General Information

Specification

Front Suspension

Items		Specification
Suspension type		Double wishbone
Shock absorber	Type	Gas pressurized
	Stroke	99.0mm
	I.D. color	White
Coil spring	Free height (I.D. color)	361.8mm (Blue – Blue)
		365.3mm (Pink – Blue)

Rear Suspension

Items		Specification
Suspension type		Multi-link
Shock absorber	Type	Gas pressurized
	Stroke	136.6mm
	I.D. color	White
Coil spring	Free height(I.D. color)	306.0mm

Wheel & Tire

Items		Specification
Tire		245/70 R17
		265/60 R18
Wheel		7.5J×17
		7.5J×18
Tire pressure	Front	2.2kg/cm^2(32psi)
	Rear	2.2kg/cm^2(32psi)

Wheel Alignment

Items	Front	Rear
Toe	0±2mm (0±0.079in.)	2.1±2mm (0.082±0.079in.)
Camber	-0.50°±0.5°	-1.00°±0.5°
Caster	3.80°±0.5°	-
King-pin	13.92°	-

※ in = individual

Tightening Torques

Front Suspension

Item	Tightening torque (kgf.m)		
	N.m	kgf.m	lb-ft
Drive shaft nuts	245 ~ 275	24.5 ~ 27.5	177 ~ 199
Wheel nuts	90 ~ 110	9.0 ~ 11.0	65 ~ 80
Strut assembly to wheel housing penal bolts	45 ~ 55	4.5 ~ 5.5	33 ~ 40
Strut assembly to knuckle bolts	80 ~ 100	8.0 ~ 10.0	58 ~ 72
Stabilizer link to strut assembly nut	100 ~ 120	10.0 ~12.0	72 ~ 87
Lower arm to frame bolt & nut	145 ~ 165	14.5 ~ 16.5	105 ~ 119
Lower arm to knuckle bolts & nut	160 ~ 200	16.0 ~ 20.0	116 ~ 145
Stabilizer bar to stabilizer link nut	100 ~ 120	10.0 ~ 12.0	72 ~ 87
Stabilizer bracket mounting bolts	45 ~ 55	4.5 ~ 5.5	33 ~ 40

Rear Suspension

Item	Tightening toque		
	N.m	kgf.m	lb-ft
Drive shaft nuts	245 ~ 275	24.5 ~ 27.5	177 ~ 199
Wheel nuts	90 ~ 110	9.0 ~ 11.0	65 ~ 80
Shock absorber to frame	80 ~ 90	8.0 ~ 9.0	58 ~ 65
Shock absorber to rear axle	80 ~ 90	8.0 ~ 9.0	58 ~ 65
Upper arm to frame	100 ~ 120	10.0 ~ 12.0	72 ~ 87
Upper arm to rear axle	80 ~ 90	8.0 ~ 9.0	58 ~ 65
Lower arm to frame	140 ~ 160	14.0 ~ 16.0	101 ~ 116
Lower arm to rear axle	140 ~ 160	14.0 ~ 16.0	101 ~ 116
Stabilizer bar to rear axle	100 ~ 120	10.0 ~ 12.0	72 ~ 87
Stabilizer link to stabilizer bar nut	100 ~ 120	10.0 ~ 12.0	72 ~ 87
Stabilizer bar to frame	45 ~ 55	4.5 ~ 5.5	33 ~ 40
Assist arm to frame	140 ~ 160	14.0 ~ 16.0	101 ~ 116
Assist arm to rear axle	100 ~ 120	10.0 ~ 12.0	72 ~ 87

Special Service Tools

Tool (Number and Name)	Illustration	Use
09546-26000 Strut spring compressor		Compression of coil spring
09568-34000 Ball joint puller		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.

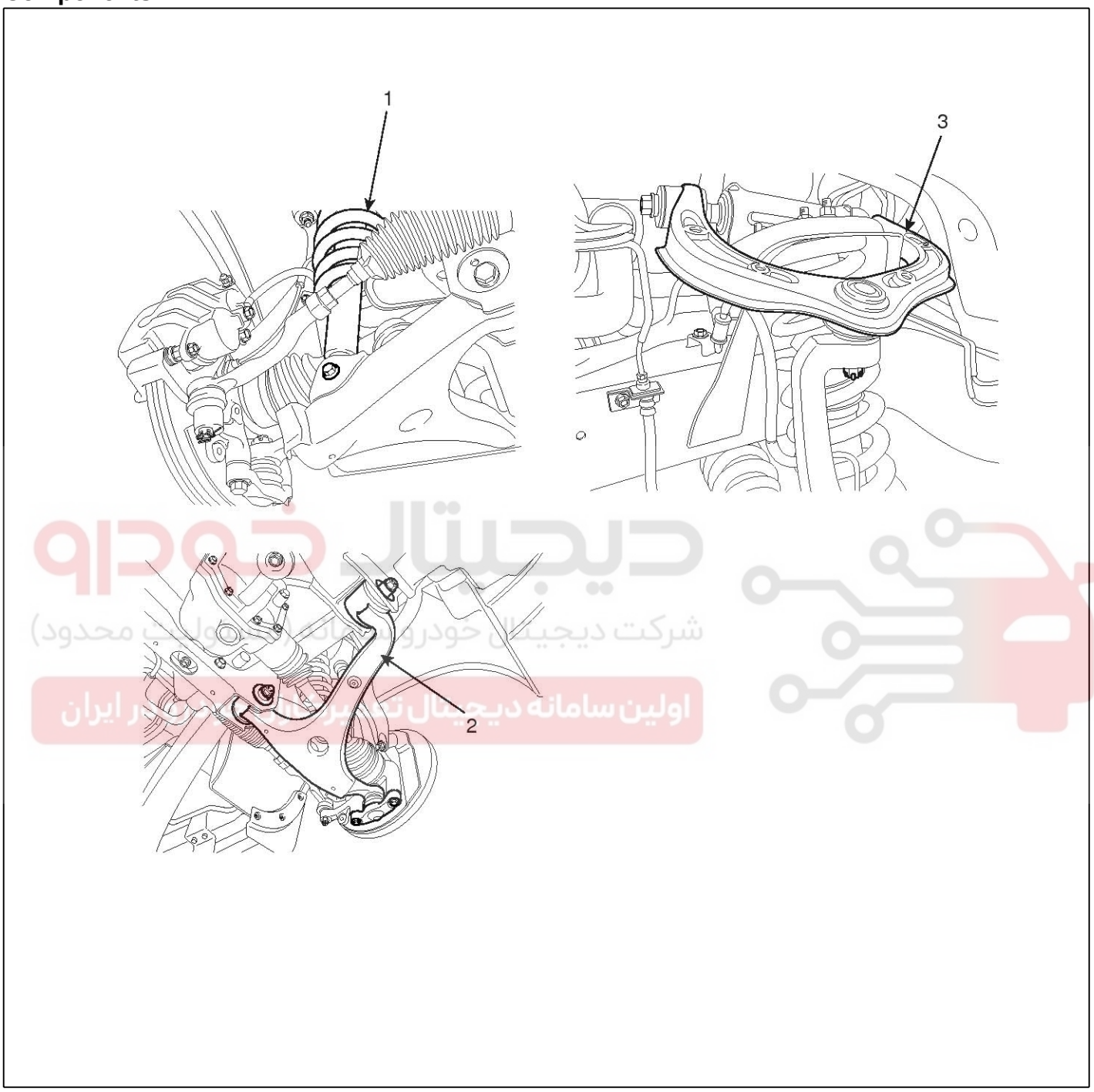
Careful attention must be paid to the tire and wheels. There are several symptoms that can be caused by damaged or worn tire and wheels. Perform a careful visual inspection of the tires and wheel assemblies. Spin the tires slowly and watch for signs of lateral or radial runout. Refer to the tire wear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

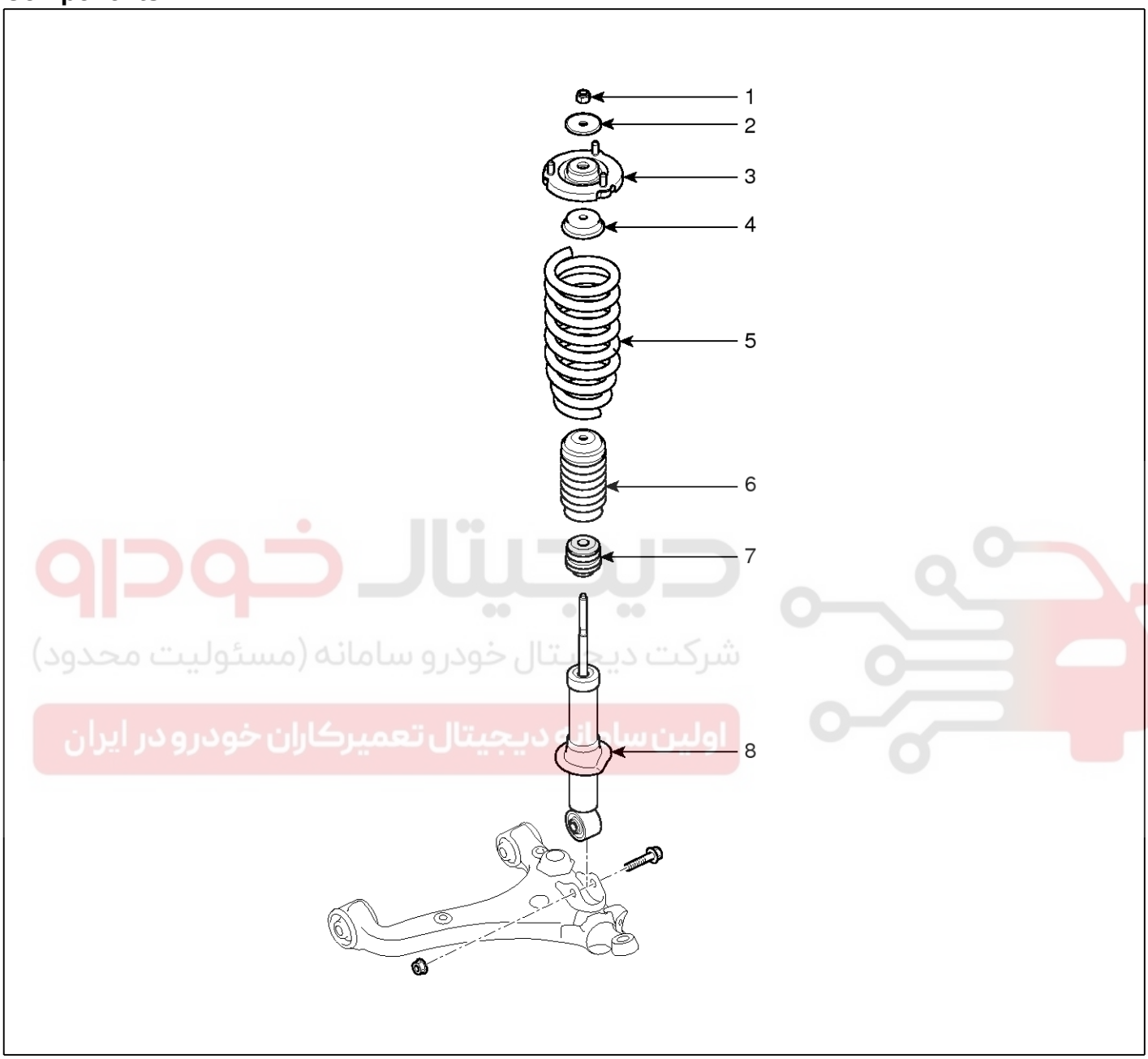


SHMSS8300D

1.Front strut assembly
2.Front lower arm
3.Front upper arm

Front Strut Assembly

Components



SHMSS8304D

1.Self locking nut
2.Strut washer
3.Insulator assembly
4.Strut bearing
5.Coil spring
6.Dust cover
7.Bumper rubber
8.Shock absorber

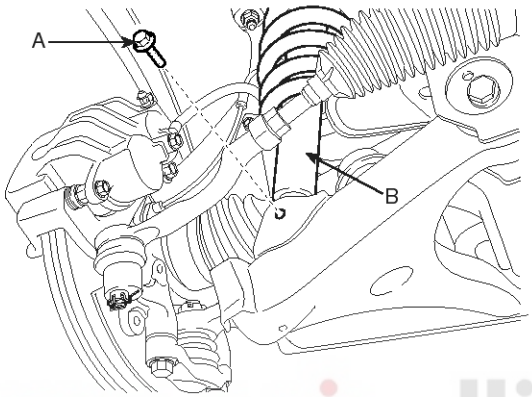
Replacement

1. Remove the front wheel & tire.

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

2. Disconnect the front strut assembly (B) with the lower arm by loosening the bolts & nuts (A).

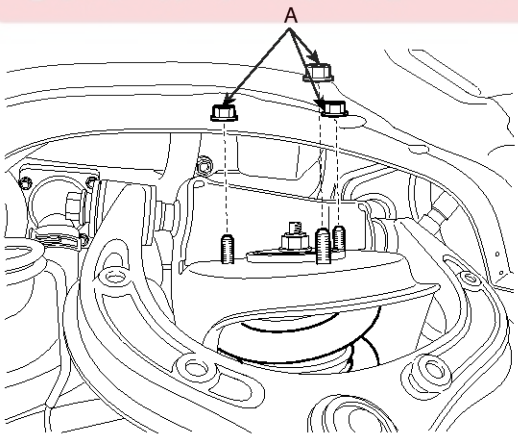
Tightening torque:
120 ~ 140 N.m (12.0 ~ 14.0kgf.m, 87 ~ 101lb-ft)



SHMSS8101D

3. Disconnect the front strut assembly with the frame by loosening the nuts (A).

Tightening torque:
45 ~ 55N.m (4.5 ~ 5.5kgf.m, 33 ~ 40lb-ft)



SHMSS8102D

4. Installation is the reverse of the removal.

Disassembly and Reassembly

1. Compress the coil spring with a strut spring compressor. Do not compress the spring more than necessary.
2. Loosen the lock nut.

Tightening torque:
76 ~ 95N.m (7.6 ~ 9.5kgf.m, 55 ~ 69lb-ft)

3. Disassemble the components of front strut assembly in sequence. (Refer to Front strut assembly components.)
4. Reassembly is the reverse of the disassembly.

Inspection

1. Check the components for damage or deformation.
2. Compress and extend the piston rod and check that there is no abnormal resistance or unusual sound during operation.
3. When disposing the shock absorber, fully extend the piston rod and then drill a hole on the section to discharge gas from the cylinder.

⚠CAUTION
The gas coming out is harmless, but be careful of chips that may fly when drilling. Be sure to wear safety goggles or eye protection when performing this task.

Front Upper Arm

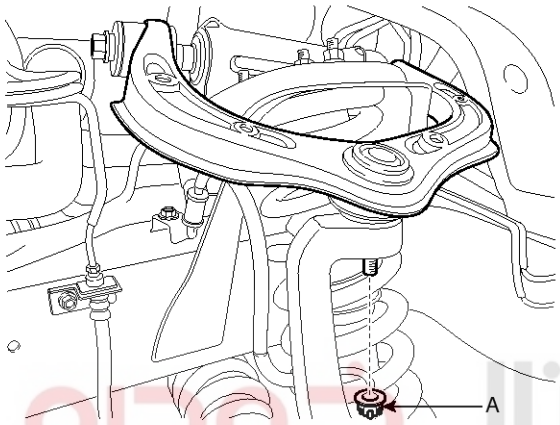
Replacement

1. Remove the front wheel & tire.

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

2. Remove the split pin and bolt & nut (A).

Tightening torque:
80 ~ 100N.m (8.0 ~ 10.0kgf.m, 58 ~ 78lb-ft)

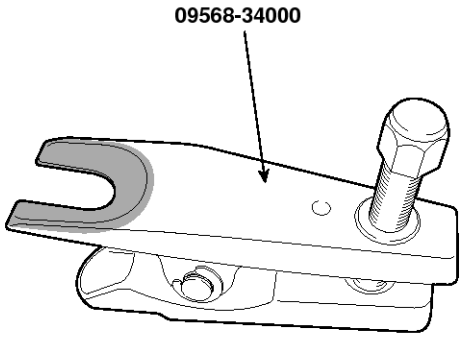


SHMSS8103D

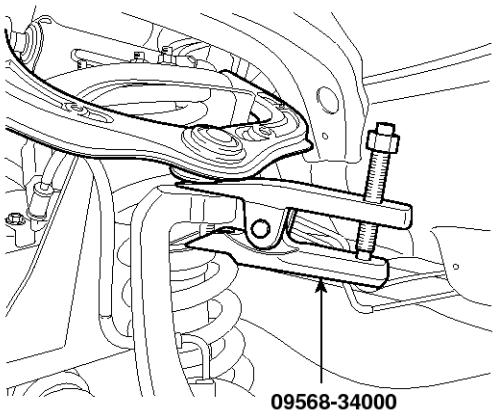
3. Disconnect the front lower arm with the knuckle by using a SST (09568-34000).

Tightening torque:
90 ~ 120N.m (9.0 ~ 12.0kgf.m, 65 ~ 87lb-ft)

⚠CAUTION
Be careful not to damage the lower arm ball joint boot when removing or installing the lower arm.



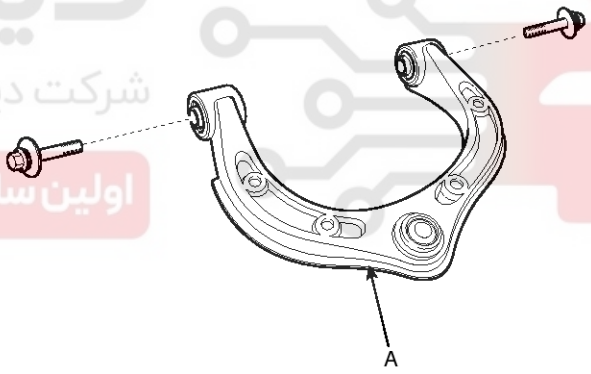
SHMSS8104D



SHMSS8105D

4. Loosen the bolt and then remove the front upper arm (A) from the frame.

Tightening torque:
120 ~ 140N.m (12.0 ~ 14.0kgf.m, 87 ~ 101lb-ft)



SHMSS8106D

5. Installation is the reverse of the removal.

Front Lower Arm

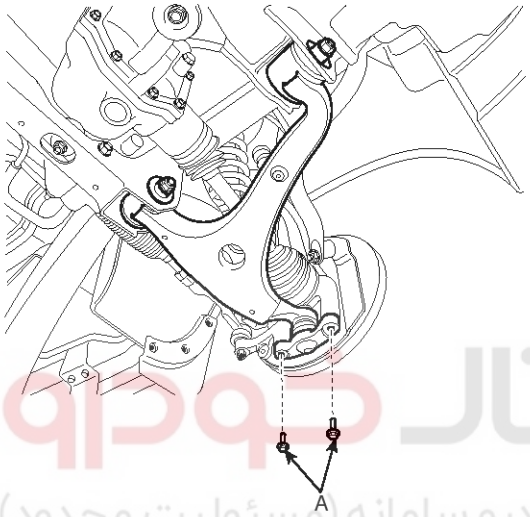
Replacement

1. Remove the front wheel & tire.

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

2. Remove the bolt (A).

Tightening torque:
140 ~ 160N.m (14.0 ~ 16.0kgf.m, 101 ~ 116lb-ft)

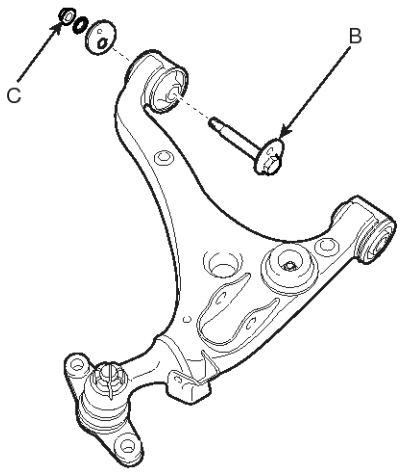


SHMSS8107D

⚠CAUTION
Be careful not to damage the lower arm ball joint boot when removing or installing the lower arm.

3. Loosen the bolt & nut (B, C) and then remove the front lower arm from the frame.

Tightening torque:
145 ~ 165N.m (14.5 ~ 16.5kgf.m, 105 ~ 119lb-ft)



SHMSS8108D

4. Installation is the reverse of the removal.

Inspection

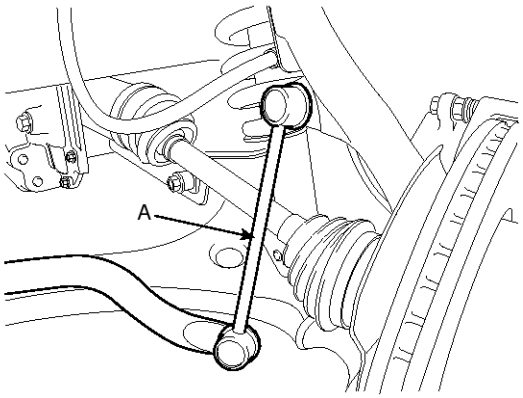
1. Check the lower arm ball joint boot for wear or damage and replace the lower arm assembly if necessary.
2. Check the lower arm bushing for wear or damage and replace the lower arm assembly if necessary.

Front Stabilizer Bar

Replacement

1. Disconnect the stabilizer links (A) with the knuckle.

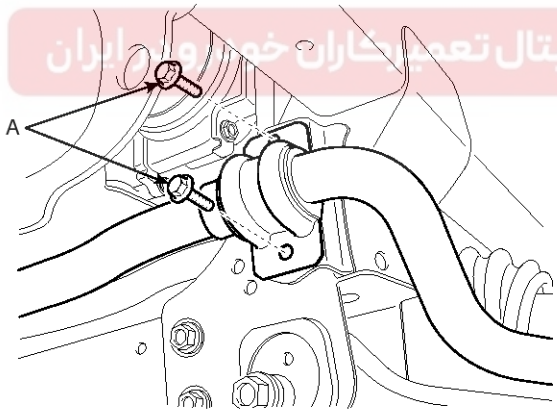
Tightening torque:
100 ~ 120N.m (10.0 ~ 12.0kgf.m, 72 ~ 87lb-ft)



SHMSS8109D

2. Remove the stabilizer bar from the frame by loosening the mounting bolts (A).

Tightening torque:
45 ~ 55N.m (4.5 ~ 5.5kgf.m, 33 ~ 40lb-ft)



SHMSS8110D

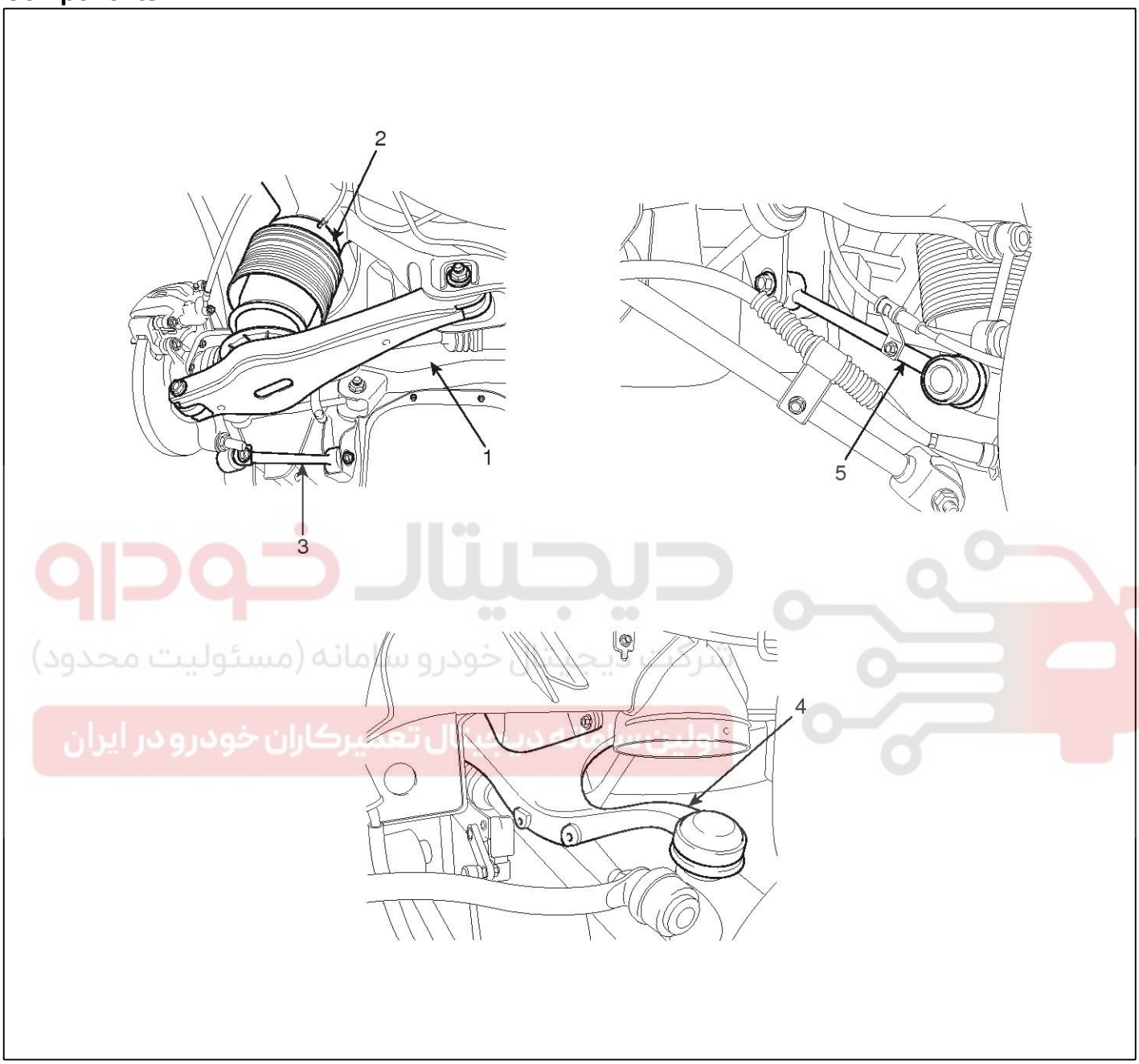
3. Installation is the reverse of the removal.

Inspection

1. Check the stabilizer bar bushing for wear or damage and replace it if necessary.
2. Check the stabilizer bar link ball joint for damage and replace the stabilizer link if necessary.

Rear Suspension System

Components

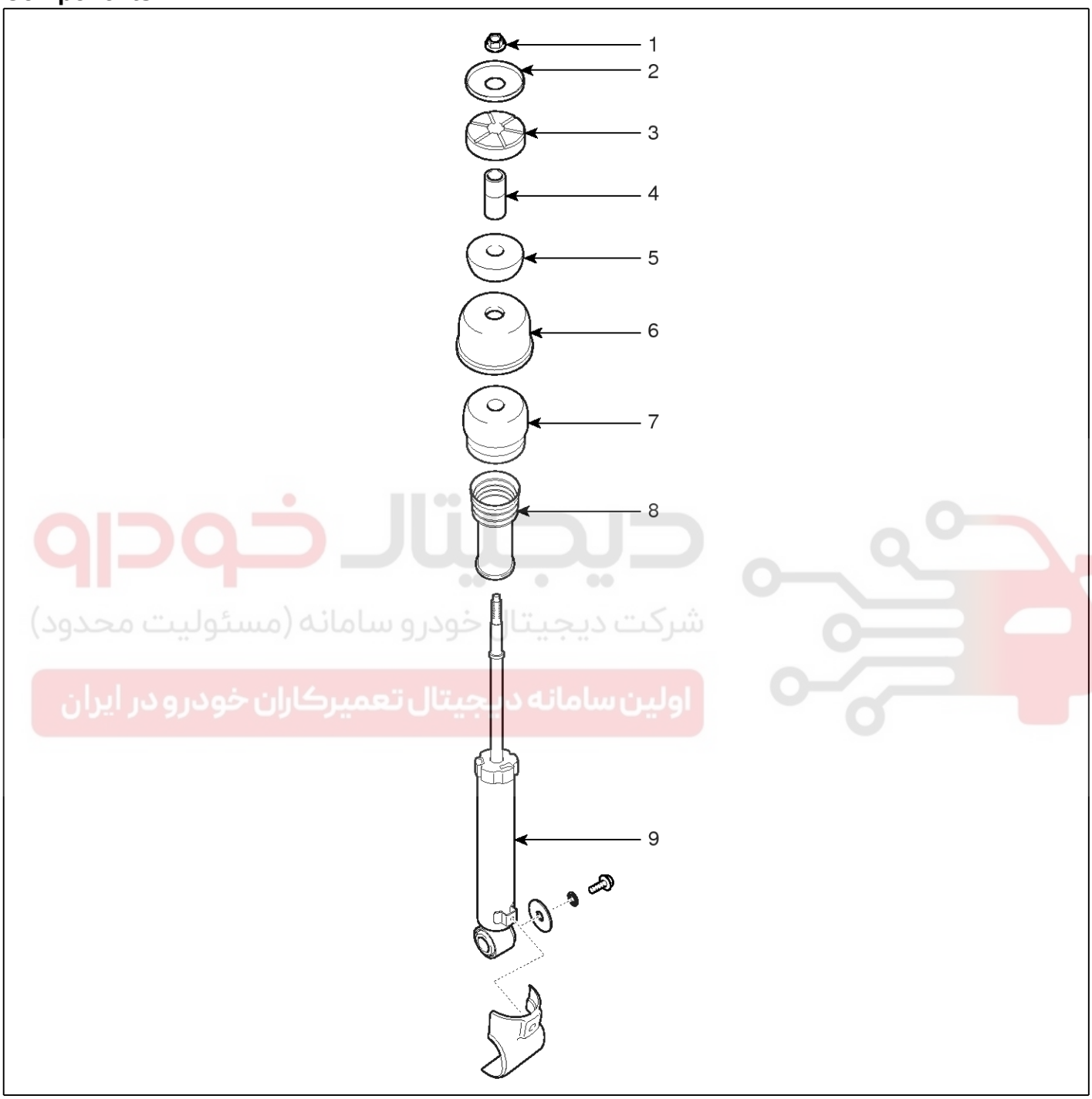


SHMSS8301D

1.Rear lower arm
2.Air spring
3.Rear trailing arm
4.Rear upper arm
5.Assist arm

Rear Shock Absorber

Components



SHMSS9307L

1.Self locking nut
2.Busing cover
3.Upper bushing
4.Bush
5.Lower bushing
6.Bumper rubber cover
7.Bumper rubber
8.Dust cover
9.Shock absorber

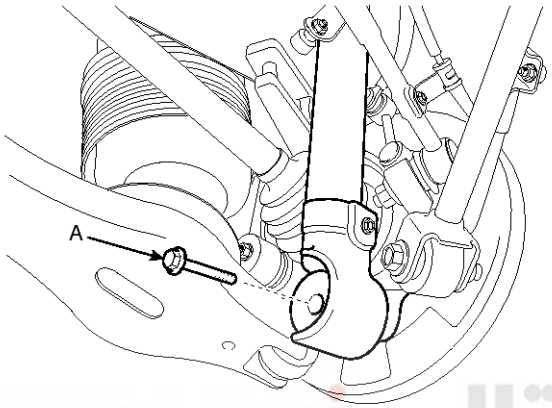
Replacement

1. Remove the rear wheel & tire.

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

2. Disconnect the rear shock absorber with the rear carrier by loosening the bolt (A).

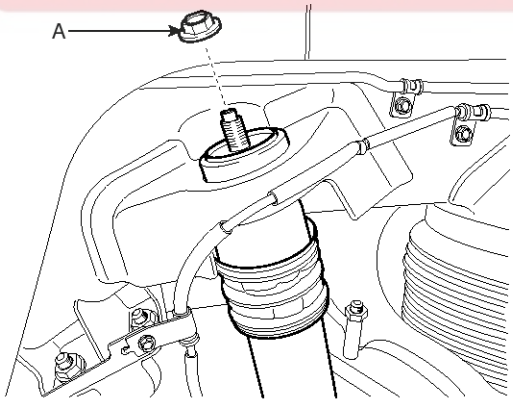
Tightening torque:
80 ~ 90N.m (8.0 ~ 9.0kgf.m, 58~ 65lb-ft)



SHMSS8113D

3. Disconnect the rear shock absorber with the frame by loosening the nut (A).

Tightening torque:
80 ~ 90N.m (8.0 ~ 9.0kgf.m, 58~ 65lb-ft)



SHMSS8114D

4. Installation is the reverse of the removal.

Inspection

1. Check the components for damage or deformation.
2. Compress and extend the piston rod and check that there is no abnormal resistance or unusual sound during operation.
3. When disposing the shock absorber, fully extend the piston rod and then drill a hole on the section to discharge gas from the cylinder.

⚠CAUTION
The gas coming out is harmless, but be careful of chips that may fly when drilling. Be sure to wear safety goggles or eye protection when performing this task.

Rear Upper Arm

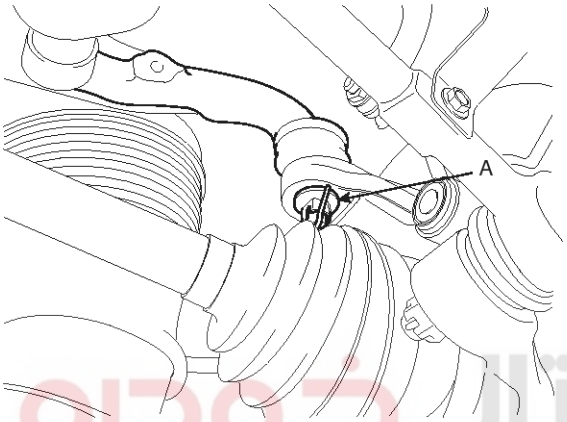
Replacement

1. Remove the rear wheel & tire.

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

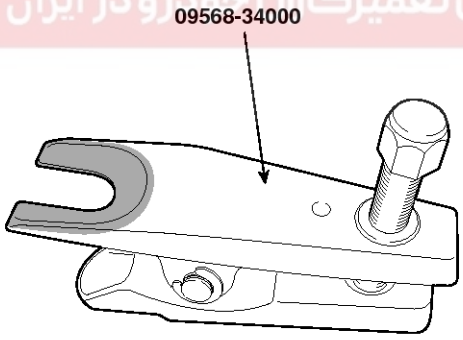
2. Remove the split pin and bolt & nut (A).

Tightening torque:
80 ~ 90N.m (8.0 ~ 9.0kgf.m, 58~ 65lb-ft)

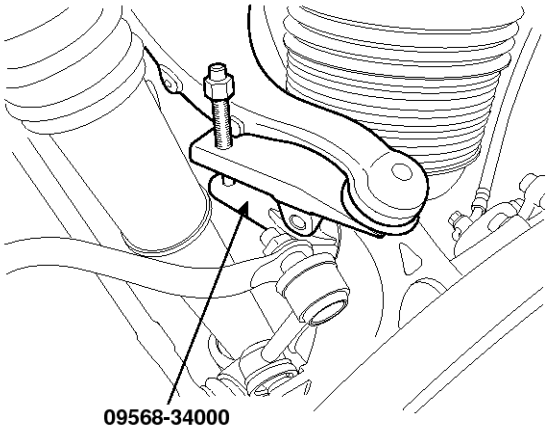


SHMSS8115D

3. Disconnect the rear upper arm with rear carrier by using a SST (09568-34000).

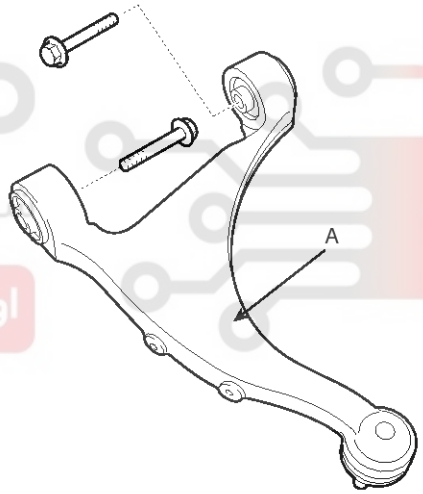


SHMSS8104D



SHMSS8116D

4. Disconnect the rear upper arm (A) with the frame by loosening the bolt.



SHMSS8117D

5. Installation is the reverse of the removal.

Inspection

Check the rear upper arm bushing for wear or damage and then replace the rear upper arm assembly if necessary.

Rear Lower Arm

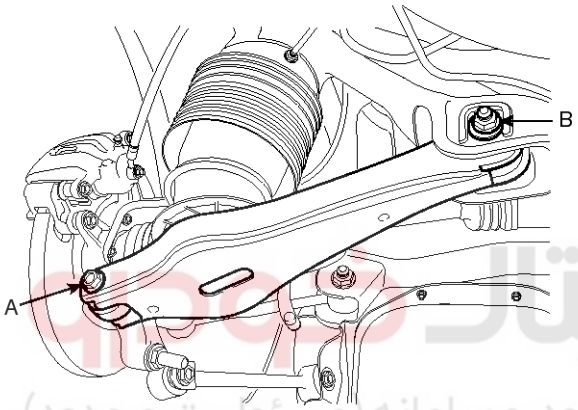
Replacement

1. Remove the rear wheel & tire.

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

2. Support the lower portion of the rear lower arm with a jack securely.
3. Loosen the bolt & nut (A, B) and then remove the rear lower arm.

Tightening torque:
140 ~ 160N.m (14.0 ~ 16.0kgf.m, 101 ~ 116lb-ft)



SHMSS8119D

4. Installation is the reverse of the removal.

Inspection

1. Check the rear lower arm bushing for wear or damage and replace rear lower arm if necessary.
2. Check the spring pad and seat for wear or damage and replace it if necessary.

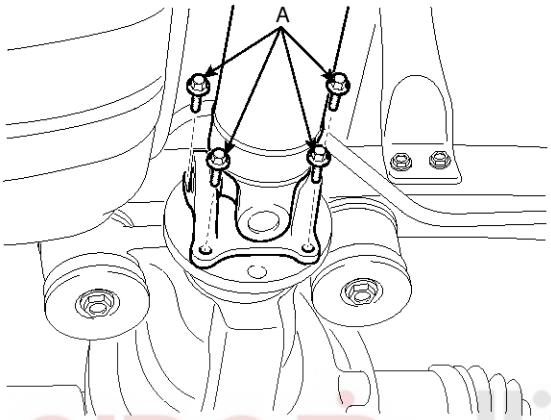
Rear Stabilizer Bar

Replacement

1. Remove the rear wheel & tire.

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

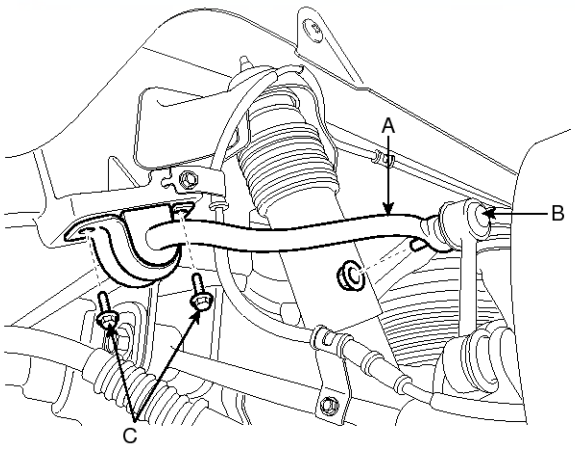
2. Remove the fuel tank.
3. Loosen the bolt (A) from the propeller shaft.



SHMSS8131D

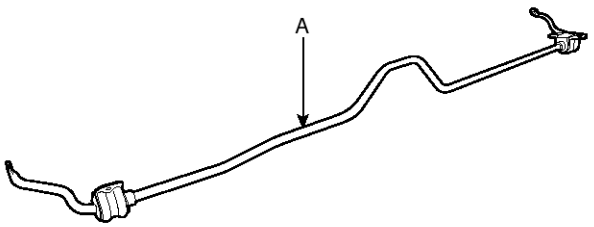
4. Remove the stabilizer (A) from the stabilizer link (B).
5. Remove the bolt (C) form the stabilizer.

Tightening torque:
A, B: 100 ~ 120N.m (10.0 ~ 12.0kgf.m, 72 ~ 87lb-ft)
C: 45 ~ 55N.m (4.5 ~ 5.5kgf.m, 33 ~ 40lb-ft)



SHMSS9308L

6. Remove the stabilizer bar.



SHMSS8133D

7. Installation is the reverse of the removal.

Inspection

1. Check the stabilizer bar bushing for wear or damage and replace it if necessary.
2. Check the stabilizer bar link ball joint for damage and replace the stabilizer link if necessary.

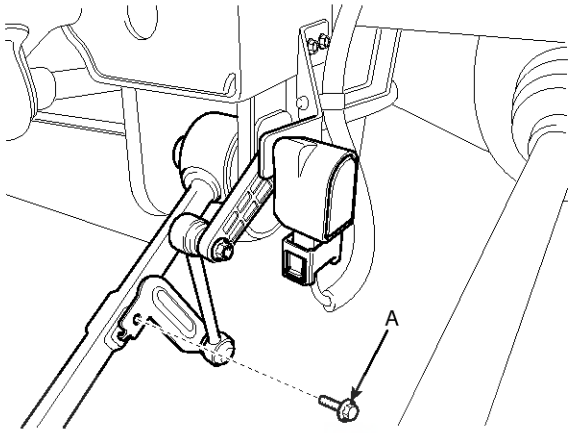
Rear Assist Arm

Replacement

1. Remove the rear wheel & tire.

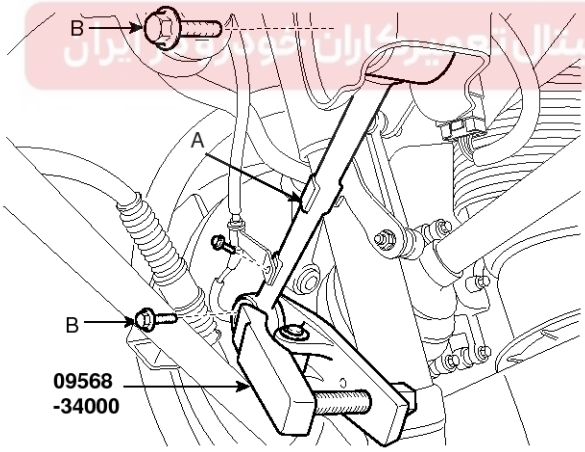
Tightening torque:
90 ~ 110N.m (9.0 ~ 11.0kgf.m, 65 ~ 80lb-ft)

2. Loosen the bolt (A).



SHMSS8125D

3. Disconnect the assist arm (A) with rear carrier by using a SST (09568-34000).
4. Loosen the bolt (B) and then remove the assist arm (A).



SHMSS8307D

5. Installation is the reverse of the removal.

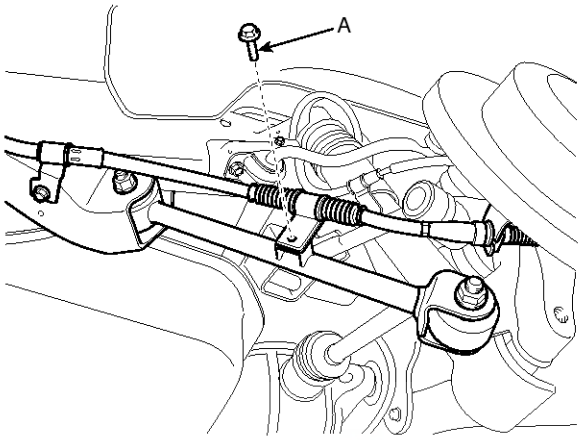
Trailing Arm

Replacement

1. Remove the rear wheel & tire.

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

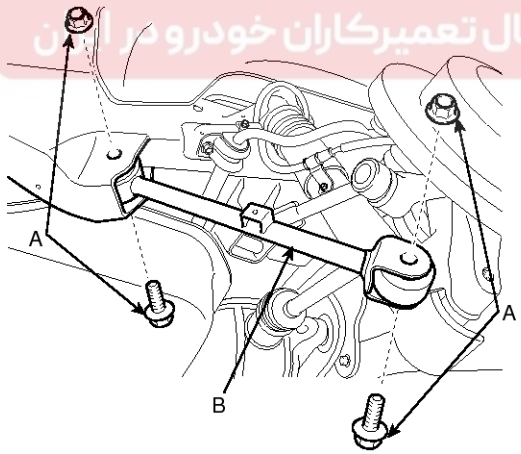
2. Loosen the bolt (A).



SHMSS8120D

3. Loosen the bolt (A) & nuts and then remove the trailing arm (B).

Tightening torque:
140 ~ 160N.m (14.0 ~ 16.0kgf.m, 101 ~ 116lb-ft)



SHMSS8121D

4. Installation is the reverse of the removal.

Tires/Wheels

Tire

Tire Wear

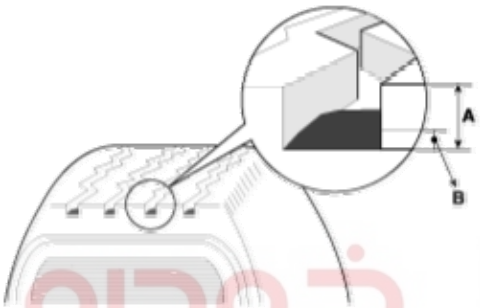
1. Measure the tread depth of the tires.

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.



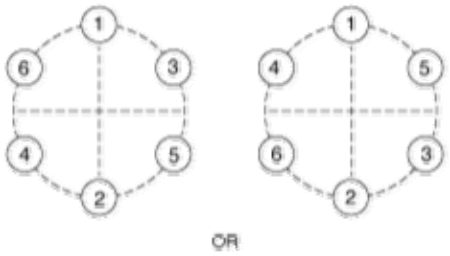
KHRE404A

Wheel

Hub Nut Tightening Sequence

Tighten the hub nuts as follows.

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



SHMSS8303D

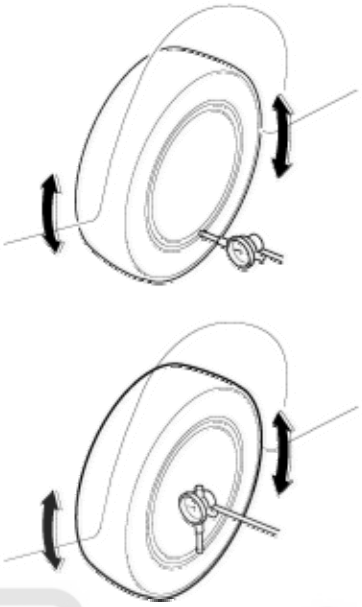
⚠CAUTION
When using an impact gun, final tightening torque should be checked using a torque wrench.

Run Out Inspection

1. Jack up the vehicle.
2. Measure the wheel Run-out by using a dial indicator as illustration below.

Radial mm(in)	Below 0.3(0.012)
Lateral mm(in)	Below 0.3(0.012)

3. If measured value exceeds the standard value, replace the wheel.



KHRE402A

Alignment

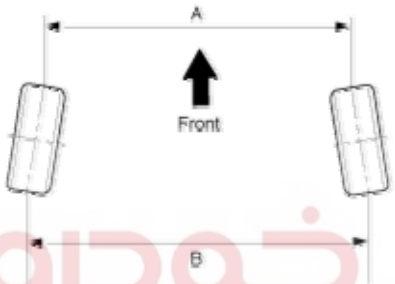
Front Wheel Alignment

⚠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



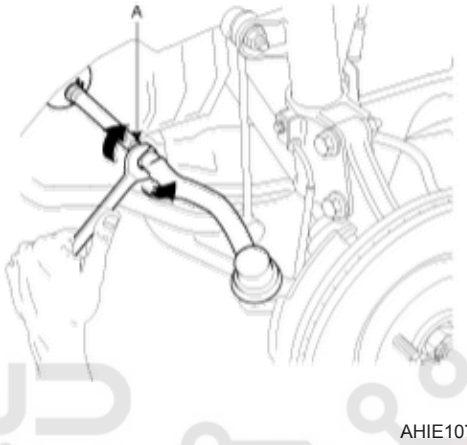
SHDSS6512L

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)



AHIE107B

※ in = individual

4. 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: -0.50°±0.5°

Caster angle : 3.80°±0.5°

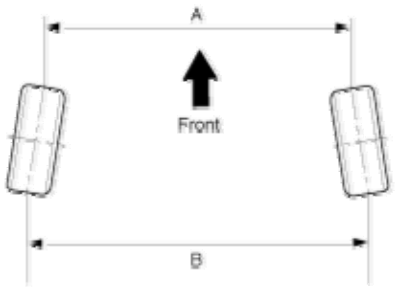
Rear Wheel Alignment

⚠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



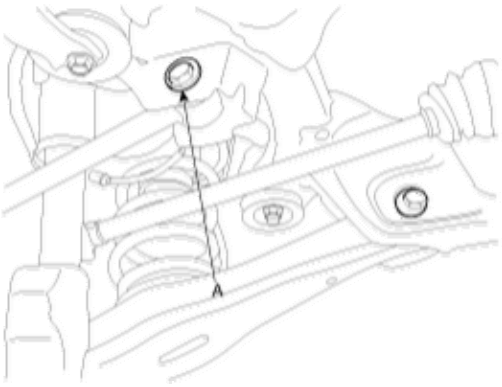
SHDSS6512L

B - A > 0: Toe in
B - A < 0: Toe out

Toe Adjustment

1. Loosen the nut holding the assist arm cam bolt (A).
2. Adjust rear toe by turning the rear assist arm cam bolt (A) clockwise or counter clockwise. Toe adjustment should be made by turning the right and left cam bolt by the same amount.

Toe: 2.1±2mm (0.082±0.079in)



SENSS7007D

※ in = individual

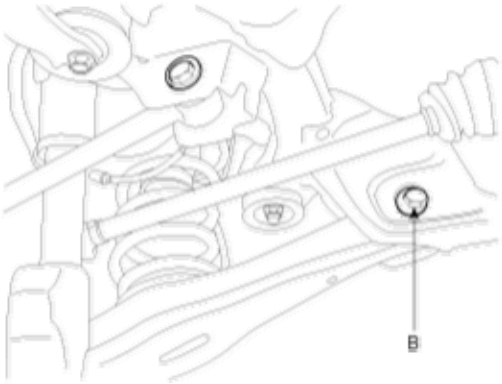
3. When completing the toe adjustment, tighten the nut to specified torque.

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

Camber Adjustment

1. Loosen the nut holding the rear lower arm cam bolt (B).
2. Adjust rear camber by turning the rear lower arm cam bolt (B) clockwise or counter clockwise. Rear camber adjustment should be made by turning the right and left cam bolt by the same amount.

Camber: -1.00°±0.5°



SENSS7513D

3. When completing the rear camber adjustment, tighten the nut to specified torque.

Tightening torque :
140 ~ 160N.m (14.0 ~ 16.0kgf.m, 101 ~ 116lb-ft)

Rear Air Suspension System

Specification

Air spring

Items	Specification
Air spring volume at design position	2.6ℓ
Maximum outher bellow diameter	Φ175mm
Burst pressure	20.0 bar

Compressor

Items	Specification
Operation voltage	12 VDC
Max. perm. Current	35A max
Lower operation temperature	-40℃
Upper operation temperature	80℃

Solenoid valve

Items	Specification
Operation voltage	12 V PWM
Maximum pressure	9bar

Height Sensor

Items	Specification
Required supply voltage	5 V (DC)
Storage Temperature	- 40℃~ 80℃

Reservoir Tank

Items	Specification
Operating pressure	16.5 bar
Burst pressure	40 bar
Air tank volume	2.5ℓ

ECU

Items	Specification
Rated Voltage	12 V DC
Operating Voltage	10 ~ 16 V DC
Operation Temperature	-40℃~ 80℃
Storage Temperature	-40℃~ 85℃

Tightening Torques

Item	Tightening torque (kgf.m)		
	N.m	Kgf.m	lb-ft
Reservoir tank to frame	4 ~ 6	0.4 ~ 0.6	2.8 ~ 4.3
Height sensor to frame	4 ~ 6	0.4 ~ 0.6	2.8 ~ 4.3
Solenoid valve to frame	17 ~ 26	1.7 ~ 2.6	12.2 ~ 18.8
Compressor to frame	17 ~ 26	1.7 ~ 2.6	12.2 ~ 18.8

Description

As shown in the picture, the overall layout is simple because the rear side only has an air spring (2 corner system). The system consists of two air springs and height sensors, control module, pneumatic components such as reservoir tank, compressor (temperature sensor is embedded), solenoid valve block assembly (pressure sensor is embedded) and ESC switch. Also the air tube is connected to all relevant components to implement the pneumatic control system.

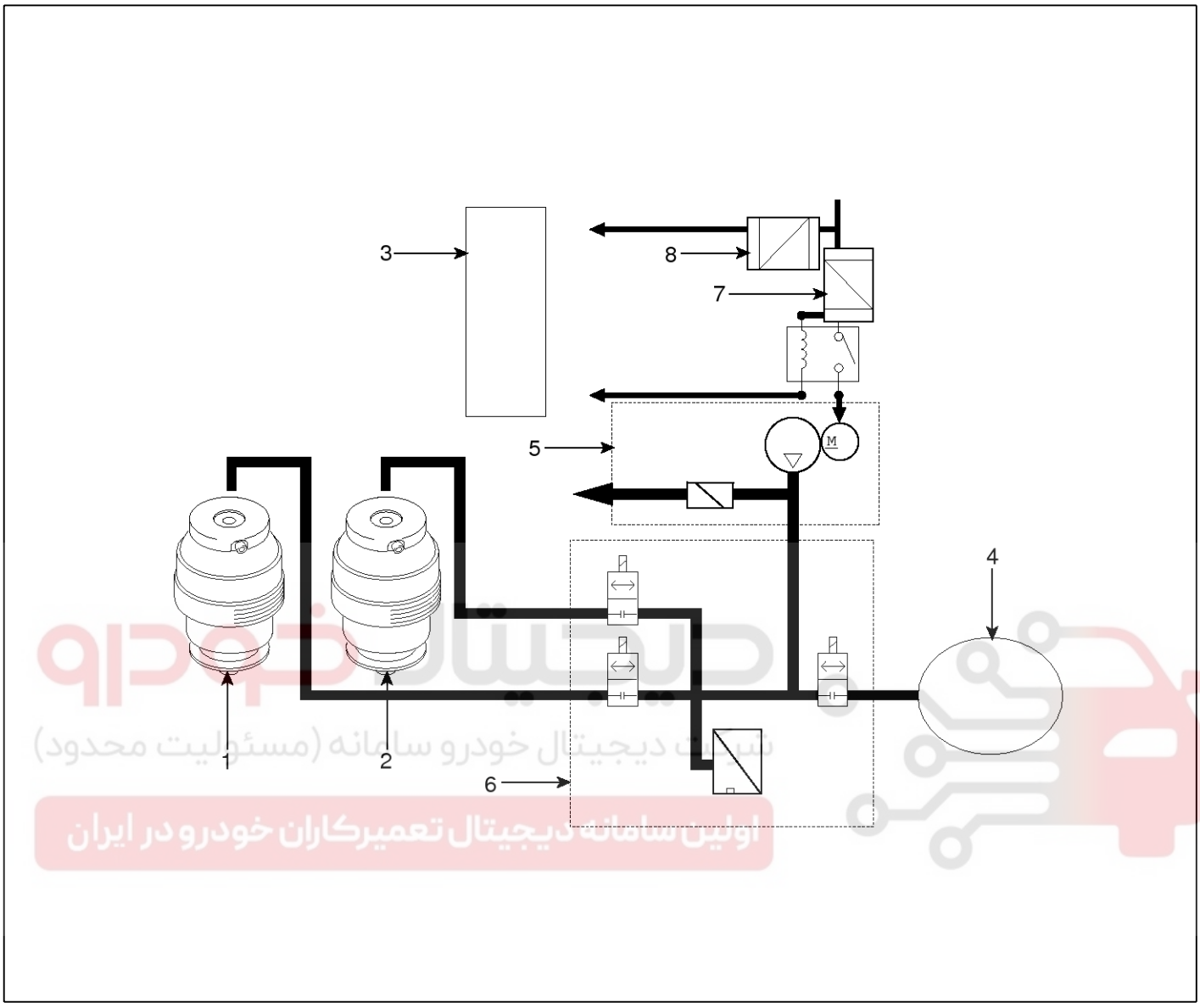
When the vehicle level is lifted, the system intakes the ambient air so that it is called ‘Open Loop’ type.

Operation

As it is explained in the section of system layout, the close loop has some merit comparing the existing open loop type applied in Centennial.

In case of open loop type, system intakes the air from atmosphere and compresses it whenever necessary, therefore the system response time (leveling control time) is long. Even Lexus takes several minutes for controlling the vehicle level.

System Air Filling



SHMSS8150D

1. Air spring
2. Airspring
3. ECU
4. Reservoir tank
5. Compressor assembly
6. Solenoid valve
7. 40A Fuse
8. 15A Fuse

This job should be done whenever the system components were replaced with new one (except the electrical sensor or control module). Using air filling machine, supply the air to the air filling valve offered in the LH side of engine room. Air will flow to reservoir tank, compressor and will arrive in the air springs.

- Due to the length of air tube and location, at first the front air spring is fulfilled and the rear air spring will be completed later on.
- The vehicle has to be lifted up. (The air spring (rubber) may be bent if the air spring was empty when the system filling starts)
- - IG ON and the particular mode in the scanner are required but engine starting is not necessary

  (Refer to the section of 'System air filling procedure' for more detail information)
- While the system air filling, the compressor (built in vehicle) does not operate.
- There are two kinds of air filling;

  System air filling: the external air pressure is supplied at the factory or workshop (1 time) the vehicle compressor does not operate. It is not possible to do this filling by vehicle compressor. The overload of compressor must be avoided and furthermore, the vehicle compressor will not operate if the air pressure (volume) is too low. (Less than 80 ~ 120 bar-liter)

  Garage air filling (Supplementary filling): whenever the supplemental air is required in the system, the air is filled by the vehicle compressor.

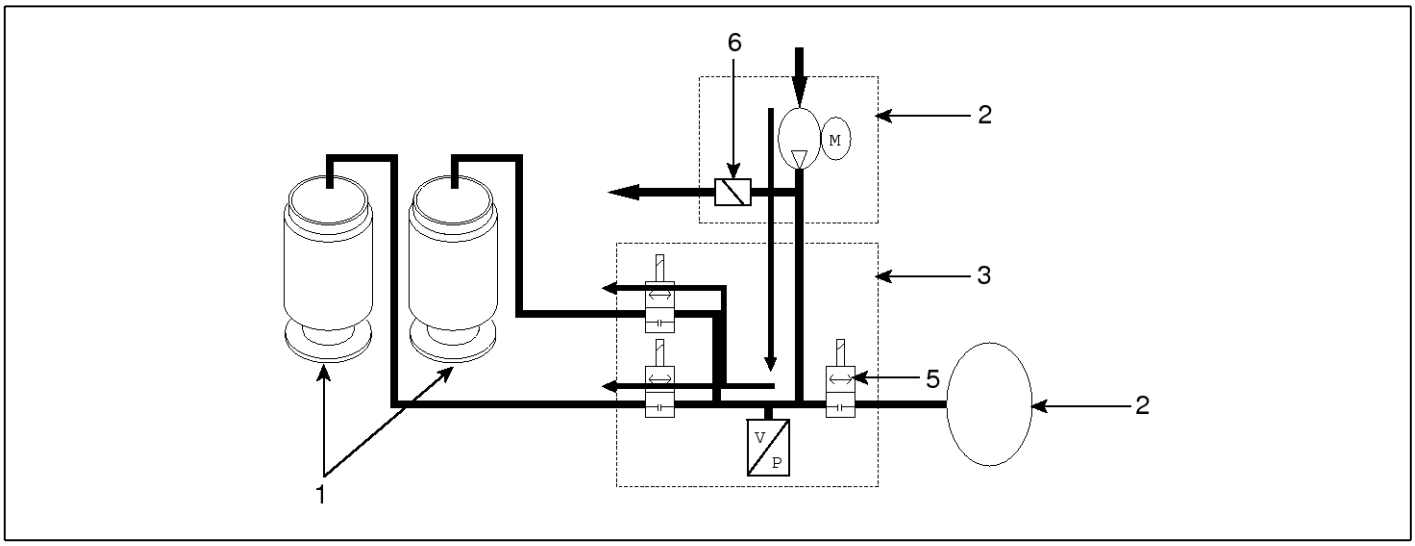
Depending on the capacity and the pressure of the air filling machine, the whole time to complete differs but mostly it takes around 50 sec.

The target air pressure level at each component is;

- Front air spring: around 7.5bar, Rear air spring: around 8.5bar, Reservoir: around 9~10bar.

However, it may change with a little amount in the case of air spring depending on the weight of vehicle (passenger & baggage)

Lifting Level

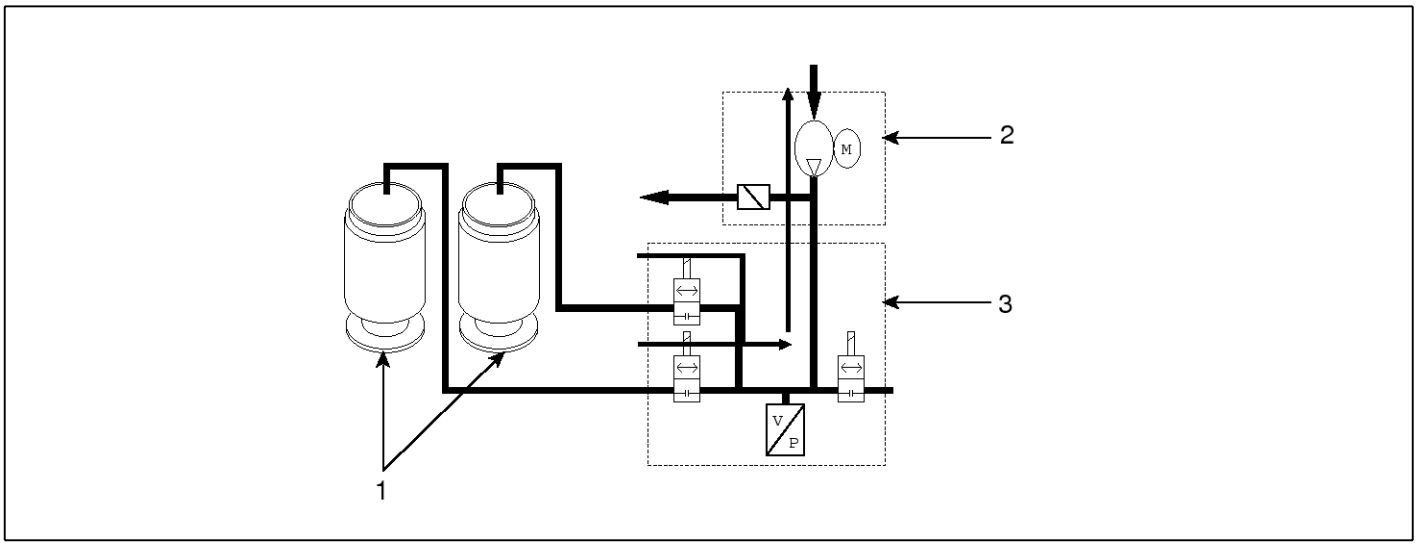


SHMSS8151D

1. Air spring
2. Compressor assembly
3. Solenoid valve
4. Reservoir tank
5. Pressure sensor
6. Exhaust valve

By operating the compressor, the compressed air inside reservoir tank will be moved into the air spring via solenoid valve block in order to lift up the vehicle height. During lifting mode, the air does not pass the dryer as shown in the picture. The front rear springs are lifted at first and then front springs are followed when lift the vehicle. The reason is to reduce the air resistance while driving and avoid giving an excessive headlamp beam to the driver in opposite direction lane on the road for the safety.

Lowering Level



SHMSS8152D

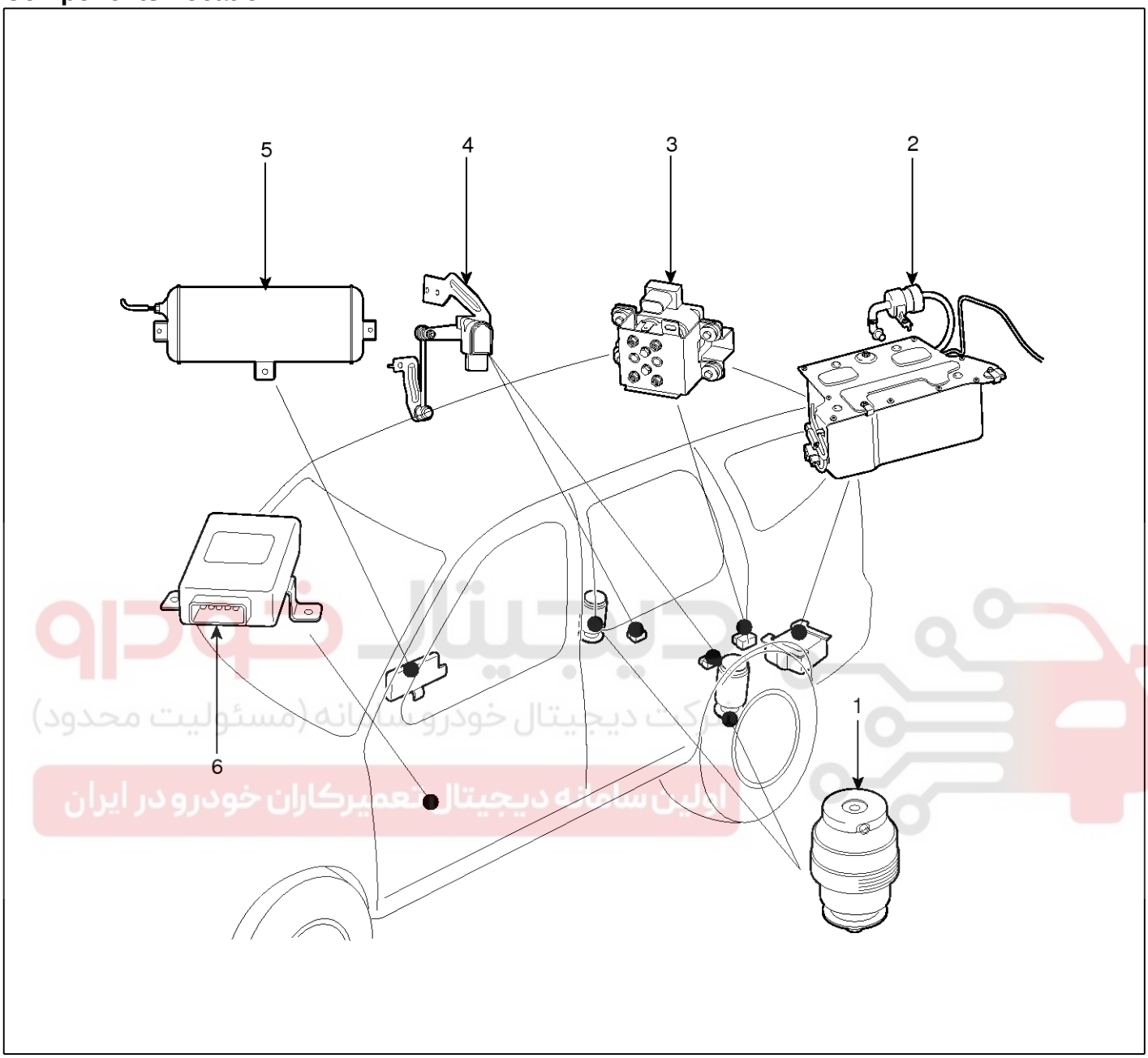
1. Air spring
2. Compressor assembly
3. Solenoid valve

Whenever lowering the vehicle, the dryness is accomplished by flow the air through dryer as shown in the picture. The reverse valve and air spring valves are open so that the compressed air comes out from the air spring. At the same time, the compressor is operated so that the air passes through the dryer in order to store dried air into the reservoir tank. Be sure that even during the process of lowering, the compressor will operate in normal condition (as long as the compressor and compressor relay is normal).

Of course, if the compressor or compressor relay is failed, the lowering (down-leveling) is available by operating the ambient valve (No. 7 in the picture) only like a process of ‘air discharge’ but this is done only in case of emergency condition.

For example, the vehicle is running with high level and the compressor (or relay) failure is detected, if the vehicle speed is higher than 70kph for 10sec or more, the vehicle height should be lowered to normal level by ambient valve for the safety and lower fuel consumption.

Components Location



SHMSS8135D

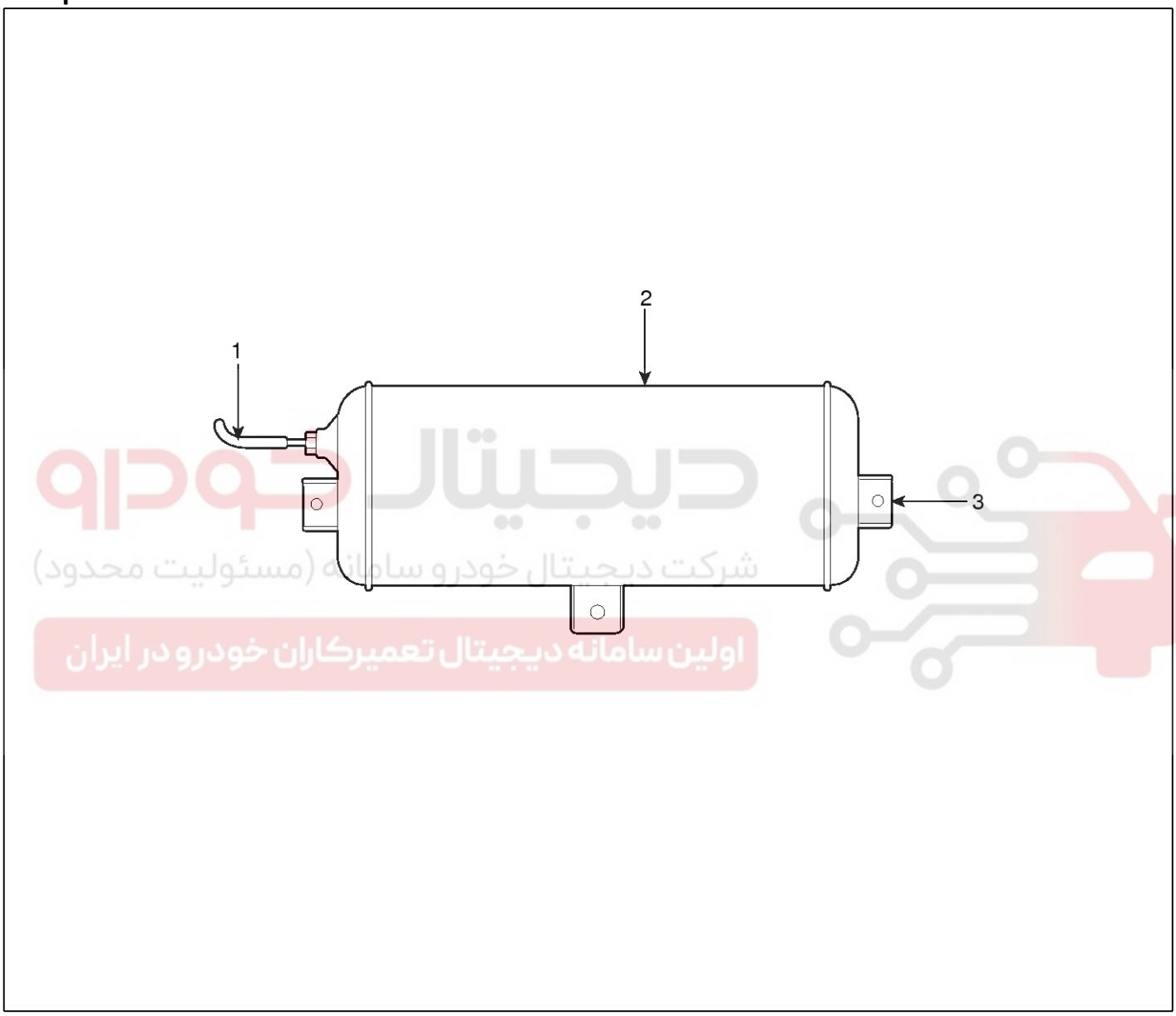
1. Air spring
2. Compressor
3. Solenoid valve
4. Height sensor
5. Reservoir tank
6. ECU

Reservoir Tank

Description

The volume is 2.5 liter and the maximum operation pressure is 16.5bar. (Bursting pressure: 40bar)

Components

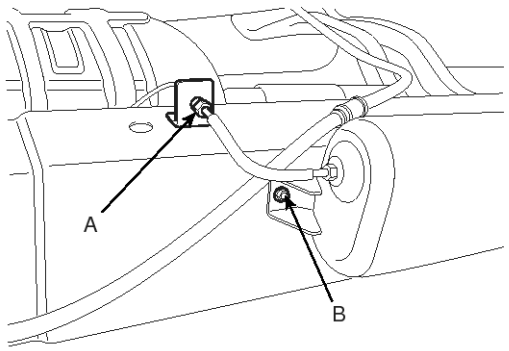


SHMSS8146D

1. Air tube
2. Reservoir tank
3. Bracket

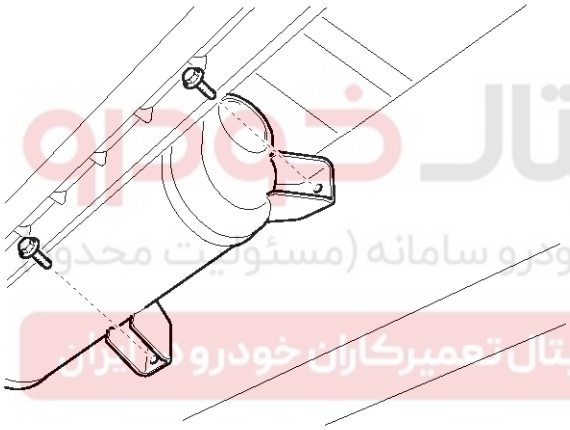
Replacement

1. Remove the connector (A) & bolt (B).



SHMSS8156D

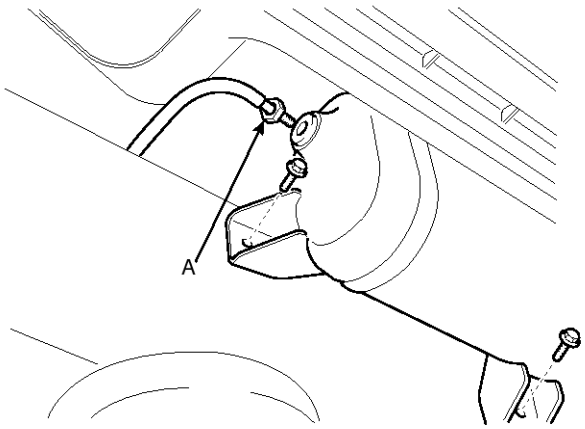
2. Loosen the bolts.



SHMSS9309L

3. Installation is the reverse of removal.

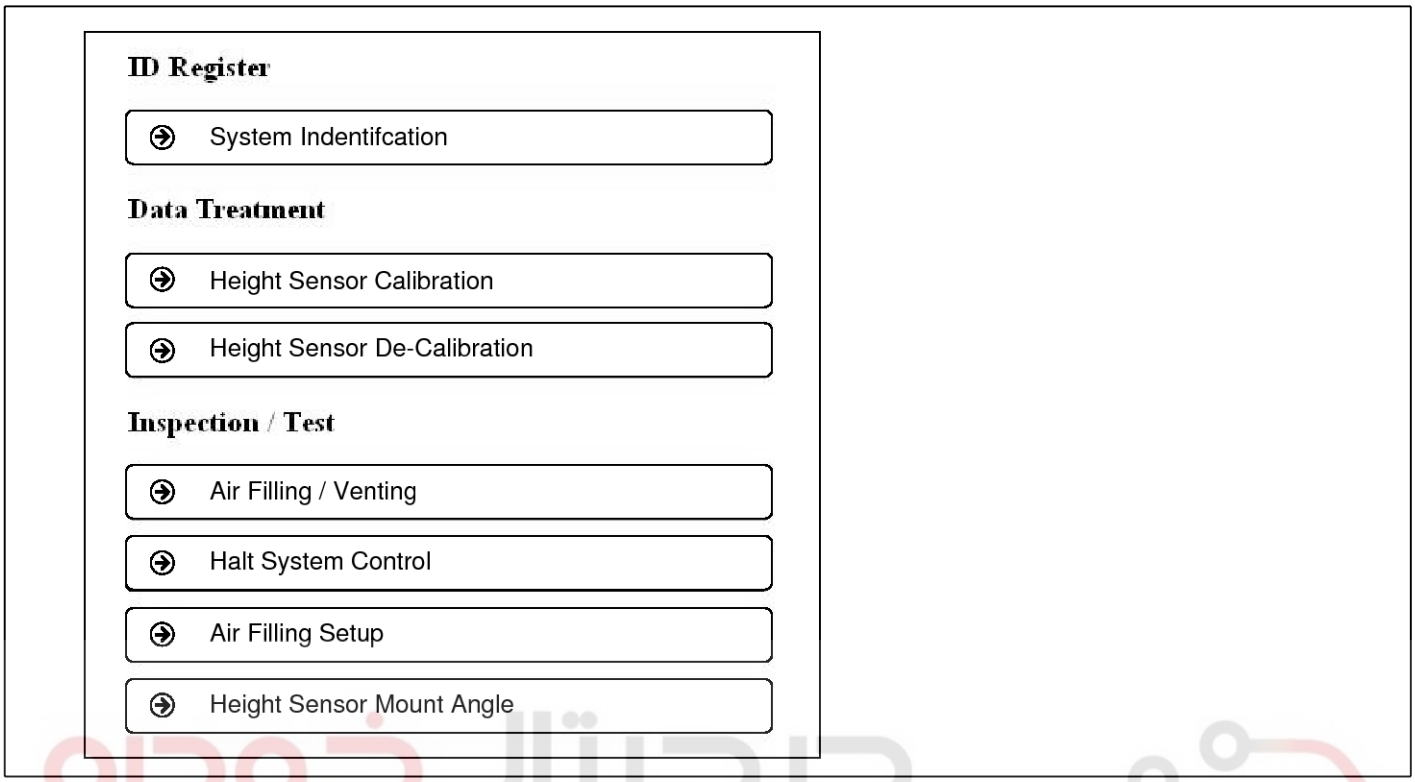
⚠CAUTION
Do not use the connector (A) again.



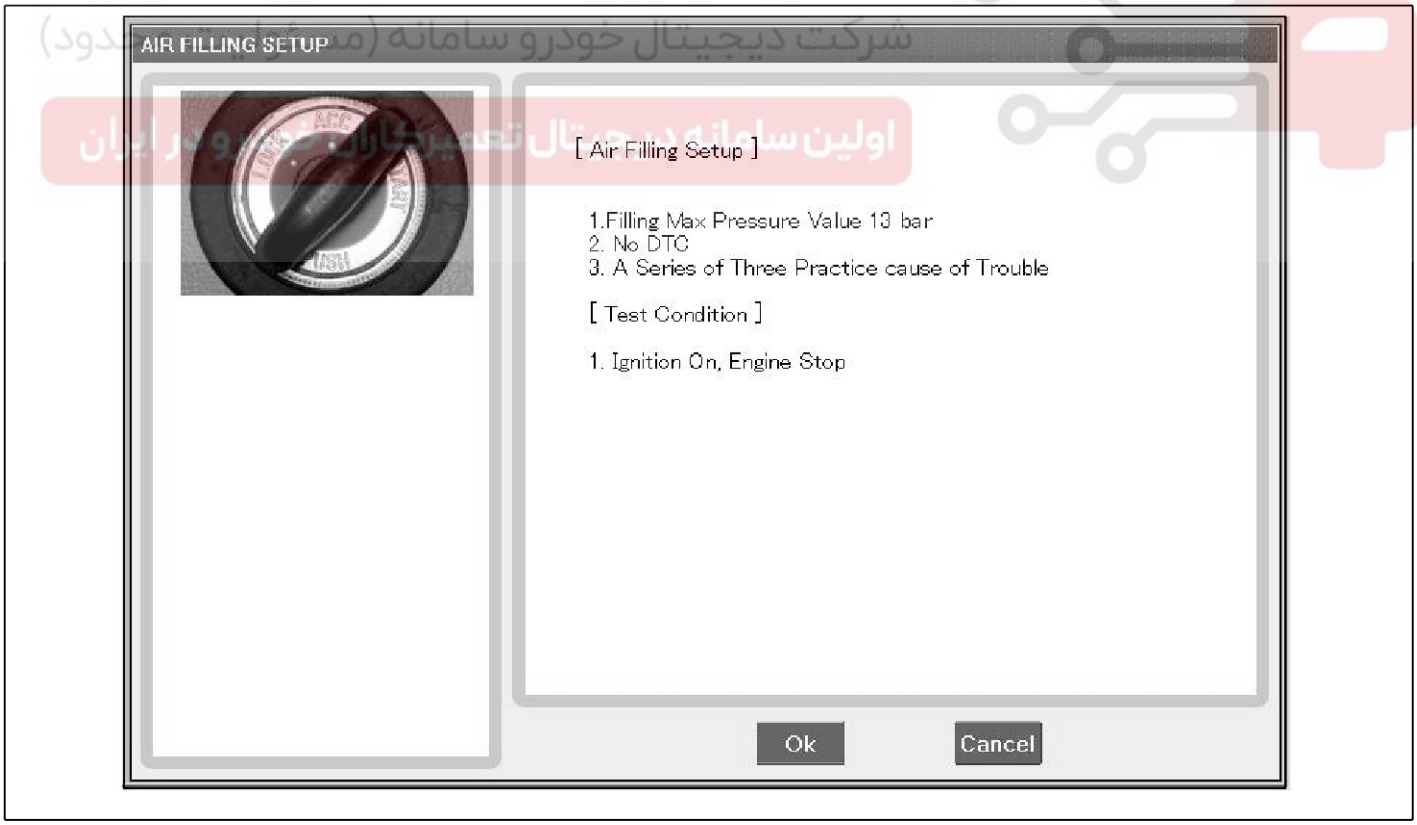
SHMSS8319D

- Confirm that whether the tube is escaped a not by puling it.
- When connecting, make sure each tube goes into the hole upto specified area.

Air Filling Setup



SHMSS9311L



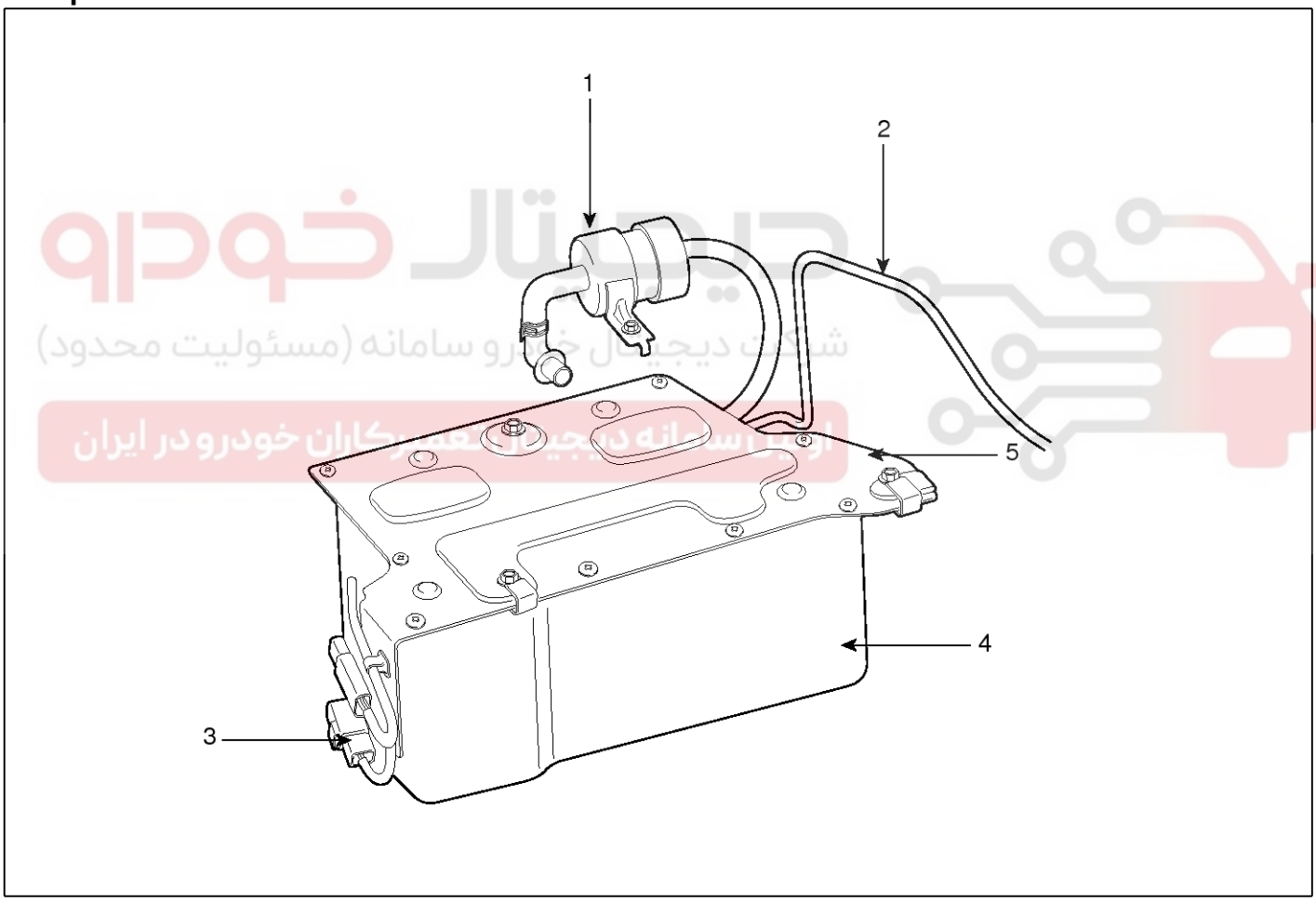
SHMSS9312L

Compressor

Description

It compresses the air and supply to the air spring in order to control the vehicle level. Also it replenishes the air in the reservoir tank if necessary. It is powered by ECS relay which is located in the engine room fuse box. (rear of vehicle battery) A case is adopted covers the compressor in order to reduce the operating noise so that it cannot be separated when replace the compressor. An air filter is located on the compressor assembly as shown in the picture, it filters the dust and water whenever intakes the ambient air. It is recommended to replace every 2 years.

Components

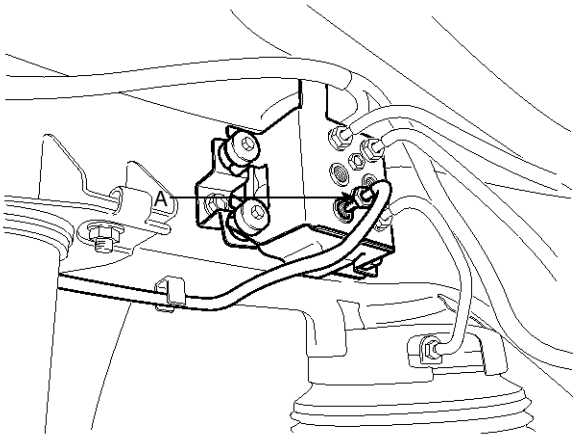


SHMSS9302L

1. Air filter
2. Air tube
3. Connector
4. Upper Bracket
5. Case

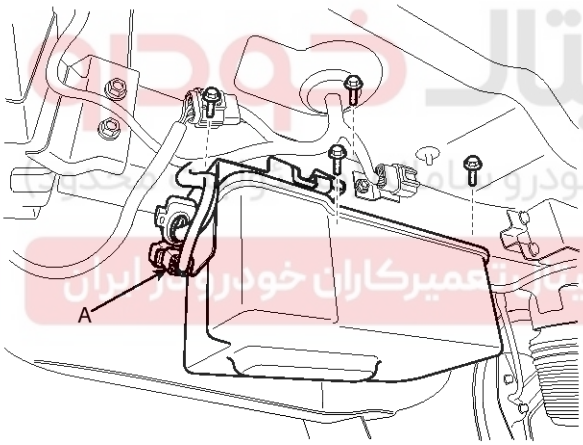
Replacement

1. Remove the spare tire.
2. Remove the connector (A) & air tube.



SHMSS8138D

3. Disconnect the connector (A) and then loosen the bolts.

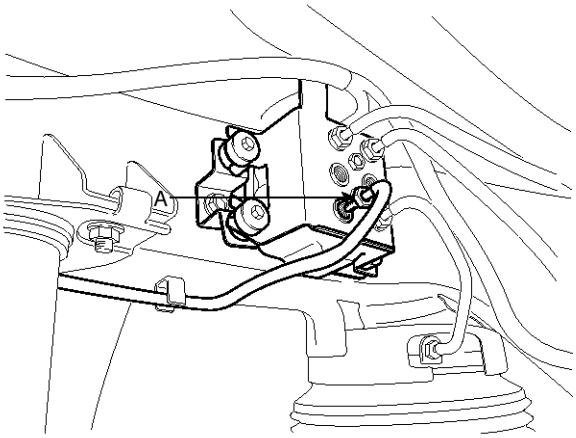


SHMSS9303L

4. Installation is the reverse of removal.

⚠CAUTION

- **Do not damage the connector (A).**



SHMSS8138D

- **Do not use the connector (A) again.**
- **Confirm that whether the tube is escaped a not by puling it.**
- **Avoid suffering excessive impact.**
- **Do not pile up the parts.**
- **When connecting, make sure each tube goes into the hole upto specified area.**

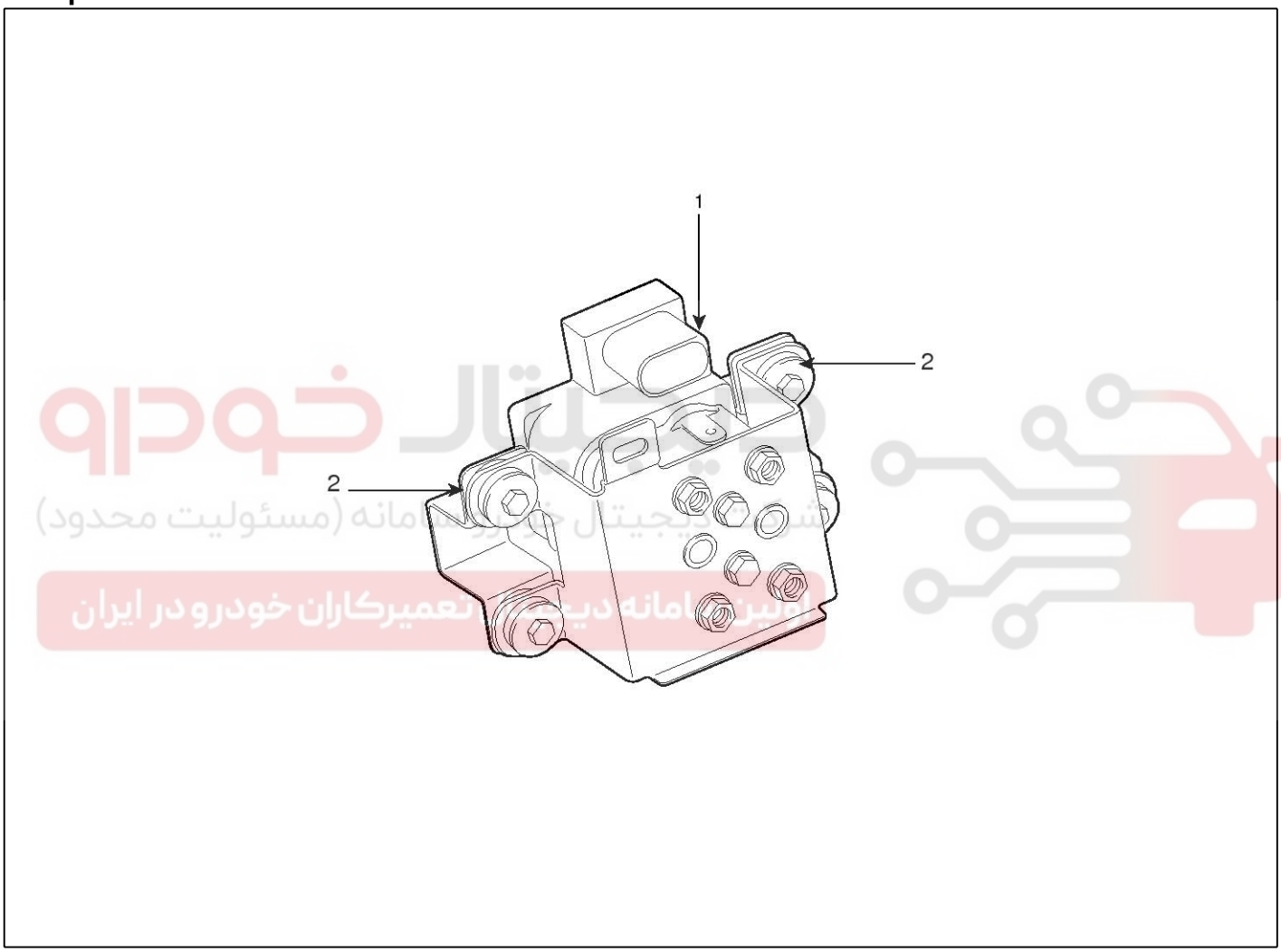
Solenoid Valve

Description

In order to control the solenoid valves, a valve relay exists inside the control module.

Each solenoid cannot be replaced alone, instead the assembly must be replaced. If any solenoid has a failure, the system will be shut down.

Components

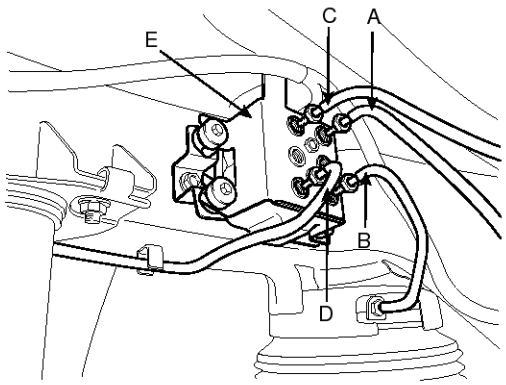


SHMSS9304L

1. Connector
2. Bracket

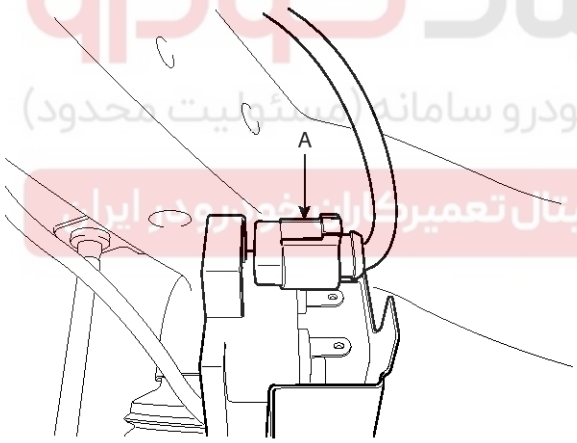
Replacement

1. Remove the reservoir tank tube (A), left air spring tube (B), right air spring tube (C), compressor tube (D).
2. Loosen the bolt and then remove the solenoid valve (E).



SHMSS8141D

3. Disconnect the connector (A).



SHMSS8142D

4. Installation is the reverse of removal.

⚠CAUTION

- **Do not damage the connector.**
- **Confirm the tube color in installation process.**

Reservoir tank tube	Blue (A)
Left air spring tube	Yellow (B)
Right air spring tube	Red (C)
Compressor tube	Green (D)

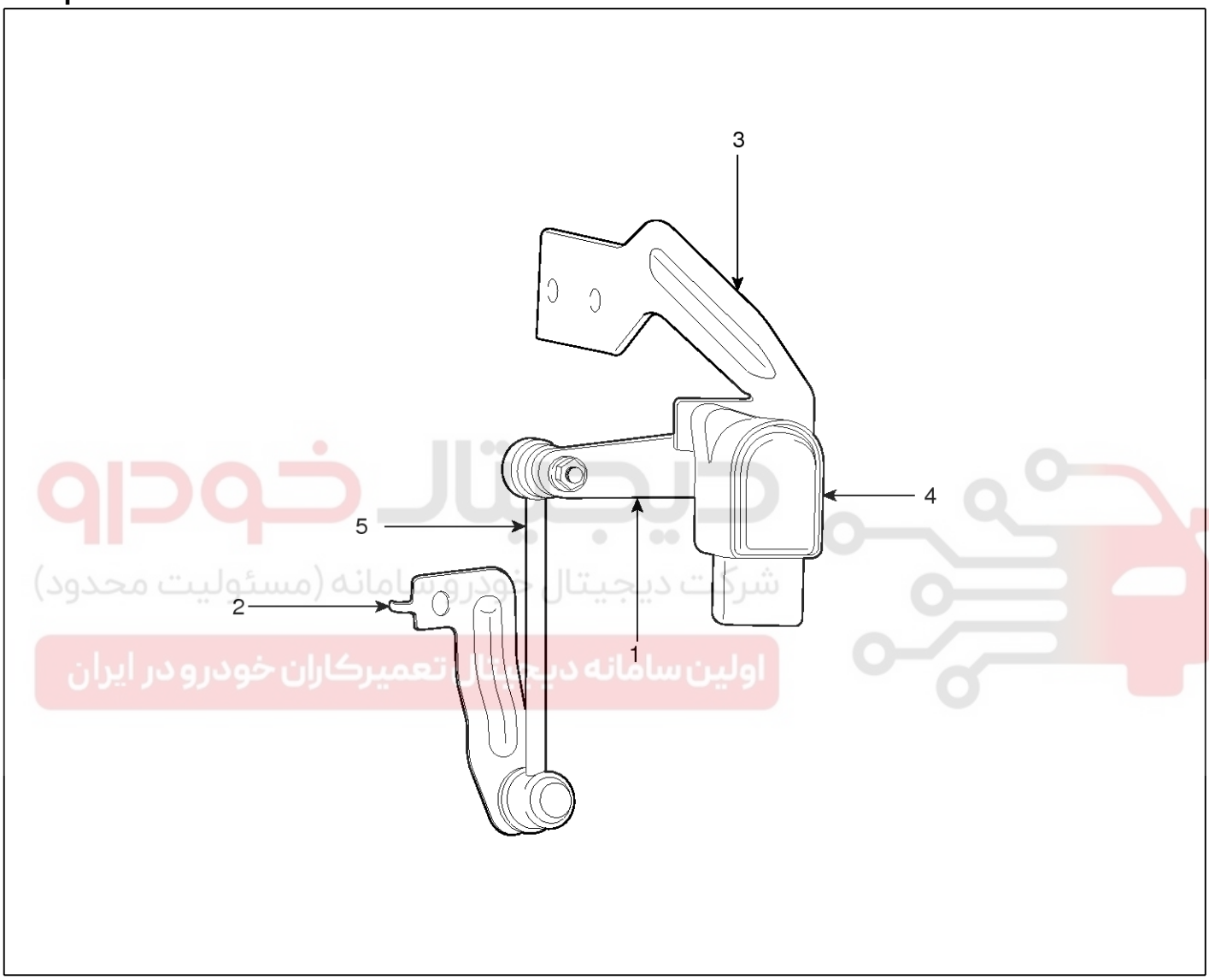
- **Confirm that whether the tube is escaped a not by puling it.**
- **Air tube marking takes care not to be came off.**
- **Take care not to drop.**
- **Avoid suffering excessive impact.**
- **Take care not to twisted.**
- **When connecting, make sure each tube goes into the hole up to specified area.**

Height Sensor

Description

In order to implement 2 corner air suspension system, two height sensors are applied on the rear suspension.

Components

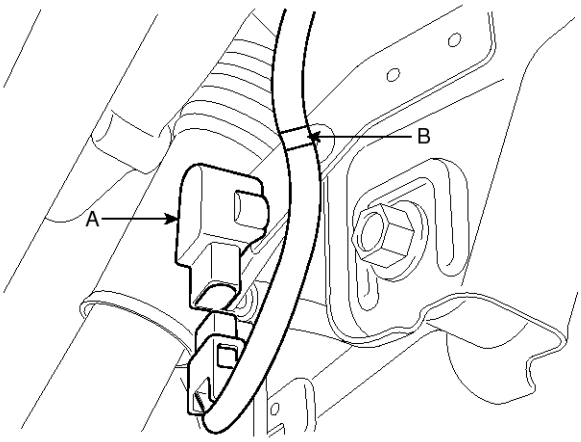


SHMSS9305L

1. Lever
2. Bracket
3. Bracket
4. Height Sensor
5. Rod

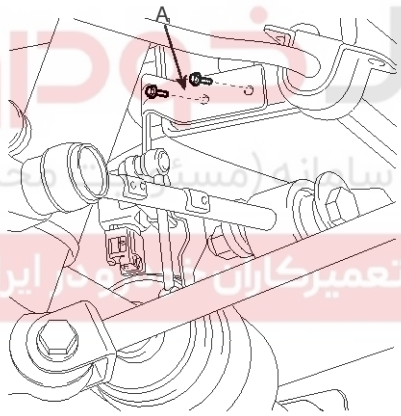
Replacement

1. Remove the front wheel & tire.
2. Remove the connector (A) & clip (B).



SHMSS8144D

3. Loosen the bolt and then remove the height sensor (A).



SHMSS8157D

4. Installation is the reverse of removal.

⚠CAUTION

- **Avoid suffering excessive impact.**
- **Do not entering the water into pin inside.**

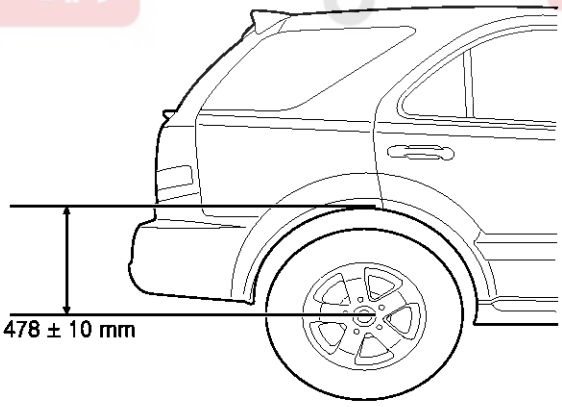
Calibration

Due to the deviation during sensor mounting as well as the sensor itself, it is required to calibrate the sensor when,

- sensor was replaced
- air spring was replaced
- ECS control module was replaced
- lower arm was replaced
- assist arm was replaced

When calibrate the sensor, must comply with the following procedure.

1. Set the vehicle height to the normal level (using ECS switch if necessary) Be sure that the normal level is based on the design height.
2. Connect the scanner and turn off the ignition.
3. Move to the menu of 'Filling reservoir tank using compressor' in the Actuator Test of the scanner as shown in the captured picture in below.
4. Move to the menu of 'Height sensor calibration' in the scanner, click OK button and the current vehicle height value may appear in the scanner.
5. Measure the actual vehicle height using the measuring tape as shown in the picture.
6. If the measure value is out of specification (referred to as 'design height: 478±10mm), repeat the procedure from No.3 to No.5.

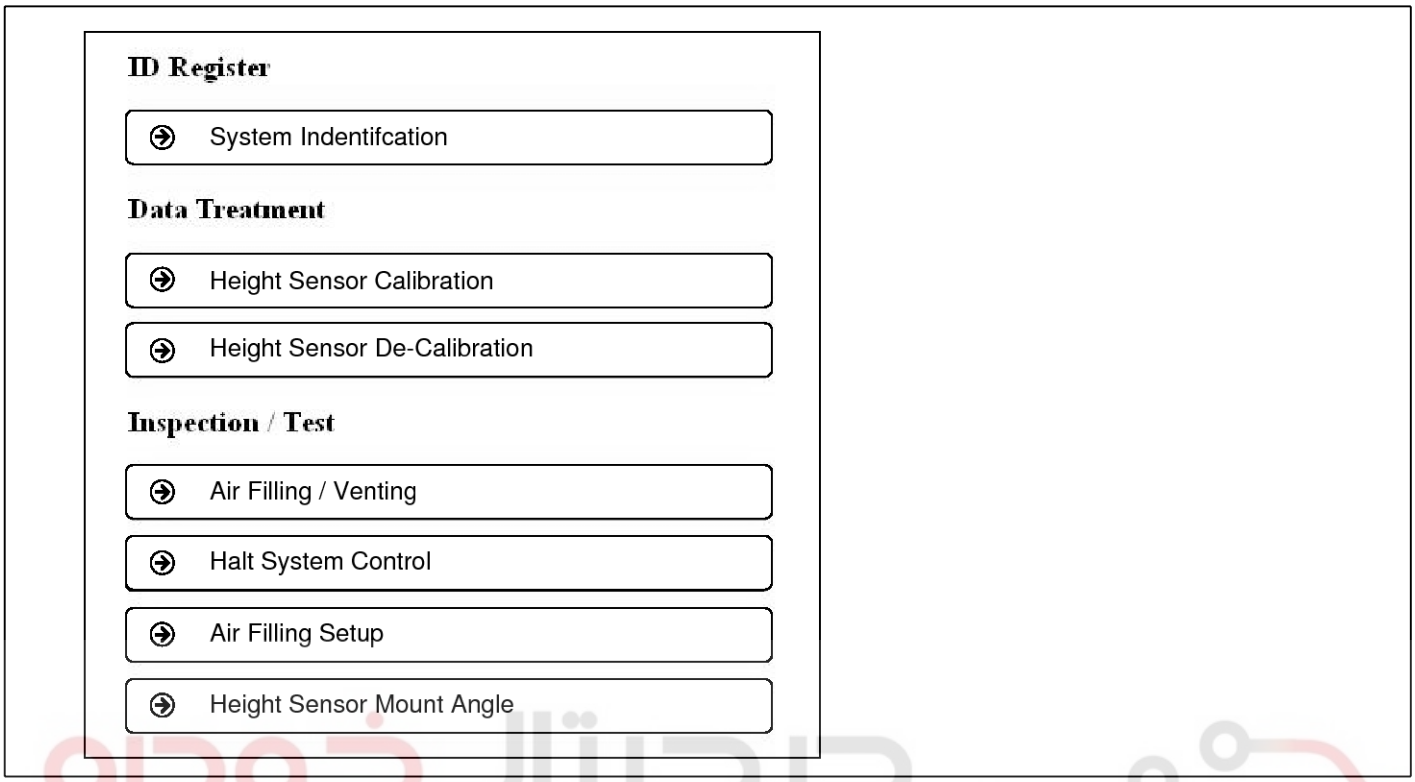


SHMSS8155D

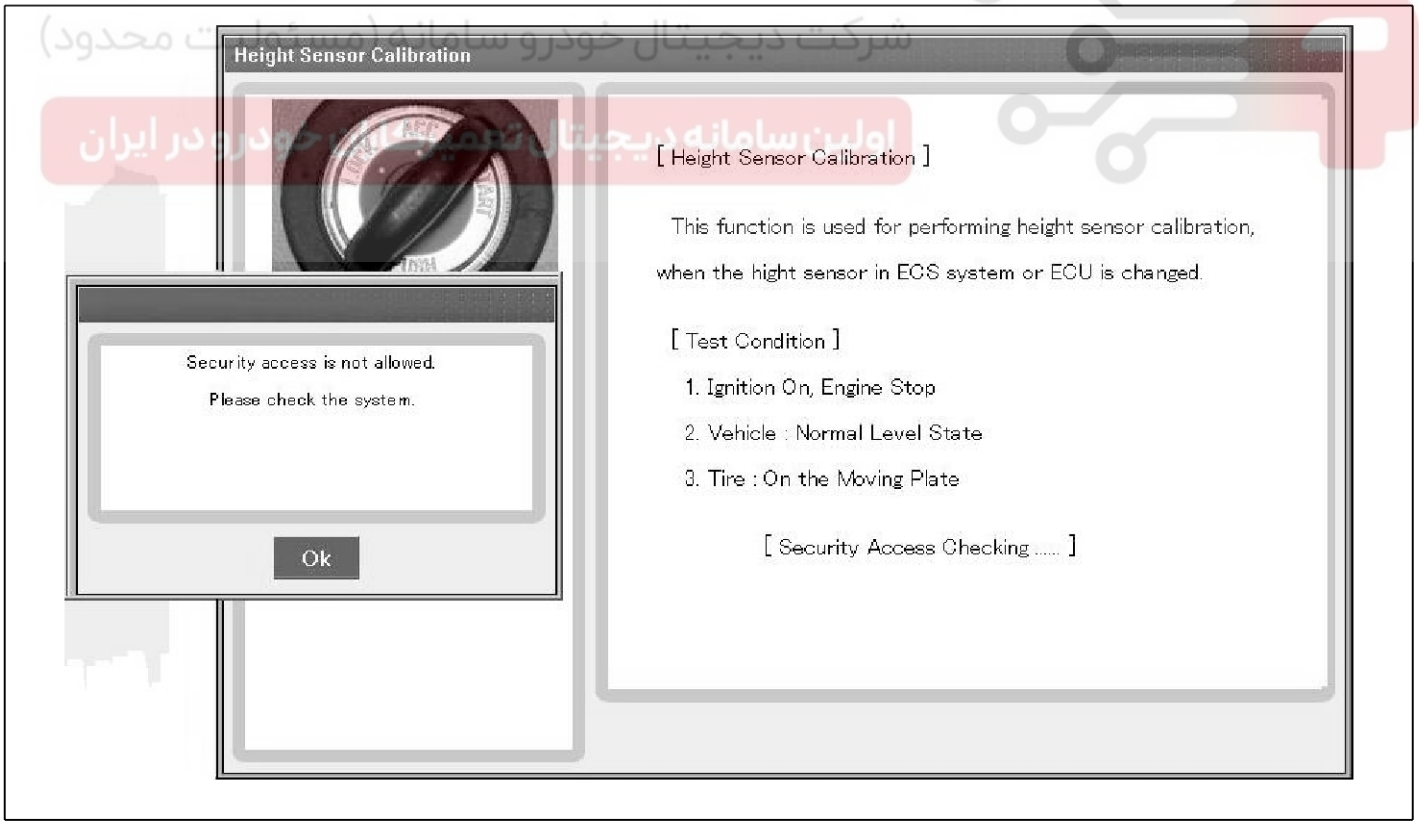
7. Input the measured value to the scanner (for left and right respectively)

   (The system may recognize the input value as a current vehicle height)
8. If the deviation exists between left and right, the system may perform the self leveling in order to reach to the design height.

Height Sensor Calibration



SHMSS9311L



SHMSS9313L

Height Sensor De-Calibration

ID Register

- System Indentifcation

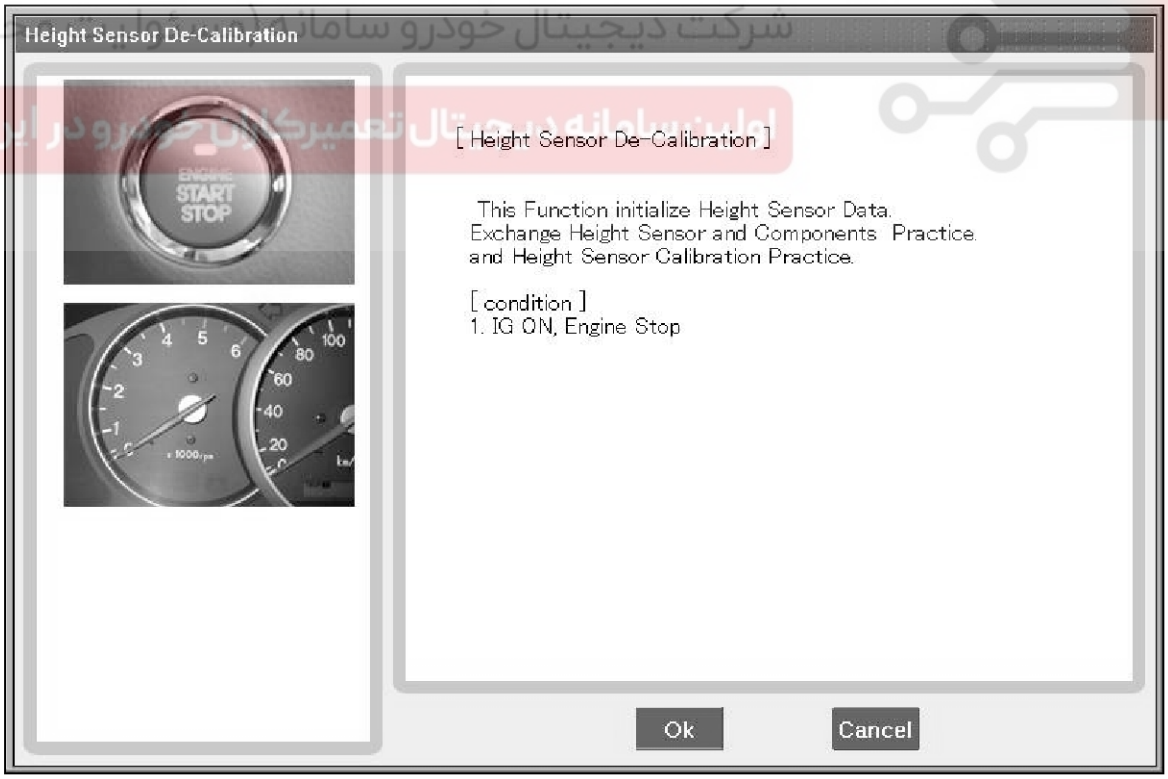
Data Treatment

- Height Sensor Calibration
- Height Sensor De-Calibration

Inspection / Test

- Air Filling / Venting
- Halt System Control
- Air Filling Setup
- Height Sensor Mount Angle

SHMSS9311L



SHMSS9314L

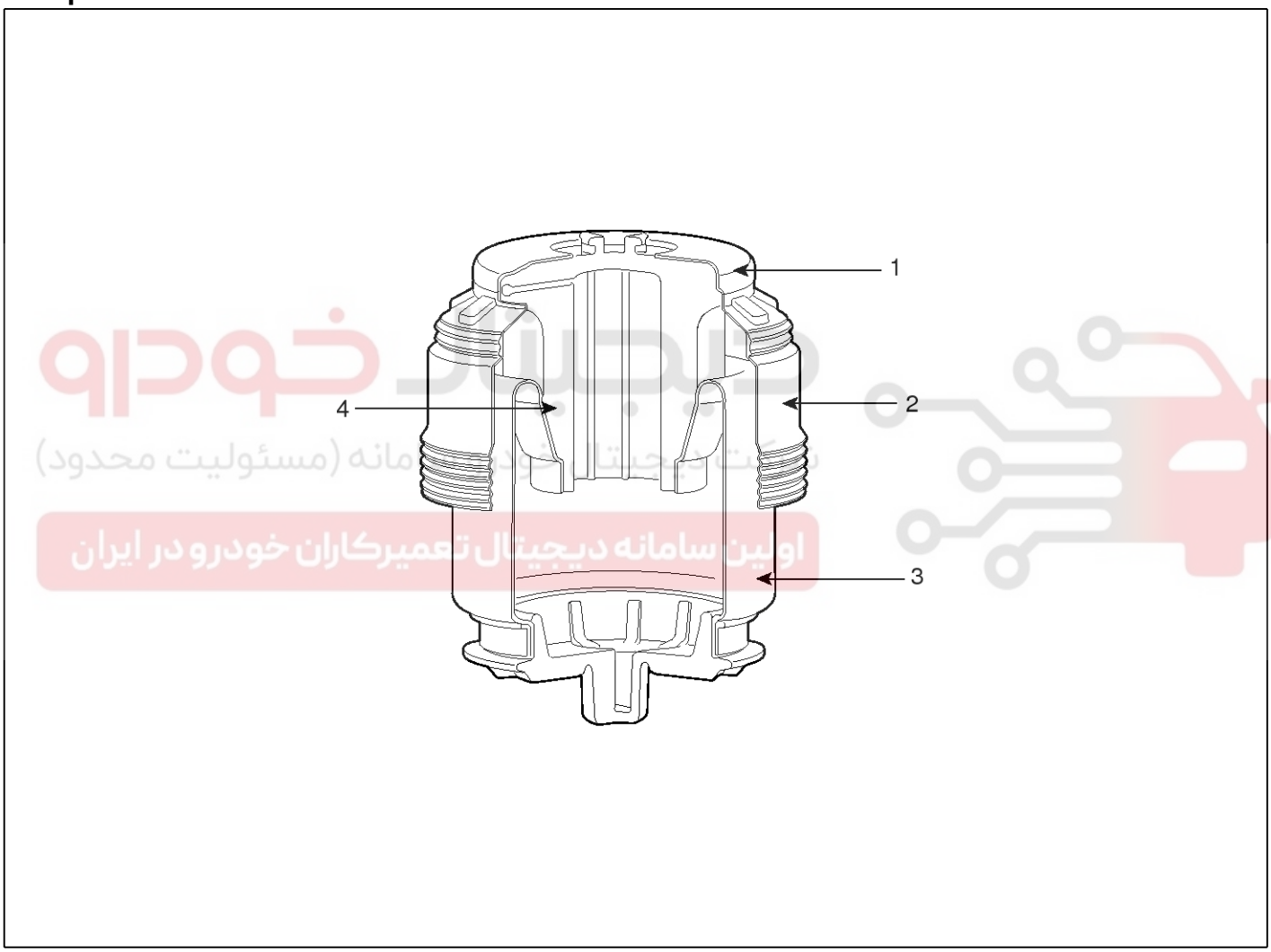
SHMSS9315L

Air Spring

Description

It supports the vehicle body and control the vehicle level receiving the compressed air from the compressor and reservoir tank. The air spring for left and right cannot be interchanged. In case that the vehicle level is fully lowered due to the air leak, the driving should be avoided. The designated flat bed truck is recommended to use to move the vehicle to the service shop.

Components



SHMSS9306L

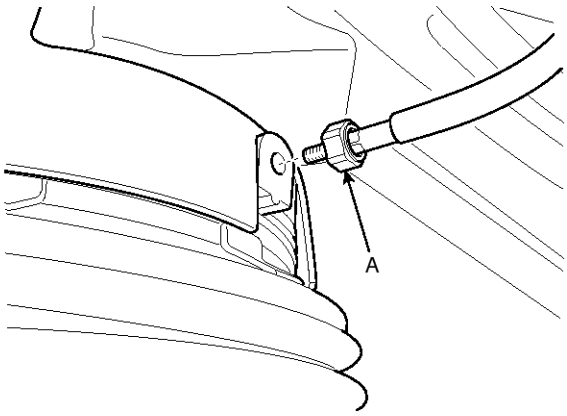
1. Air pad
2. Air sleeve
3. Dust cover
4. Canister

Replacement

1. Remove the rear wheel & tire.

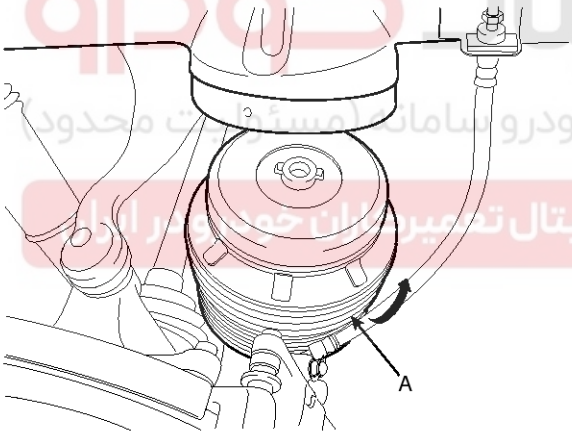
Tightening torque :
90 ~ 110N.m (9.0 ~ 11.0kgf.m, 65 ~ 80lb-ft)

2. Remove the connector (A) & air tube.



SHMSS8129D

3. Twists and then remove the air spring (A).

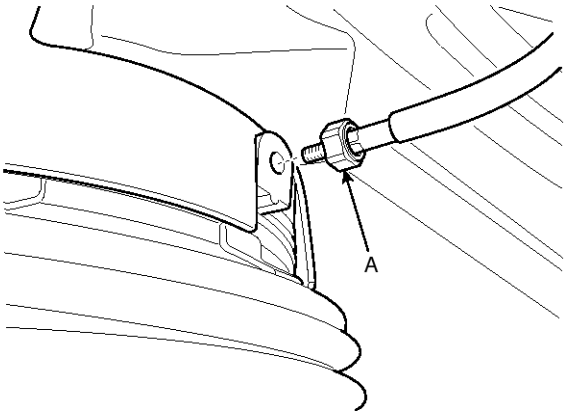


SHMSS8130D

4. Installation is the reverse of removal.

⚠CAUTION

- **Do not damage the connector (A).**



SHMSS8129D

- **Do not use the connector again.**
- **Take care not to twist upper and lower.**
- **Confirm that whether the tube is escaped a not by puling it.**
- **When connecting, make sure each tube goes into the hole up to specified area.**

Air Filling / Venting

ID Register

- System Indentifcation

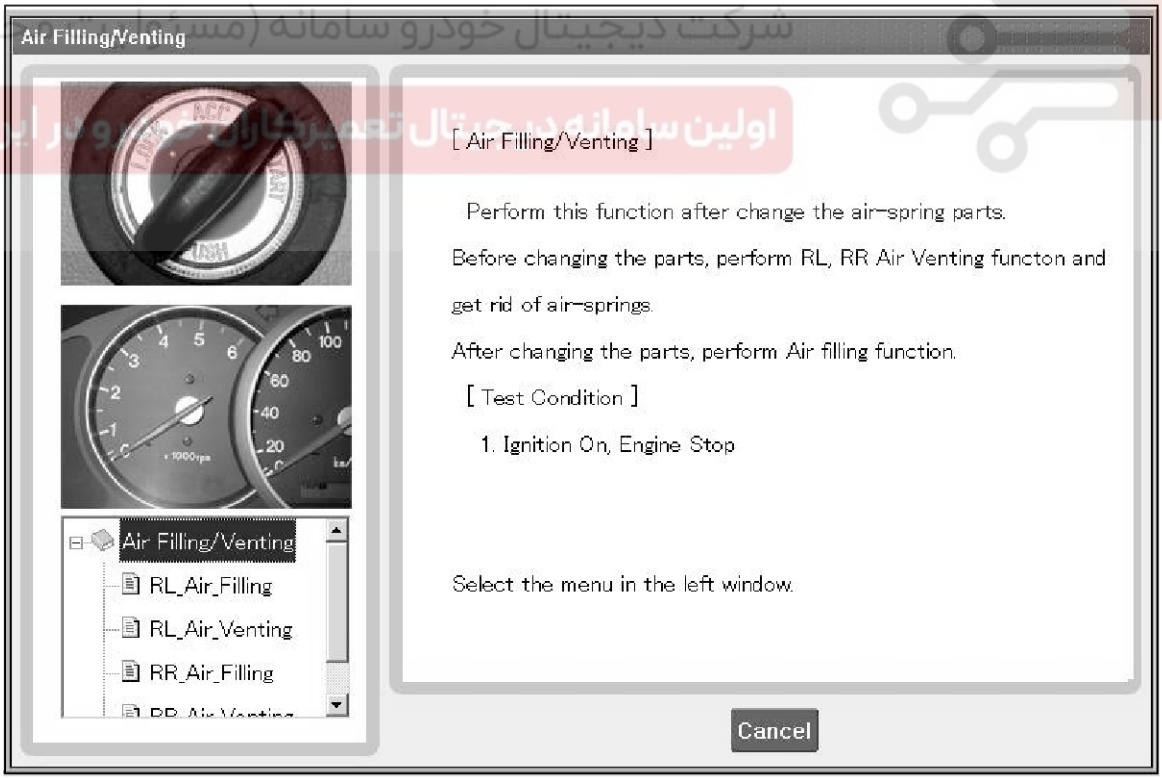
Data Treatment

- Height Sensor Calibration
- Height Sensor De-Calibration

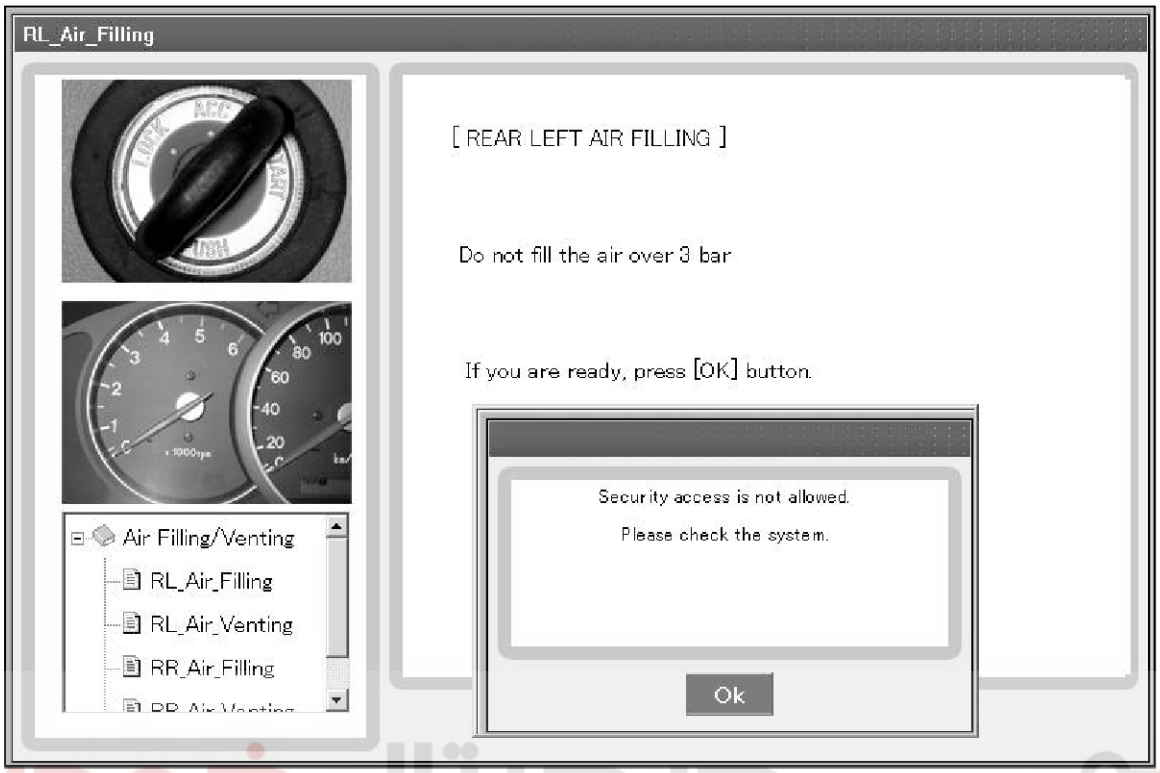
Inspection / Test

- Air Filling / Venting
- Halt System Control
- Air Filling Setup
- Height Sensor Mount Angle

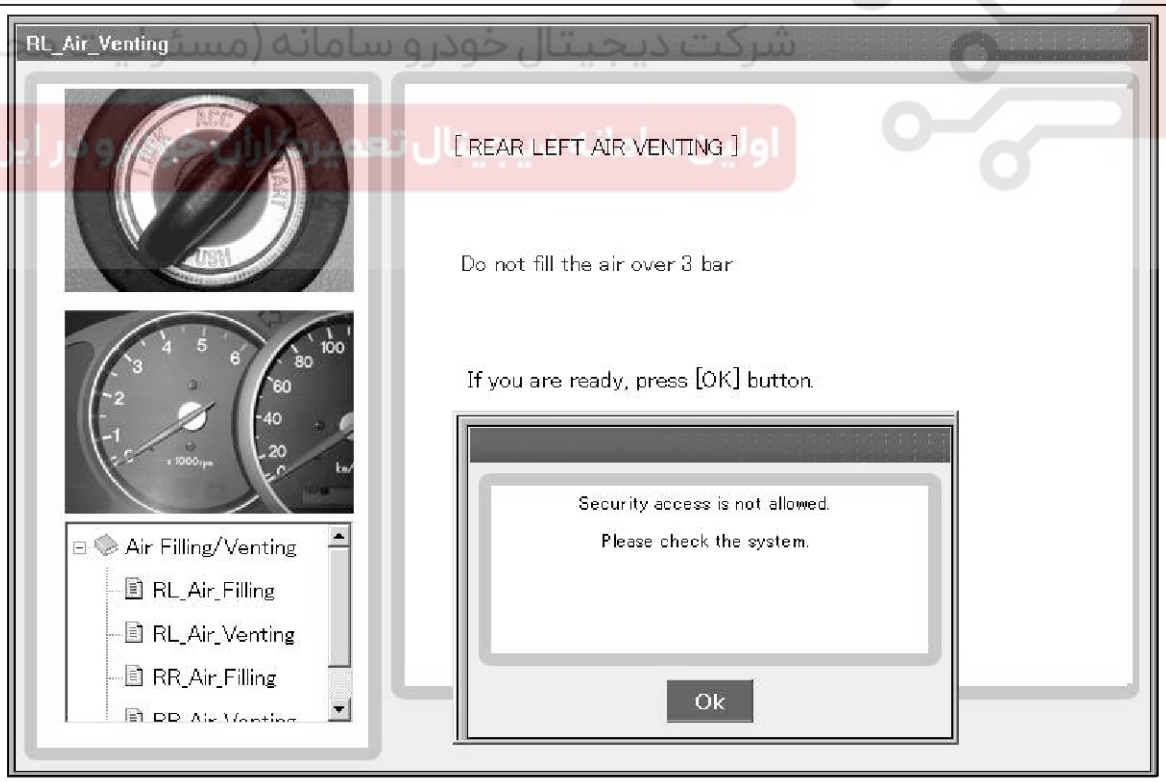
SHMSS9311L



SHMSS9316L



SHMSS9317L



SHMSS9318L

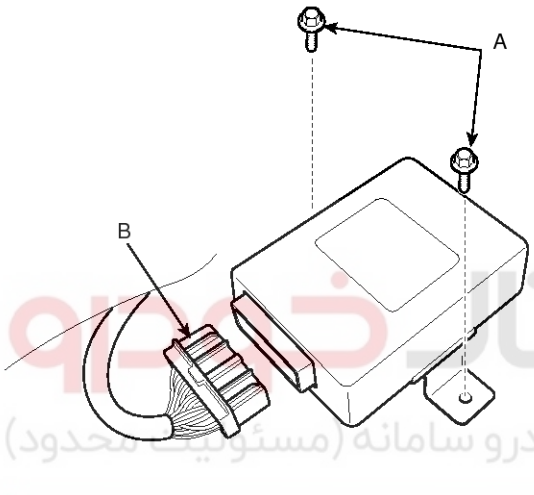
ECU

Description

Receiving signals from the sensor and other modules via CAN, it controls the vehicle level manually or automatically. It is installed at the lower of driver seat as shown in the picture.

Replacement

1. Remove the LH front seat. (Refer to BD group)
2. Loosen the bolt (A).
3. Disconnect the connector (B) by then remove the ECU.



SHMSS8149D

4. Installation is the reverse of removal.

⚠CAUTION

- **Do not damage the connector.**
- **Take care not to damage the pin of connecting portion of connector.**
- **Avoid suffering excessive impact.**
- **Take care not to drop.**
- **Do not pile up the parts.**