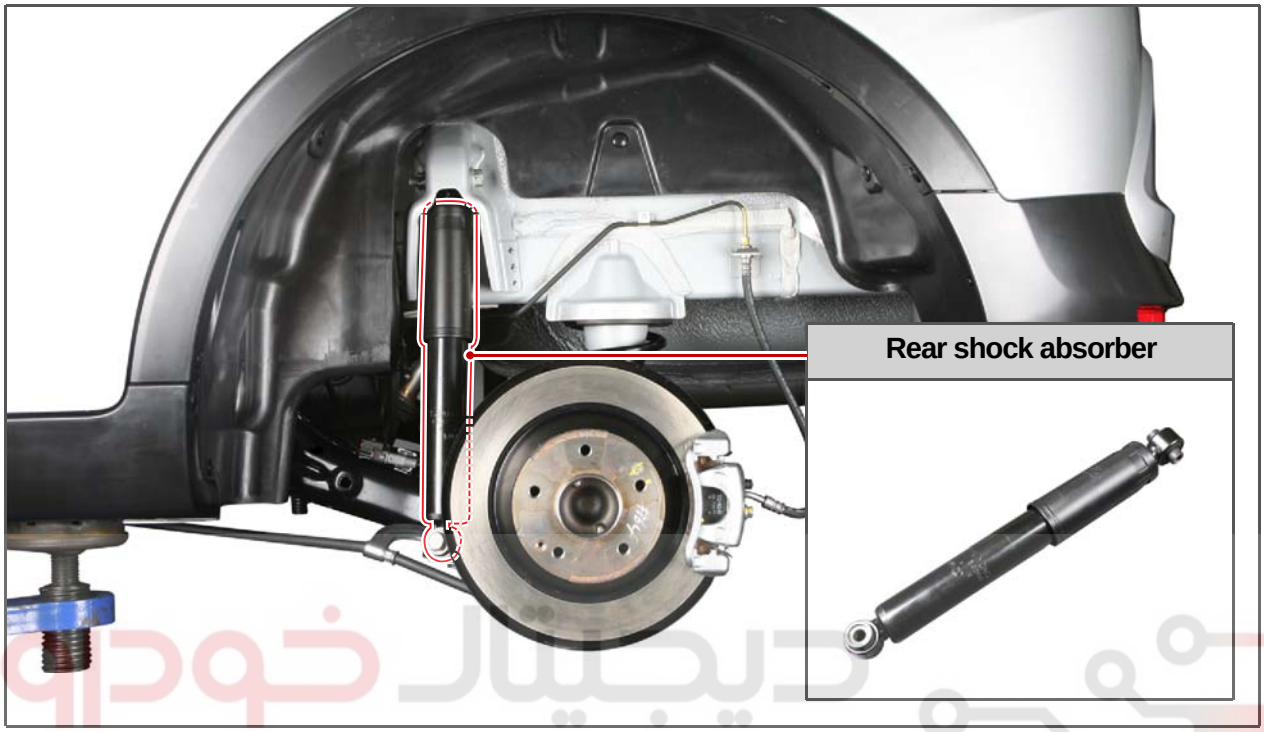
1. Front stabilizer bar
2. Front stabilizer bar link
3. Nut
4. Front stabilizer bar bushing
5. Bolt
6. Front stabilizer bar mounting bracket

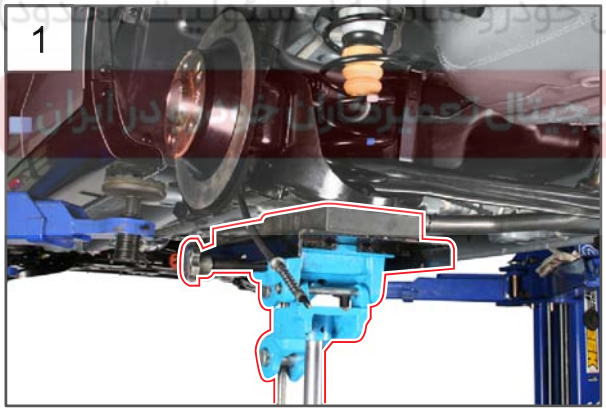
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4511-01

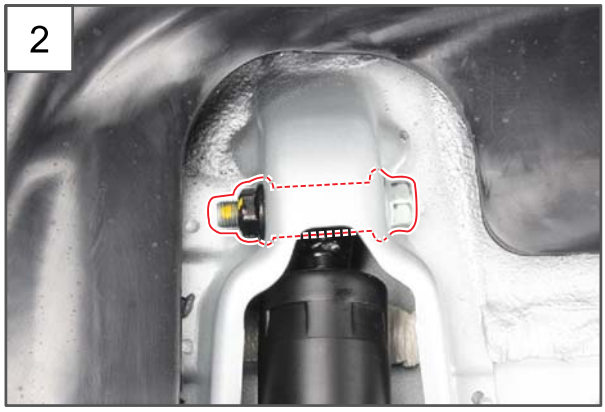
REAR SHOCK ABSORBER (2WD)

Preceding work - Remove the rear wheel.



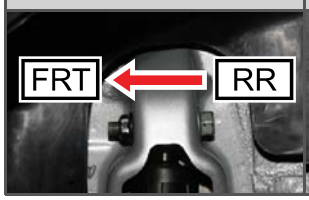
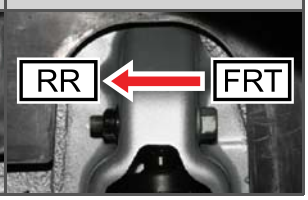


1. Place a jack under the rear torsion beam to support the vehicle.



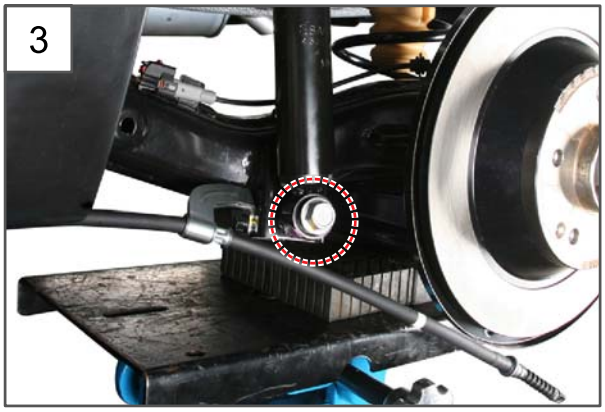
2. Unscrew the upper mounting bolt/nut (17 mm) for the rear shock absorber.

Tightening torque 78.5 to 98.0Nm

LH bolt tightening direction	RH bolt tightening direction
	

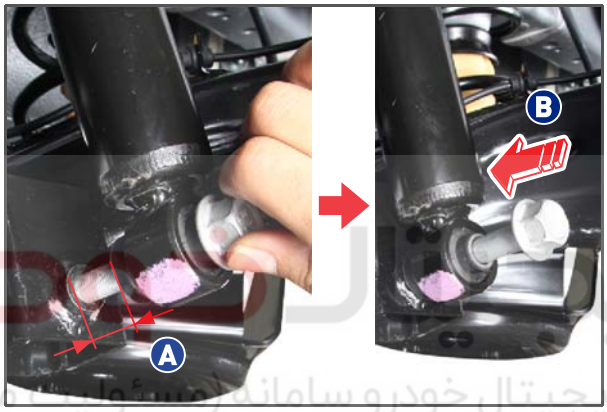
Modification basis	
Application basis	
Affected VIN	

3



3. Unscrew the lower mounting bolt (17 mm) for the rear shock absorber.

Tightening torque 78.5 to 98.0Nm



CAUTION

Push in (B) the rear shock absorber lower mounting bolt with a certain distance (A) from the mounting, and tighten the bolt to the specified tightening torque.

4

4. Remove the rear shock absorber.

5

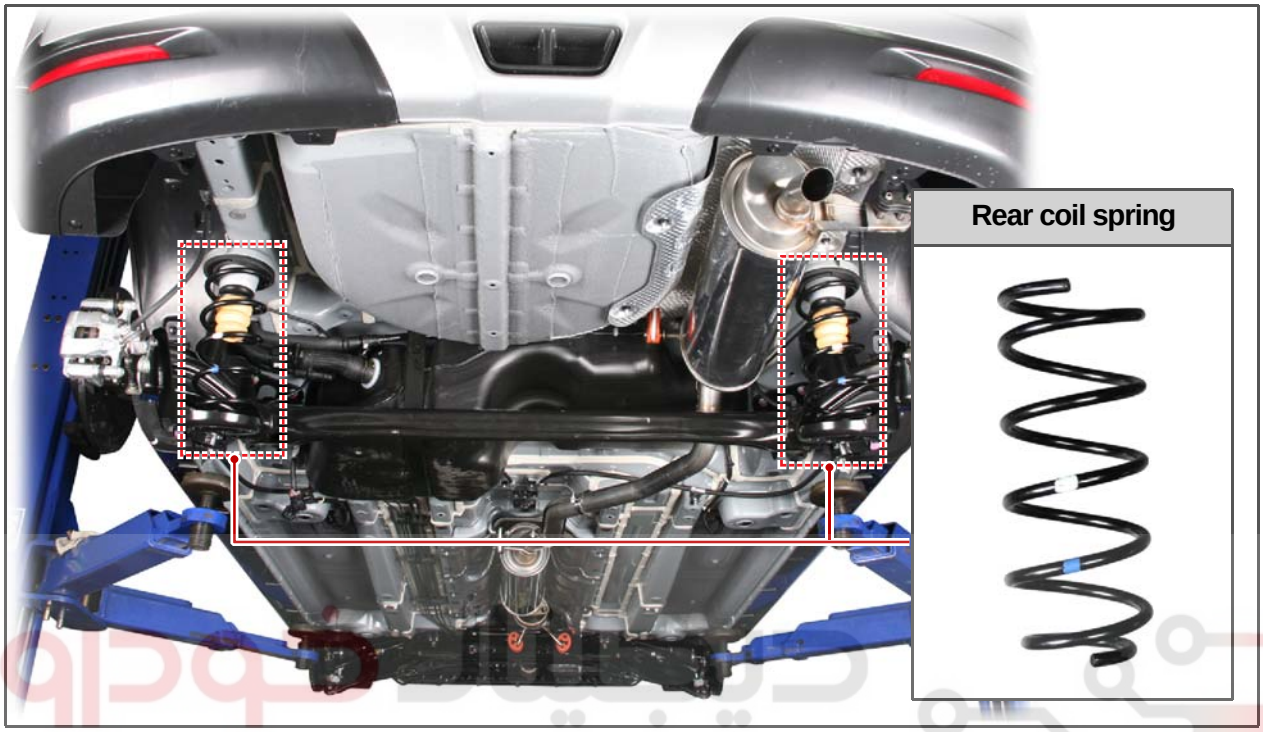
5. Install in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

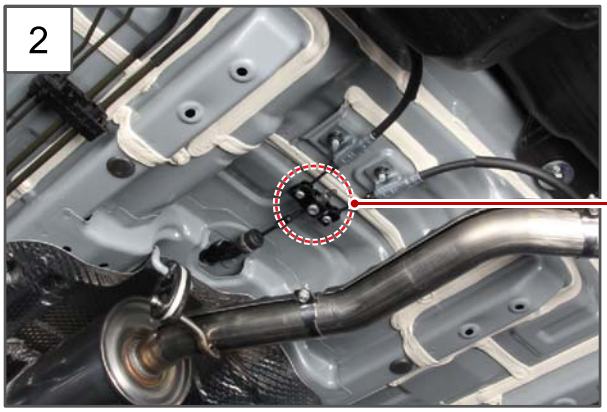
S.G.N. 4511-02

REAR COIL SPRING (2WD)

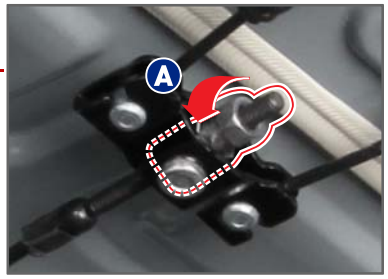
Preceding work - Remove the rear wheel.



1. Prior to removing the equalizer nut, make the installation mark at the front, under the vehicle.

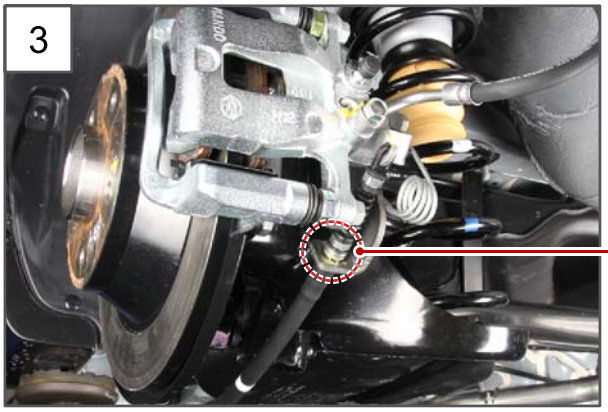


2. Loosen the equalizer nut (12 mm) completely by rotating it counterclockwise to loosen the parking brake cable.



Modification basis	
Application basis	
Affected VIN	

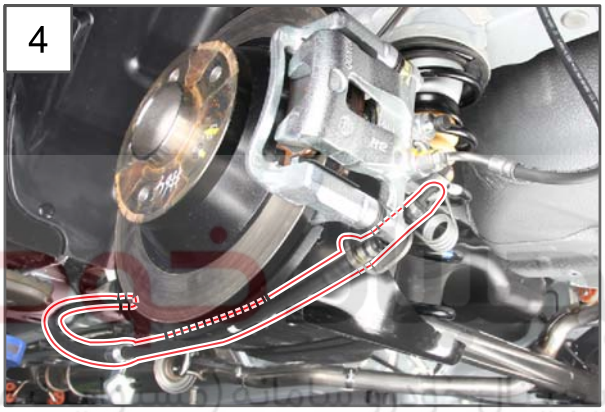
3



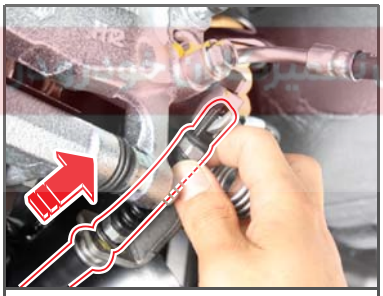
3. Remove the retaining pin for the rear parking brake cable.

Retaining pin

4



4. Remove the rear parking brake cable from the rear brake caliper.

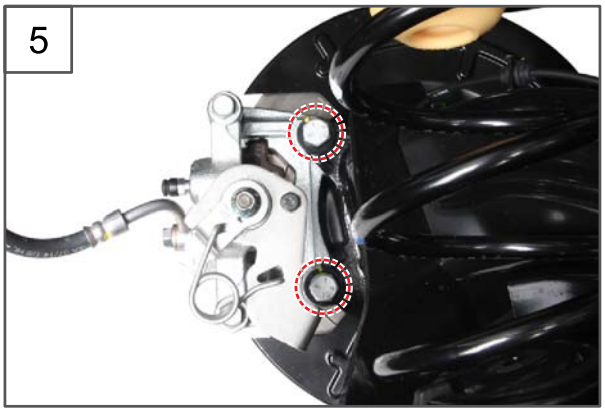


Pull on the rear parking brake cable in the direction of the arrow.

Free the end of rear parking brake cable by moving it in the direction of the arrow.

Remove the rear parking brake cable.

5

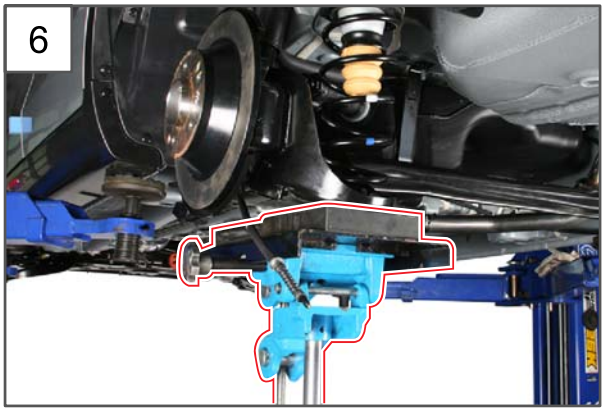


5. Unscrew the 2 rear brake caliper mounting bolts (19 mm).

Tightening torque 53.9 to 63.7 Nm

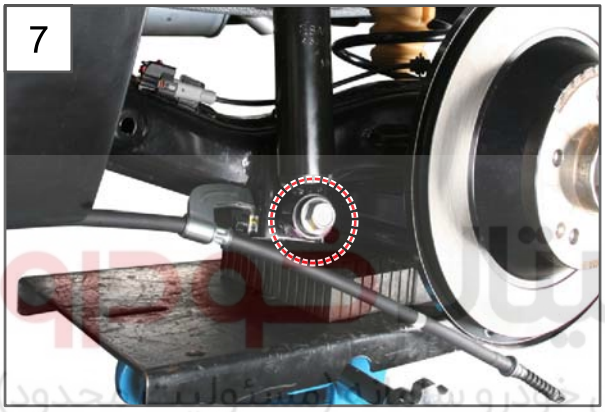
Modification basis	
Application basis	
Affected VIN	

6



6. Place a jack under the rear torsion beam to support the vehicle.

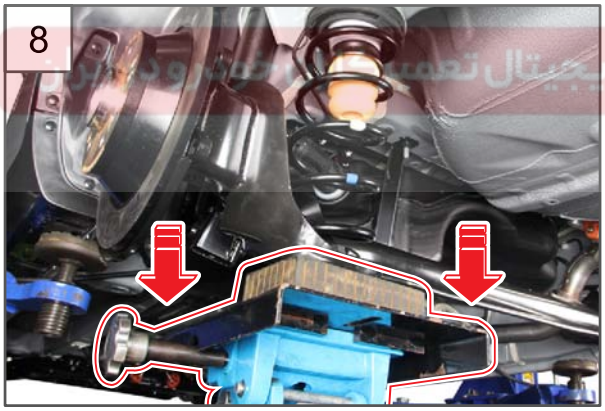
7



7. Unscrew the lower mounting bolt (17 mm) for the rear shock absorber.

Tightening torque 78.5 to 98.0Nm

8



8. Lower the jack under the rear torsion beam slowly.

9

9. Remove the rear coil spring.

Modification basis	
Application basis	
Affected VIN	

10

10.Remove the bumper stopper.

11

11.Unscrew the bumper stopper mounting bolt (14 mm).

Tightening torque 14.7 to 16.7 Nm

12

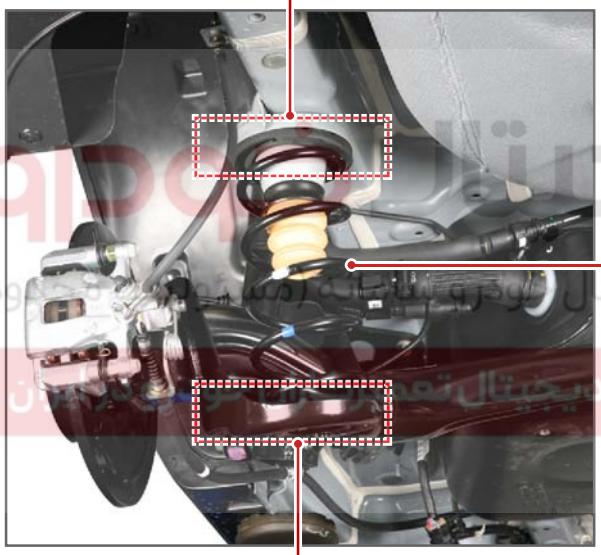
12.Remove the rear coil spring lower rubber.

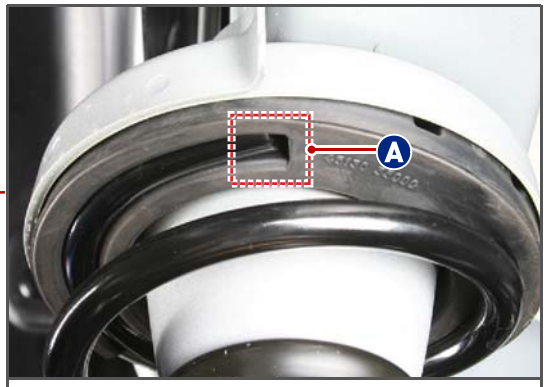
13

13.Install in the reverse order of removal.

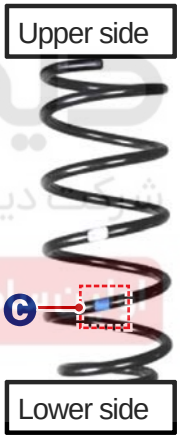
Modification basis	
Application basis	
Affected VIN	

Cautions for installation

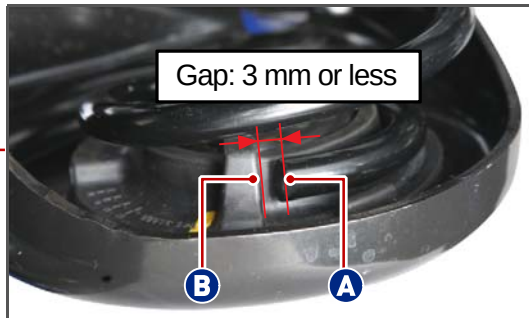




Make sure that the end of the rear coil spring is seated correctly on the groove part (A).



Pay attention to the installation direction of the rear coil spring when installing. Install by referencing the mark (C) located on the 2nd winding from the bottom of the spring.



Make sure that the bottom end (A) of the coil spring contacts with the stopper (B) of the lower seat. The gap between these two surfaces should be 3 mm or less.

Modification basis	
Application basis	
Affected VIN	

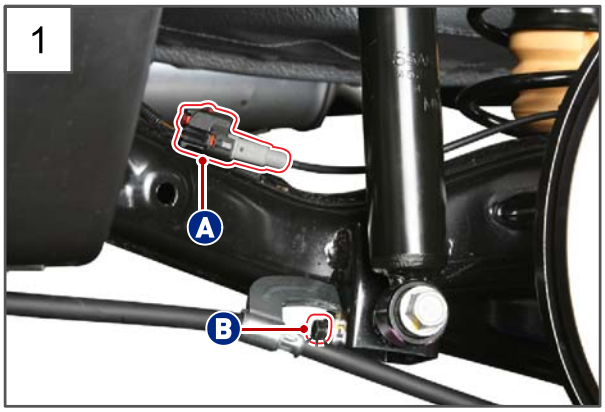
S.G.N. 4510-01

REAR TORSION BEAM ASSEMBLY (2WD)

Preceding work
- Disconnect the negative battery cable.
- Remove the rear wheel.

Rear torsion beam assembly

1



1. Disconnect the rear wheel speed sensor connector (A) and unscrew the mounting bolt (B, 12 mm) for the rear parking brake cable bracket.

Tightening torque 39.2 to 58.8 Nm

Modification basis	
Application basis	
Affected VIN	

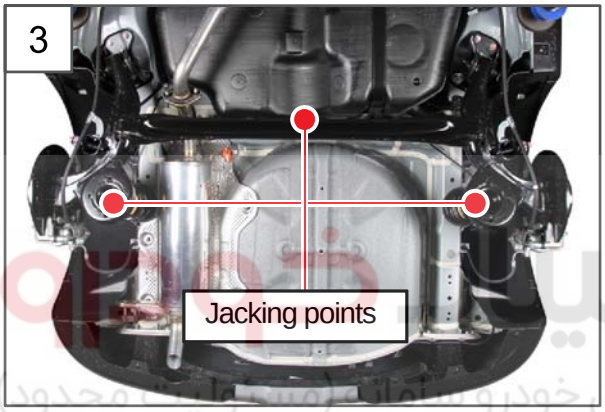
2

2. Remove the rear coil spring.한다.

NOTE

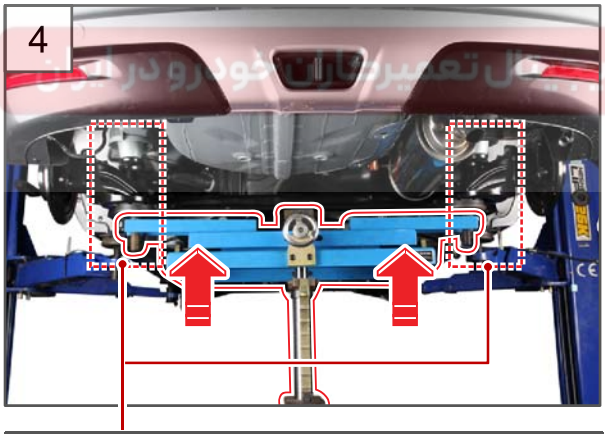
Refer to "REAR COIL SPRING" under this subsection.

3

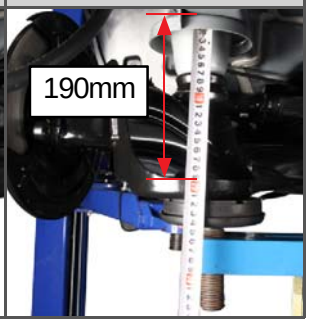


3. Place a jack under the rear torsion beam to support the vehicle.

4

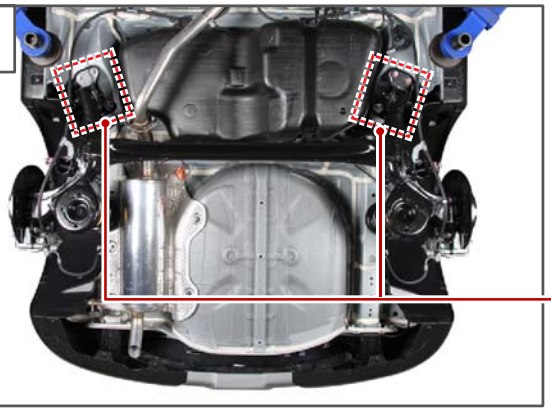


4. Compress the rear torsion beam (from 300 mm to 190 mm) by lifting up the jack under the rear torsion beam.

Before compression	After compression
	

Modification basis	
Application basis	
Affected VIN	

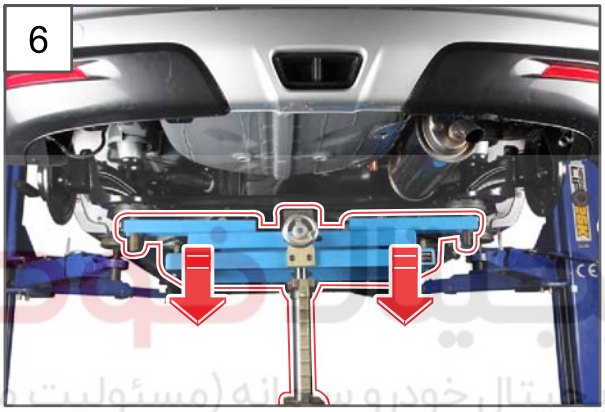
5



5. Unscrew the 4 mounting bolts (17 mm) for the rear torsion beam on both sides.

Tightening torque 39.2 to 58.8 Nm

6



6. Remove the rear torsion beam after lowering the jack under the rear torsion beam slowly.

7

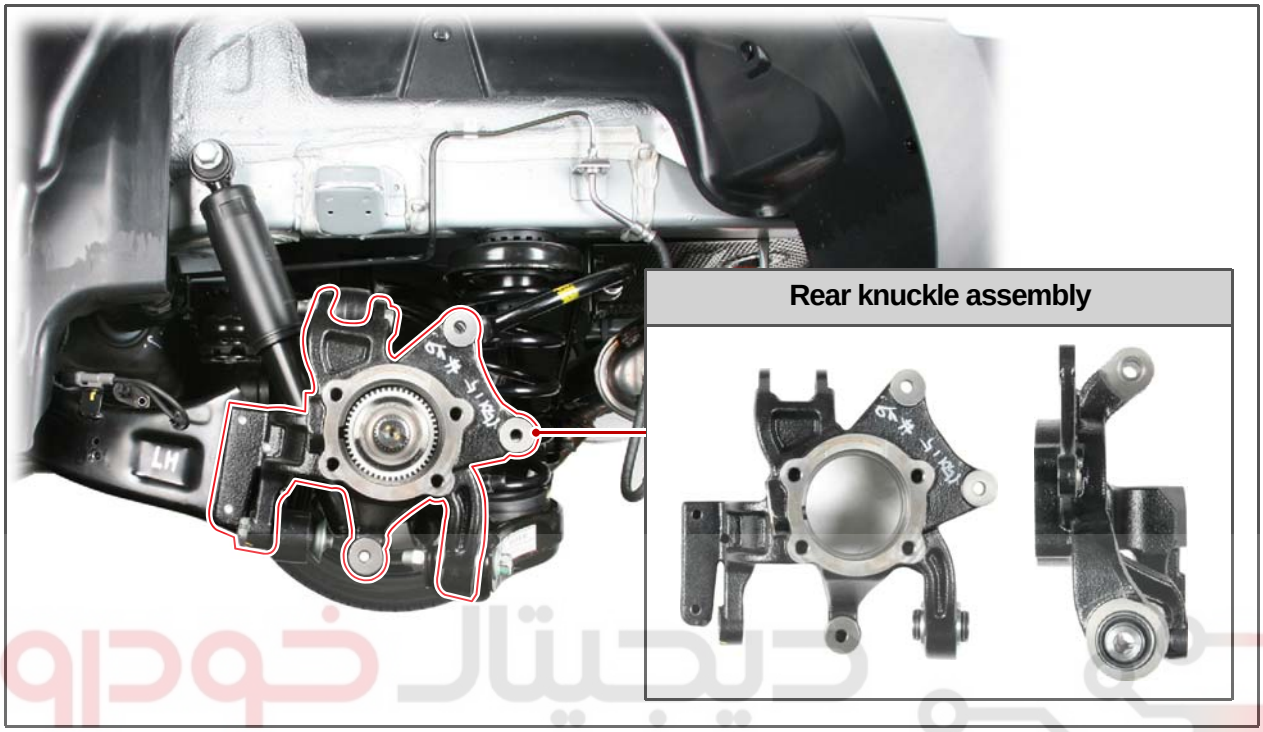
7. Install in the reverse order of removal.

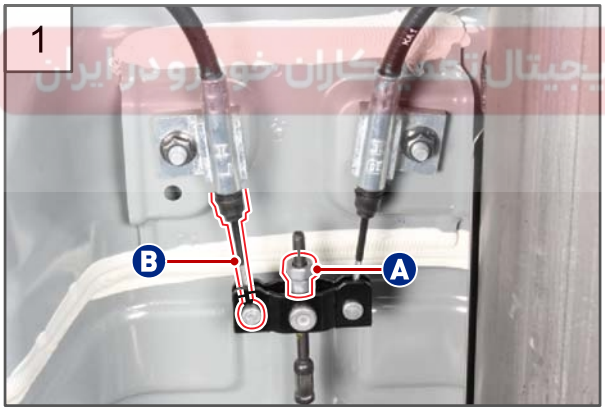
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4520-24

REAR KNUCKLE ASSEMBLY (AWD)

Preceding work - Remove the rear wheel.





1. Unscrew the equalizer nut (A, 12 mm) separate the rear parking brake cable (B) from the center parking brake cable.

NOTE

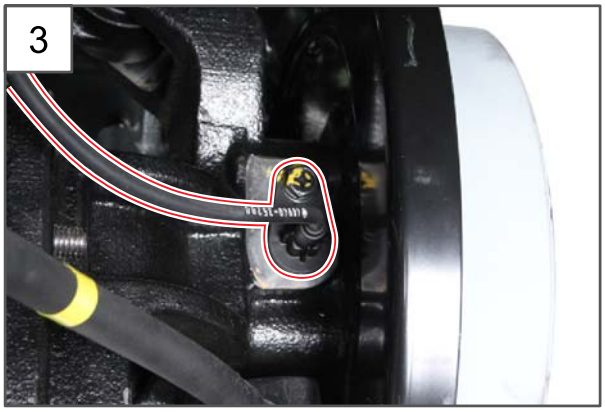
Disconnect the corresponding cable only according to the knuckle on which you are working.

2. Unscrew the mounting bolt (12 mm) for the rear parking brake cable on the rear trailing arm side.

Tightening torque 9.8 to 12.7 Nm

Modification basis	
Application basis	
Affected VIN	

3

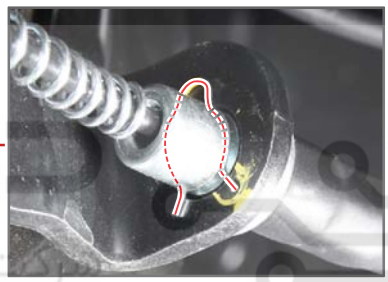


3. Unscrew the mounting bolt (10 mm) for the rear wheel speed sensor to remove the sensor from the knuckle.

Tightening torque 3.9 to 7.8 Nm

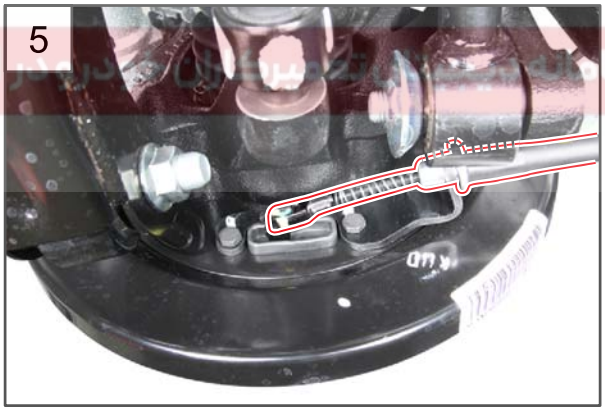
4

4. Remove the retaining pin for the rear parking brake cable.

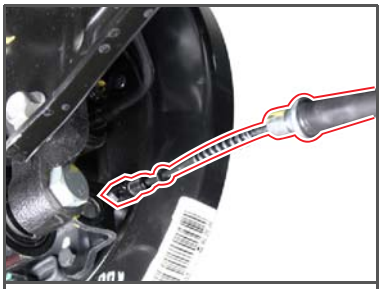


Retaining pin

5

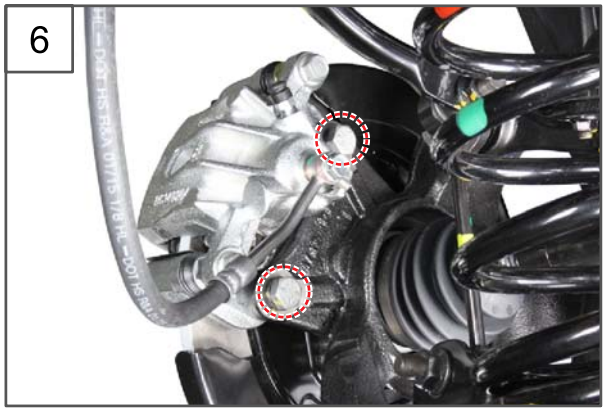


5. Pull out the rear parking cable from the operating lever.

		
Pull on the rear parking brake cable in the direction of the arrow.	Separate the rear parking cable from the operating lever.	Remove the rear parking brake cable from the dust shield.

Modification basis	
Application basis	
Affected VIN	

6



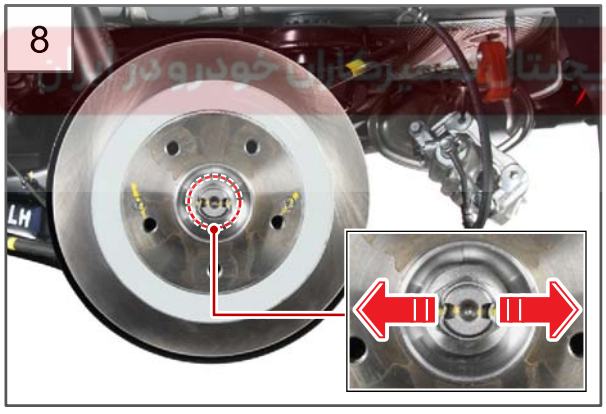
6. Unscrew the 2 mounting bolts (17 mm) on the rear brake caliper.

Tightening torque 53.9 to 63.7 Nm

7

7. Detach the rear brake caliper assembly and secure it to the vehicle body.

8



8. Release the caulking of the rear hub nut in the direction of the arrow shown in the picture to remove the rear hub nut (30 mm).

Tightening torque 245 to 343 Nm

CAUTION

Replace the hub nut with a new one when installing.

9

9. Unscrew two mounting screws and remove the brake disk.

Tightening torque 4.9 to 6.8 Nm

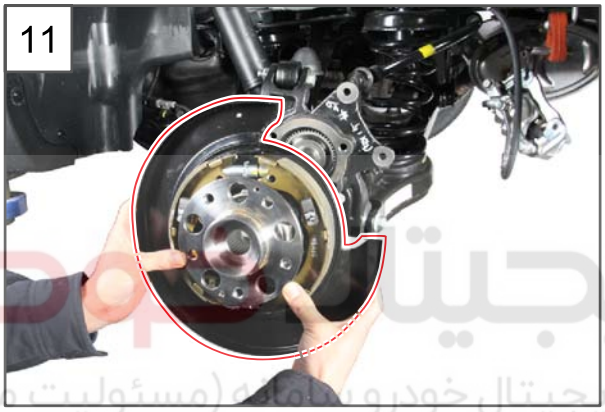
Modification basis	
Application basis	
Affected VIN	

10

10. Unscrew the 4 hexagon mounting bolts (10 mm) for the rear hub.

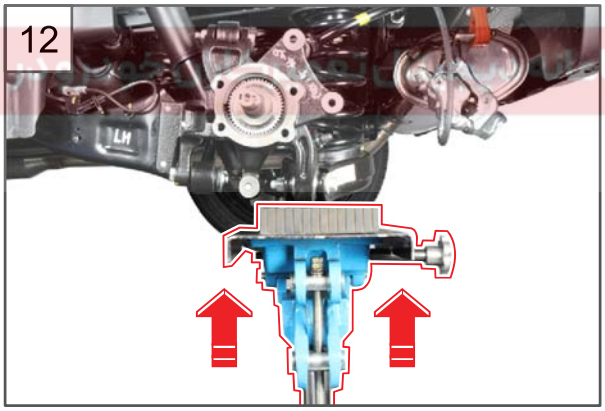
Tightening torque **107 to 127 Nm**

11



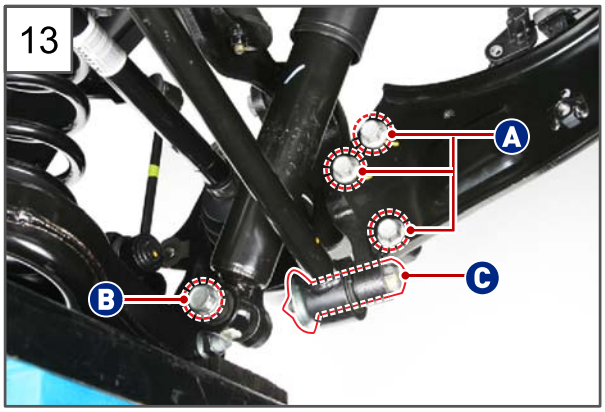
11. Remove the rear hub assembly and dust shield assembly at the same time.

12



12. Place a jack firmly under the rear lower arm knuckle side.

13



13. Unscrew the 3 mounting bolts (A, 14 mm) for the trailing arm on the knuckle side, mounting bolt (B, 17 mm) for the rear shock absorber, mounting bolt/nut (C, 19 mm) for the track rod.

Tightening torque
(A) 49.0 to 68.6 Nm
(B) 78.5 to 98.0Nm
(C) 98.0 to 117.6 Nm

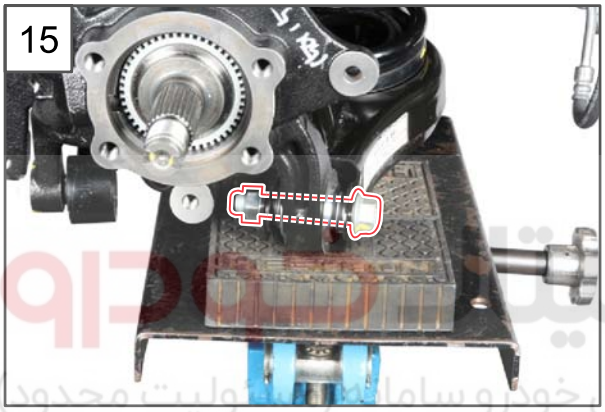
Modification basis	
Application basis	
Affected VIN	

14

14.Unscrew the mounting bolt/nut (19 mm) of the rear upper arm on the knuckle side.

Tightening torque 98.0 to 117.6 Nm

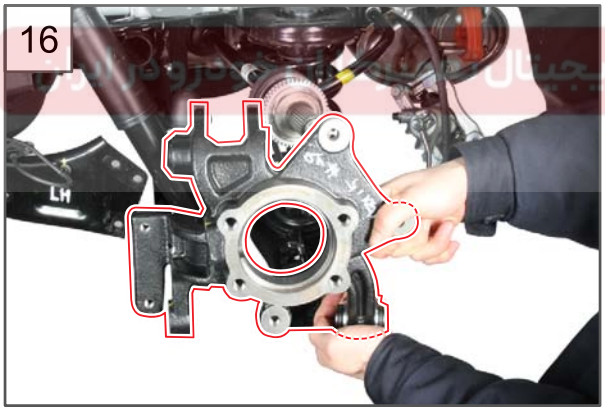
15



15.Unscrew the mounting bolt/nut (19 mm) of the rear lower arm on the knuckle side.

Tightening torque 137.2 to 156.9 Nm

16



16.Remove the rear knuckle assembly.

17

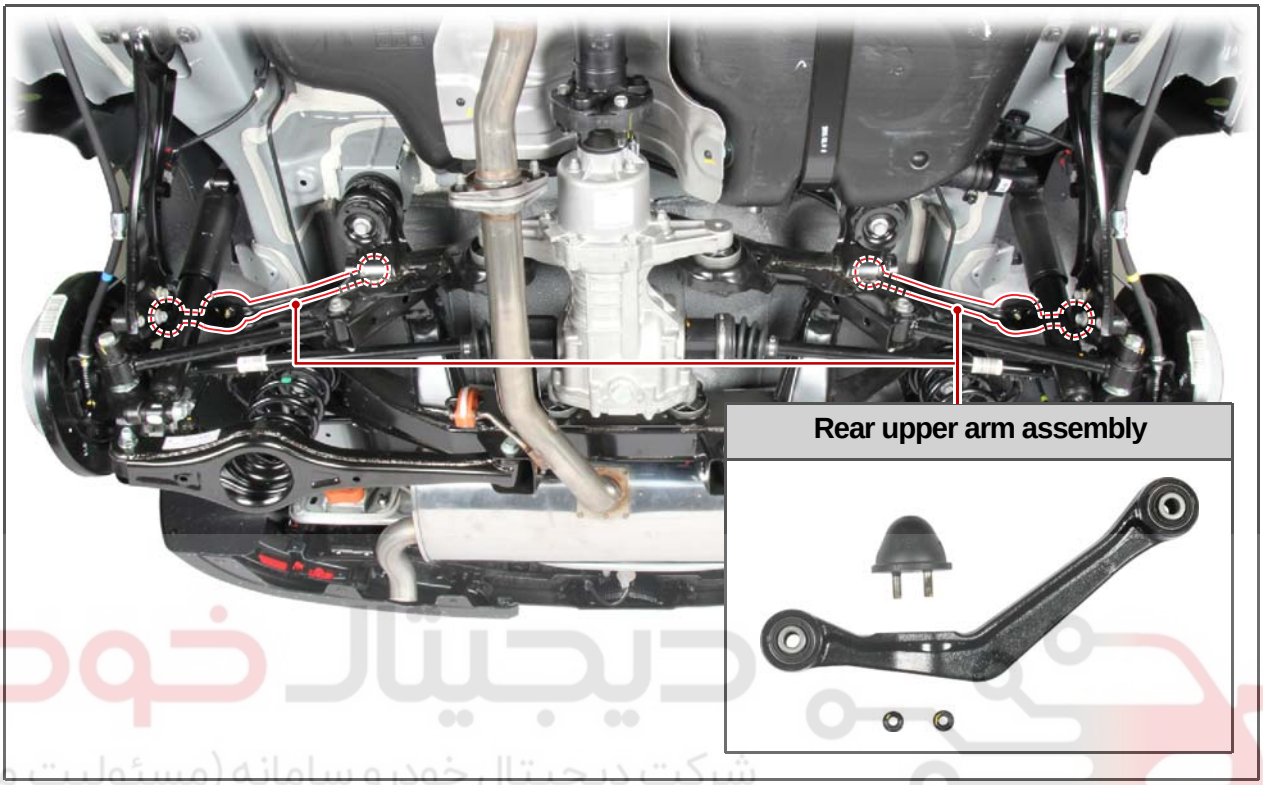
17.The procedures for the left and right sides are the same. Install in the reverse order of removal.

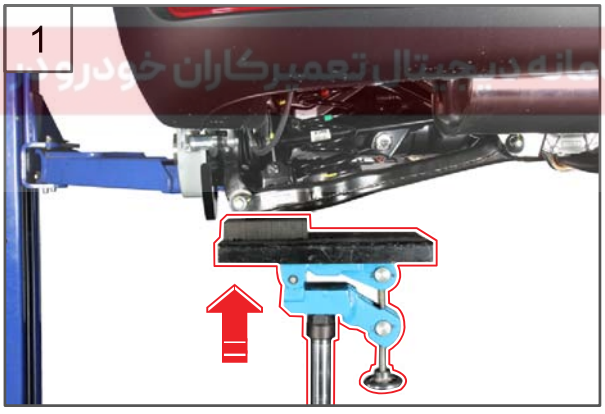
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4520-01

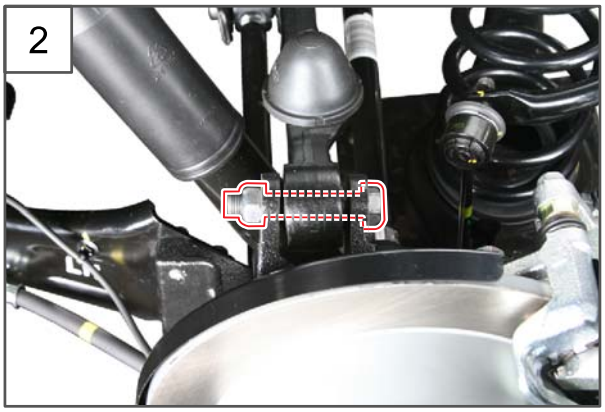
REAR UPPER ARM ASSEMBLY (AWD)

Preceding work - Remove the rear wheel.





1. Place a jack firmly under the rear lower arm knuckle side.



2. Unscrew the mounting bolt/nut (19 mm) of the rear upper arm on the knuckle side.

Tightening torque 98.0 to 117.6 Nm

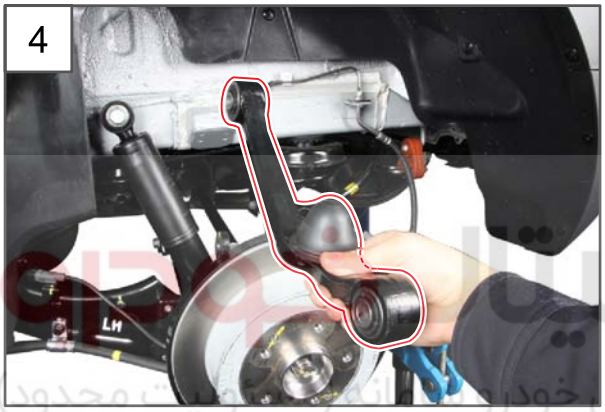
Modification basis	
Application basis	
Affected VIN	

3

3. Unscrew the mounting bolt/nut (17 mm/19 mm) of the rear upper arm on the sub frame side.

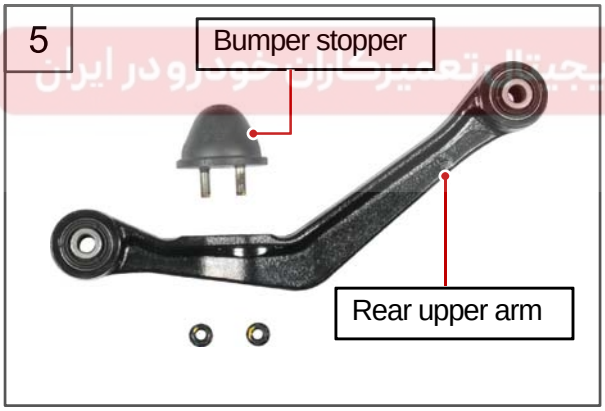
Tightening torque **98.0 to 117.6 Nm**

4



4. Remove the rear upper arm assembly.

5



5. The procedures for the left and right sides are the same. Install in the reverse order of removal.

NOTE

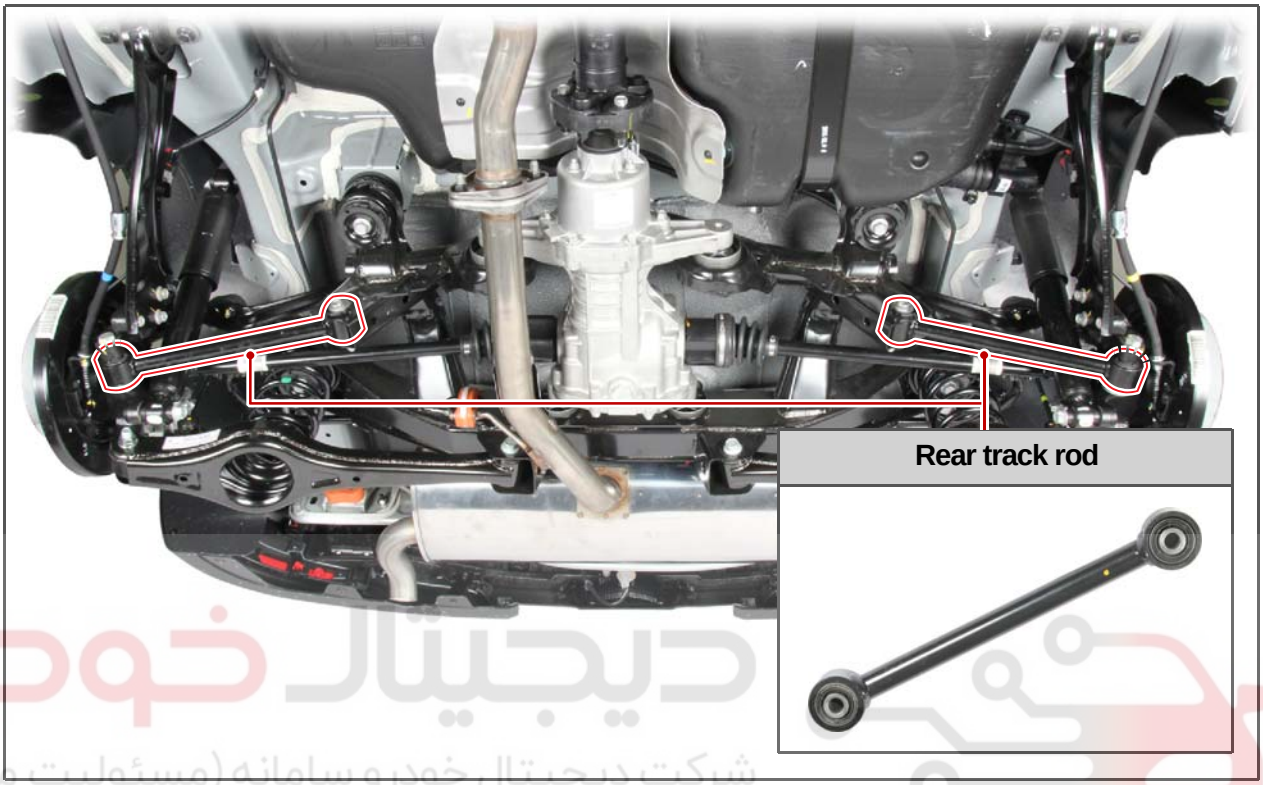
Align the bolt with the bolt groove by adjusting the jack up or down when installing.

Modification basis	
Application basis	
Affected VIN	

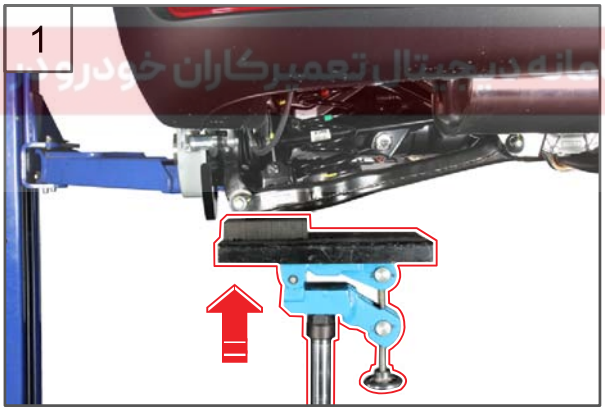
S.G.N. 4520-07

REAR TRACK ROD (AWD)

Preceding work - Remove the rear wheel.

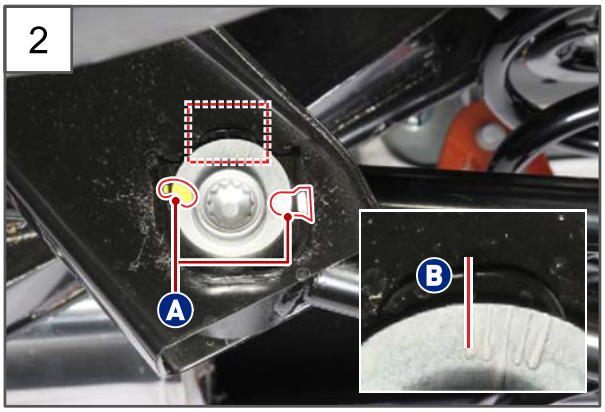


1



1. Place a jack firmly under the rear lower arm knuckle side.

2



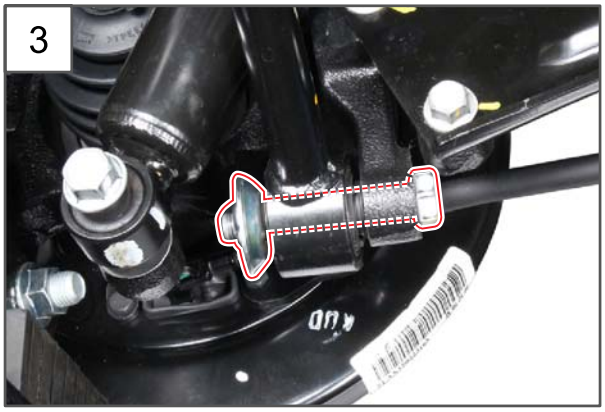
2. Paint a mark (A) on the cam bolt of the rear track rod on the sub frame side, and note down the reading (B).

CAUTION

Make sure that the mark and the scale are aligned with each other when installing.

Modification basis	
Application basis	
Affected VIN	

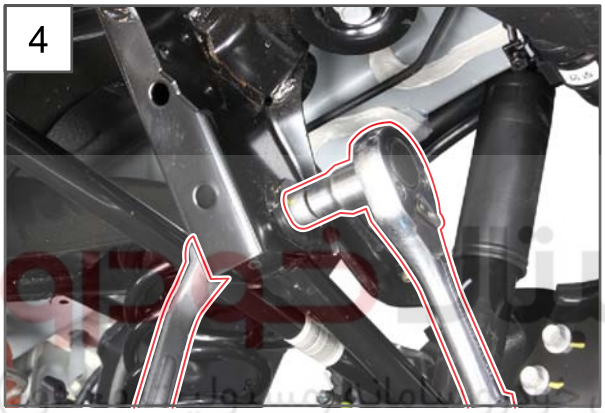
3



3. Unscrew the mounting bolt/nut (19 mm) of the rear track rod on the knuckle side.

Tightening torque 98.0 to 117.6 Nm

4



4. Unscrew the hexagon mounting bolt/nut (12 mm/19 mm) of the rear track rod on the sub frame side.

Tightening torque 98.0 to 117.6 Nm

5

5. Remove the rear track rod.

6

6. The procedures for the left and right sides are the same. Install in the reverse order of removal.

NOTE

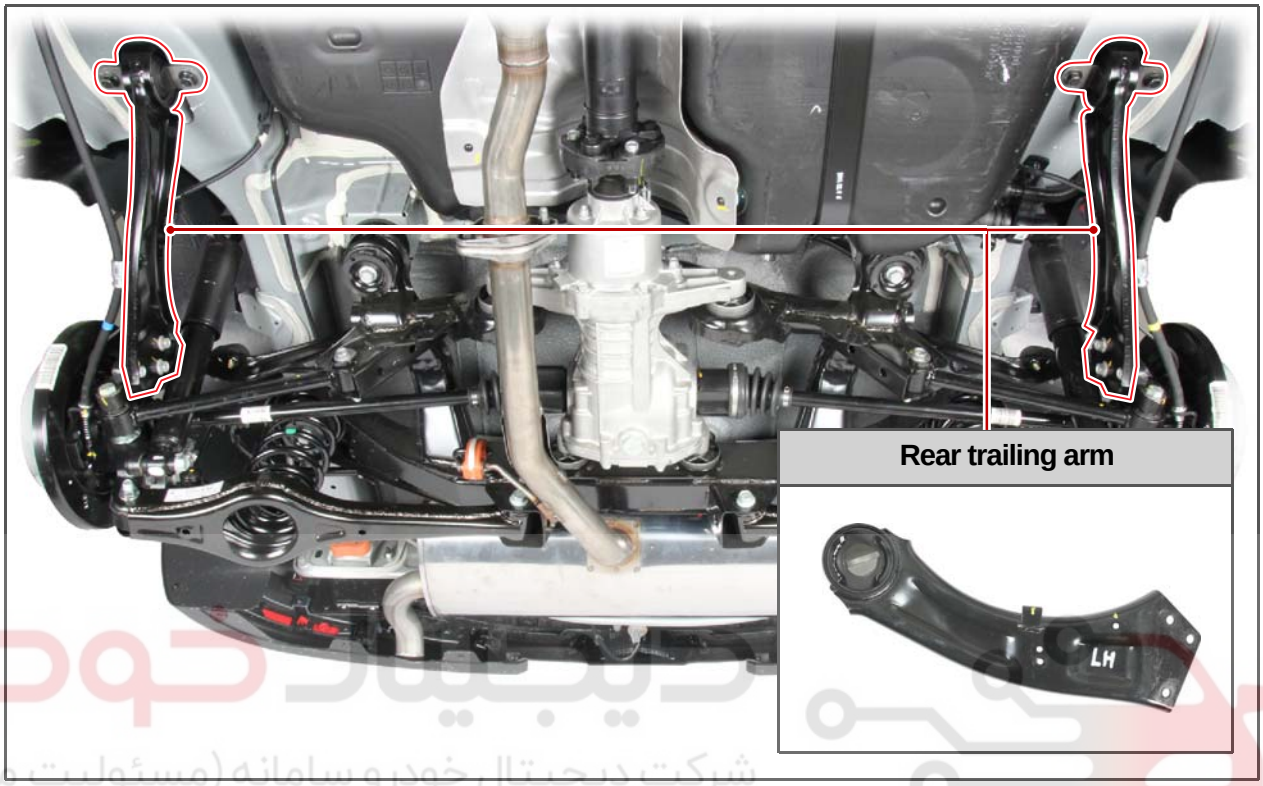
Align the bolt with the bolt groove by adjusting the jack up or down when installing.

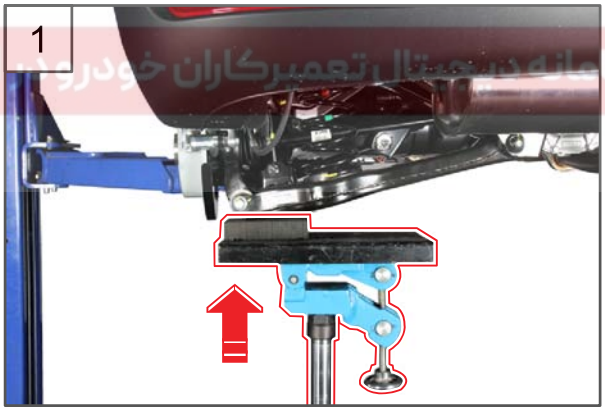
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4520-04

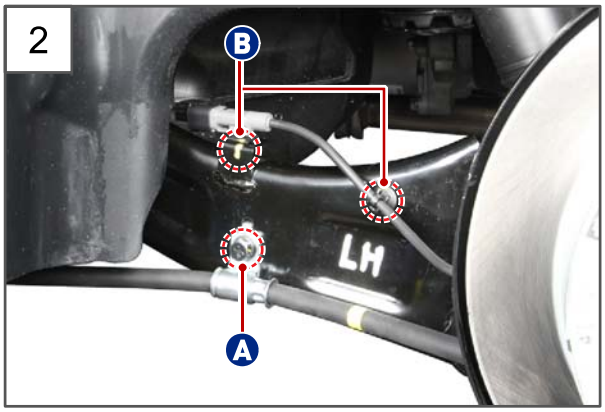
REAR TRAILING ARM ASSEMBLY (AWD)

Preceding work - Remove the rear wheel.





1. Place a jack firmly under the rear lower arm knuckle side.



2. Unscrew the mounting bolt (A, 12 mm) for the rear parking brake cable and the mountings (B, 2 points) for the rear wheel speed sensor wiring from the rear trailing arm.

Tightening torque (A) 9.8 to 12.7 Nm

Modification basis	
Application basis	
Affected VIN	

3

3. Unscrew the 2 mounting bolts (14 mm) for the rear trailing arm on the vehicle body side.

Tightening torque 88.3 to 107.9Nm

4

4. Unscrew the 3 mounting bolts (14 mm) on the rear trailing arm knuckle.

Tightening torque 49.0 to 68.6 Nm

5

5. Remove the rear trailing arm.

6

6. The procedures for the left and right sides are the same. Install in the reverse order of removal.

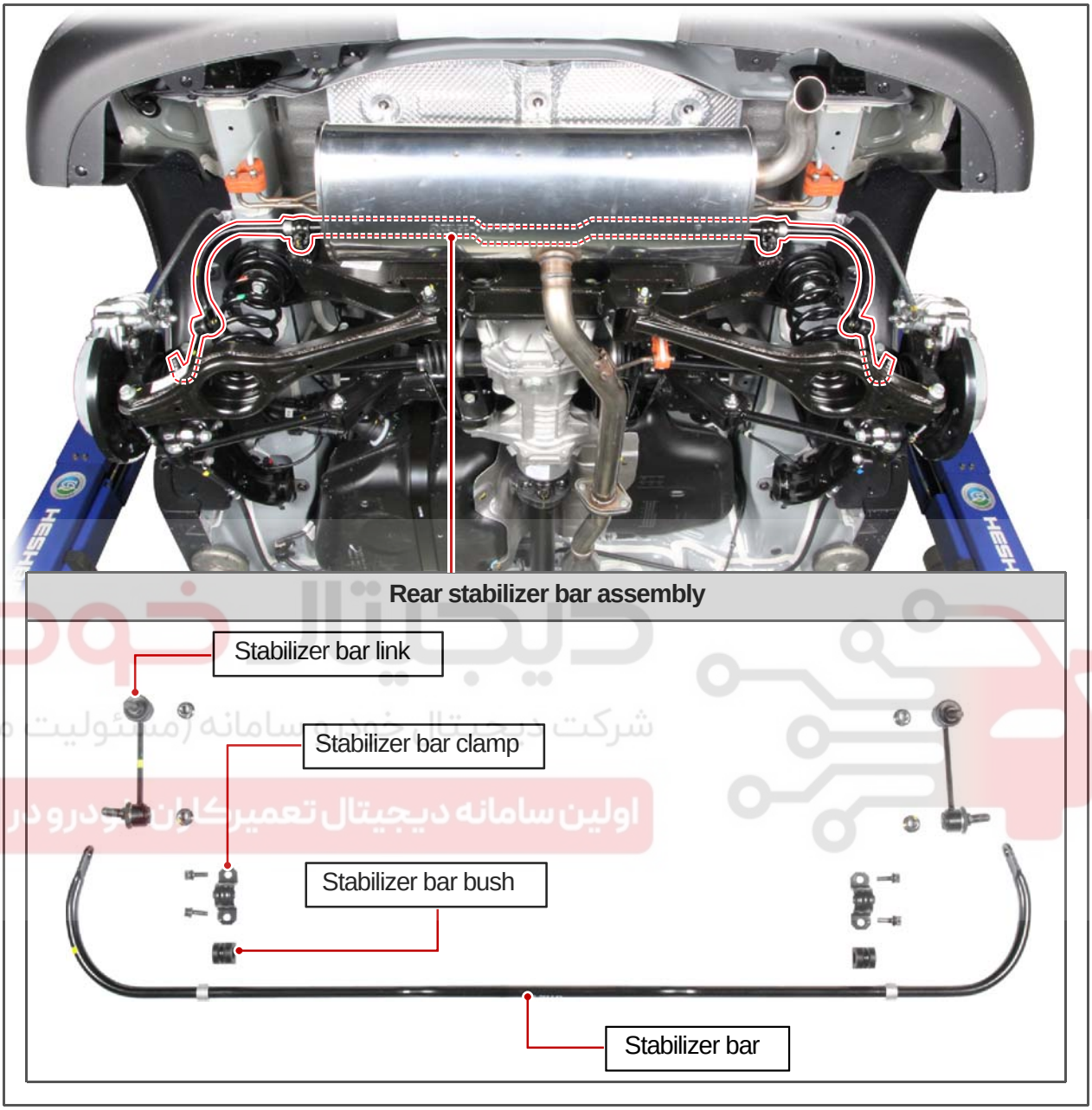
NOTE

Align the bolt with the bolt groove by adjusting the jack up or down when installing.

Modification basis	
Application basis	
Affected VIN	

S.G.N. 4520-11

REAR STABILIZER BAR ASSEMBLY (AWD)



Modification basis	
Application basis	
Affected VIN	

▶ Replacement of stabilizer bar link

1

1. Unscrew the upper mounting nut (17 mm) on the rear stabilizer bar link.

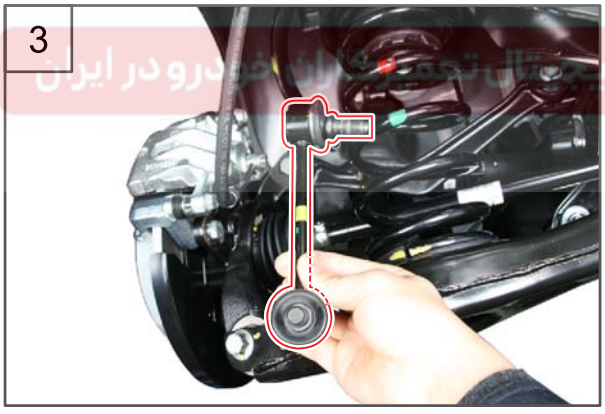
Tightening torque 39.2 to 58.8 Nm

2

2. Unscrew the lower mounting nut (17 mm) on the rear stabilizer bar link.

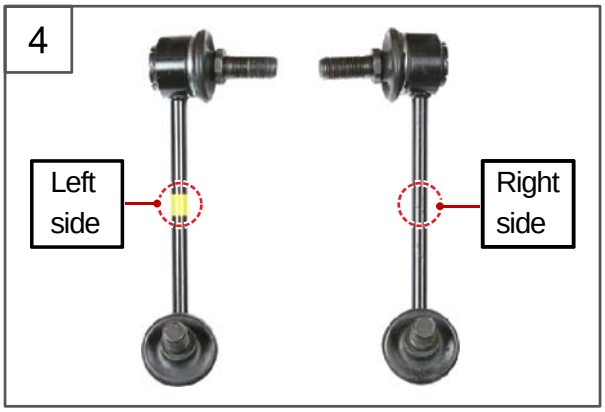
Tightening torque 39.2 to 58.8 Nm

3



3. Remove the rear stabilizer bar link.

4



4. The procedures for the left and right sides are the same. Install in the reverse order of removal.

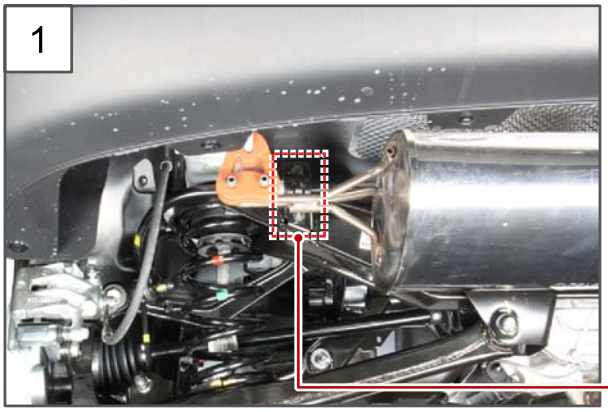
CAUTION

The left rear stabilizer bar link is wrapped with yellow tape, and no tape is wrapped on the right rear stabilizer bar link.

Modification basis	
Application basis	
Affected VIN	

▶ Replacement of stabilizer bar bush

1

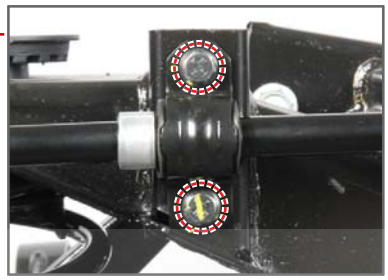


1. Unscrew the 2 mounting bolts (12 mm) for the rear stabilizer bar clamp.

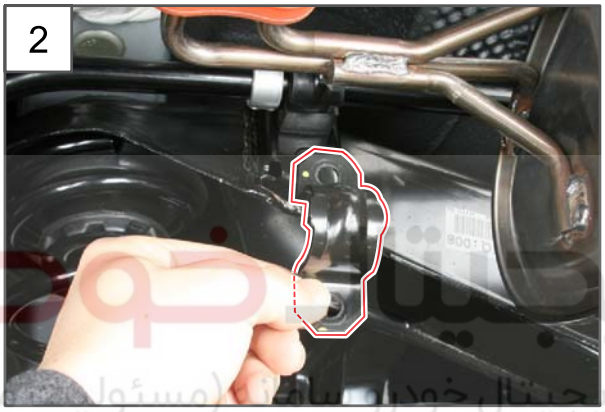
Tightening torque 19.6 to 29.4 Nm

⚠ CAUTION

Unscrew or tighten the bolts in several steps, alternately.

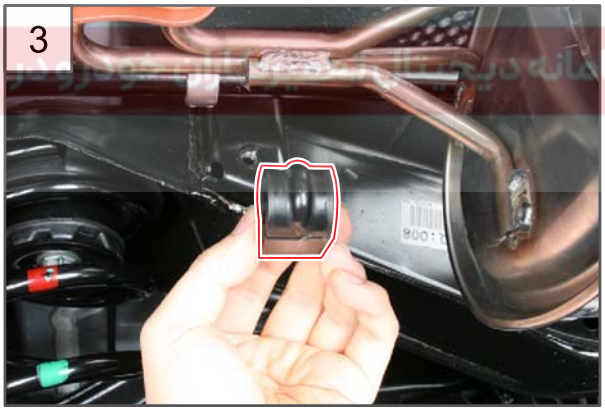


2



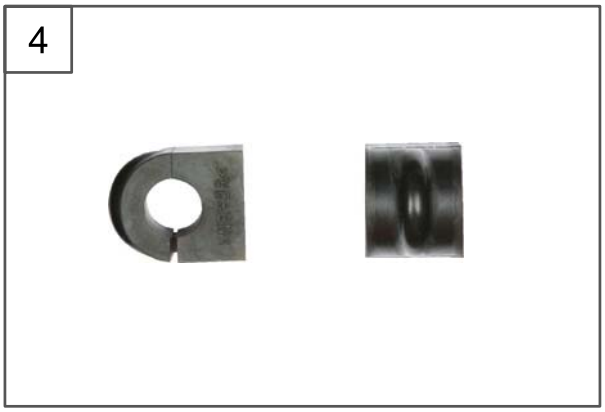
2. Remove the rear stabilizer bar clamp.

3



3. Remove the rear stabilizer bar bush.

4



4. The procedures for the left and right sides are the same. Install in the reverse order of removal.

⚠ CAUTION

Make sure that the cut surface of the stabilizer bar bush faces downward when installing it.

Modification basis	
Application basis	
Affected VIN	

▶ Replacement of stabilizer bar

1

1. Unscrew the upper mounting nut (17 mm) on the rear stabilizer bar link.

Tightening torque 39.2 to 58.8 Nm

2

2. Remove the 2 rear hangers (A) on the rear exhaust muffler.

3

3. Unscrew the 2 clamps (12 mm) on each side of the rear stabilizer bar and remove it though the space between the vehicle body and rear exhaust muffler.

Tightening torque 19.6 to 29.4 Nm

CAUTION

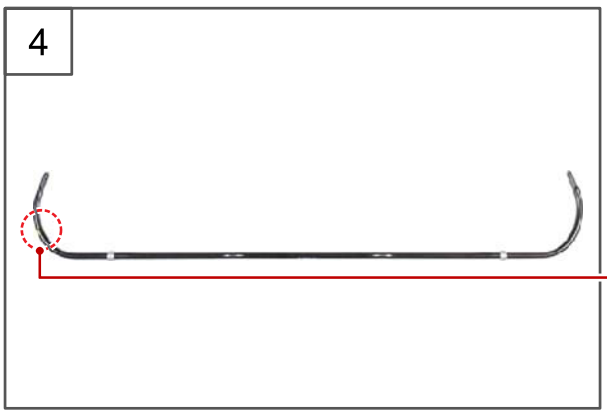
Do not pull the rear exhaust muffler with excessive force when removing the rear stabilizer bar.

4. Install in the reverse order of removal.

CAUTION

The side with yellow paint mark is the left side.

4

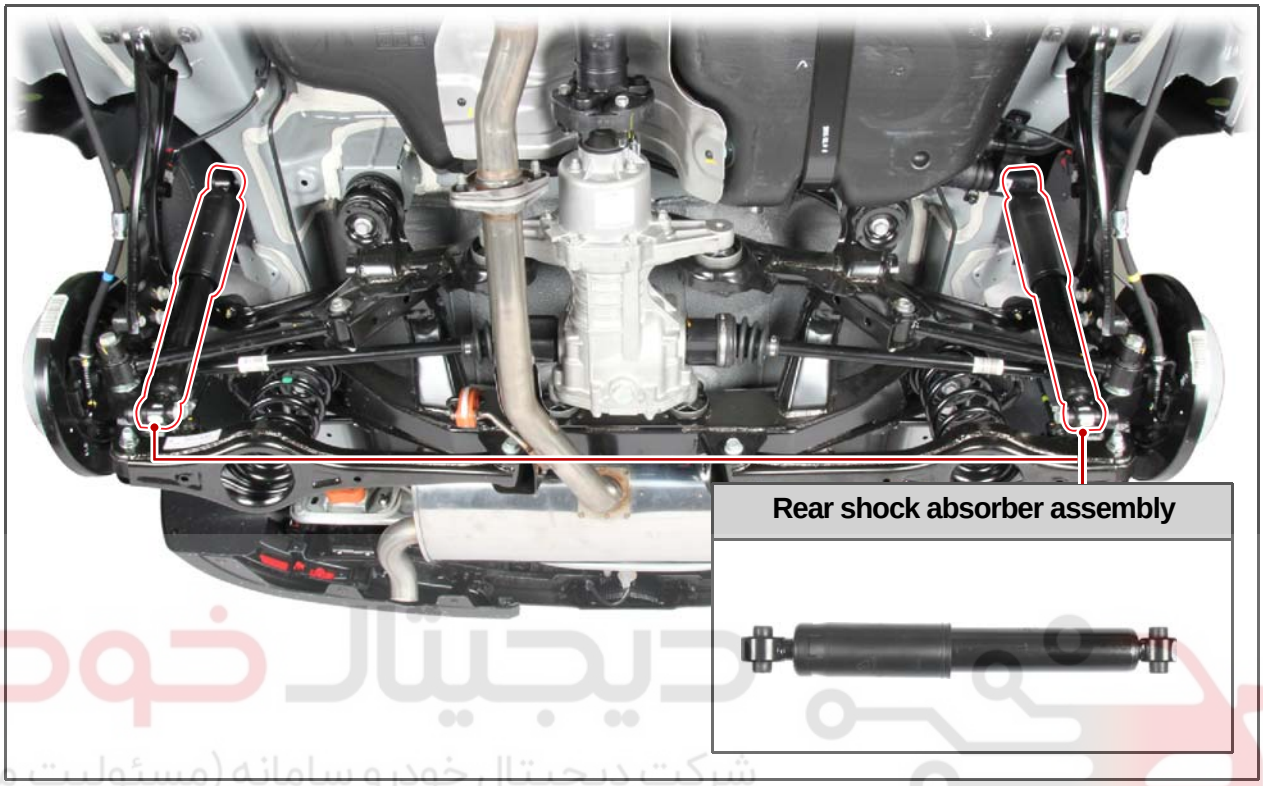


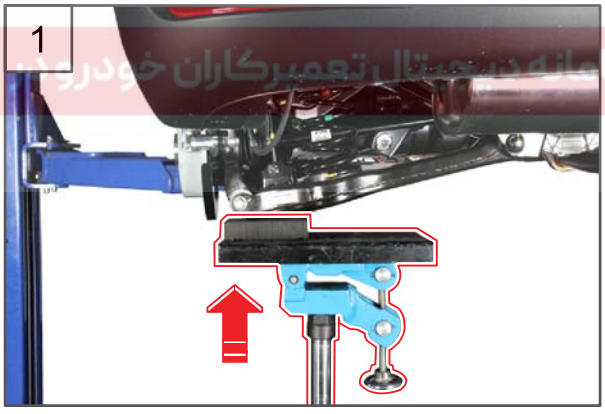
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4511-01

REAR SHOCK ABSORBER (AWD)

Preceding work - Remove the rear wheel.





1. Place a jack firmly under the rear lower arm knuckle side.

2. Unscrew the lower mounting bolt (17 mm) for the rear shock absorber.

Tightening torque 78.5 to 98.0Nm

Modification basis	
Application basis	
Affected VIN	

3

3. Unscrew the upper mounting bolt (19 mm) for the rear shock absorber.

Tightening torque 78.5 to 98.0Nm

4

4. Remove the rear shock absorber assembly.

5

6. The procedures for the left and right sides are the same. Install in the reverse order of removal.

NOTE

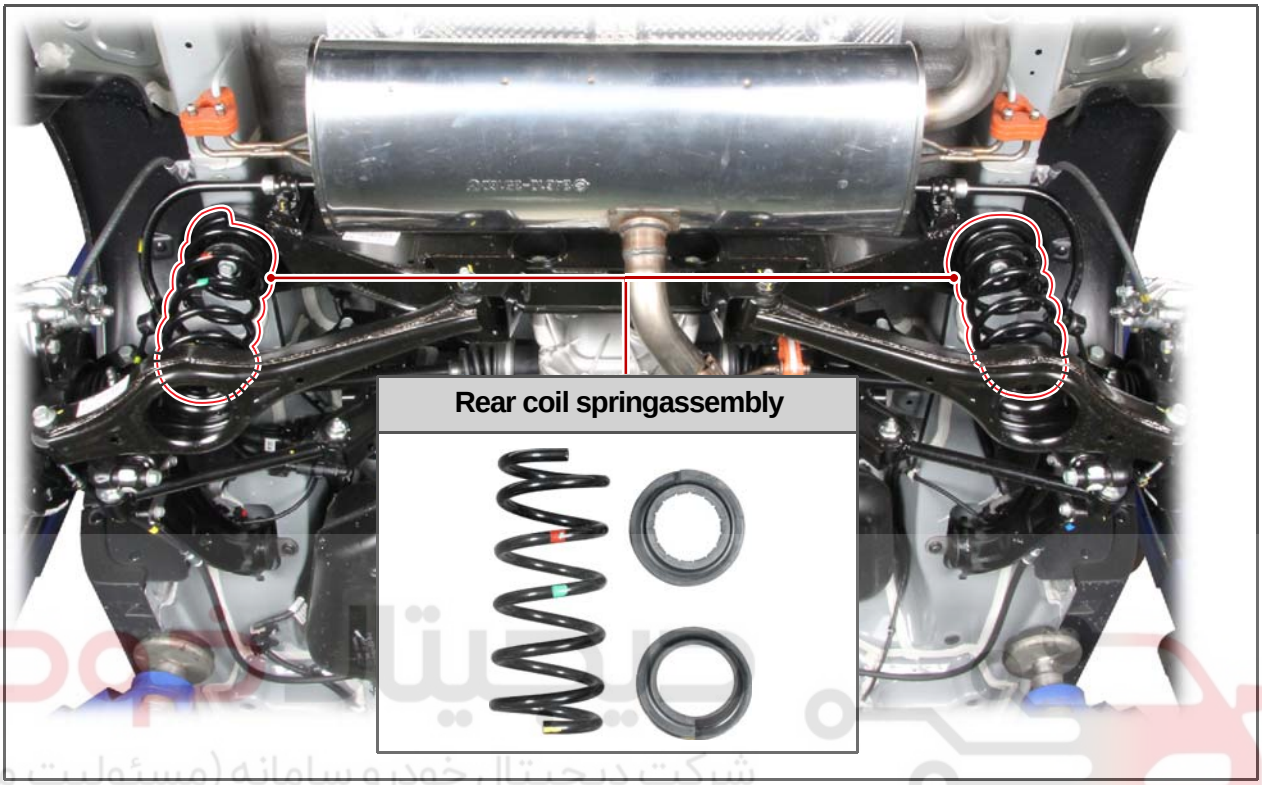
Align the bolt with the bolt groove by adjusting the jack up or down when installing.

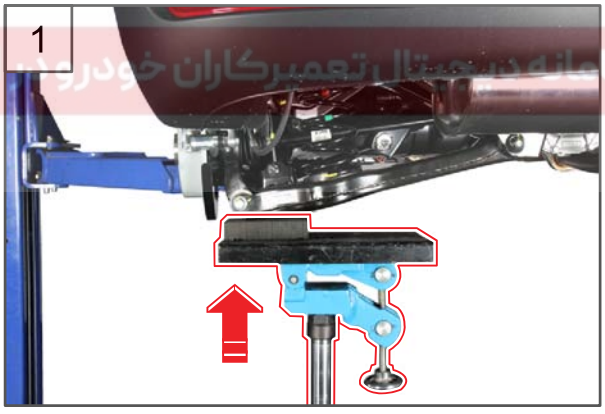
Modification basis	
Application basis	
Affected VIN	

S.G.N. 4511-02

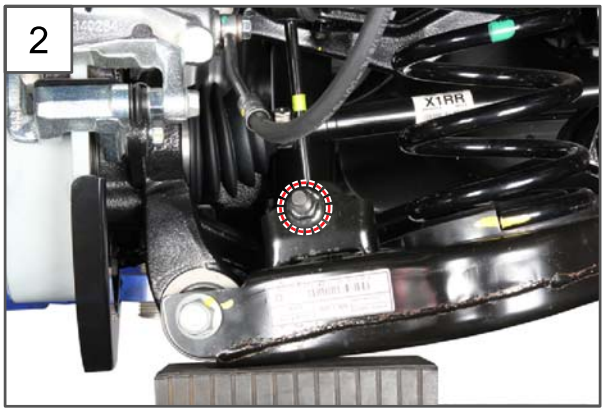
REAR COIL SPRING (AWD)

Preceding work - Remove the rear wheel.





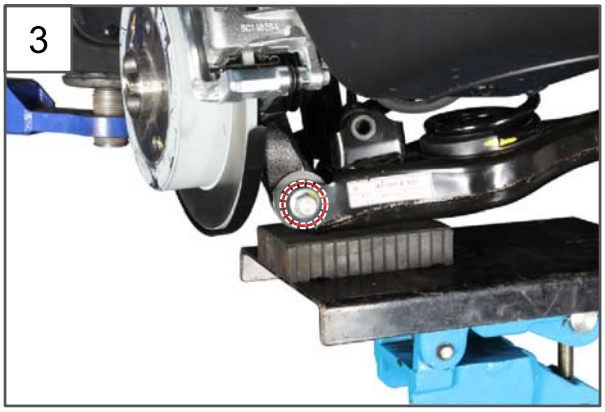
1. Place a jack firmly under the rear lower arm knuckle side.



2. Unscrew the mounting nut (17 mm) of the rear stabilizer bar link on the lower arm side to free the rear stabilizer bar link.

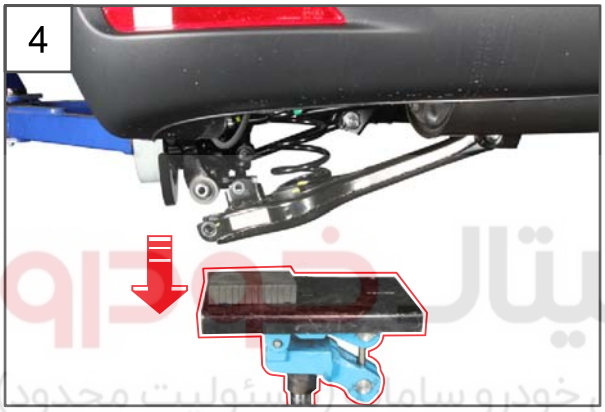
Tightening torque 39.2 to 58.8 Nm

Modification basis	
Application basis	
Affected VIN	

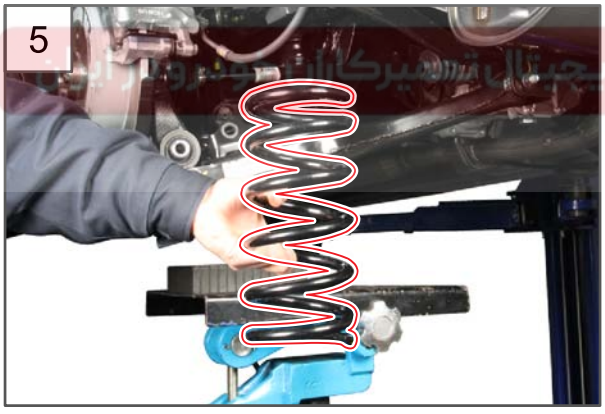


3. Unscrew the mounting bolt/nut (19 mm) of the rear lower arm on the knuckle side.

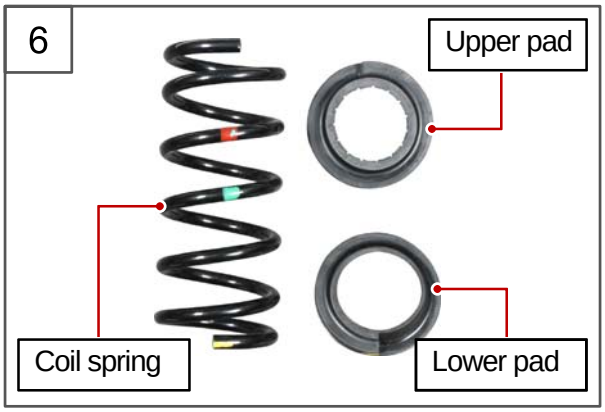
Tightening torque 137.2 to 156.9 Nm



4. Lower the jack slowly.



5. Snap off the rear lower arm and remove the rear coil spring.

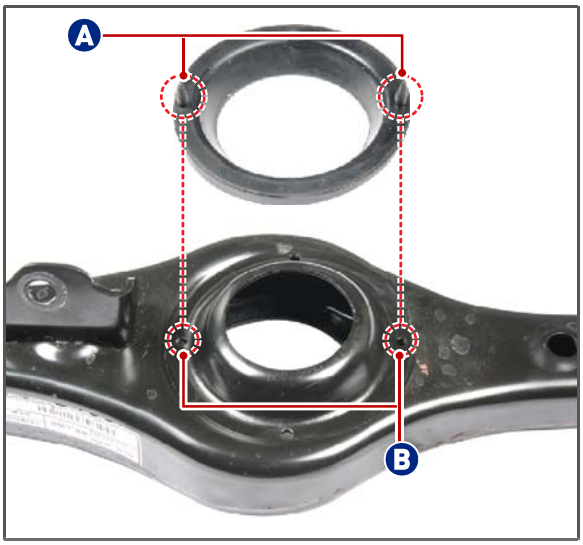


6. The procedures for the left and right sides are the same. Install in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

Cautions for installation

▶ Installing rear coil spring lower pad

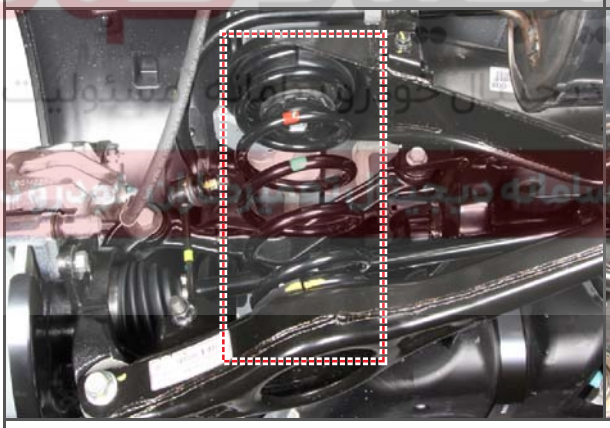
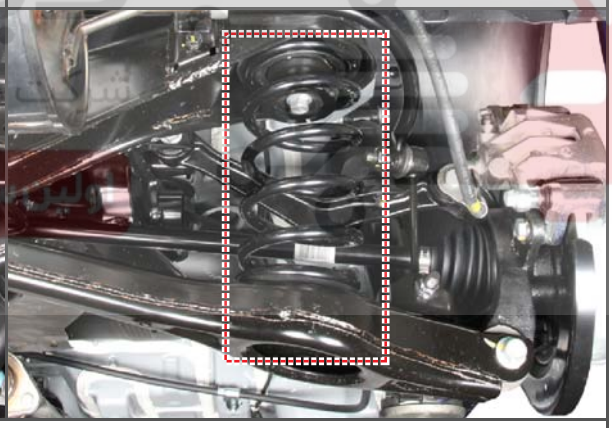


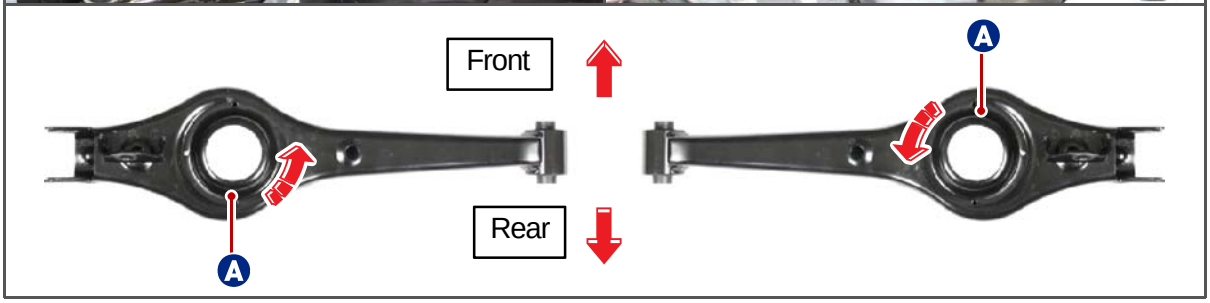
Fit the protrusions (A) on the lower pad of the rear coil spring into the grooves (B) of the rear lower arm.

CAUTION

Install the LH/RH lower pads according to the starting point of the rear coil spring.

▶ Starting point of rear coil spring

Left rear coil spring	Right rear coil spring
	



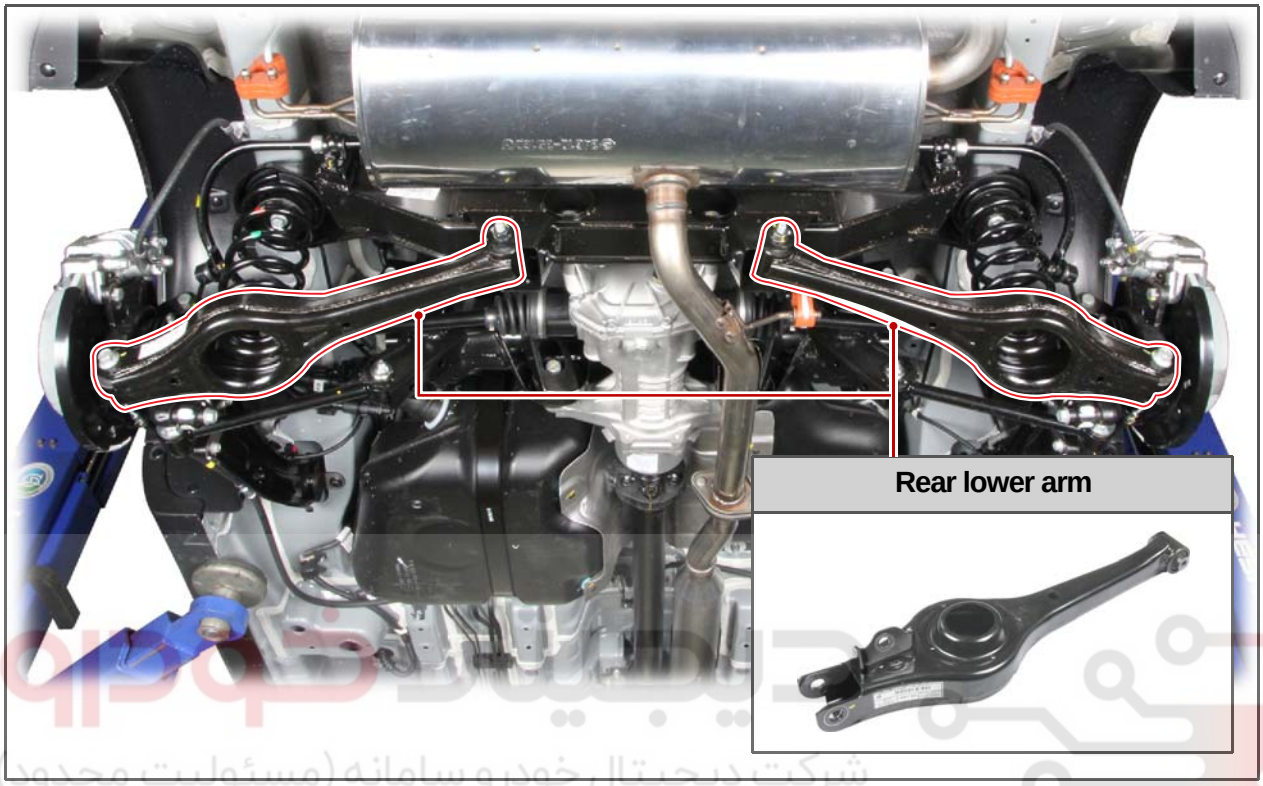
CAUTION

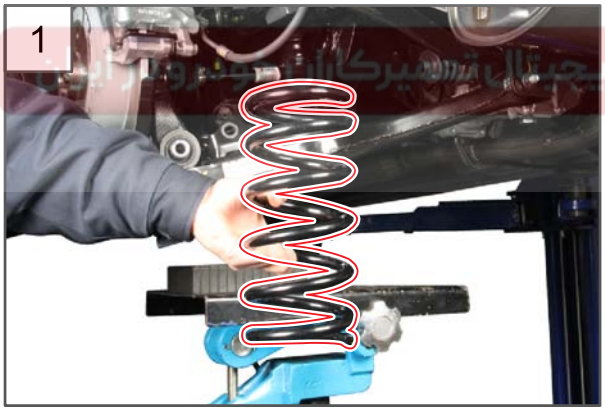
The rear coil spring is wound to the arrow direction respectively, starting at point (A) (LH: rear direction, RH: front direction). Install the rear lower arm to the coil spring lower pad while paying attention to this.

Modification basis	
Application basis	
Affected VIN	

S.G.N. 4520-17 REAR LOWER ARM (AWD)

Preceding work - Remove the rear wheel.





1. Remove the rear coil spring.

NOTE

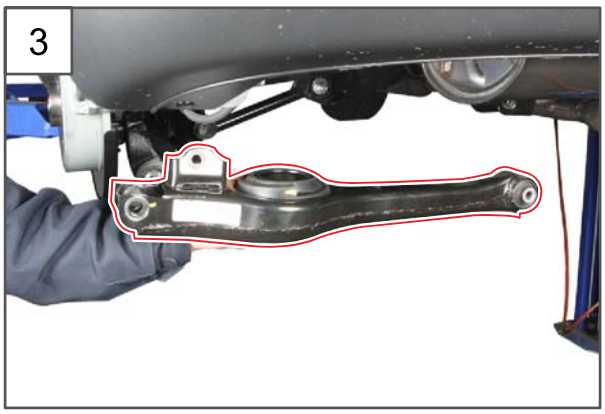
Refer to "REAR COIL SPRING" under "REMOVAL AND INSTALLATION" in this chapter.

2. Unscrew the mounting bolt/nut (19 mm) of the rear lower arm on the sub frame side.

Tightening torque 98.0 to 117.6 Nm

Modification basis	
Application basis	
Affected VIN	

3



3. Remove the rear lower arm.

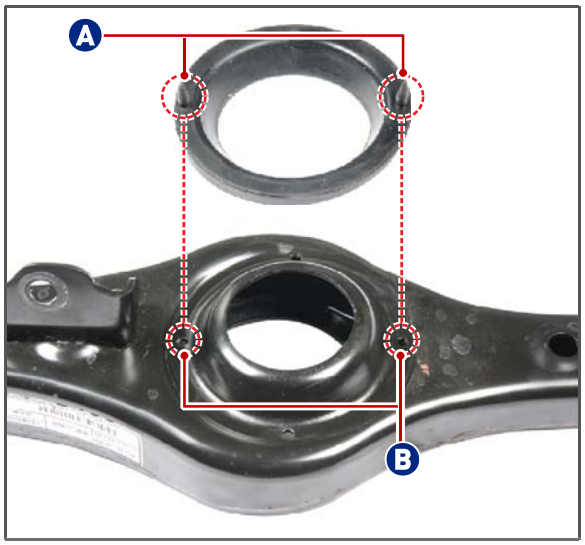
4

4. The procedures for the left and right sides are the same. Install in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

Cautions for installation

▶ Installing rear coil spring lower pad

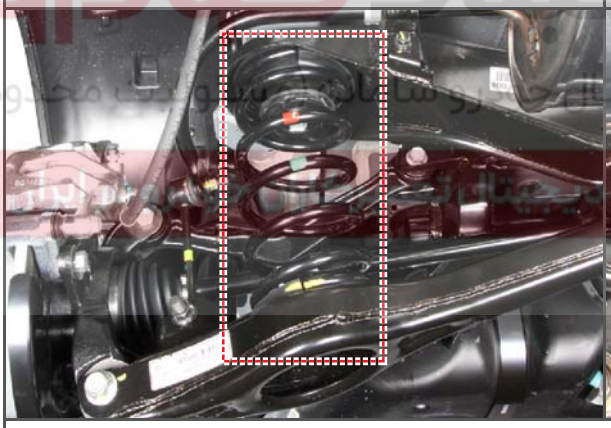
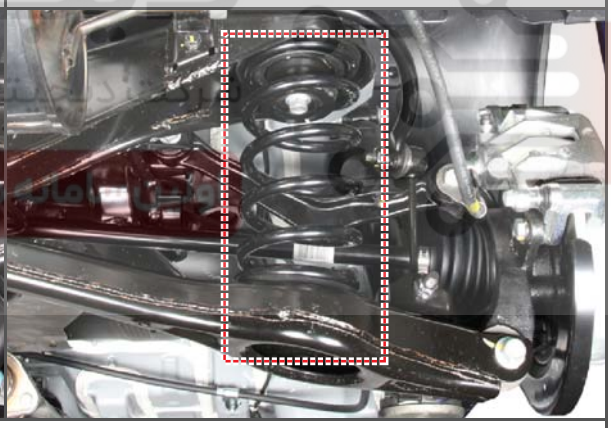


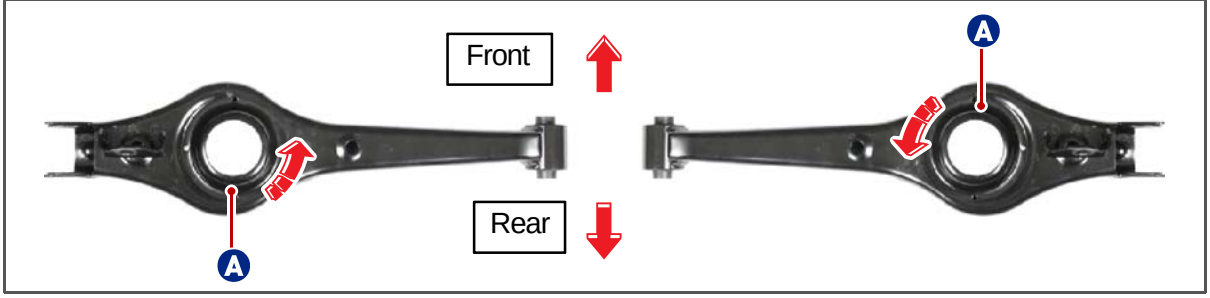
Fit the protrusions (A) on the lower pad of the rear coil spring into the grooves (B) of the rear lower arm.

CAUTION

Install the LH/RH lower pads according to the starting point of the rear coil spring.

▶ Starting point of rear coil spring

Left rear coil spring	Right rear coil spring
	



CAUTION

The rear coil spring is wound to the arrow direction respectively, starting at point (A) (LH: rear direction, RH: front direction). Install the rear lower arm to the coil spring lower pad while paying attention to this.

Modification basis	
Application basis	
Affected VIN	