General Information

Specifications

Front Suspension

Item		Specification
Suspension type		MacPherson Strut
Shock absorber	Type	Gas
Coil spring	Free Height [I.D. color]	336.0mm (Blue - 2)
		341.95mm (Green - 2)

Rear Suspension

Item		Specification
Suspension type		Torsion Beam Axle
Shock absorber	Type	Gas
Coil spring	Free Height [I.D. color]	304.63mm (Blue)

Wheel & Tire

Item		Specification
Wheel	Aluminum	5.0J x 15
		6.0J x 16
		7.0J x 17
	Steel	5.5J x 15
Tire		185/70 R15
		195/65 R15
		205/60 R16
		215/50 R17
Tire pressure		2.2kg/cm² (32psi)

Wheel Alignment

Item		Specification			
		185/65 R15	195/65 R15	205/55 R16	215/45 R17
Front	Toe-in	0±2.0mm	0±2.0mm	0±2.0mm	0±2.0mm
	Camber angle	-0.64˚±0.5˚	-0.64˚±0.5˚	-0.64˚±0.5˚	-0.64˚±0.5˚
	Caster angle	4.38˚±0.5˚	4.38˚±0.5˚	4.38˚±0.5˚	4.38˚±0.5˚
	King-pin angle	13.61˚±0.5˚	13.61˚±0.5˚	13.61˚±0.5˚	13.61˚±0.5˚
Rear	Camber angle	-1.5˚±0.5˚	-1.5˚±0.5˚	-1.5˚±0.5˚	-1.5˚±0.5˚
	Toe-in	4.4±2.2mm	4.4±2.2mm	4.4±2.2mm	4.4±2.2mm

Tightening Torques

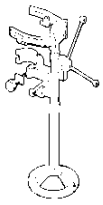
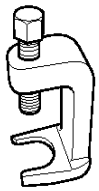
Front Suspension

Item		Tightening torque (kgf.m)		
		Nm	Kgf.m	lb-ft
Hub nuts		90 ~ 110	9 ~ 11	65 ~ 80
Lower arm to sub frame		140 ~ 160 /100 ~ 120	14 ~ 16 /10 ~ 12	101 ~ 115 /72 ~ 87
Tie rod end castle nut		24 ~ 34	2.4 ~ 3.4	72 ~ 87
Steering gear box to sub frame	MDPS	50 ~ 65	5 ~ 6.5	36 ~ 47
	HPS	60 ~ 80	6 ~ 8	43 ~ 58
Stabilizer bar to stabilizer link		100 ~ 120	10 ~ 12	72 ~ 87
Stabilizer bar to sub frame		45 ~ 55	4.5 ~ 5.5	32 ~ 40
Stabilizer bar to front strut assembly		100 ~ 120	10 ~ 12	72 ~ 87
Front strut assembly to front axle		140 ~ 160	14 ~ 16	101 ~ 115

Rear Suspension

Item	Tightening torque (kgf.m)		
	Nm	Kgf.m	lb-ft
Hub nuts	90 ~ 110	9.0 ~ 11.0	65 ~ 80
Shock absorber to body	100 ~ 120	10.0 ~12.0	72 ~ 87
Shock absorber to torsion beam axle	100 ~ 120	10.0 ~12.0	72 ~ 87
Torsion beam axle to body	100 ~ 120	10.0 ~ 12.0	72 ~ 87

Special Service Tools

Tool (Number and Name)	Illustration	Use
09546-26000 Strut spring compressor	 E4626000	Compression of coli spring
09568-2J100 Ball joint puller	 SBHSS8062D	Remover of ball joint

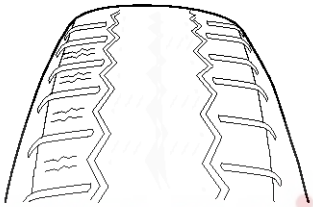
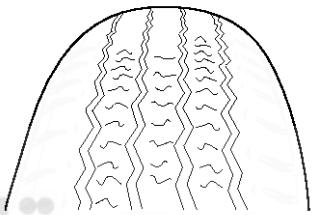
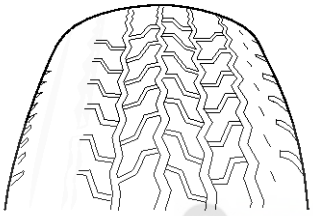
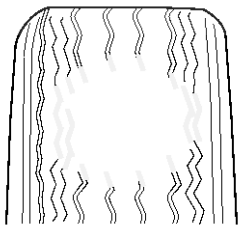
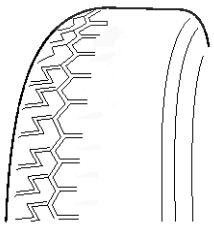
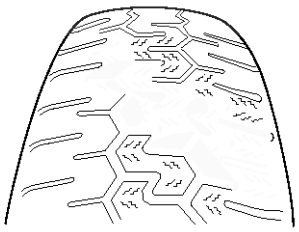
Troubleshooting

Symptom	Possible cause	Remedy
Hard steering	Improper front wheel alignment Excessive turning resistance of lower arm ball joint Low tire pressure No power assist	Correct Replace Adjust Repair and replace
Poor return of steering wheel to center	Improper front wheel alignment	Correct
Poor or rough ride	Improper front wheel alignment Malfunctioning shock absorber Broken or worn stabilizer Broken or worn coil spring Worn lower arm bushing	Correct Repair or replace Replace Replace Replace the lower arm assembly
Abnormal tire wear	Improper front wheel alignment Improper tire pressure Malfunctioning shock absorber	Correct Adjust Replace
Wandering	Improper front wheel alignment Poor turning resistance of lower arm ball joint Loose or worn lower arm bushing	Correct Repair Retighten or replace
Vehicle pulls to one side	Improper front wheel alignment Excessive turning resistance of lower arm ball joint Broken or worn coil spring Bent lower arm	Correct Replace Replace Repair
Steering wheel shimmy	Improper front wheel alignment Poor turning resistance of lower arm ball joint Broken or worn stabilizer Worn lower arm bushing Malfunctioning shock absorber Broken or worn coil spring	Correct Replace Replace Replace Replace Replace
Bottoming	Broken or worn coil spring Malfunctioning shock absorber	Replace Replace

Wheel /tire noise, vibration and harshness concerns are directly related to vehicle speed and are not generally affected by acceleration, coasting or decelerating. Also, out-of-balance wheel and tires can vibrate at more than one speed. A vibration that is affected by the engine rpm, or is eliminated by placing the transmission in Neutral is not related to the tire and wheel. As a general rule, tire and wheel vibrations felt in the steering wheel are related to the front tire and wheel assemblies. Vibrations felt in the seat or floor are related to the rear tire and wheel assemblies. This can initially isolate a concern to the front or rear.

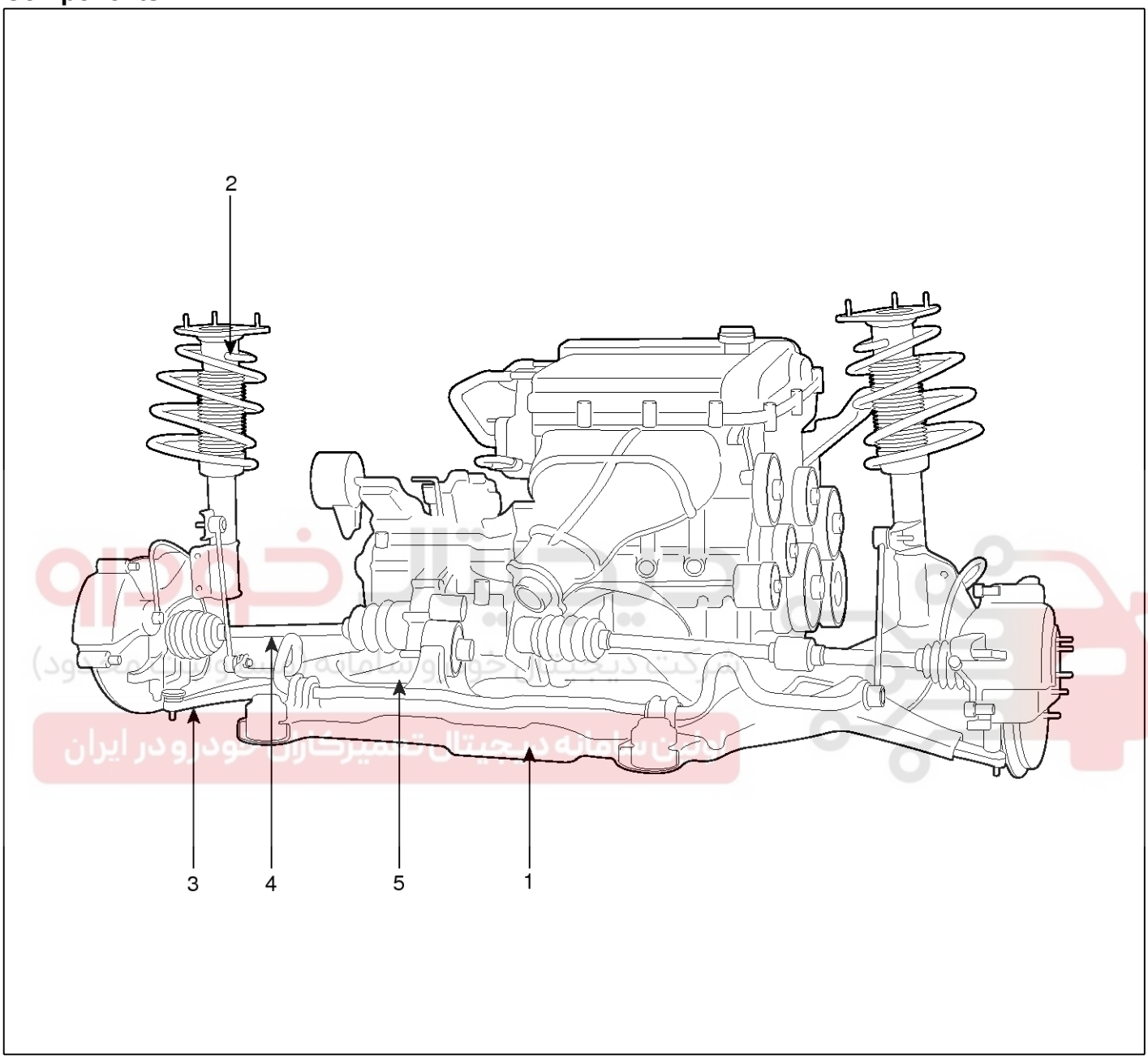
Careful attention must be paid to the tire and wheels. There are several symptoms that can be caused by damaged or worn tire and wheels. Perform a careful visual inspection of the tires and wheel assemblies. Spin the tires slowly and watch for signs of lateral or radial runout. Refer to the tire wear chart to determine the tire wear conditions and actions

Wheel and tire diagnosis

Rapid wear at the center	Rapid wear at both shoulders	Wear at one shoulder
 AHIE002A	 AHIE002B	 AHIE002C
• Center-tread down to fabric due to excessive over inflated tires • Lack of rotation • Excessive toe on drive wheels • Heavy acceleration on drive	• Under-inflated tires • Worn suspension components • Excessive cornering speeds • Lack of rotation	• Toe adjustment out of specification • Camber out of specification • Damaged strut • Damaged lower arm
Partial wear	**Feathered edge**	**Wear pattern**
 AHIE002D	 AHIE002F	 AHIE002G
• Caused by irregular burrs on brake drums	• Toe adjustment out of specification • Damaged or worn tie rods • Damaged knuckle	• Excessive toe on non-drive wheels • Lack of rotation

Front Suspension System

Components

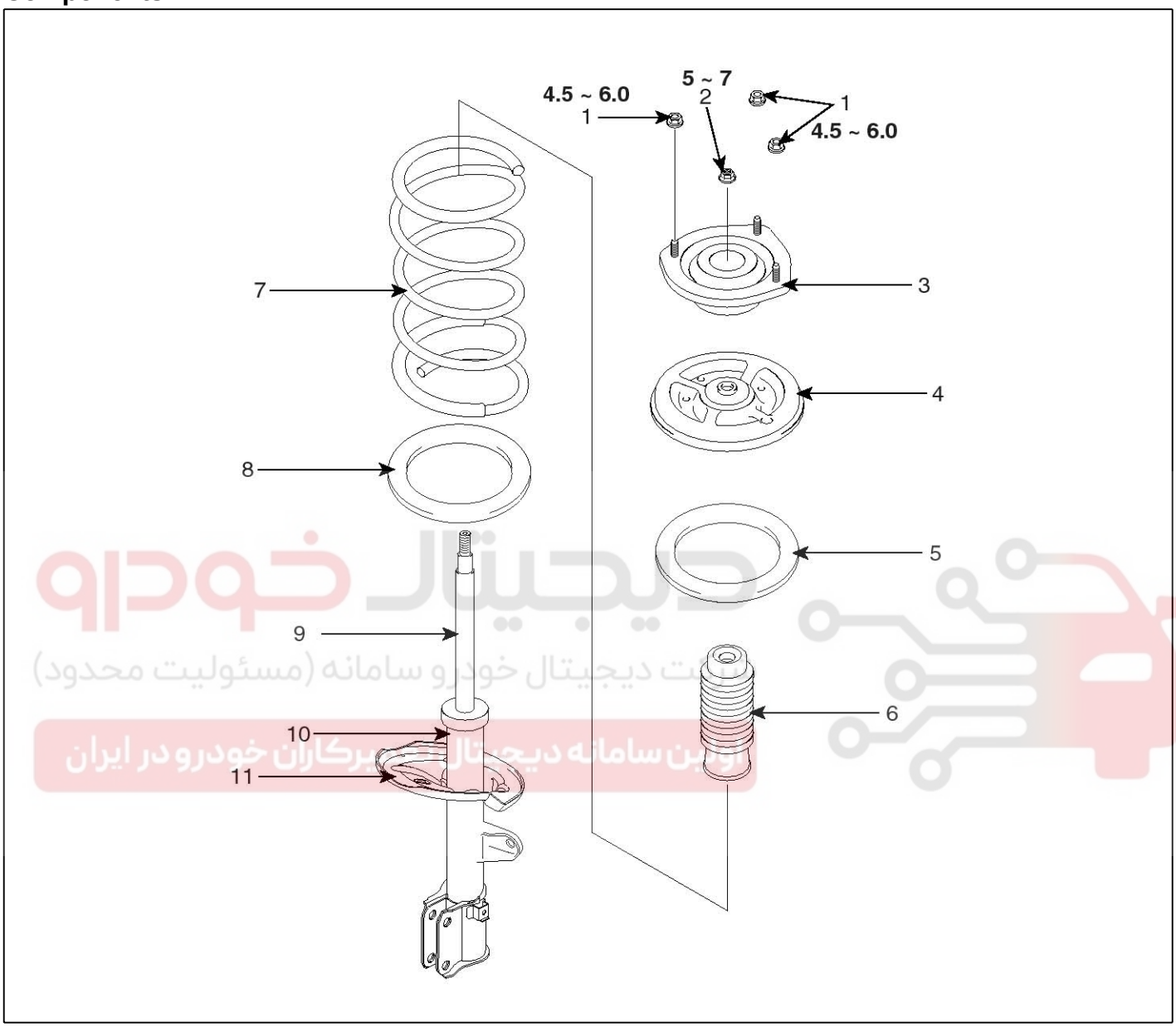


STDSS9001D

1. Sub frame
2. Strut Assembly
3. Lower Arm
4. Drive Shaft
5. Stabilizer Bar

Front Strut Assembly

Components



STDSS9000L

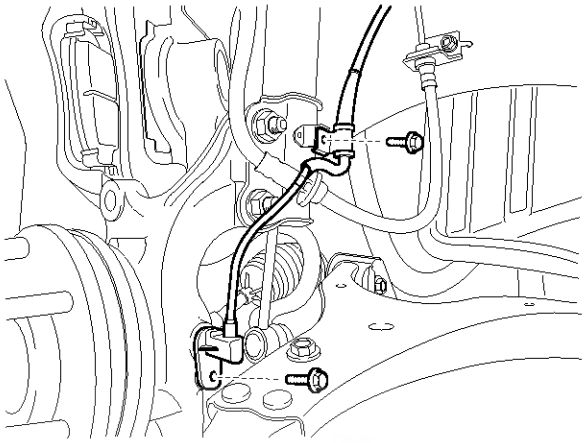
1. Nuts
2. Lock nut
3. Insulator
4. Strut bearing
5. Spring upper pad
6. Strut dust cover & bumper rubber
7. Coil spring
8. Spring lower pad
9. Piston road
10. Strut assembly
11. Spring lower seat

Replacement

1. Remove the front wheel & tire.

Tightening torque Nm (kgf.m, lb-ft) :
90 ~ 110 (9.0 ~ 11.0, 65 ~ 80)

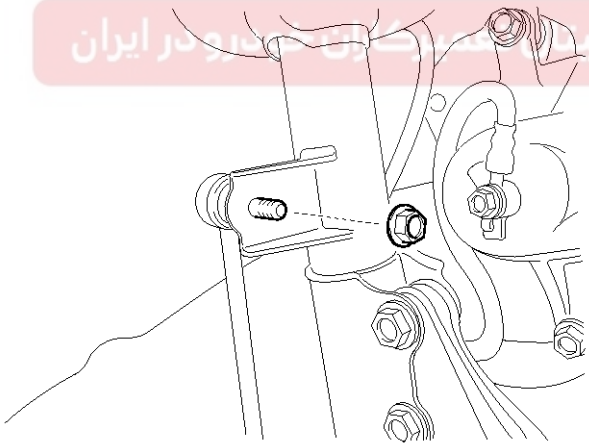
2. Remove the brake hose and the wheel speed sensor bracket from the front strut assembly by loosening the mounting bolts.



STDSS9301D

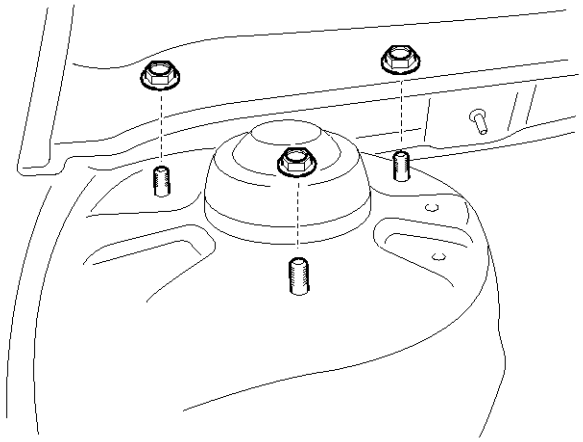
3. Disconnect the stabilizer link with the front strut assembly after loosening the nut.

Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



STDSS9002D

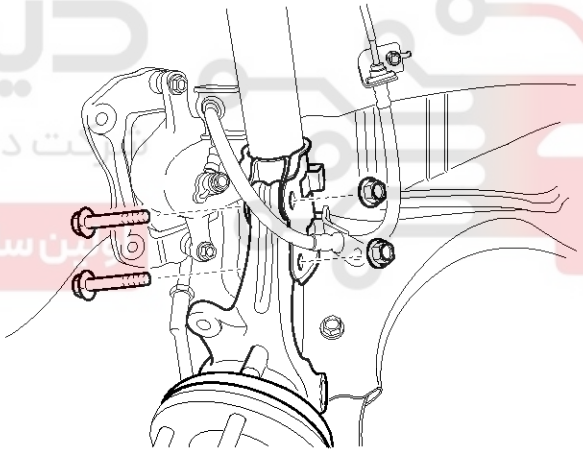
4. Remove the cap and than loosen the strut mounting nuts.



STDSS9003D

5. Disconnect the front strut assembly with the knuckle by loosening the bolt & nut.

Tightening torque Nm (kgf.m, lb-ft) :
140 ~ 160 (14.0 ~ 16.0, 101 ~ 115)

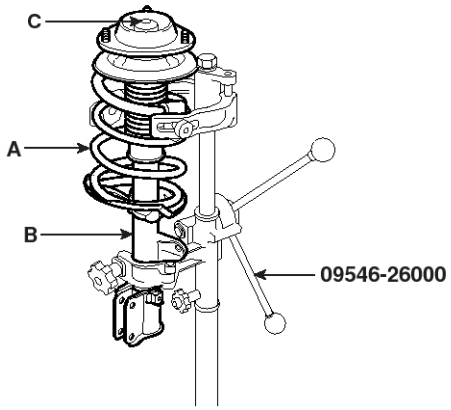


STDSS9302D

6. Installation is the reverse of removal.

Disassembly

1. Using the special tool (09546-26000), compress the coil spring (A) until there is only a little tension of the spring on the strut.

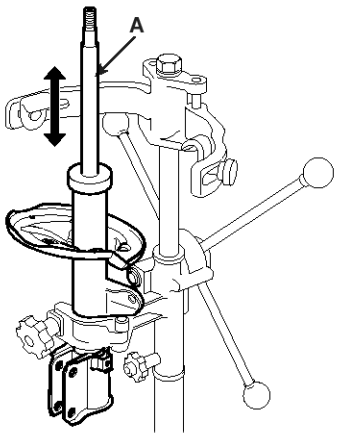


AHJF101J

2. Remove the self-locking nut (C) from the strut assembly (B).
3. Remove the insulator, spring seat, coil spring and dust cover from the strut assembly.

Inspection

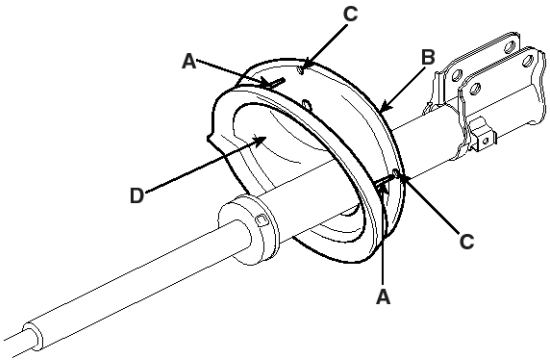
1. Check the strut insulator bearing for wear or damage.
2. Check rubber parts for damage or deterioration.
3. Compress and extend the piston rod (A) and check that there is no abnormal resistance or unusual sound during operation.



AHJF101L

Reassembly

1. Install the spring lower pad (D) so that the protrusions (A) fit in the holes (C) in the spring lower seat (B).



AHIE101S

2. Compress coil spring using special tool (09546-26000).

   Install compressed coil spring into shock absorber.

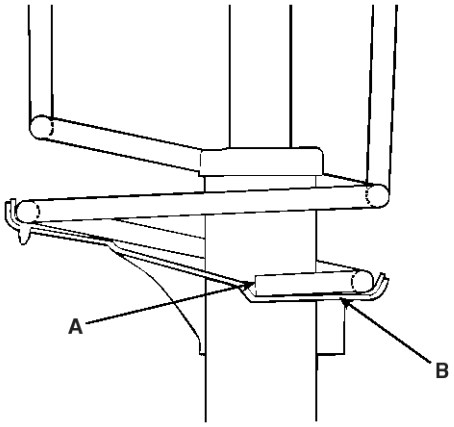
   NOTICE

   a. *Indicated two identification color marks on the coil spring one follows model option (see page SS-2) the other follows load classification according to the below.*

      Pay attention to distiuguish between the two marks and then install them.

   b. *Install the coil spring wth the idemtification mark directed toward the knuckle.*

3. After fully extending the piston rod, install the spring upper seat and insulator assembly.
4. After seating the upper and lower ends of the coil spring (A) in the upper and lower spring seat grooves (B) correctly, tighten new self-locking nut temporarily.



AHIE101T

5. Remove the special tool (09546-26000).
6. Tighten the self-locking nut to the specified torque.

Tightening torque :
50 ~ 70 Nm (5 ~7 kgf·m, 36 ~ 50 lb-ft)

Front Lower Arm

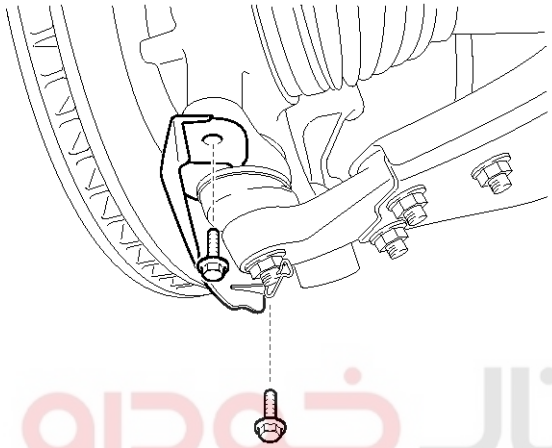
Replacement

1. Remove the front wheel & tire.

Tightening torque Nm (kgf.m, lb-ft) :
90 ~ 110 (9.0 ~ 11.0, 65 ~ 80)

2. Remove the lower arm ball joint mounting bolts.

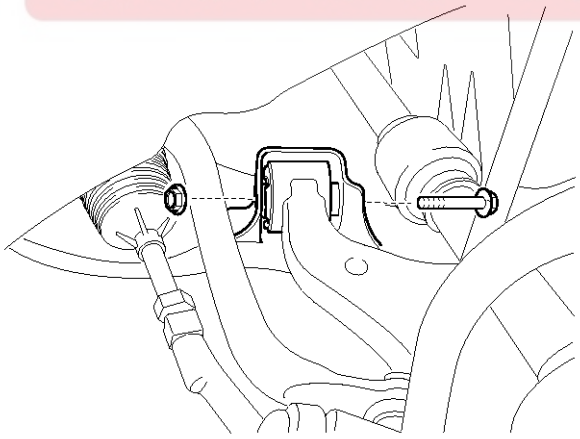
Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



STDSS9004D

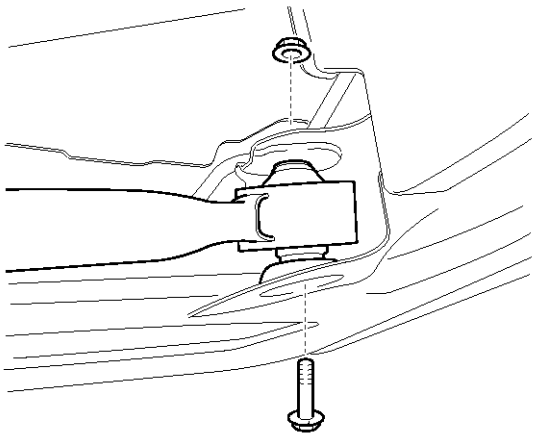
3. Remove the lower arm mounting bolts.

Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



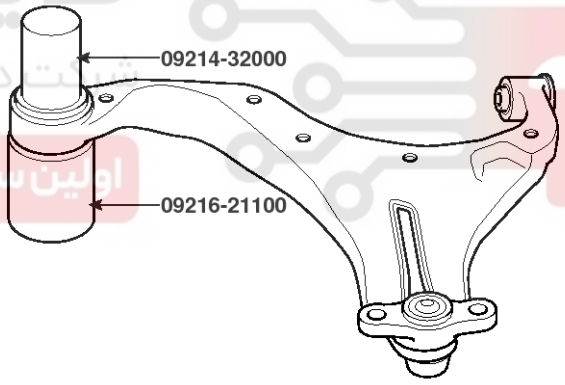
STDSS9005D

Tightening torque Nm (kgf.m, lb-ft) :
140 ~ 160 (14.0 ~ 16.0, 101 ~ 115)



STDSS9006D

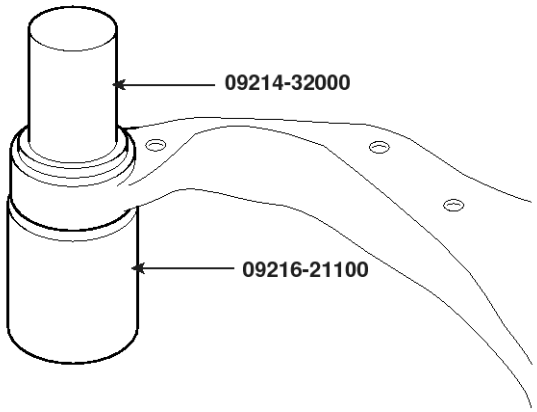
4. Using the special tools (09214-32000 & 09216-211000), remove the bushing from the lower arm.



KHNF500B

5. Apply soap solution to the following parts.
   A. Outer surface of the bushing.
   B. Inner surface of the lower bushing mounting part.

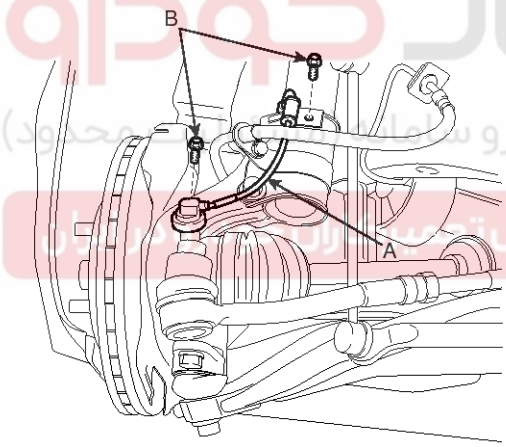
6. Using the special tools (09214-32000 & 09216-21100), install the busing on the lower arm.



AHJF021D

⚠CAUTION
Insert bush as to arrow direct toward this dir shown.

Separation force is over 800Kg



KHNF101A

7. Installation is the reverse of removal.

Front Stabilizer Bar

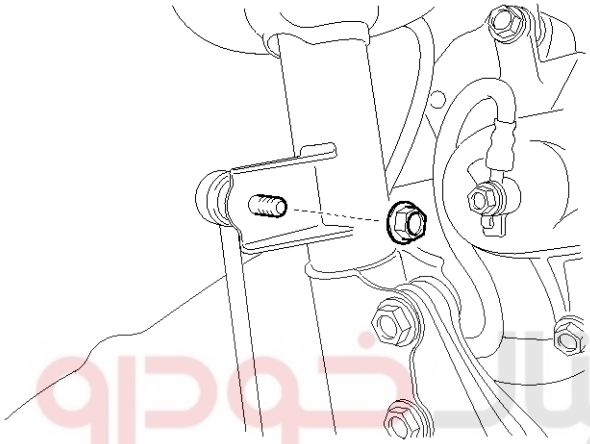
Replacement

1. Remove the front wheel & tire.

Tightening torque Nm (kgf.m, lb-ft) :
90 ~ 110 (9.0 ~ 11.0, 65 ~ 80)

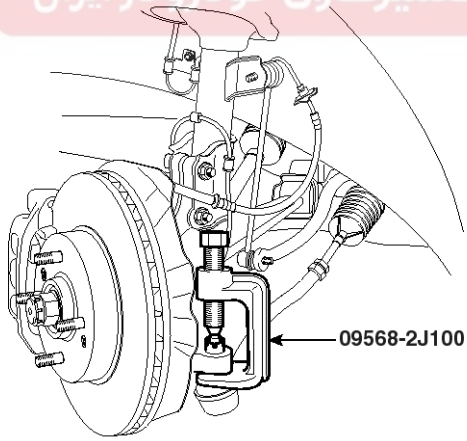
2. Disconnect the stabilizer link with the front strut assembly after loosening the nut.

Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



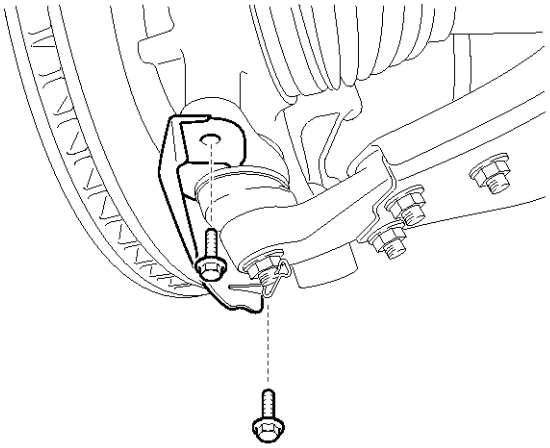
STDSS9002D

3. Disconnect the tie-rod end with the knuckle using a SST (09568-2J100).



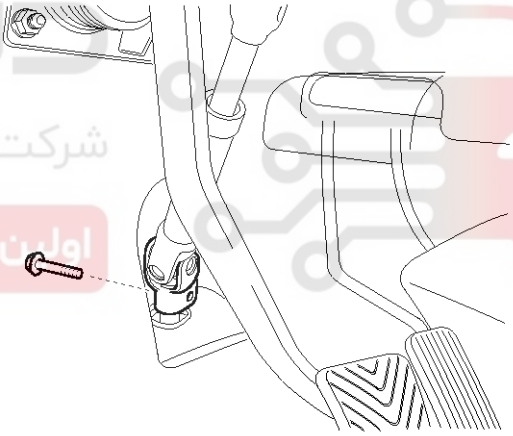
STDSS9312D

4. Remove the two bolts for lower arm ball joint.



STDSS9004D

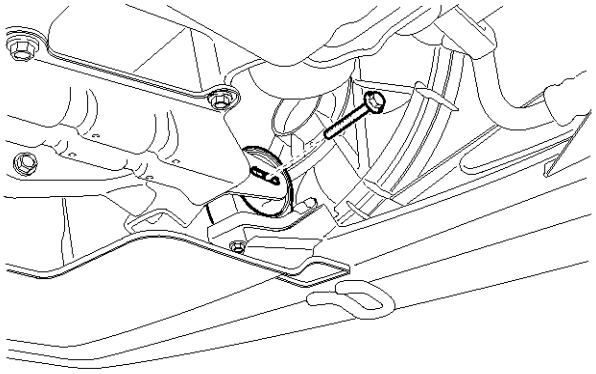
5. Loosen the bolt and then disconnect the universal joint assembly from the pinion of the steering gear box.



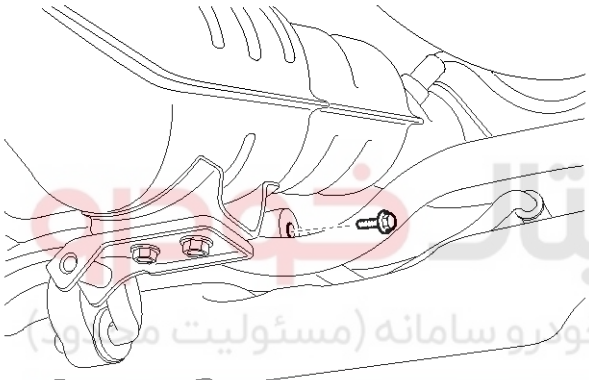
STDSS9007D

⚠CAUTION
Keep the neutral-range to prevent the damage of the clock spring inner cable when you handlethe steering wheel.

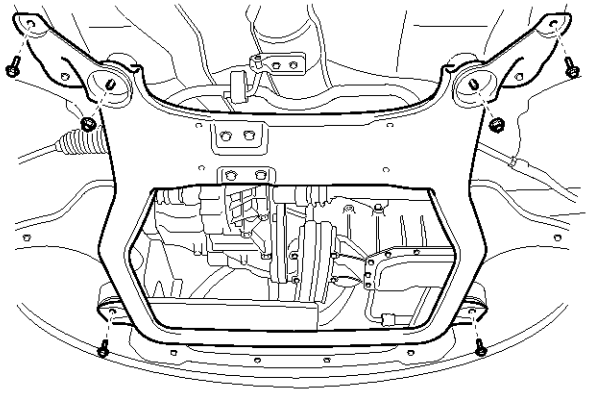
6. Remove the cross member from the body by loosening the mounting bolts and nuts.



STDSS9008D



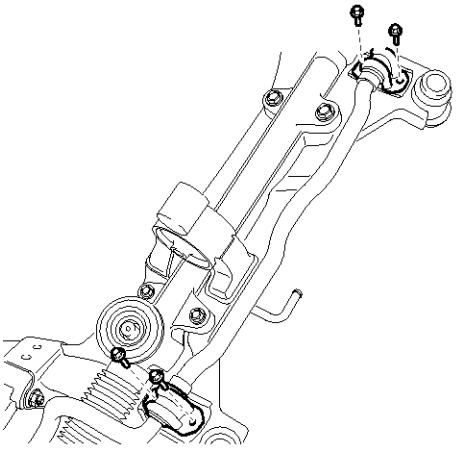
STDSS9009D



STDSS9010D

7. Remove the stabilizer from the cross member by loosening the bracket mounting bolts.

Tightening torque Nm (kgf.m, lb-ft) :
45 ~ 55 (4.5 ~ 5.5, 32 ~ 40)



STDSS9011D

8. Installation is the reverse of removal.

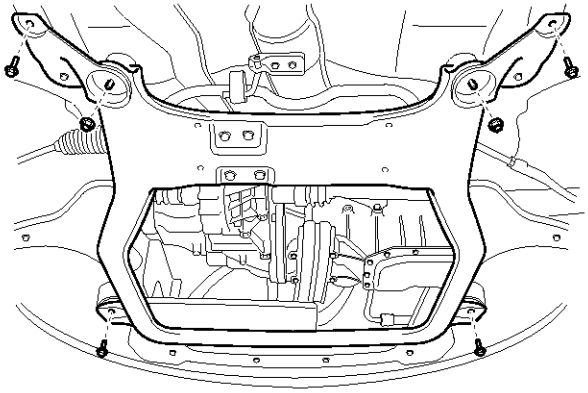
Inspection

1. Check the bushing for wear and deterioration.
2. Check the front stabilizer bar for deformation.
3. Check the front stabilizer link ball joint for damage.

Front Cross Member

Replacement

1. Remove the sub frame. (Refer to front stabilizer)

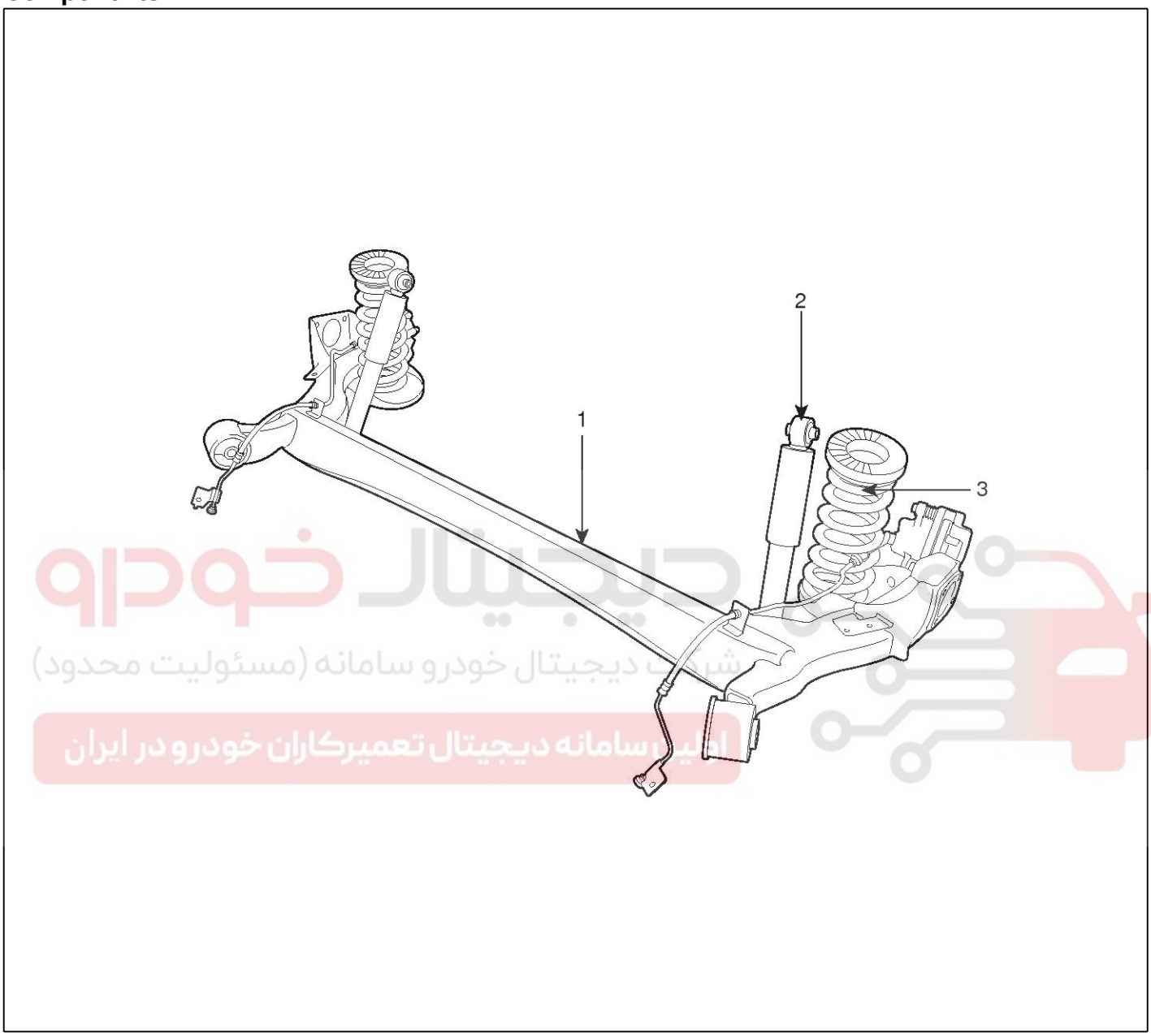


STDSS9010D

2. Remove the front lower arm.
3. Remove the front strut assembly.
4. Remove the front stabilizer.
5. Remove the steering gear box.
6. Installation is the reverse of removal.

Rear Suspension System

Components

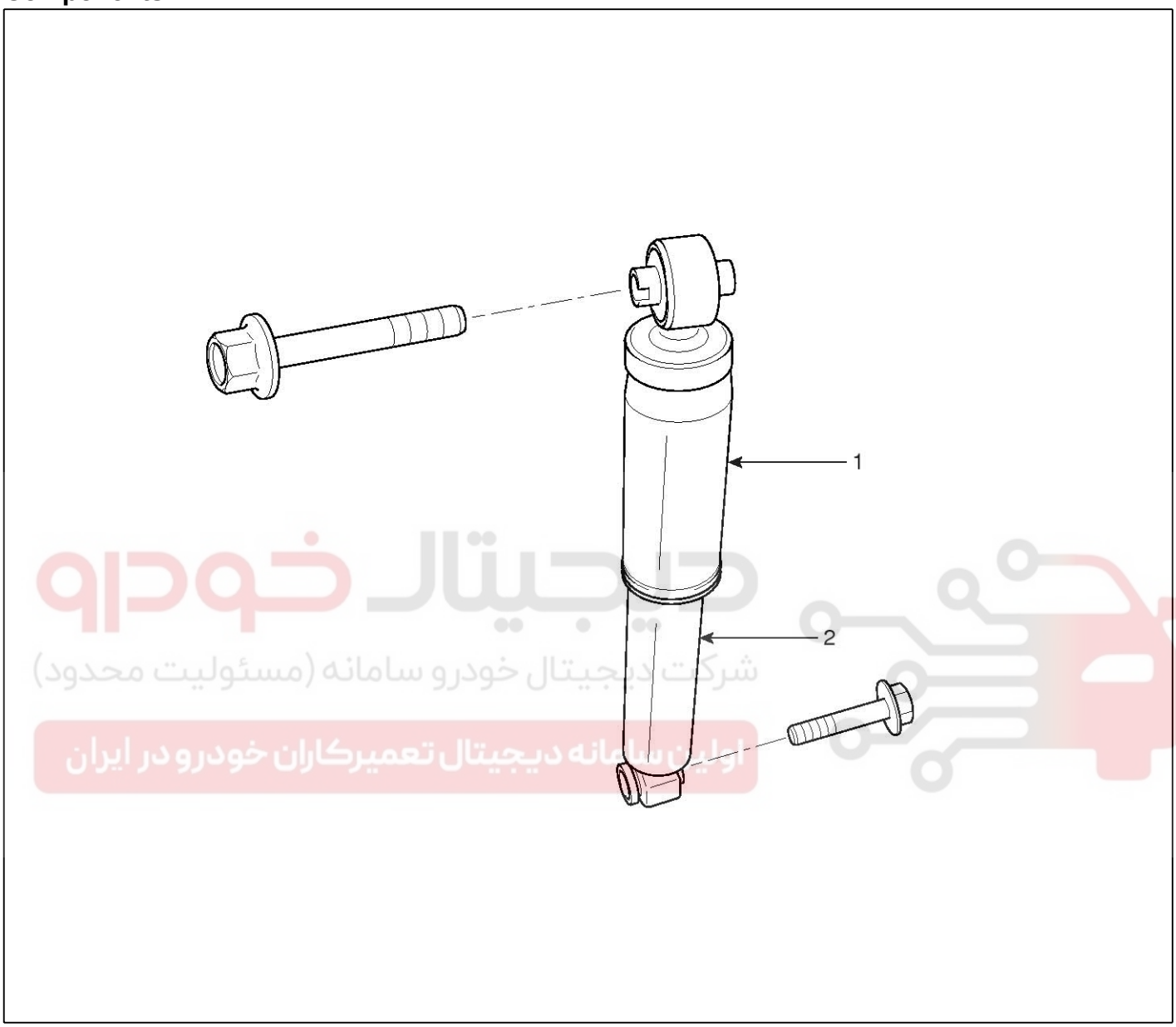


STDSS9012D

1. Torsion beam axle
2. Rear shock absorber
3. Coil spring assembly

Rear Shock Absorber

Components



SHDSS8003C

1. Dust cover
2. Shock absorber

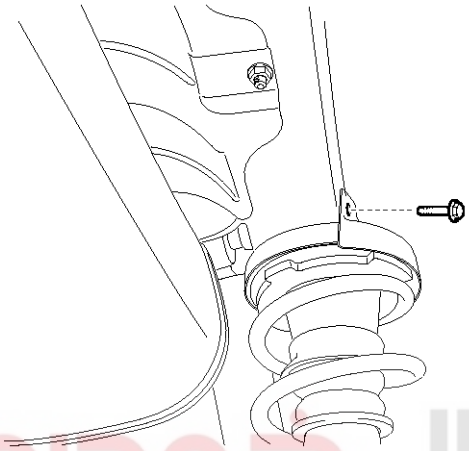
Replacement

1. Remove the rear wheel & tire.

Tightening torque Nm (kgf.m, lb-ft) :
90 ~ 110 (9.0 ~ 11.0, 65 ~ 80)

2. Remove the rear shock absorber from the frame by loosening the bolt.

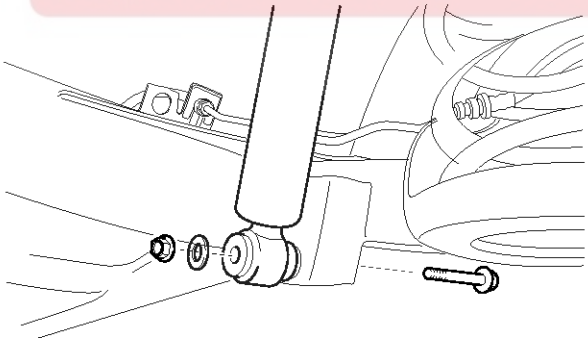
Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



STDSS9013D

3. Remove the rear shock absorber from the torsion beam axle by loosening the nut.

Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



STDSS9014D

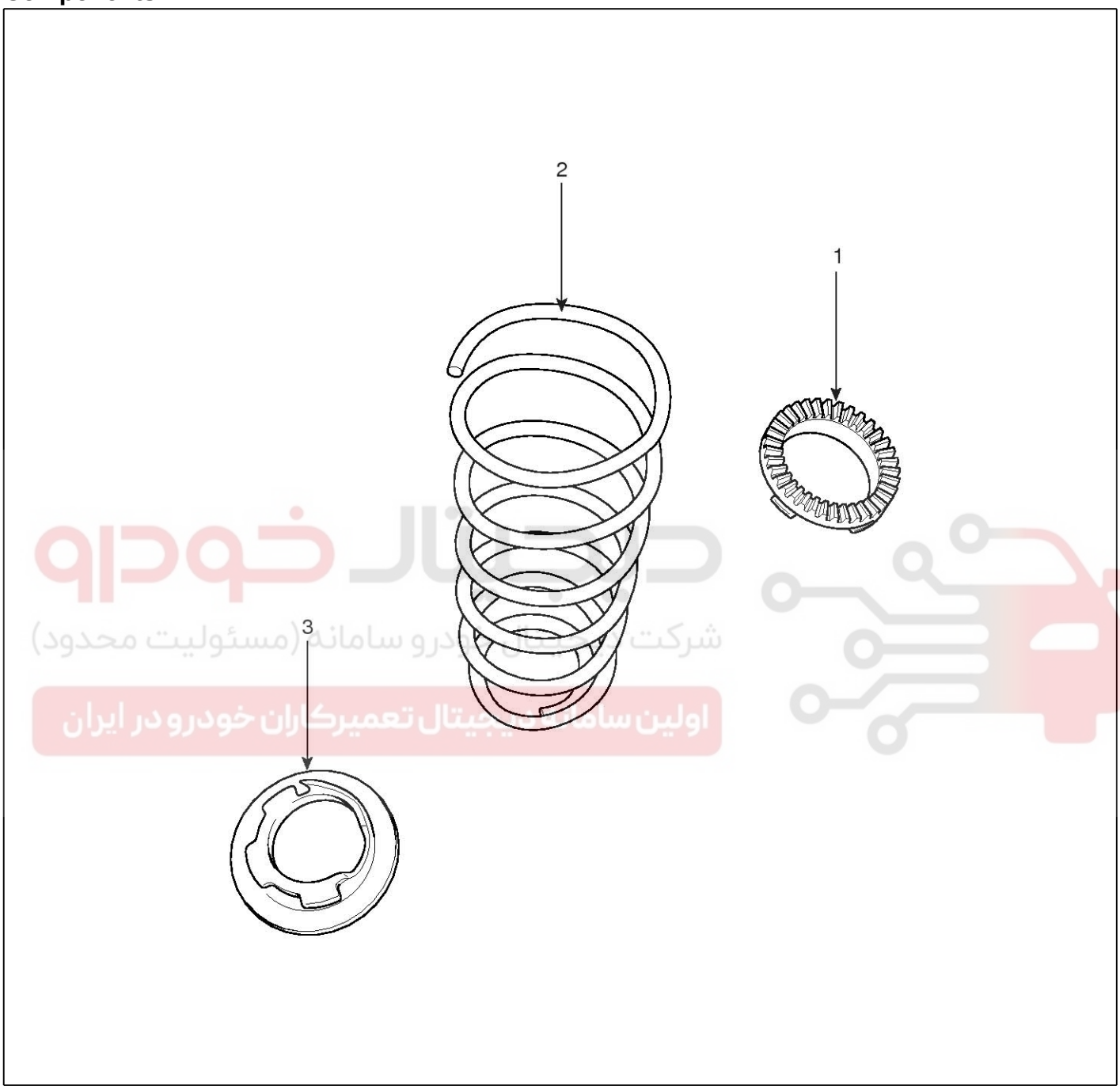
4. Installation is the reverse of removal.

Inspection

1. Check the components for damage or deformation.
2. Compress and extend the piston and check that there is no abnormal resistance or unusual sound during operation.

Rear Coil Spring

Components



STDSS9305D

1. Spring upper pad
2. Spring
3. Spring lower pad

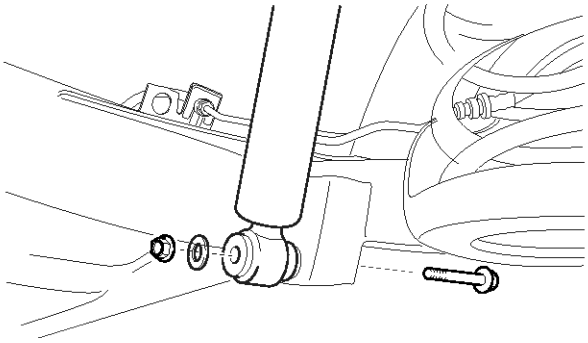
Replacement

1. Remove the rear wheel & tire.

Tightening torque Nm (kgf.m, lb-ft) :
90 ~ 110 (9.0 ~ 11.0, 65 ~ 80)

2. Remove the rear shock absorber from the torsion beam axle by loosening the nut.

Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



STDSS9014D

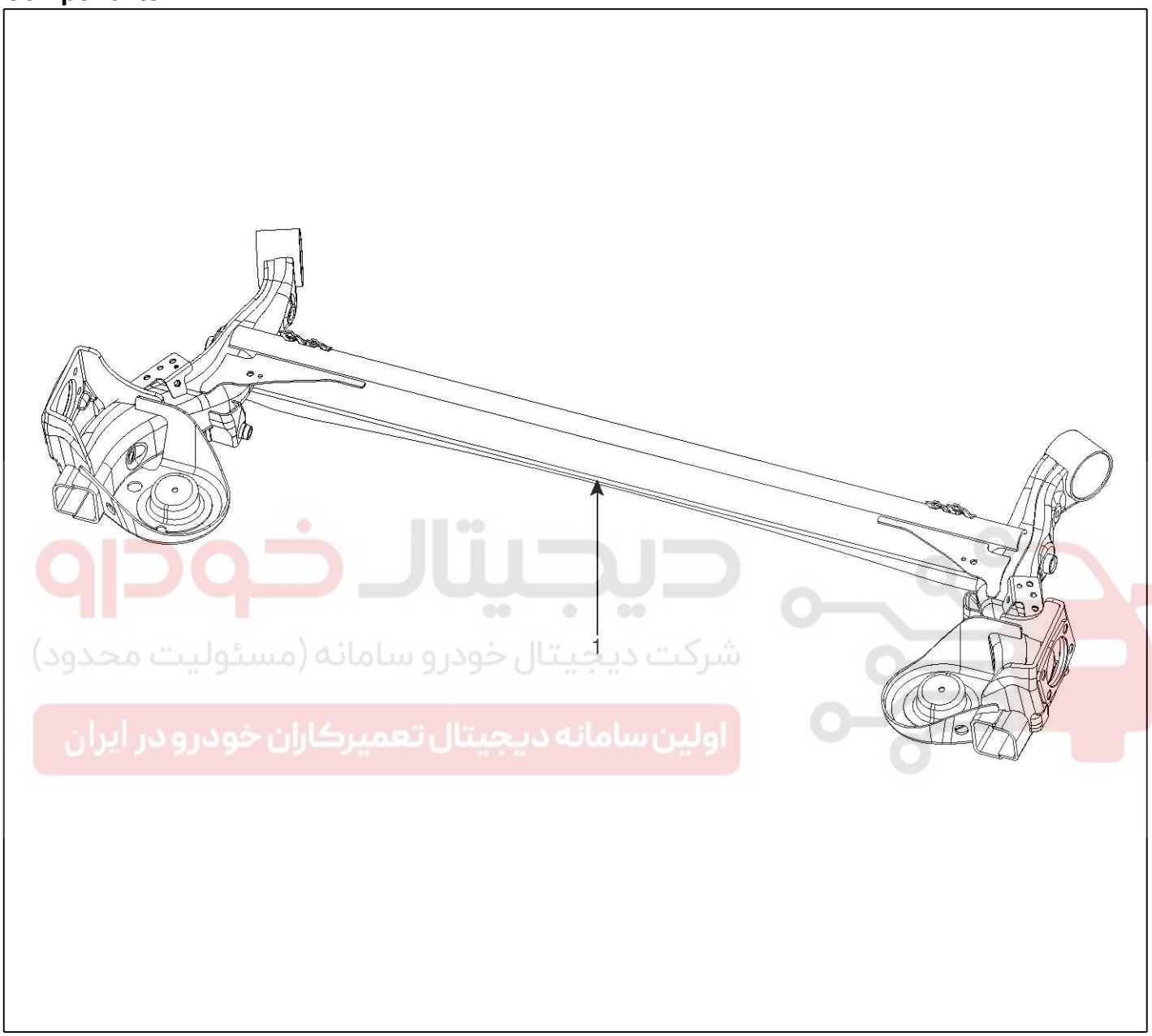
3. Installation is the reverse of removal.

Inspection

1. Check the coil spring for crack and deformation.
2. Check the coil spring pad for damage and deformation.

Rear torsion beam axle

Components



STDSS9307D

1. Rear torsion beam axle

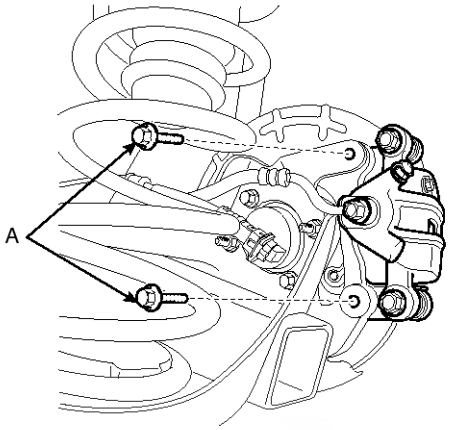
Replacement

1. Remove the rear wheel & tire.

Tightening torque Nm (kgf.m, lb-ft) :
90 ~ 110 (9.0 ~ 11.0, 65 ~ 80)

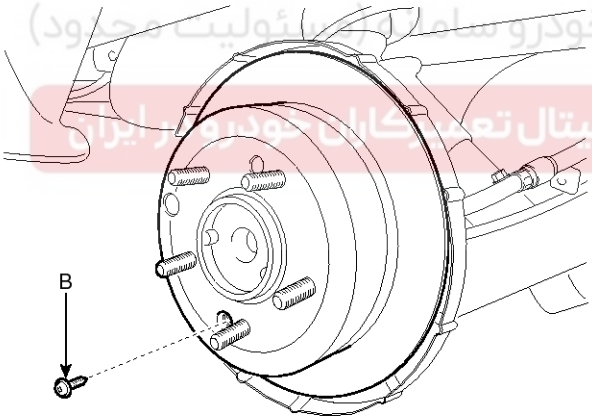
2. Loosen the bolts (A).

Tightening torque Nm (kgf.m, lb-ft) :
65 ~ 75 (6.5 ~ 7.5, 47 ~ 54)



STDSS9308D

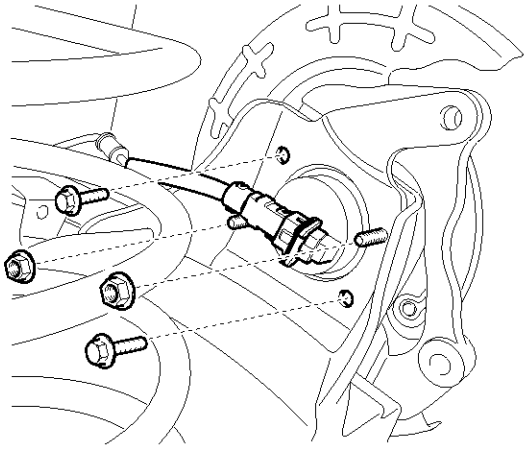
3. Loosen the screw (B).



STDSS9309D

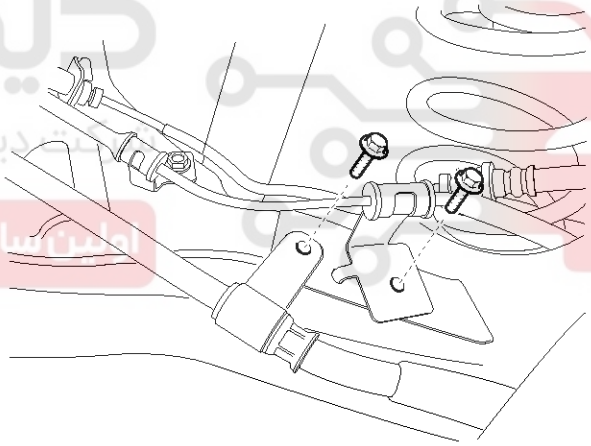
4. Remove the wheel speed sensor cable and the loosening the mounting bolts.

Tightening torque Nm (kgf.m, lb-ft) :
60 ~ 70 (6.0 ~ 7.0, 43 ~ 50)



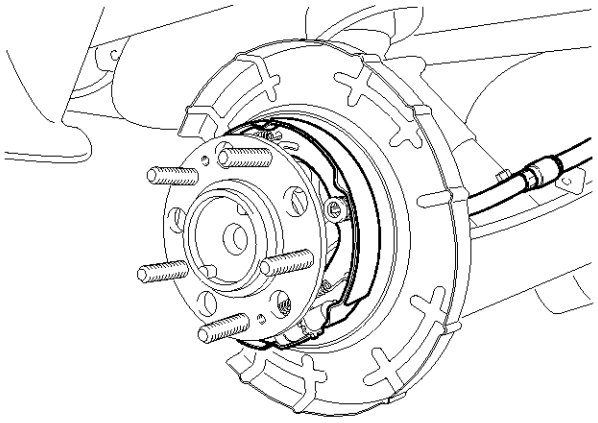
STDSS9311D

5. Remove the wheel speed sensor cable and parking break cable mounting bracket bolts.



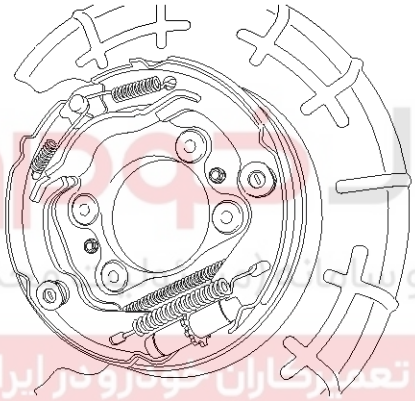
STDSS9015D

6. Remove the rear hub unit bearing.



STDSS9310D

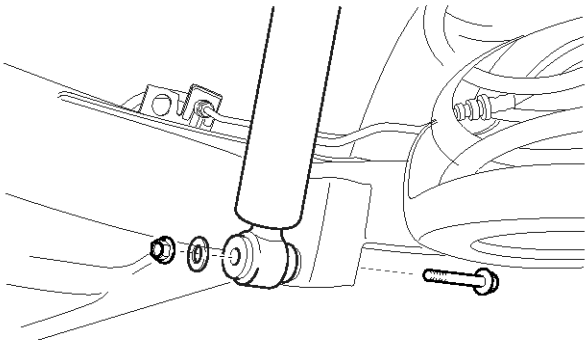
7. Remove the parking brake cable.



STDSS9016D

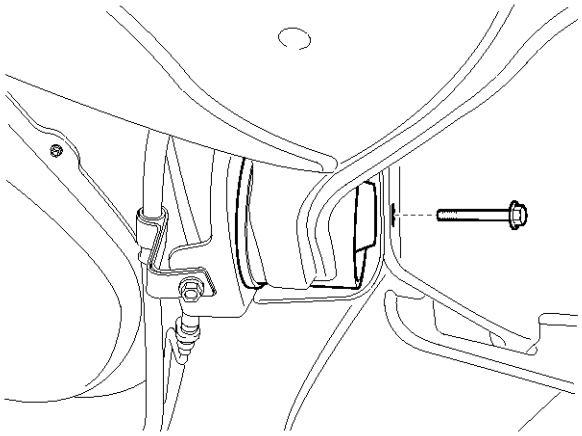
8. Remove the rear shock absorber from the torsion beam axle by loosening the nut.

Tightening torque Nm (kgf.m, lb-ft) :
100 ~ 120 (10.0 ~ 12.0, 72 ~ 87)



STDSS9014D

9. Remove the torsion axle from the body loosening the bolts.



STDSS9017D

10. Installation is the reverse of removal.

Tires/Wheels

Alignment

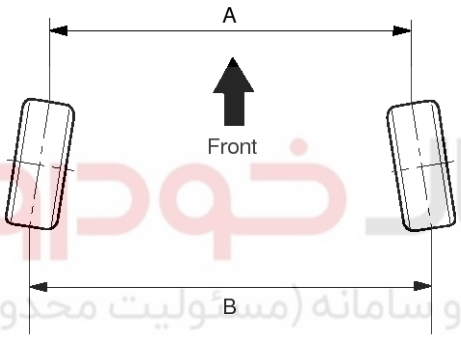
Front Wheel Alignment

⚠CAUTION

When using a commercially available computerized wheel alignment equipment to inspect the front wheel alignment, always position the vehicle on a level surface with the front wheels facing straight ahead.

Prior to inspection, make sure that the front suspension and steering system are in normal operating condition and that the tires are inflated to the specified pressure.

Toe



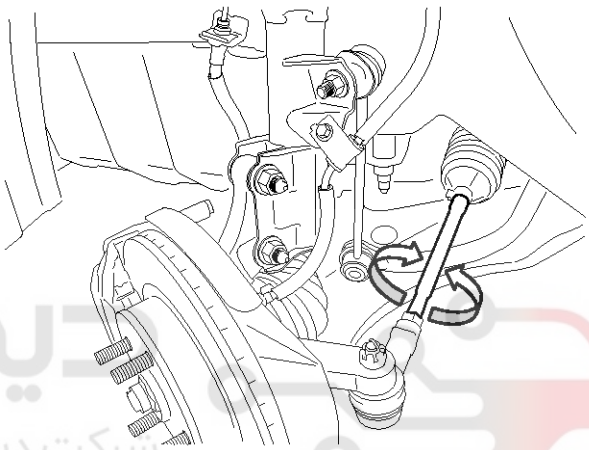
SHDSS6512L

B - A > 0: Toe in (+)
B - A < 0: Toe out (-)

Toe Adjustment

1. Loosen the tie rod end lock nut.
2. Remove the bellows clip to prevent the bellows from being twisted.
3. Adjust the toe by screwing or unscrewing the tie rod. Toe adjustment should be made by turning the right and left tie rods by the same amount.

Toe: 0±2mm (0±0.079in.)



SPASS8309L

※ in. = individual

1. When completing the toe adjustment, install the bellows clip and tighten the tie rod end lock nut to specified torque.

Tightening torque :
50 ~ 55N.m (5.0 ~ 5.5kgf.m, 36 ~ 40lb-ft)

Camber and Caster

Camber and Caster are pre-set at the factory, so they do not need to be adjusted. If the camber and caster are not within the standard value, replace or repair the damaged parts and then inspect again.

Camber angle: -0.64˚±0.5˚

Caster angle: 4.38˚±0.5˚

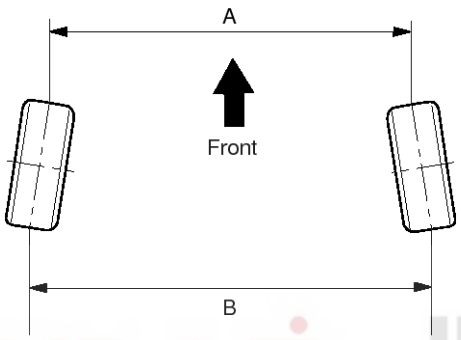
Rear Wheel Alignment

⚠CAUTION

When using a commercially available computerized wheel alignment equipment to inspect the rear wheel alignment, always position the vehicle on a level surface.

Prior to inspection, make sure that the rear suspension system is in normal operating condition and that the tires are inflated to the specified pressure.

Toe



SHDSS6512L

B - A > 0: Toe in (+)
B - A < 0: Toe out (-)

Toe is pre-set at the factory, so it does not need to be adjusted. If the toe is not within the standard value, replace or repair the damaged parts and then inspect again.

Toe: 4.4±2.2mm

Camber

Camber is pre-set at the factory, so it does not need to be adjusted. If the camber is not within the standard value, replace or repair the damaged parts and then inspect again.

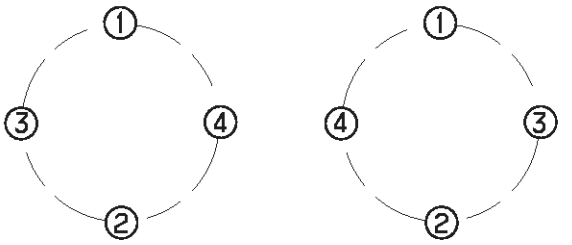
Camber: -1.5°±0.5°

Wheel

Hub Nut Tightening Sequence

Tighten the hub nuts as follows.

Tightening torque :
90 ~ 110N.m (9.0 ~ 11.0kgf.m, 65 ~ 80lb-ft)



SPASS8310L

CAUTION
When using an impact gun, final tightening torque should be checked using a torque wrench.

Tire

Tire Wear

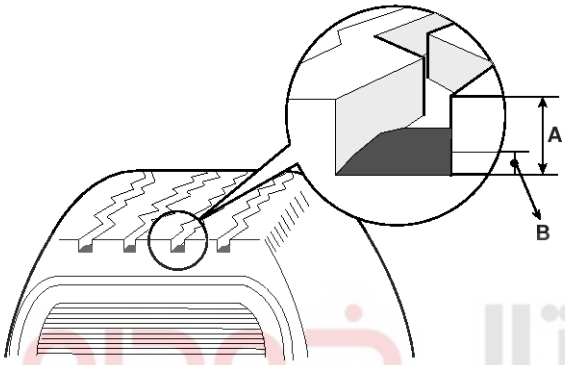
1. Measure the tread depth of the tires.

Tread depth [limit] : 1.6 mm (0.063 in)

2. If the remaining tread depth (A) is less than the limit, replace the tire.

NOTICE

When the tread depth of the tires is less than 1.6 mm(0.063 in), the wear indicators (B) will appear.



KHRE404A