GENESIS COUPE(BK) > 2013 > G 3.8 GDI > Suspension System

Suspension System > General Information > Specifications

Specifications

Front Suspension

Item		Specification
Suspension type		Multi link
Shock absorber	Type	Gas
		Strut tower bar
Coil spring	Free Height [I.D. color]	319.0mm (12.5590 in) Green
Ride height		383±10mm (15.0787±0.3937 in)

Rear Suspension

Item		Specification
Suspension type		Multi link
Shock absorber	Type	Gas
Coil spring	Free Height [I.D. color]	302.4mm (11.9055 in) Cyan
Ride height		383±10mm (15.0787±0.3937 in)

Wheel & Tire

Item			Specification
Wheel			7.5J x 18 : 8.0J x 18
			8.0J x 19 : 8.5J x 19
Temporary Spare Wheel	Aluminum		4.0T x 18
	Steel		4.0T x 17
Tire			225/45 R18 : 245/45 R18
			225/40 R19 : 245/40 R19
Temporary Spare Tire	Aluminum		T135/80 R18
	Steel		T135/90 D17
Tire pressure	Front	P225/45R18	2.5+0.07kg/cm² (35+1.0psi)
		P225/40R19	2.5+0.07kg/cm² (35+1.0psi)
		T135/90D17	4.2+0.07kg/cm² (60+1.0psi)
	Rear	P245/45R18	2.5+0.07kg/cm² (35+1.0psi)
		P245/40R19	2.5+0.07kg/cm² (35+1.0psi)
		T135/80R18	4.2+0.07kg/cm² (60+1.0psi)

Wheel Alignment

Item		Specification	
		Front	Rear
Toe-in	Total	0.28°±0.2°	0.16°±0.2°
	Individual	0.14°±0.1°	0.08°±0.1°
Camber angle		-0.7°±0.5°	-1.5°±0.5°
Caster angle		7.45°±0.5°	-
King-pin angle		13.7°	-

Tightening Torques

Front Suspension

Item	Tightening torque		
	N.m	kgf.m	lb-ft
Wheel nuts	88.3 ~ 107.9	9.0 ~ 11.0	65.1 ~ 79.6
Tension arm to sub frame	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Tension arm to front axle	78.5 ~ 88.3	8.0 ~ 9.0	57.9 ~ 65.1
Tension arm to flexible hose	6.9 ~ 10.8	0.7 ~ 1.1	5.1 ~ 8.0
Lateral arm to sub frame	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Lateral arm to front axle	78.5 ~ 88.3	8.0 ~ 9.0	57.9 ~ 65.1
Front stabilizer bar to sub frame	49.0 ~ 63.7	5.0 ~ 6.5	36.2 ~ 47.0
Front stabilizer bar to stabilizer link	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Steering gear box to front axle	23.5 ~ 33.3	2.4 ~ 3.4	17.4 ~ 24.6

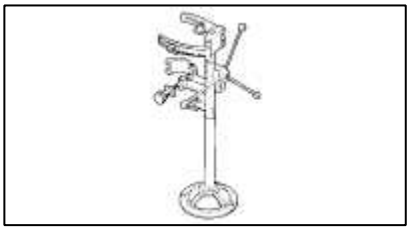
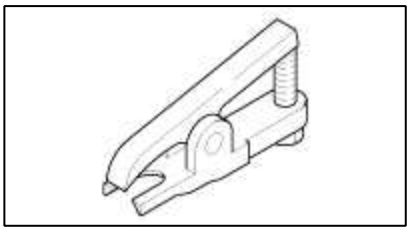
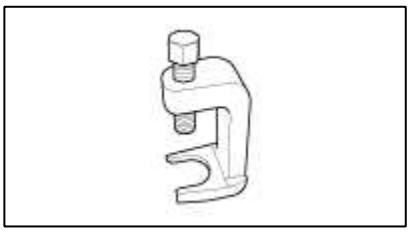
Rear Suspension

Item	Tightening torque		
	N.m	kgf.m	lb-ft
Wheel nuts	88.3 ~ 107.9	9.0 ~ 11.0	65.1 ~ 79.6
Rear shock absorber to frame	44.1 ~ 58.8	4.5 ~ 6.0	32.5 ~ 43.4
Rear shock absorber to lower arm	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Front upper arm to sub frame	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Front upper arm to rear axle	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Rear upper arm to sub frame	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Rear upper arm to rear axle	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Rear stabilizer bar to sub frame	49.0 ~ 63.7	5.0 ~ 6.5	36.2 ~ 47.0
Rear stabilizer link to lower arm	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8

Rear stabilizer bar to stabilizer link	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Rear lower arm to sub frame	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Rear lower arm to rear axle	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Assist arm to sub frame	137.3 ~ 156.9	14.0 ~ 16.0	101.3 ~ 115.7
Assist arm to rear axle	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Trailing arm to sub frame	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Trailing arm to rear axle	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8

Suspension System > General Information > Special Service Tools

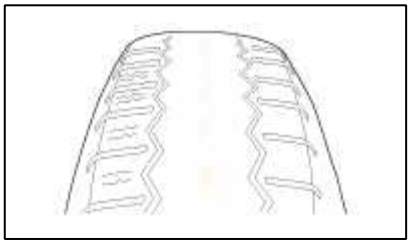
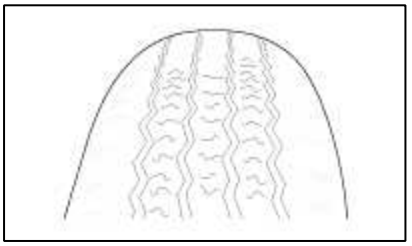
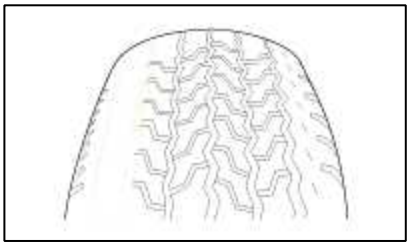
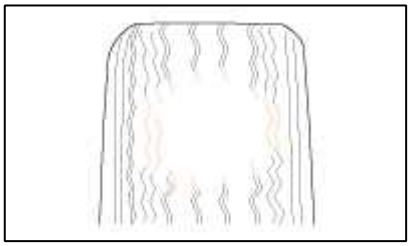
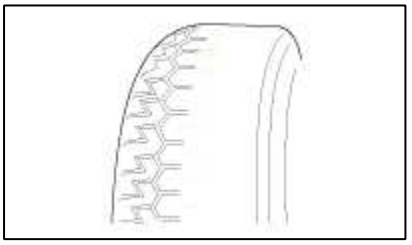
Special Service Tools

Tool (Number and Name)	Illustration	Use
09546-26000 Strut spring compressor		Compression of coil spring
09568-34000 Ball joint remover		Removal of Ball joint
09568-2J100 Ball joint remover		Removal of Ball joint

Suspension System > General Information > Troubleshooting

Troubleshooting

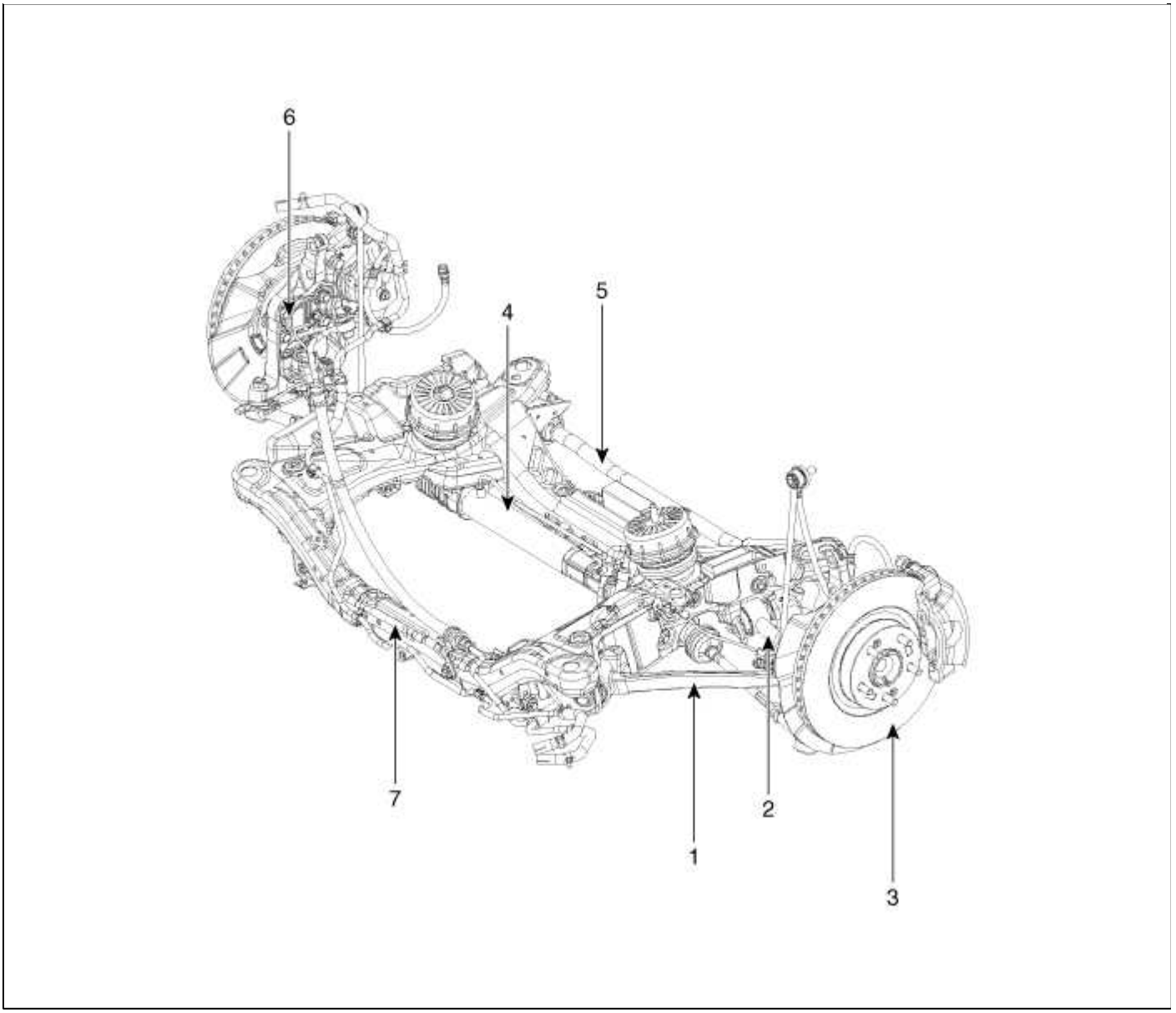
Trouble symptom	Probable cause	Remedy
Hard steering	Improper front wheel alignment	Repair
	Excessive turning resistance of lower arm ball joint	Replace
	Flat tire	Adjust
	No power assist	Repair or Replace
Poor return of steering wheel to center	Improper front wheel alignment	Repair
Poor ride quality	Improper front wheel alignment	Repair
	Damaged shock absorber	Repair or Replace
	Varied or damaged stabilizer	Replace
	Varied or damaged coil spring	Replace
	Worn lower arm bushing	Replace
Abnormal tire wear	Improper front wheel alignment	Repair
	Improper tire inflation pressure	Adjust
	Worn of shock absorber	Replace
Wandering	Improper front wheel alignment	Repair
	Poor turning resistance of lower arm ball joint	Repair
	Loose or worn lower arm bushing	Re-tighten or Replace
Vehicle pulls to one side	Improper front wheel alignment	Repair
	Excessive turning resistance of lower arm ball joint	Replace
	Varied or damaged coil spring	Replace
	Bent lower arm	Replace
	Tire pressure	Adjust
	Tire lateral pull	Adjust
	Front camber/caster	Adjust
	Perform correct road test on flat, no-crown road	Adjust
Steering wheel shimmy	Improper front wheel alignment	Repair
	Excessive turning resistance of lower arm ball joint	Replace
	Varied or damaged stabilizer	Replace
	Worn lower arm bushing	Replace
	Worn of shock absorber	Replace
	Varied or damaged coil spring	Replace
Bottoming	Broken or worn spring	Replace
	Malfunction of shock absorber	Replace

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 • Under-inflated tires
Partial wear	Feathered edge	Wear pattern
		
• Caused by irregular burrs on brake drums. • Under-inflated tires • Lack of rotation	• Toe adjustment out of specification • Damaged or worn tie rods • Damaged knuckle	• Excessive toe on non-drive wheels • Lack of rotation

Suspension System > Front Suspension System > Components and Components Location

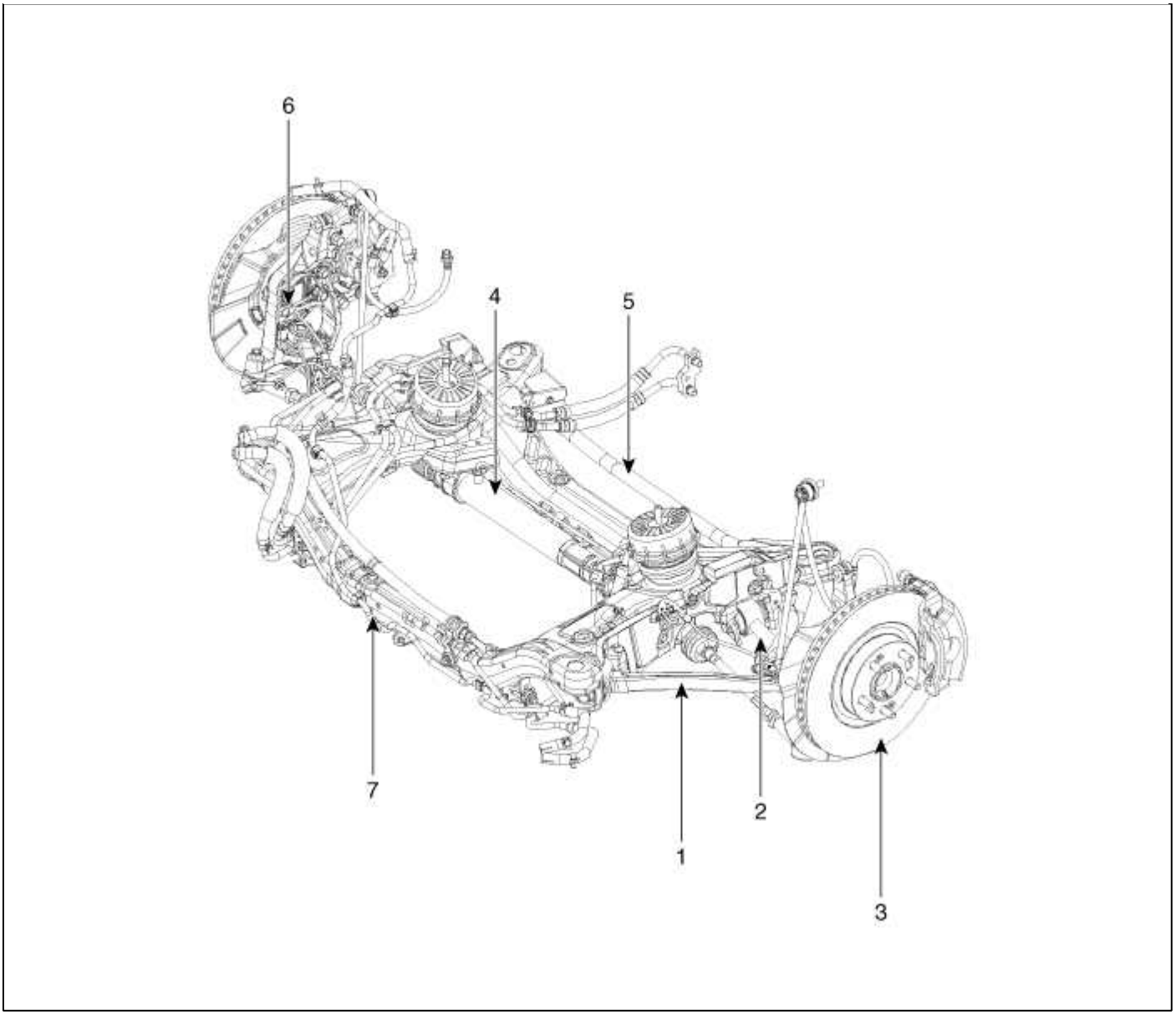
Components

[Theta]



1. Tension arm 2. Lateral arm 3. Front disk 4. Steering gearbox	5. Stabilizer bar 6. Front axle 7. Sub frame

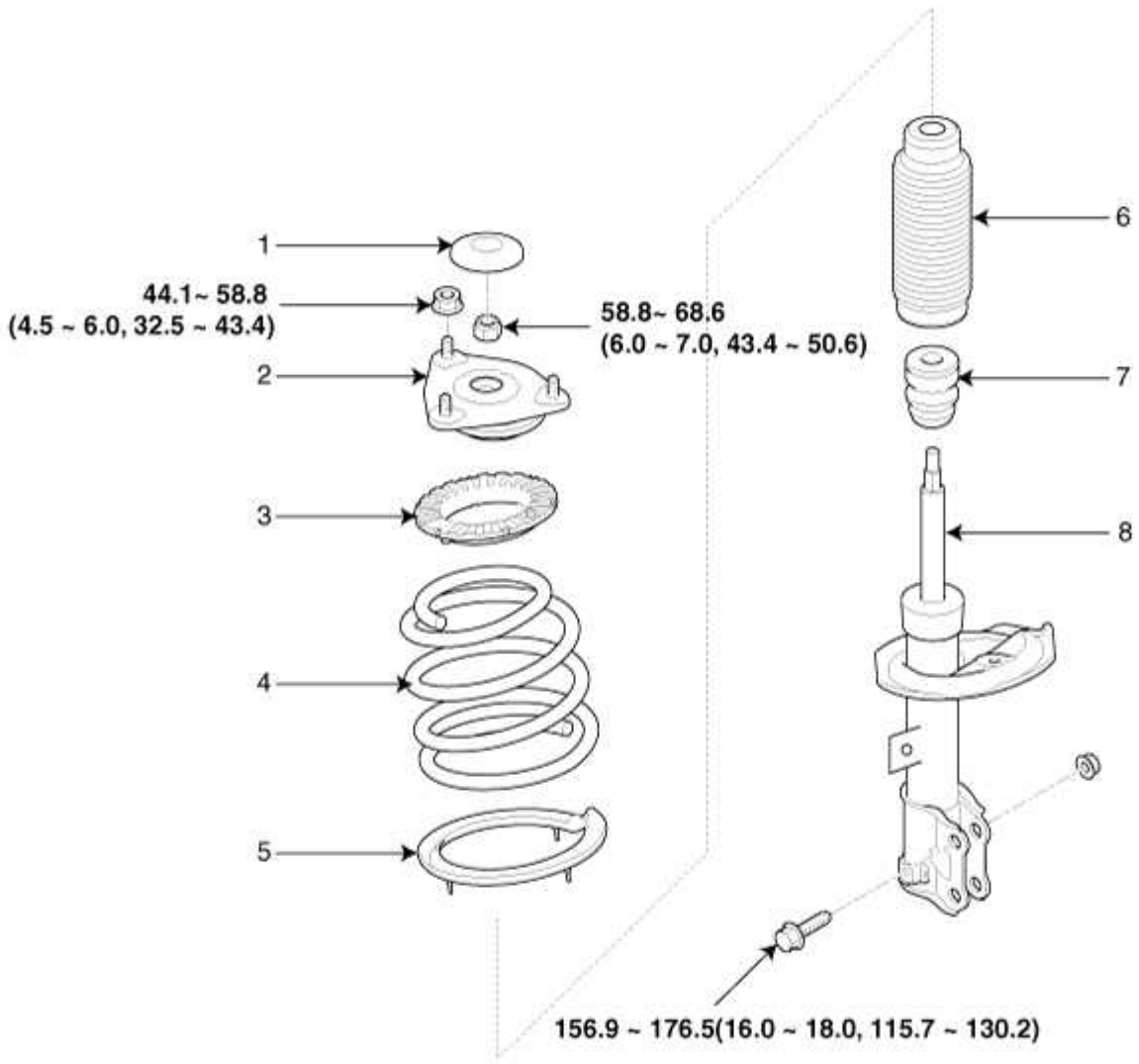
[Lamda]



1. Tension arm 2. Lateral arm 3. Front disk 4. Steering gearbox	5. Stabilizer bar 6. Front axle 7. Sub frame

Suspension System > Front Suspension System > Front Strut Assembly > Components and Components Location

Components



Torque : N.m (kgf.m, lb-ft)

1. Insulator cap 2. Insulator assembly 3. Spring upper pad 4. Coil spring	5. Spring lower pad 6. Dust cover 7. Bumper rubber 8. Shock absorber

Suspension System > Front Suspension System > Front Strut Assembly > Repair procedures

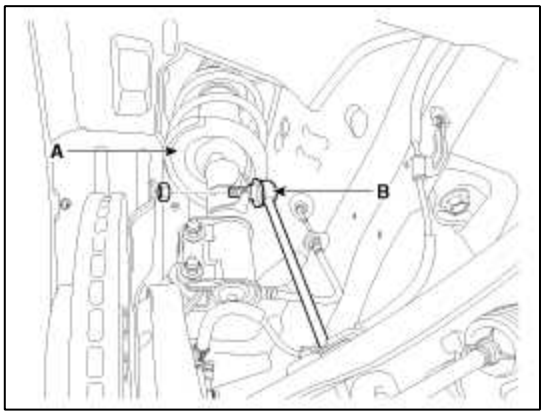
Replacement

1. Remove the front wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

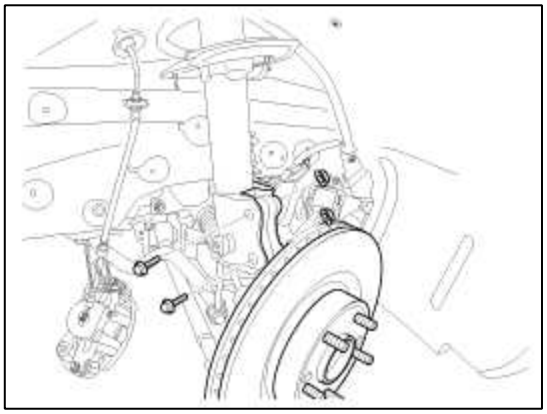
2. Disconnect the stabilizer link (B) with the front strut assembly (A) after loosening the nut.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



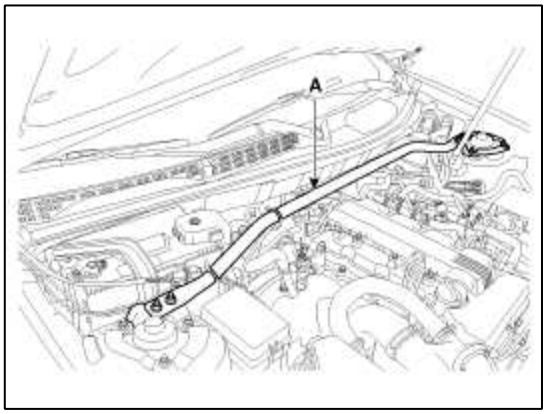
3. Disconnect the front strut assembly with the knuckle by loosening the bolt & nut.

Tightening torque :
137.3 ~ 156.9 N.m(16.0~18.0 kgf.m, 101.3 ~ 115.7 lb-ft)



4. Remove the front stabilizer bar (A)removing the nut.

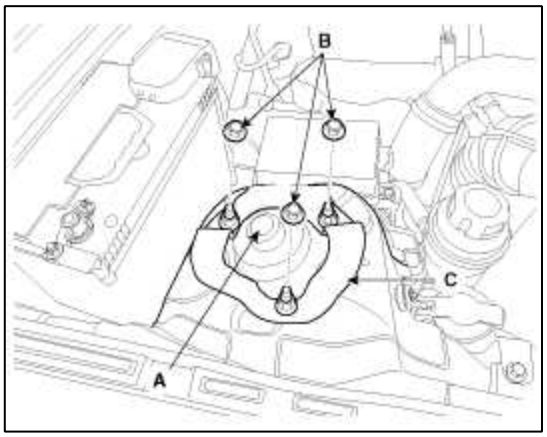
Tightening torque :
26.5 ~ 40.2 N.m(2.7 ~ 4.1 kgf.m, 19.5 ~ 29.7 lb-ft)



5. Remove the strut cap (A).

6. Remove the bracket (C)removing the nut (B).

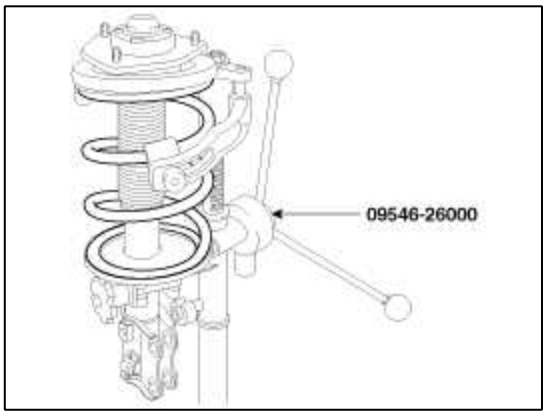
Tightening torque :
53.9 ~ 73.5 N.m(5.5 ~ 7.5 kgf.m, 39.8 ~ 54.2 lb-ft)



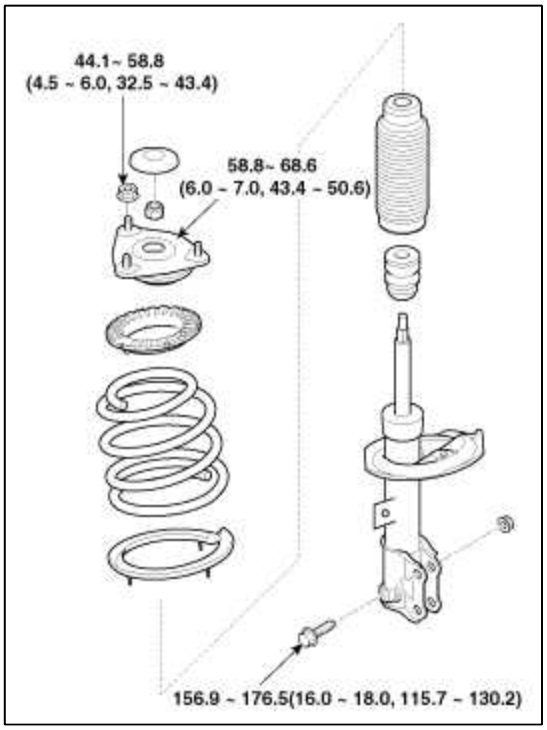
7. Installation is the reverse of removal.

Disassembly

1. Using the special tool (09546-26000), compress the coil spring.

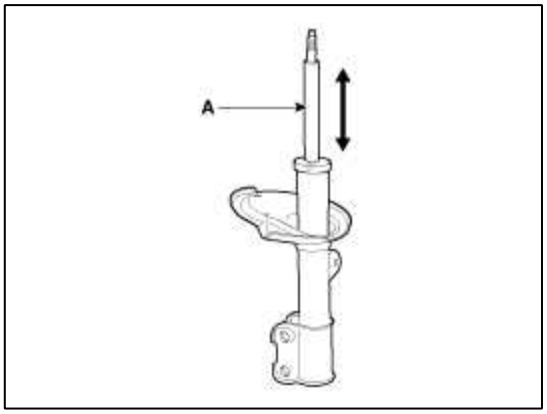


2. Remove the self-locking nut.
3. Remove the insulator, spring seat, coil spring and dust cover from the strut assembly.



Inspection

1. Check the strut insulator 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.

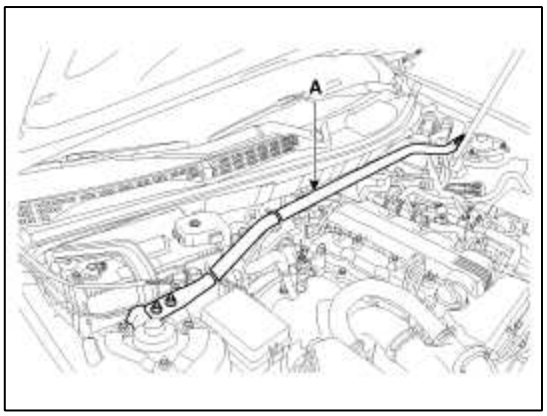


Suspension System > Front Suspension System > Front Strut Bar > Repair procedures

Replacement

1. Loosen the strut bar nuts.

Tightening torque :
26.5 ~ 40.2 N.m(2.7 ~ 4.1 kgf.m, 19.5 ~ 29.7 lb-ft)



2. Installation is the reverse of removal.

Suspension System > Front Suspension System > Front Lower Arm > Repair procedures

Replacement

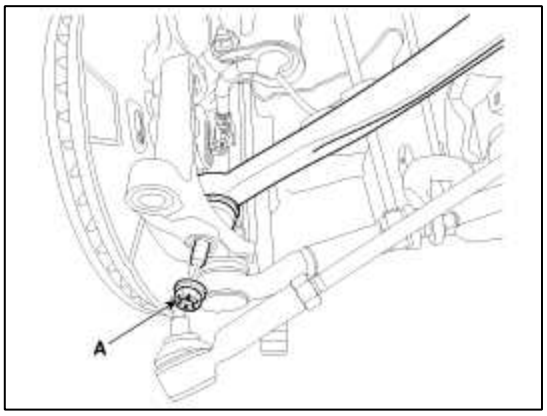
Tension arm

1. Remove the front wheel & tire.

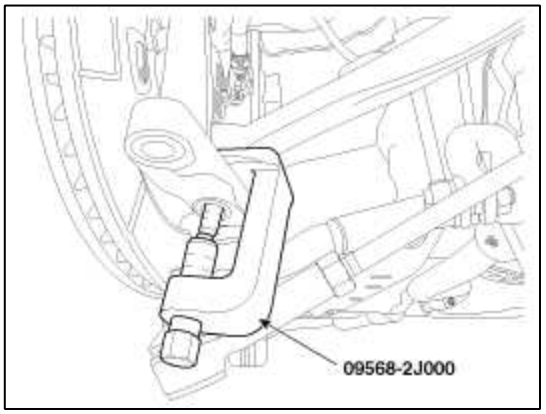
Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Remove the split pin and the castle nut (A).

Tightening torque :
78.5 ~ 88.3 N.m(8.0 ~ 9.0 kgf.m, 57.9 ~ 65.1 lb-ft)

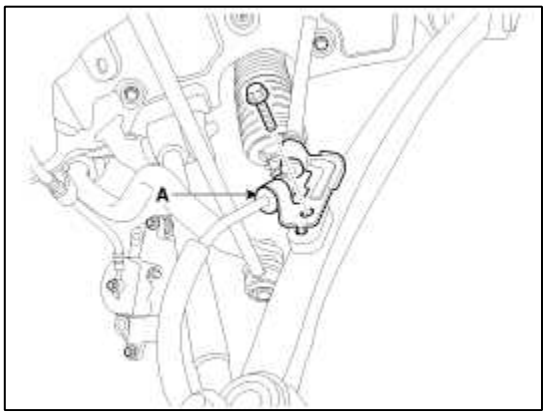


3. Separate the tension arm from the front axle ball joint by using SST (09568-2J000).



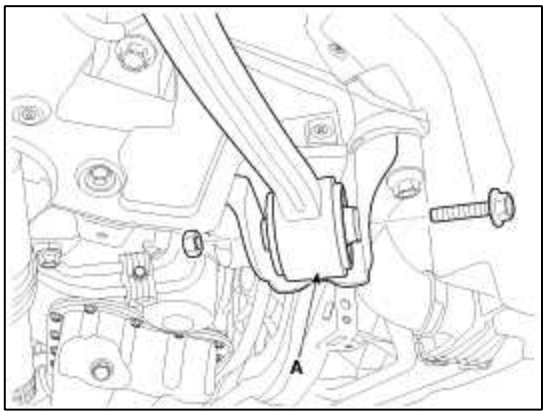
4. Remove the flexible hose (A).

Tightening torque :
6.9 ~ 10.8 N.m(0.7 ~ 1.1 kgf.m, 5.1 ~ 8.0 lb-ft)



5. Loosen the bolts and nuts and then remove the tension arm (A) from the sub frame.

Tightening torque :
137.3 ~ 156.9 N.m(14.0~16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



6. Installation is the reverse of removal.

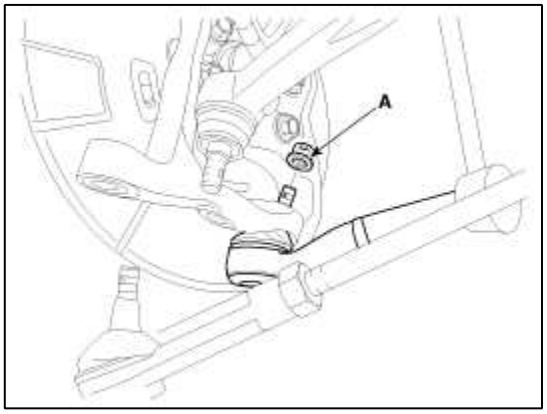
Lateral arm

1. Remove the front wheel & tire.

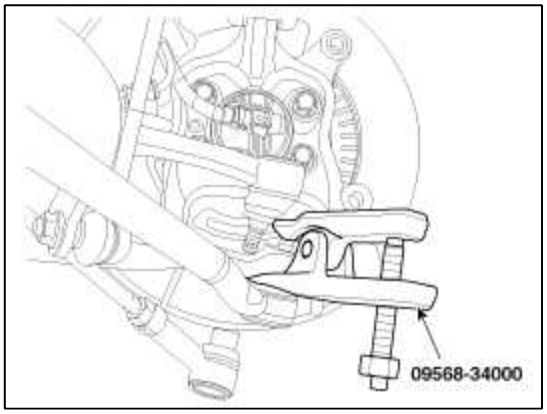
Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Remove the split pin and the castle nut (A).

Tightening torque :
78.5 ~ 88.3 N.m(9.0 ~ 11.0 kgf.m, 57.9 ~ 65.1 lb-ft)

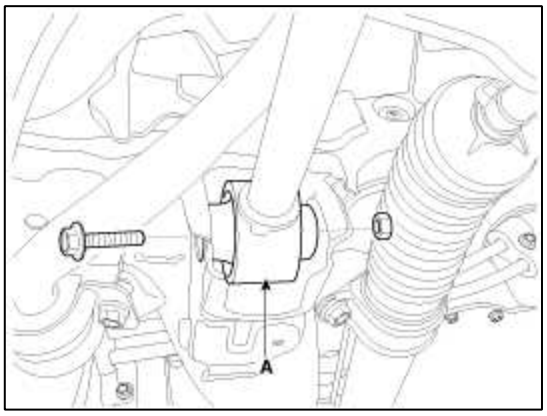


3. Separate the lateral arm from the front axle ball joint by using SST (09568-34000).



4. Loosen the bolts and nuts and then remove the lateral arm (A) from the sub frame.

Tightening torque :
137.3 ~ 156.9 N.m(16.0~18.0 kgf.m, 101.3 ~ 115.7 lb-ft)



5. Installation is the reverse of removal.

Suspension System > Front Suspension System > Front Stabilizer Bar > Repair procedures

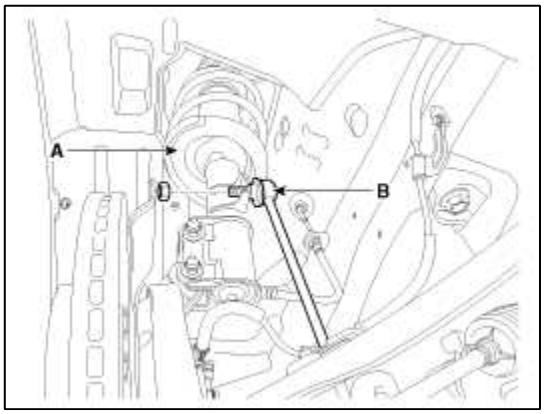
Replacement

1. Remove the front wheel & tire.

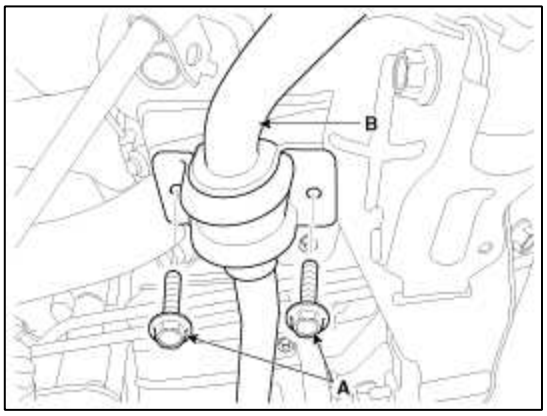
Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Disconnect the stabilizer link (B) with the front strut assembly (A) after loosening the nut.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



3. Remove stabilizer (B) from the cross member by loosening the clamp mounting bolts (A).



4. 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.

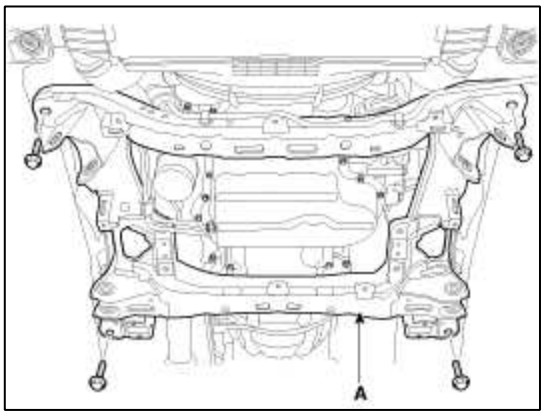
Suspension System > Front Suspension System > Sub Frame > Repair procedures

Replacement

1. Remove the front wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

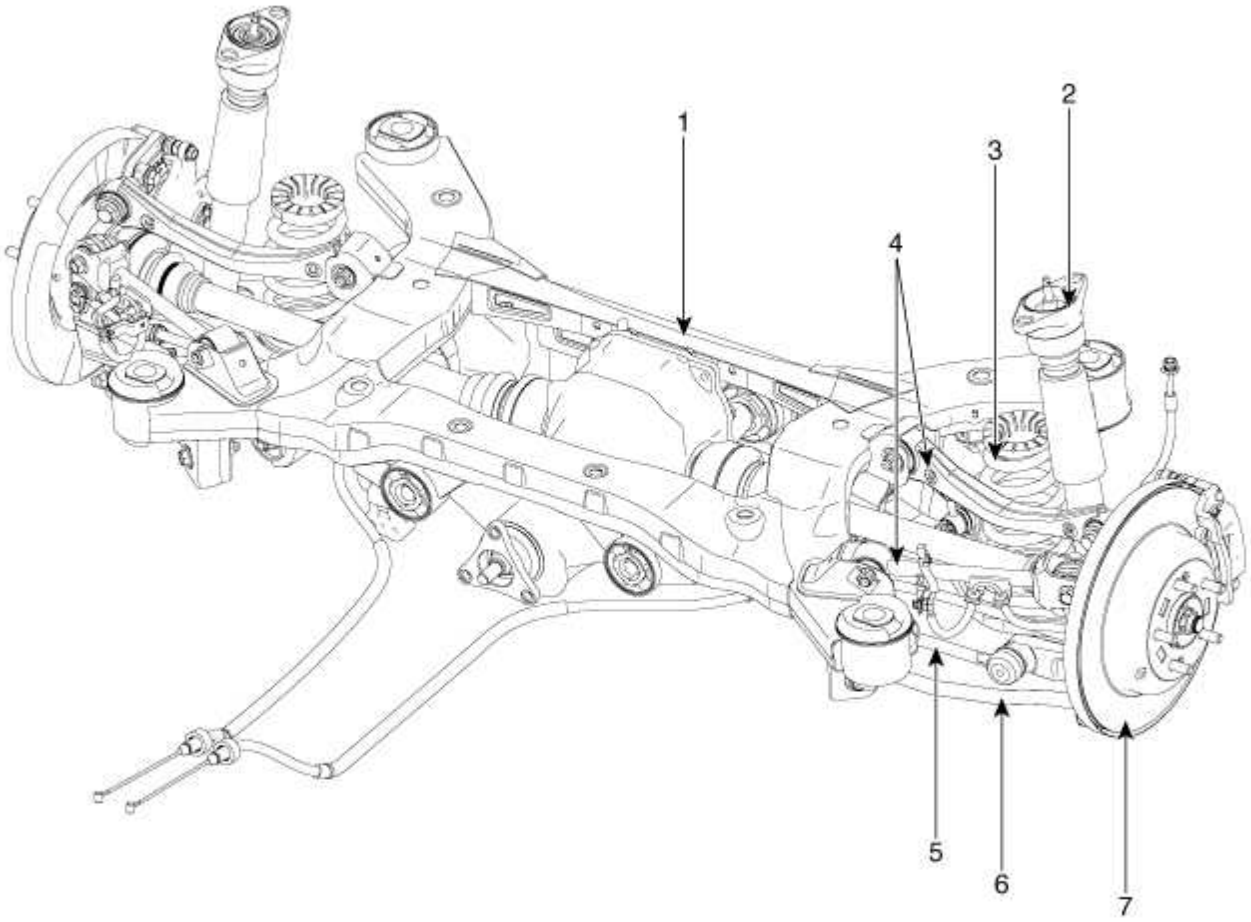
2. Remove the lower arm.
   (Refer to SS group - "Front Lower Arm")
3. Remove the front strut assembly.
   (Refer to SS group - "Front Strut Assembly")
4. Remove the front stabilizer bar.
   (Refer to SS group - "Front Stabilizer Bar")
5. Remove the steering gear box.
   (Refer to ST group - "Steering Gear Box")
6. Remove the cross member (A) from the body by loosening the mounting bolts and nuts.



7. Installation is the reverse of removal.

Suspension System > Rear Suspension System > Components and Components Location

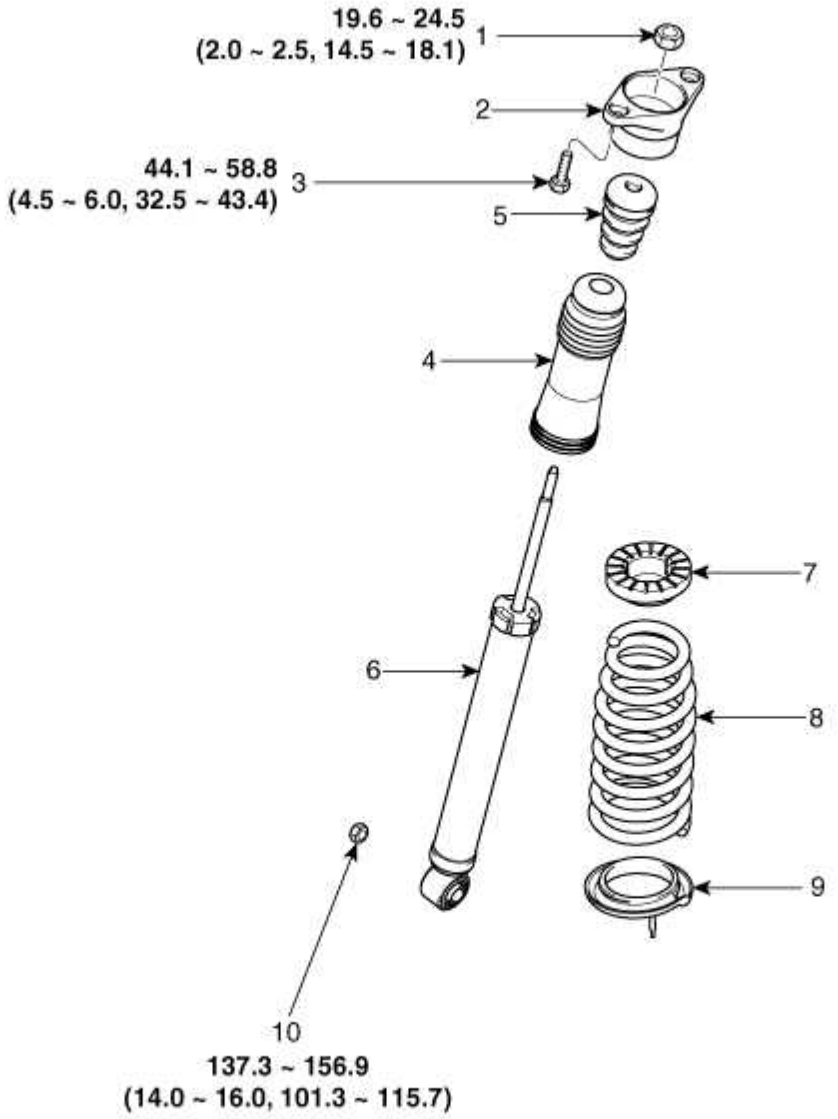
Components



1. Sub frame 2. Rear shock absorber 3. Spring 4. Rear upper arm	5. Assist arm 6. Trailing arm 7. Rear disc

Suspension System > Rear Suspension System > Rear Shock Absorber > Components and Components Location

Components



Torque : N.m (kgf.m, lb-ft)

1. Lock nut	5. Urethan bumper	8. Spring
2. Bracket	6. Shock absorber	9. Lower pad
3. Bolt	7. Upper pad	10. Nut
4. Dust cover		

Suspension System > Rear Suspension System > Rear Shock Absorber > Repair procedures

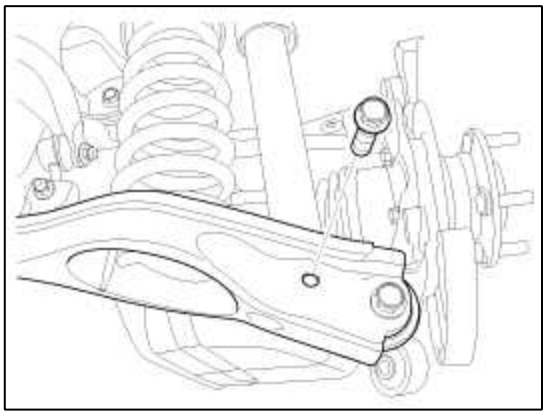
Replacement

1. Remove the rear wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

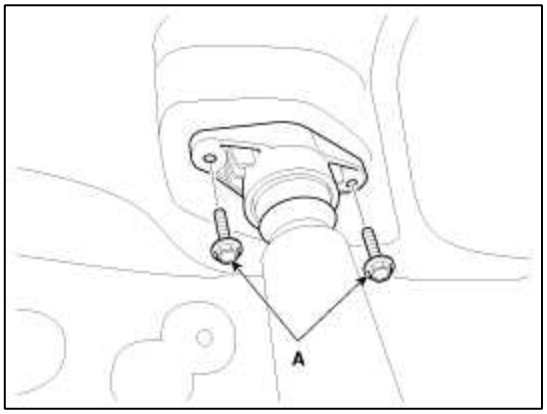
2. Loosen the bolts and nuts and then remove the rear shock absorber from the lower arm.

Tightening torque :
137.3 ~ 156.9 N.m(14.0~16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



3. Loosen the mounting bolts (A).

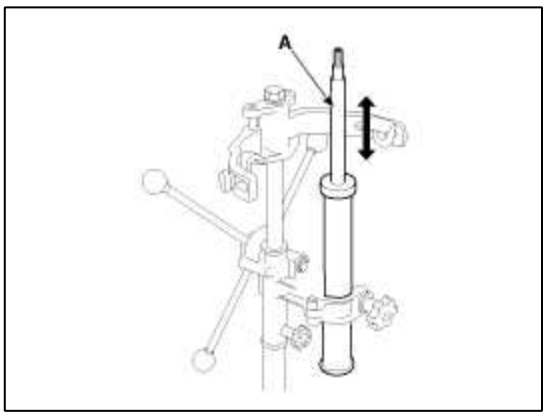
Tightening torque :
44.1 ~ 58.8 N.m(4.5 ~ 6.0 kgf.m, 32.5 ~ 43.4 lb-ft)



4. Installation is the reverse of removal.

Inspection

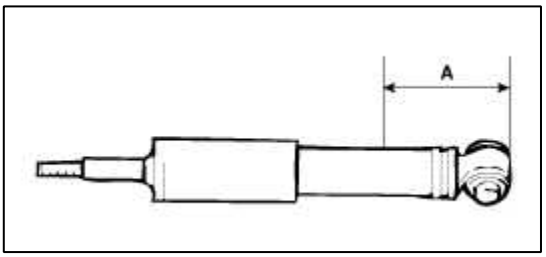
1. Check the components for damage or deformation.
2. Compress and extend the piston rod (A) and check that there is no abnormal resistance or unusual sound during operation.



Disposal

1. Fully extend the piston rod.

2. Drill a hole on the (A) 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.

Suspension System > Rear Suspension System > Rear Upper Arm > Repair procedures

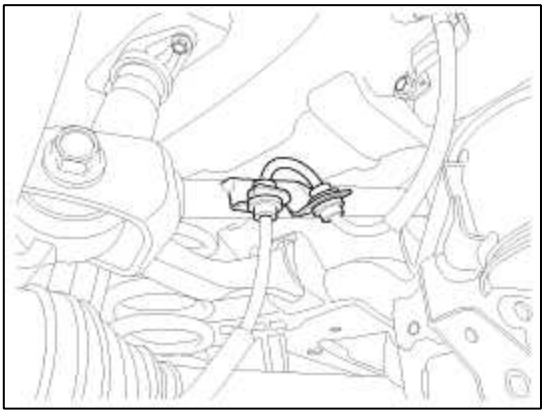
Replacement

Front Upper Arm

1. Remove the rear wheel & tire.

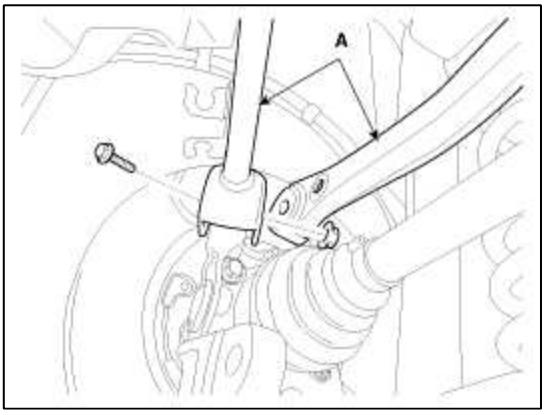
Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Remove the brake hose bracket.



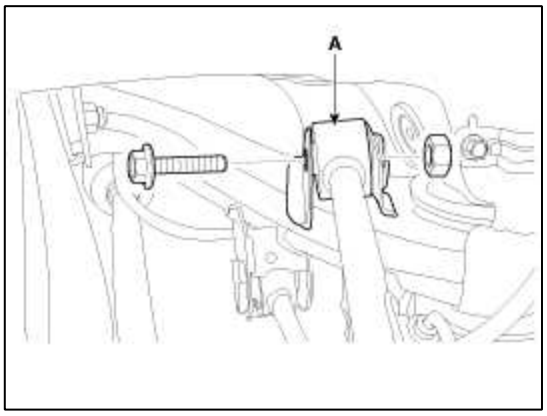
3. Loosen the bolts and nuts and then remove the front upper arm (A) from rear axle.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



4. Loosen the bolts and nuts and then remove the front upper arm (A) from sub frame.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



5. Installation is the reverse of removal.

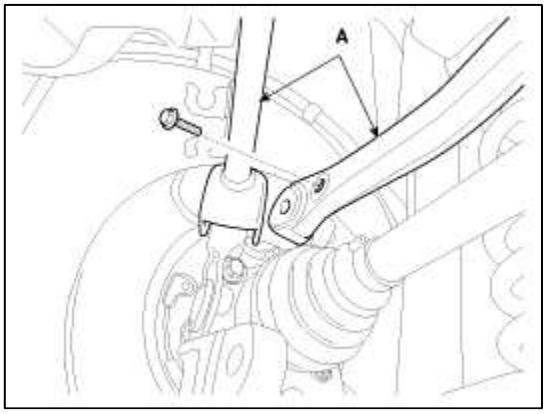
Rear Upper Arm

1. Remove the rear wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

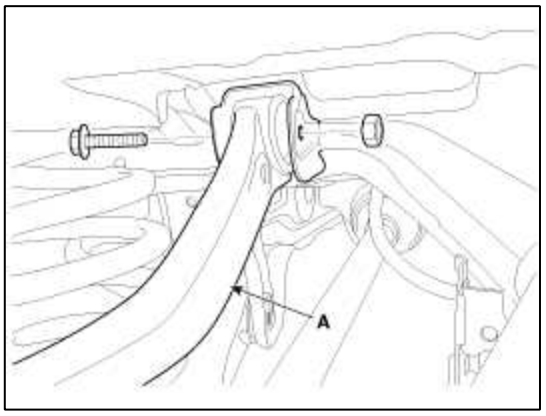
2. Loosen the bolts and nuts and then remove the rear upper arm (A) from rear axle.

Tightening torque :
137.3 ~ 156.9 N.m(14.0~16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



3. Loosen the bolts and nuts and then remove the rear upper arm (A) from sub frame.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



4. Installation is the reverse of removal.

Suspension System > Rear Suspension System > Rear Lower Arm > Repair procedures

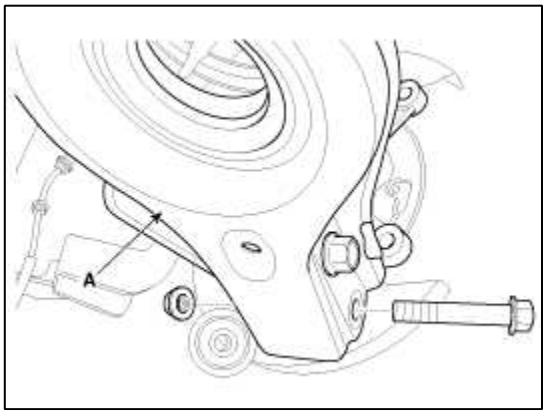
Replacement

1. Remove the rear wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

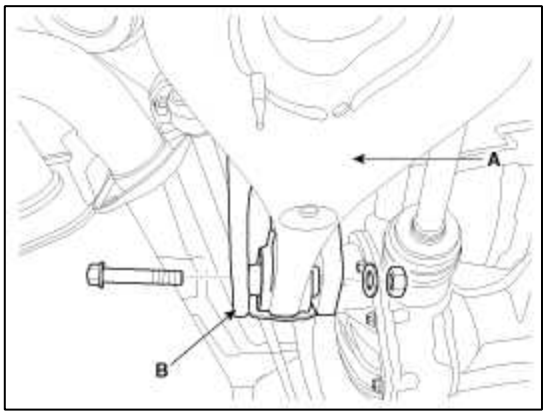
2. Remove the rear shock absorber.
3. Loosen the bolts and nuts and then remove the lower arm (A) from rear axle.

Tightening torque :
137.3 ~ 156.9 N.m(14.0~16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



4. Loosen the bolts and nuts and then remove the lower arm (A) from sub frame (B).

Tightening torque :
137.3 ~ 156.9 N.m(14.0~16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



5. Installation is the reverse of removal.

Inspection

1. Check the bushing for wear and deterioration.
2. Check the rear lower arm deformation.
3. Check the all bolts.
4. Check the coil spring pad for deterioration and deformation.

Suspension System > Rear Suspension System > Rear Stabilizer Bar > Repair procedures

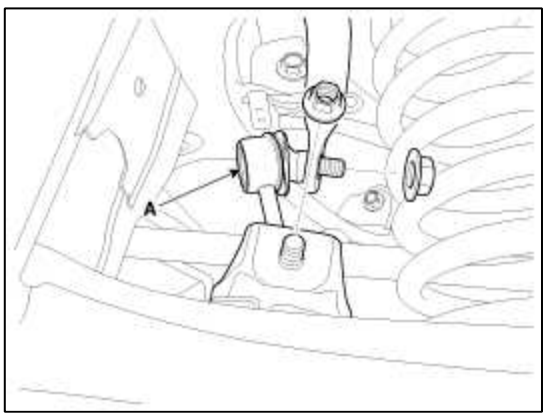
Replacement

1. Remove the rear wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

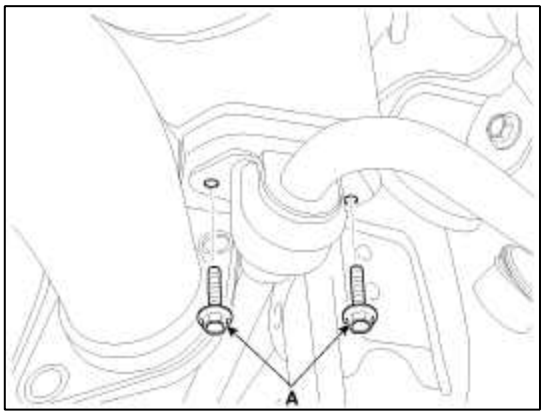
2. Loosen the nuts and then remove the stabilizer link (A) from stabilizer bar and lower arm.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



3. Loosen the mounting bolts (A).

Tightening torque :
49.0 ~ 63.7 N.m(4.5 ~ 6.0 kgf.m, 36.2 ~ 47.0 lb-ft)



4. Installation is the reverse of removal.

Inspection

1. Check the bushing for wear deterioration.
2. Check the all bolts.
3. Check the stabilizer bar for deformation.
4. Check the stabilizer link ball joint for damage.

Suspension System > Rear Suspension System > Rear Assist Arm > Repair procedures

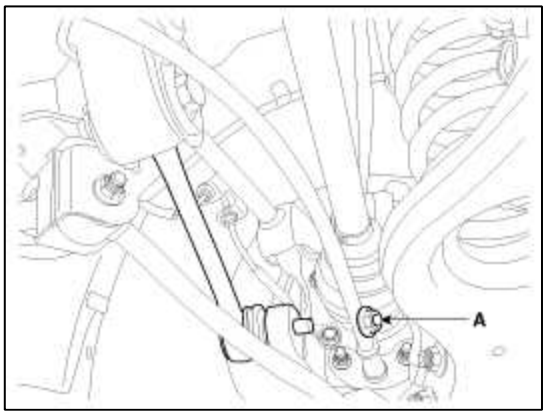
Replacement

1. Remove the rear wheel & tire.

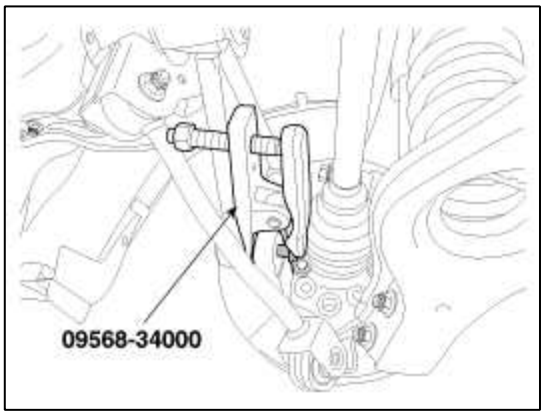
Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Loosen the nuts (A).

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)

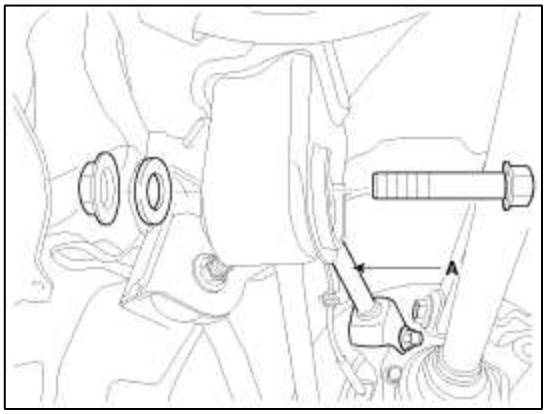


3. Separate the assist arm from the rear axle ball joint by using SST (09568-34000).



4. Loosen the bolts and nuts and then remove the assist arm (A) from sub frame.

Tightening torque :
137.3 ~ 156.9 N.m(14.0~16.0 kgf.m, 101.3 ~ 115.7 lb-ft)



5. Installation is the reverse of removal.

Suspension System > Rear Suspension System > Trailing Arm > Repair procedures

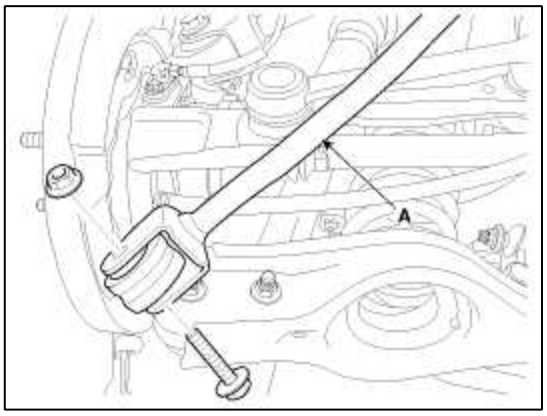
Replacement

1. Remove the rear wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

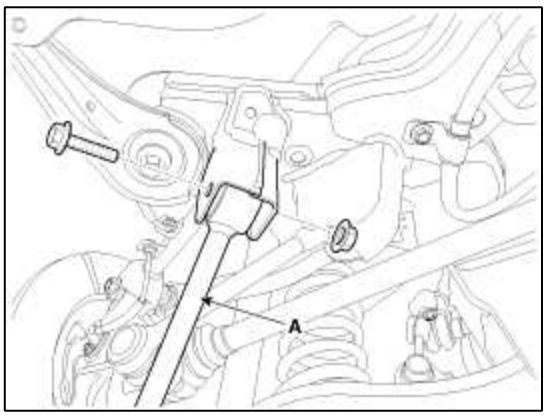
2. Loosen the bolts and nuts and then remove the trailing arm (A) from rear axle.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



3. Loosen the bolts and nuts and then remove the assist arm (A) from sub frame.

Tightening torque :
98.1 ~ 117.7 N.m(10.0 ~ 12.0 kgf.m, 72.3 ~ 86.8 lb-ft)



4. Installation is the reverse of removal.

Suspension System > Rear Suspension System > Rear Sub Frame > Repair procedures

Replacement

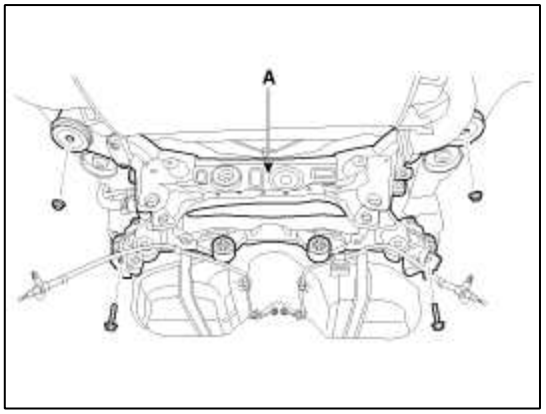
1. Remove the rear wheel & tire.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Remove the rear lower arm.
   (Refer to SS group - "Rear Lower Arm")
3. Remove the rear shock absorber.
   (Refer to SS group - "Rear Shock Absorber")
4. Remove the rear upper arm.
   (Refer to SS group - "Rear Upper Arm")
5. Remove the trailing arm.
   (Refer to SS group - "Trailing Arm")
6. Remove the assist arm.
   (Refer to SS group - "Rear Assist Arm")

7. Remove the differential carrier.
   (Refer to DS group - "Differential Carrier Assembly")
8. Loosen the bolts and nuts and then remove the sub frame (A).

Tightening torque :
156.9 ~ 176.5 N.m(16.0~18.0 kgf.m, 115.7 ~ 130.2 lb-ft)



9. Installation is the reverse of removal.

Suspension System > Tires/Wheels > Tire > Repair procedures

Tire Wear

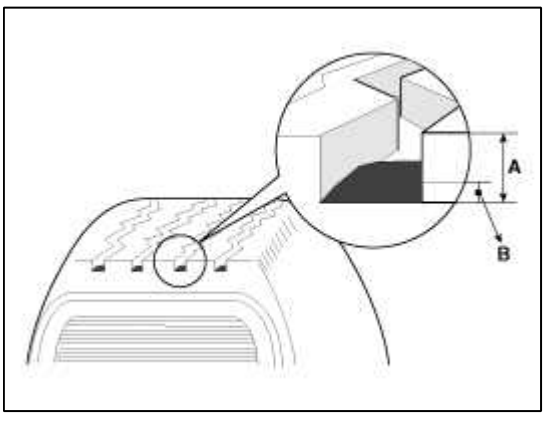
1. Measure the tread depth of the tires.

Tread depth [limit] : 1.6 mm (0.0630 in)

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

NOTE

When the tread depth of the tires is less than 1.6 mm (0.0630 in), the wear indicators (B) will appear.

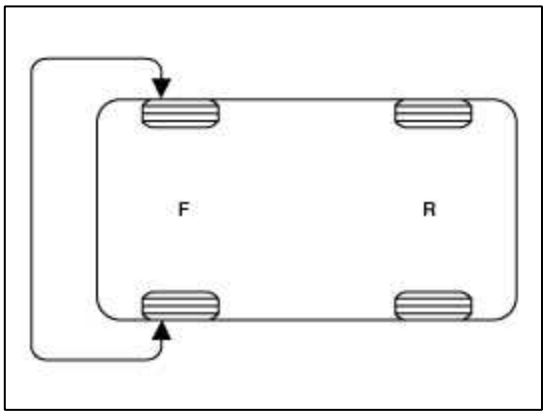


Tire Rotation

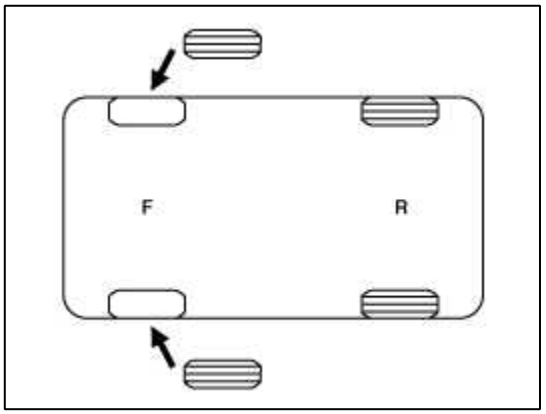
Checking For Pull And Wander

If the steering pulls to one side, rotate the tires according to the following wheel rotation procedure.

1. Rotate the front right and front left tires, and perform a road test in order to confirm vehicle stability.



2. If the steering continues to pull to the opposite side, replace the front wheels with new ones.



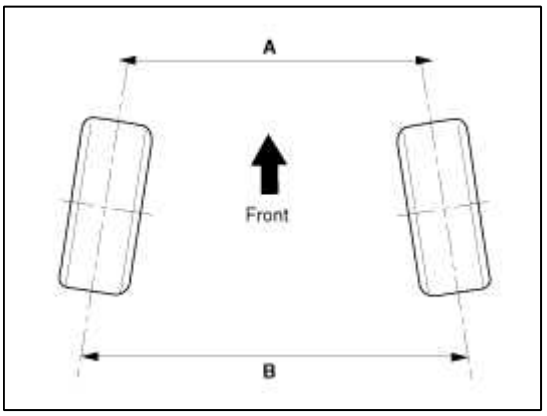
Suspension System > Tires/Wheels > Wheel > Repair procedures

Wheel Alignment

When using commercially available computerized four wheel alignment equipment (caster, camber, toe) to inspect the front wheel alignment, always position the car 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 wheels and tires face straight ahead and the tires are inflated to the specified pressure.

Toe

Toe is a measurement of how much the front of the wheels are turned in or out from the straight-ahead position.



Item	Description
A - B < 0	Positive (+) toe (toe in)
A - B > 0	Negative (-) toe (toe out)

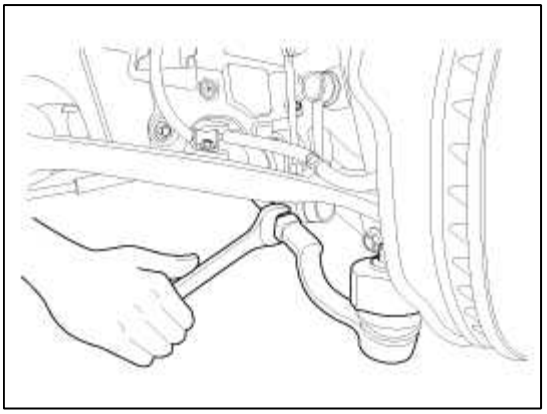
When the wheels are turned in toward the front of the vehicle, toe is positive (+) (toe in). When the wheels are turned out toward the front of the vehicle, toe is negative(-) (toe out). Toe is measured in degrees, from side to side, and totaled.
[Front]
Toe-in(B-A or angle a+b) is adjusted by turning the tie rod turnbuckles. Toe-in on the left front wheel can be reduced by turning the tie rod toward the rear of the car. Toe- in change is adjusted by turning the tie rods for the right and left heels simultaneously at the same amount as follows.

Standard value :
Toe-in
Total : 0.28°±0.2°
Individual : 0.14°±0.1°

NOTE

- Toe-in adjustment should be made by turning the right and left tie rods at the same amount.
- When adjusting toe-in, loosen the outer bellows clip to prevent twisting the bellows.
- After the adjustment, tighten the tie rod end lock nuts firmly and reinstall the bellows clip.
- Adjust each toe-in to be the range of ±0.1°.

Tie rod (A) Specified torque :
49.0 ~ 53.9 N.m (5.0 ~ 5.5 kgf.m, 36.2 ~ 39.8 lb-ft)



[Rear]

Standard value :
Toe-in
Total : 0.16°±0.2°
Individual : 0.08°±0.1°

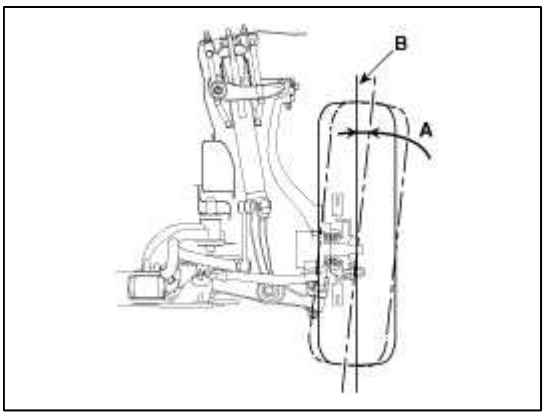
Adjust the toe-in by turning the cambolt of the assist arm.

Left cambolt : Clockwise → toe-out
Right cambolt : Clockwise → toe-in
The variation of toe by a rotation of the cambolt :
About 0.4°

CAUTION

- Each toe should be within 0.1° ± 0.1°.
  If the difference between right and left is not within +0.2°, repeat adjustment.
- After adjusting the cambolt, tighten the nut to the specified torque.

Camber
[Front]
Camber is the inward or outward tilting of the wheels at the top.



Item	Description
A	Positive camber angle
B	True vertical

When the wheel tilts out at the top, then the camber is positive (+).
When the wheel tilts in at the top, then the camber is negative(-).

Standard value : -0.7° ± 0.5°

NOTE

Camber is pre-set at the factory and doesn't need to be adjusted. If the camber is not within the standard value, replace the bent or damaged parts.

[Rear]

Standard value : -1.5° ± 0.5°
Difference between right and left angle is within 0.5°

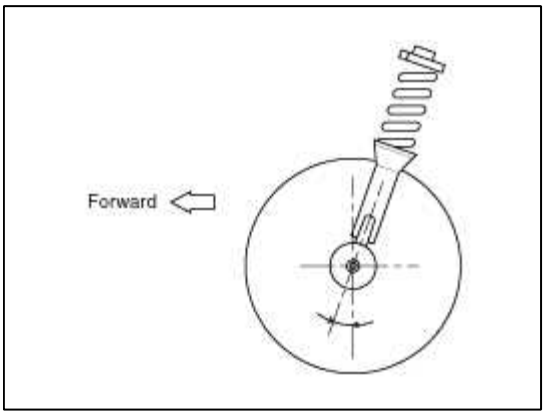
Adjust the camber by turning the cambolt of the rear lower arm.

Left cambolt : Clockwise → camber(-)
Right cambolt : Clockwise →camber(+)
The variation of camber by a rotation of the cambolt :
About 0.09°

Caster
Caster is the tilting of the strut axis either forward or backward from vertical. A backward tilt is positive (+) and a forward tilt is negative (-).

Caster is pre-set at the factory and doesn't need to be adjusted. If the caster is not within the standard value, replace the bent or damaged parts.

Caster : 7.45° ± 0.5°



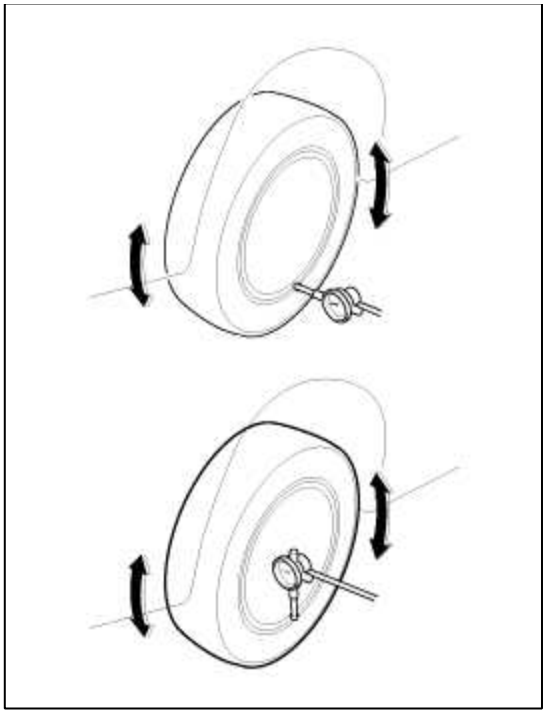
NOTE

- The worn loose or damaged parts of the front suspension assembly must be replaced prior to measuring front wheel alignment.
- Caster are pre-set to the specified value at the factory and don't need to be adjusted.
- If the caster are not within specifications, replace bent or damaged parts.
- The difference of left and right wheels about the the caster must be within the range of 0° ± 0.5°.

Wheel Runout

1. Jack up the vehicle and support it with jack stands.
2. Measure the wheel runout with a dial indicator as illustrated.
3. Replace the wheel if the wheel runout exceeds the limit.

Limit		Radial	Axial
Runout mm	Aluminium	0.3mm (0.0118 in.)	0.3mm (0.0118 in.)



Wheel Nut Tightening

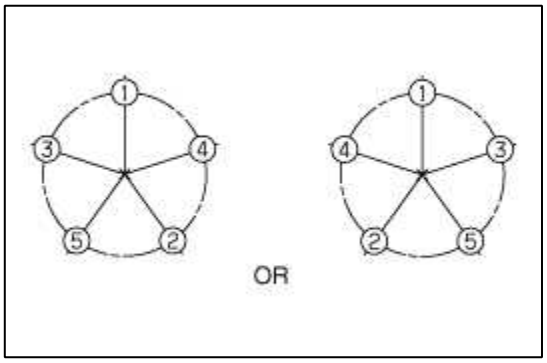
1. Tightening torque.

Tightening torque :
88.3 ~ 107.9 N.m(9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

CAUTION

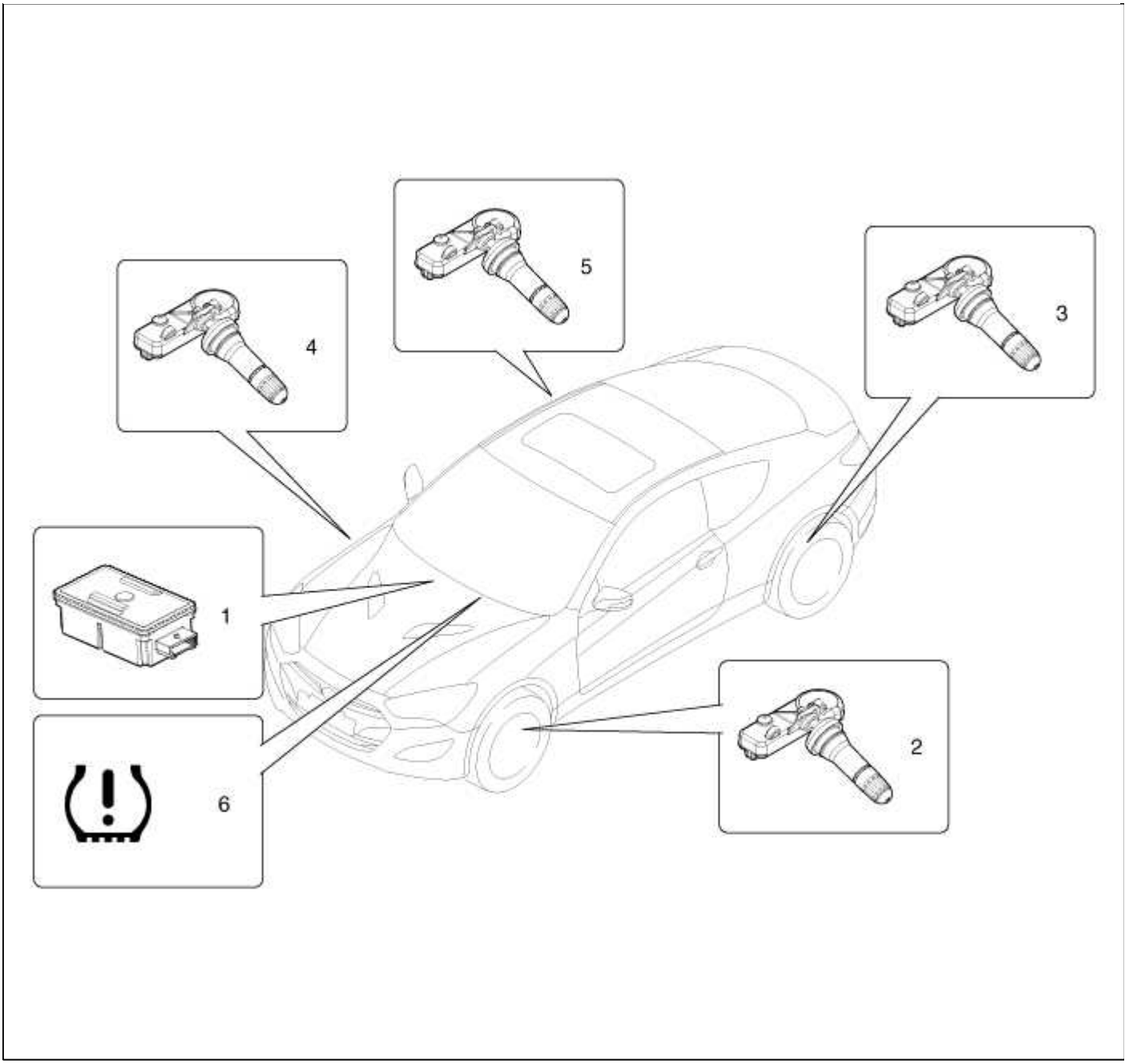
When using an impact gun, final tightening torque should be checked using a torque wrench.

2. Tightening order.
Check the torque again after tightening the wheel nuts diagonally.



Suspension System > Tire Pressure Monitoring System > Components and Components Location

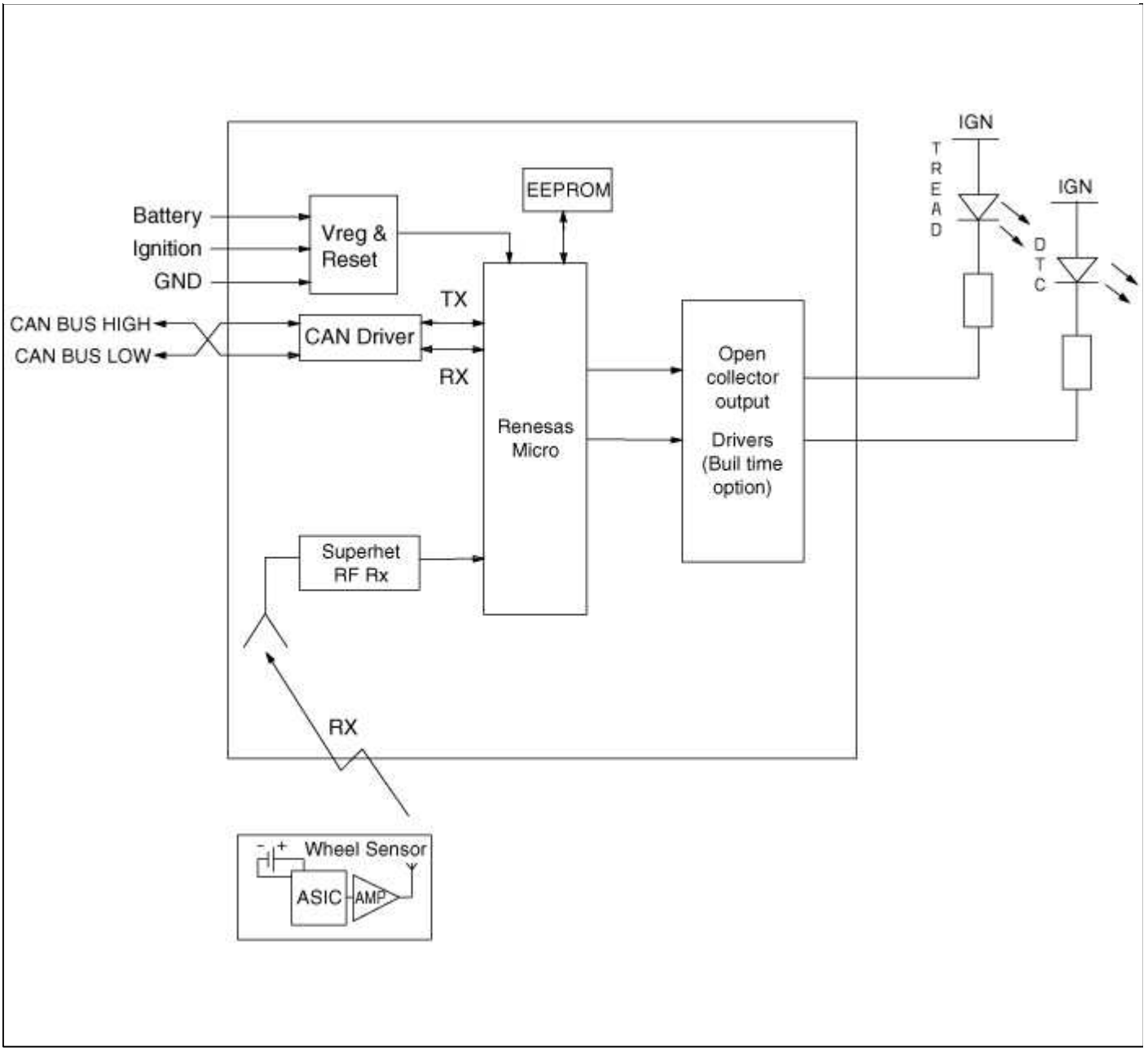
Components



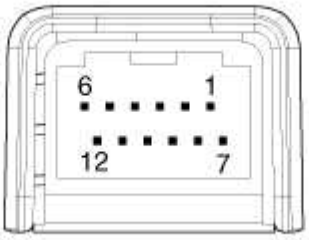
1. Receiver	4. TPMS Sensor (S2)
2. TPMS Sensor (S1)	5. TPMS Sensor (S3)
3. TPMS Sensor (S4)	6. Tread Lamp

Suspension System > Tire Pressure Monitoring System > Schematic Diagrams

Circuit Diagram



Hamess Connector



Pin No.	Discription	Remark
1	-	
2	-	
3	-	
4	Vehicle Ground	
5	CAN_HIGH	
6	Battery	
7	-	
8	-	
9	-	
10	-	
11	CAN_LOW	
12	Ignition	

Suspension System > Tire Pressure Monitoring System > Description and Operation

Description

TREAD Lamp

- Tire Under Inflation / Leak Warning.

1. Turn on condition
   A. When tire pressure is below allowed threshold
   B. When rapid leak is detected by the sensor.
   C. Indicates that tire needs to be re-inflated to placard pressure / repaired.
2. Turn off condition
   A. Under-inflation ; When tire pressure is above (warning threshold + hysteresis).
   B. Rapid Leak ; When tire pressure is above (leak warning threshold).

DTC Warning

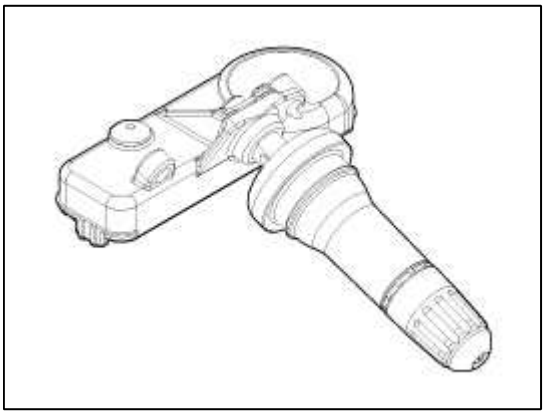
1. Turn on condition
   A. When the system detects a fault that is external to the receiver/ sensor.
   B. When the system detects a receiver fault.
   C. When the system detects a sensor fault.
2. Turn off condition
   A. If the fault is considered as 'critical', then the lamp is held on throughout the current Ignition cycle (even if the DTC has been demoted). This is because it is important to bring the problem to the drivers attention. On the following Ignition cycle, the demotion conditions will be re-checked. If the demotion conditions occur, the lamp will be turned off. It will be held on until DTC demotion checking is completed.
   B. 'Non critical' faults are those that can occur temporarily e.g. vehicle battery under voltage. The lamp is therefore turned off when the DTC demotion condition occurs.

System Fault

1. General Function
   A. The system monitors a number of inputs across time in order to determine that a fault exists.
   B. Faults are prioritized according to which has the most likely cause.
   C. Maximum fault store is equal to 15.
   D. Certain faults are not covered through DTC. The main ones are:
      1) Sensor thermal shutdown (over 257°F/125°C).
      2) Ignition Line stuck ; requires observation of lamps at Ignition ON to diagnose.

Suspension System > Tire Pressure Monitoring System > TPMS Sensor > Description and Operation

Description



1. Mode
   (1) Configuration State
      A. All sensors should be in the Low Line (Base) state.
      B. In Low Line (Base) configuration, sensor transmissions occur every 3 minutes 20 seconds (nominal) and pressure is measured every 20 seconds.
   (2) Normal Fixed Base State
      A. Sensor transmissions continue at the Low Line (Base) configuration defined rates until the state is either changed by LF command or by the sensor detecting a condition that requires a temporary change to another state.
      B. The LF command to this state must contain the sensors ID.
   (3) Storage Auto State:
      A. This state is a Low current consumption state.
      B. Sensors are in this state when they first arrive at the dealership (either on the vehicle or as replacement spares).
      C. In this state, the sensor does not measure pressure / temperature / battery level.
      D. The sensor will not transmit in this state unless requested to do so by the initiate command.

(4) Alert State:

A. The sensor automatically enters this state if the measured temperature exceeds 230 °F(110 °C) and over temperature shutdown is likely.

B. In this state, pressure is measured every 4 seconds and RF data transmitted every 4 seconds.

C. The state lasts for 1 minute if it is pressure triggered.

D. This state is alse entered when a 3 psi change in pressure from the last RF transmission occurs.

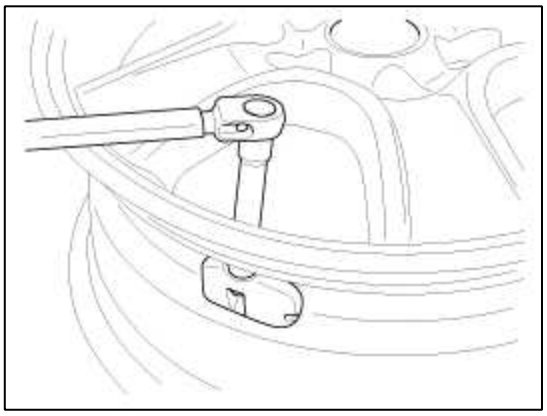
> NOTE
>
> Sensor mode is used to configure sensor between high line and low line system. TPMS sensor for UB should be set to low line.

Suspension System > Tire Pressure Monitoring System > TPMS Sensor > Repair procedures

Removal

> CAUTION
>
> Handle the sensor with care.

1. Remove the tire. (Refer to "Tire Removal")
2. Remove the valve nut.



> CAUTION
>
> The valve nut should not be re-used.

3. Discard the valve assembly.

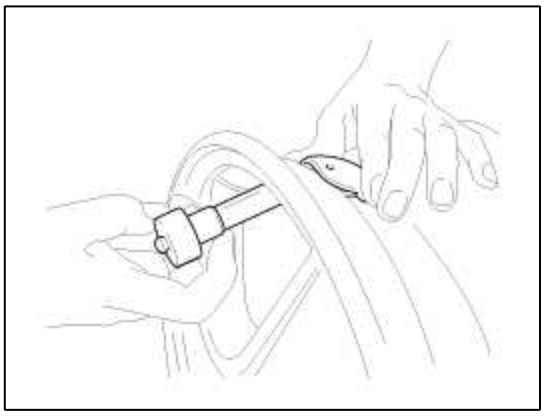
Installation

Sensor Fit

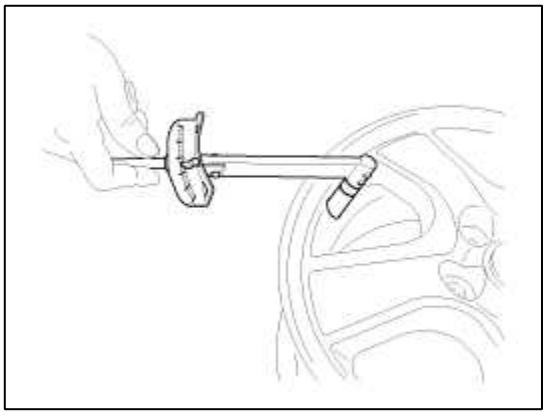
> CAUTION
>
> - Handle the sensor with care.
> - Avoid lubricant contact.
> - Ensure that the wheel to be fitted is designed for sensor mount. There should normally be a mark to indicate this.
> - Ensure that the valve hole and mating face of the wheel are clean.

1. Slide the sensor-valve unit through the valve hole of the rim. Hold the sensor against the rim and the rubber grommet against the sealing surface.

2. Insert the nut over the valve stem and then tighten the nut.



3. Continue to tightening the nut until contact with the rim and then tighten to 3.5 ~ 4.5Nm.



CAUTION

- Tighten slowly with quarter turn steps until the final torque is reached.
- Do not exceed allowed torque.
- Do not use electric or pneumatic tools.

4. Check that the sensor is firmly attached to the rim.

CAUTION

Risk of damage during the tire installation/ removal if the sensor is not firmly attached to the rim.

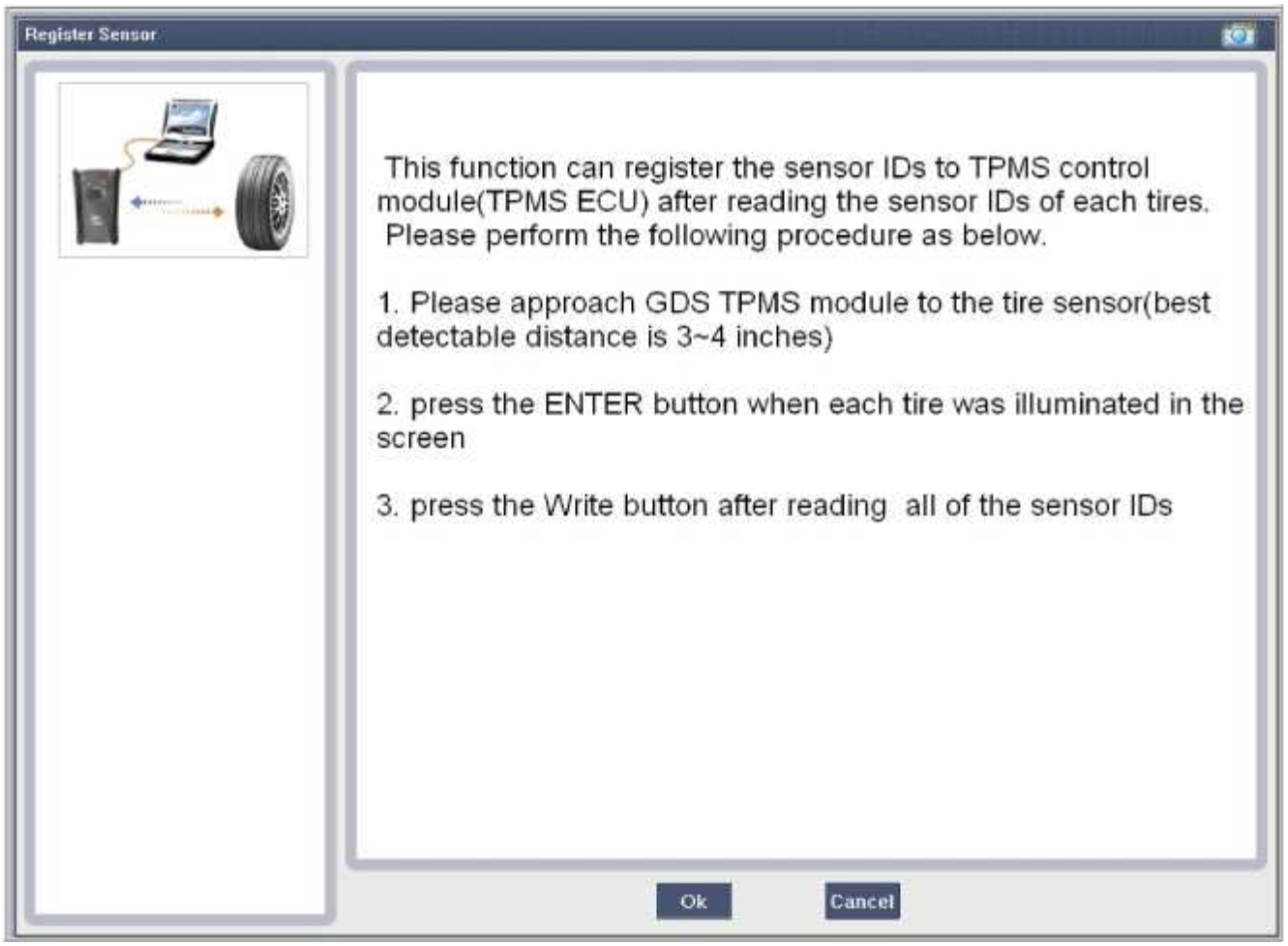
5. Carry out inflation / pressure correction and then fit valve cap.

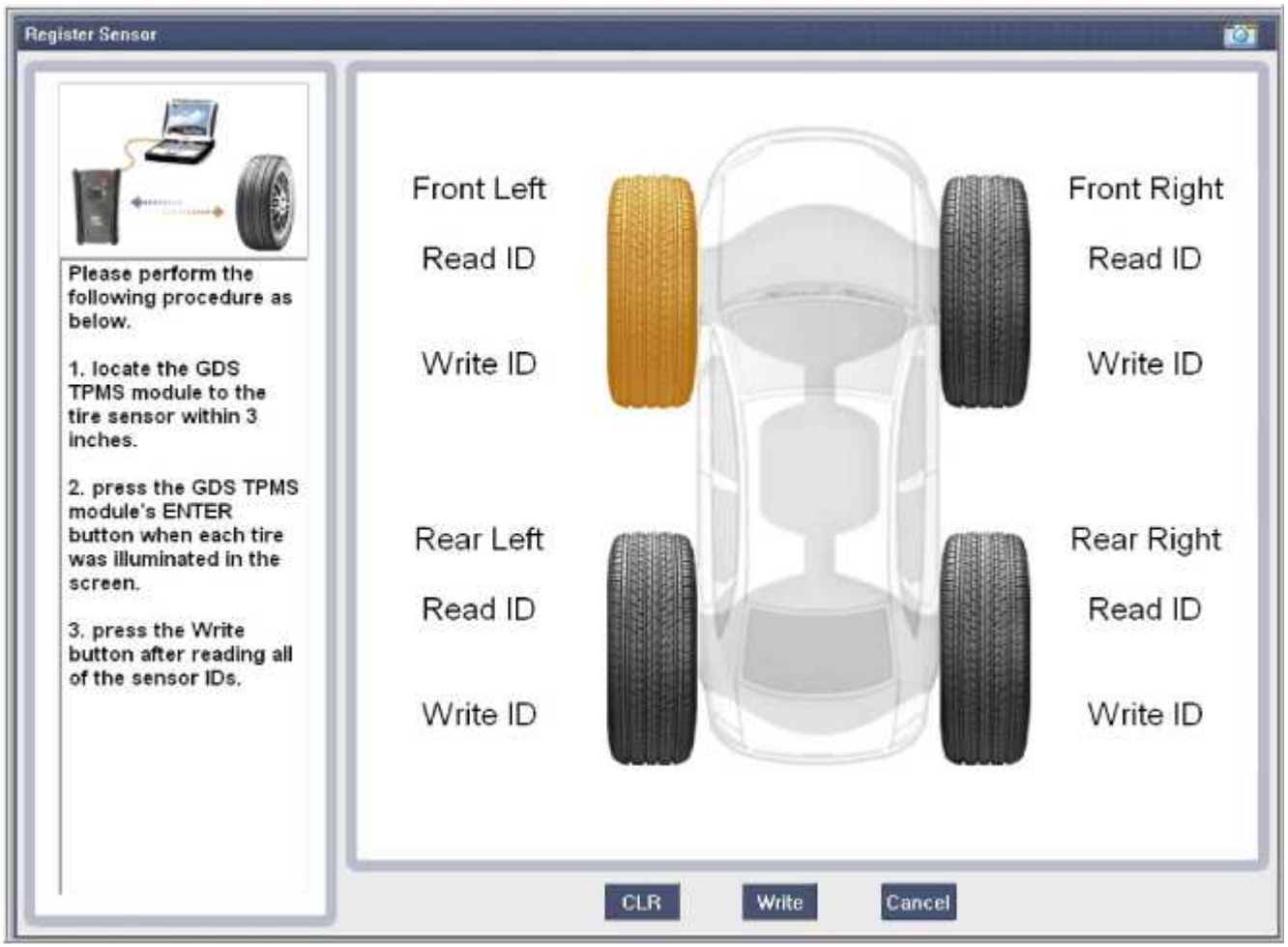
CAUTION

Change the newly installed sensor mode to Normal Fixed Base(Low Line) with the 'GDS'. Mode (Status / option) of the sensor installed to the vehicle should be Normal Fixed Base (Low).

6. Install the tire. (Refer to "Tire Installation")

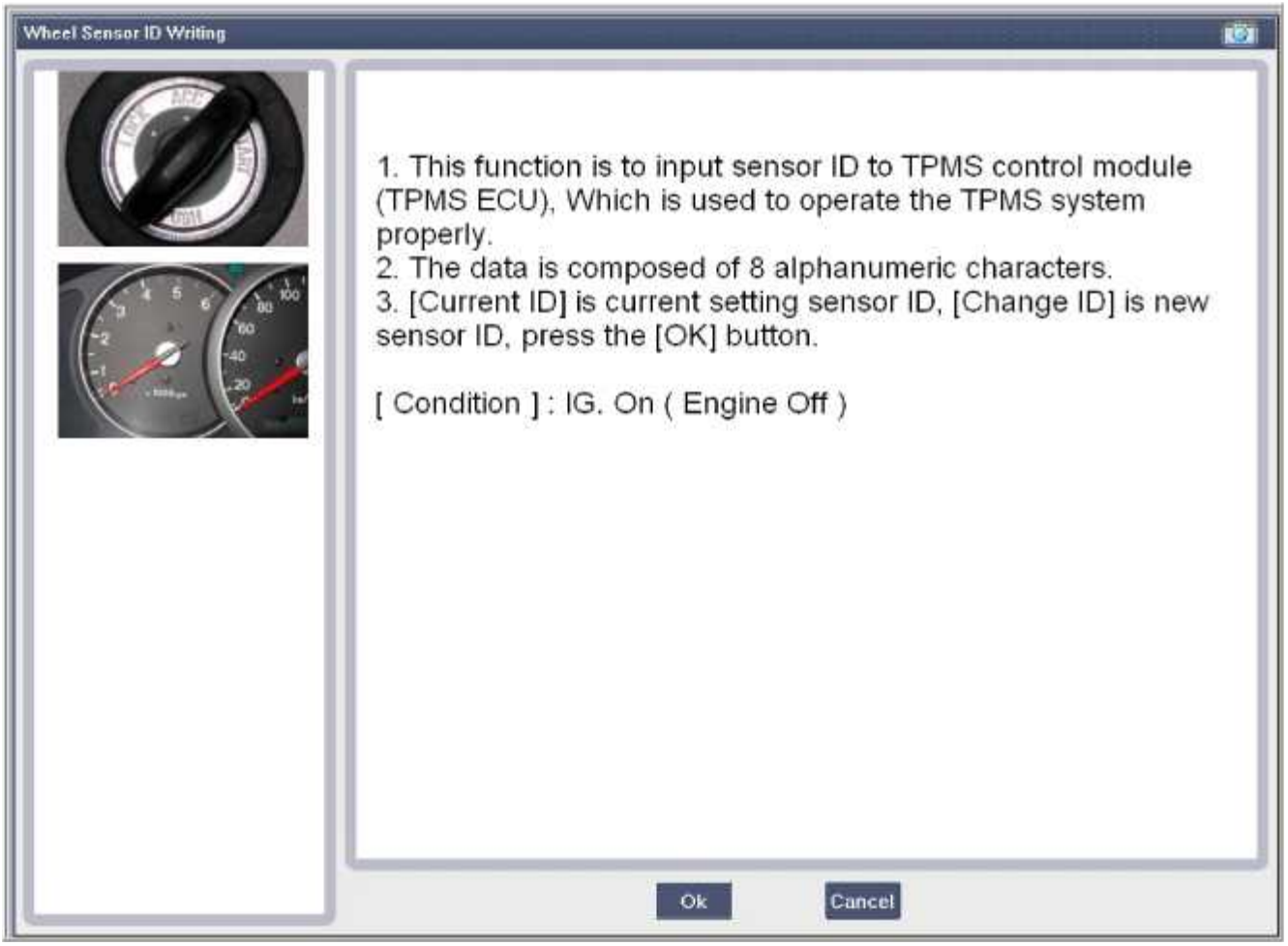
Sensor ID Writing (Wireless)

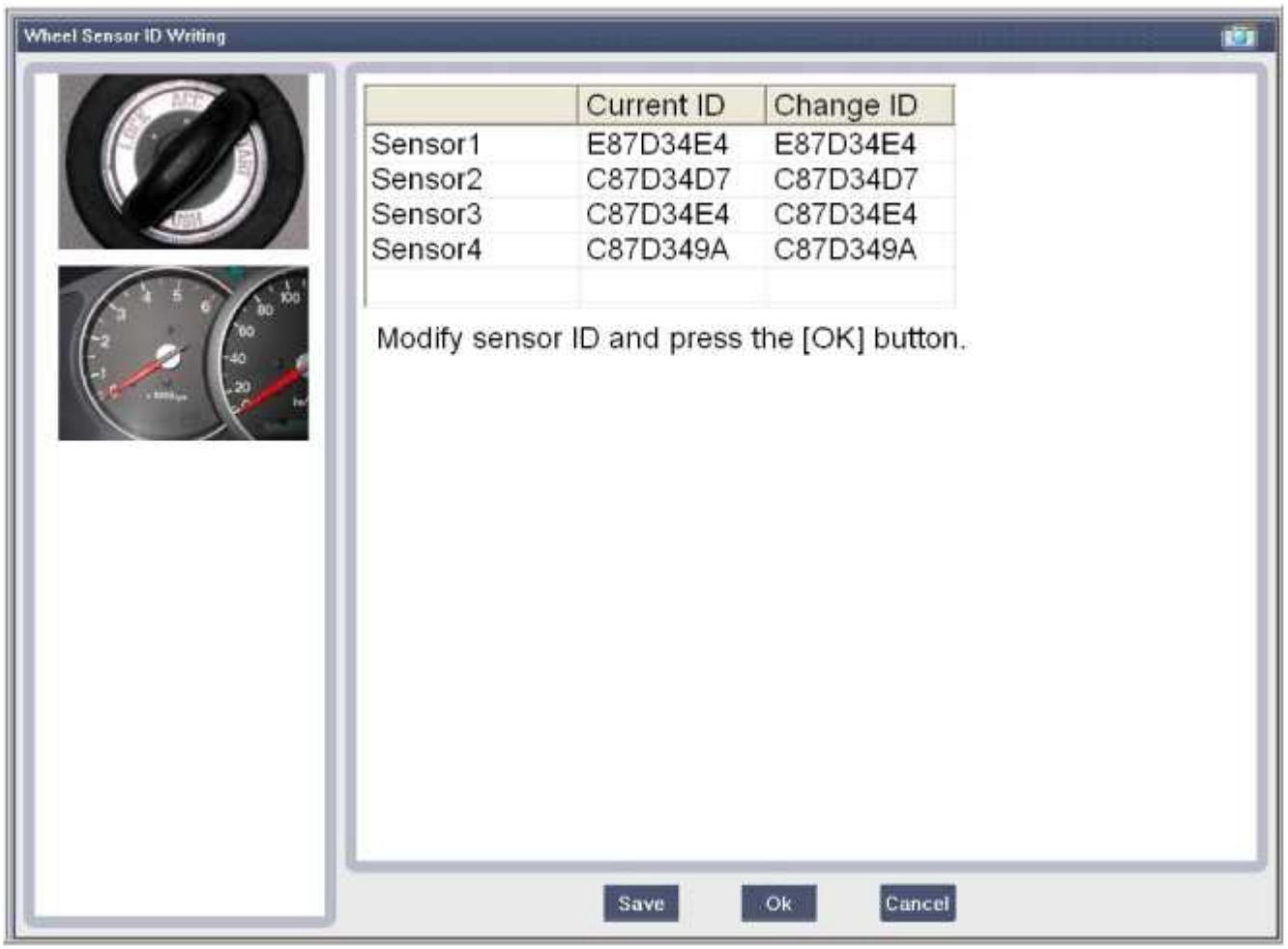

Register Sensor
This function can register the sensor IDs to TPMS control module(TPMS ECU) after reading the sensor IDs of each tires. Please perform the following procedure as below.
1. Please approach GDS TPMS module to the tire sensor(best detectable distance is 3~4 inches)
2. press the ENTER button when each tire was illuminated in the screen
3. press the Write button after reading all of the sensor IDs
Ok
Cancel

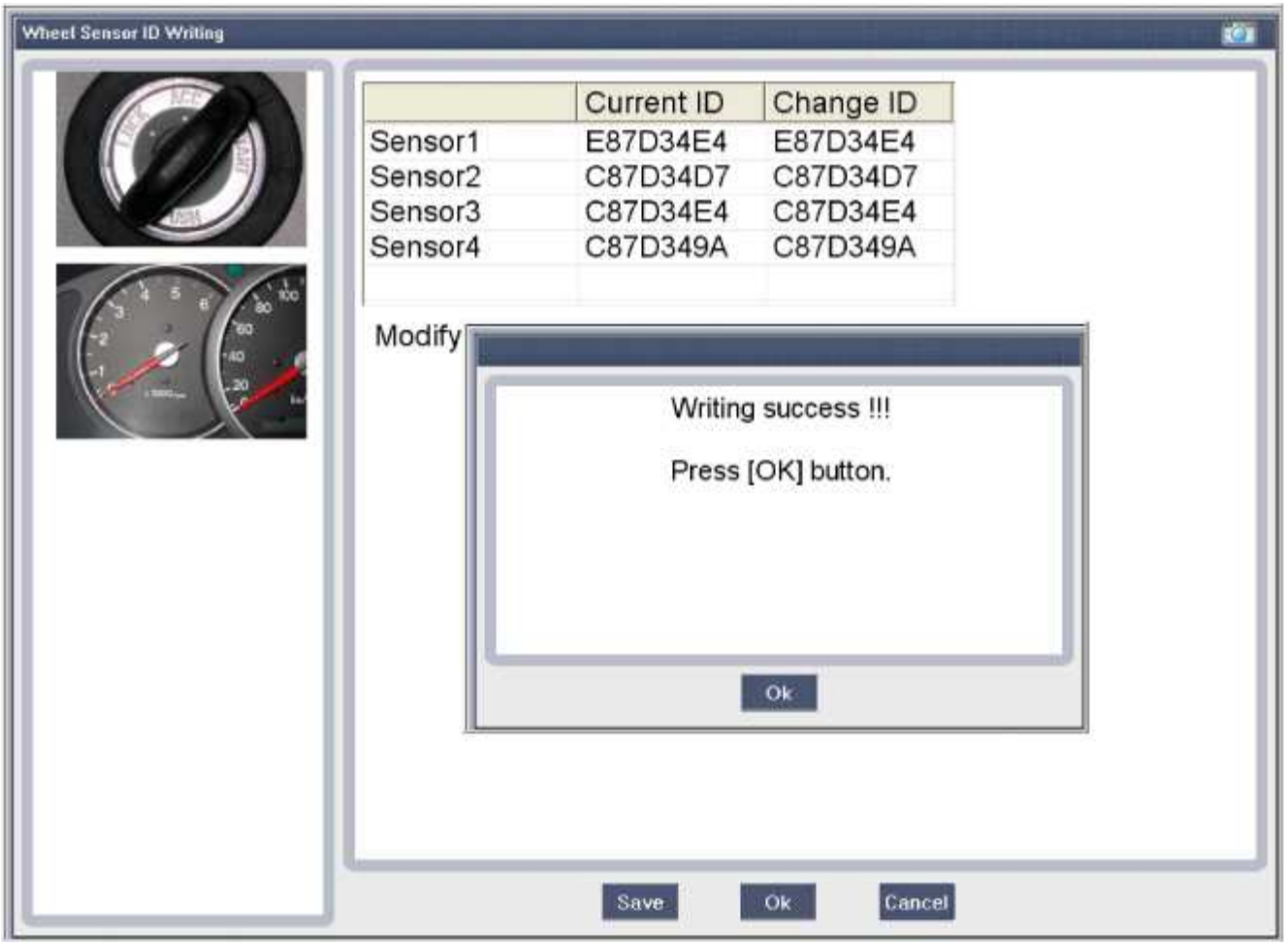

Register Sensor
Please perform the following procedure as below.
1. locate the GDS TPMS module to the tire sensor within 3 inches.
2. press the GDS TPMS module's ENTER button when each tire was illuminated in the screen.
3. press the Write button after reading all of the sensor IDs.
Front Left
Read ID
Write ID
Front Right
Read ID
Write ID
Rear Left
Read ID
Write ID
Rear Right
Read ID
Write ID
CLR
Write
Cancel


Register Sensor
Please perform the following procedure as below.
1. locate the GDS TPMS module to the tire sensor within 3 inches.
2. press the GDS TPMS module's ENTER button when each tire was illuminated in the screen.
3. press the Write button after reading all of the sensor IDs.
Front Left
Read ID
Write ID
Front Right
Read ID
Write ID
GDS TPMS
It takes Max. 30 Sec. Please, wait.....
Cancel
Rear Right
Read ID
Write ID
Write ID
Write ID
CLR
Write
Cancel

Sensor ID Writing

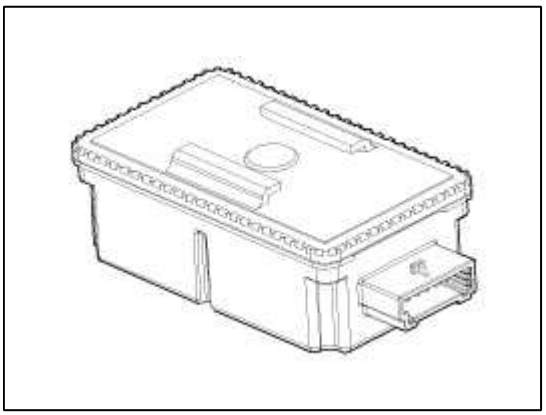

Wheel Sensor ID Writing
1. This function is to input sensor ID to TPMS control module (TPMS ECU), Which is used to operate the TPMS system properly.
2. The data is composed of 8 alphanumeric characters.
3. [Current ID] is current setting sensor ID, [Change ID] is new sensor ID, press the [OK] button.
[Condition] : IG. On (Engine Off)
Ok
Cancel


Wheel Sensor ID Writing
Current ID
Change ID
Sensor1 E87D34E4 E87D34E4
Sensor2 C87D34D7 C87D34D7
Sensor3 C87D34E4 C87D34E4
Sensor4 C87D349A C87D349A
Modify sensor ID and press the [OK] button.
Save
Ok
Cancel



Suspension System > Tire Pressure Monitoring System > TPMS Receiver > Description and Operation

Description



1. **Mode**
   (1) Virgin State
      A. The receiver as a sole part is shipped in this state. Replacement parts should therefore arrive in this state.
      B. In this state, there is no sensor monitoring and no DTC monitoring.
      C. The state indicates that platform specific parameters must be written to the receiver and that sensors are un-learned.
   (2) Normal State
      A. In order for tire inflation state and DTC monitoring to occur, the receiver must be in this state.
      B. In this state, automatic sensor learning is enabled.
   (3) Test State
      A. This state is only used in manufacturing plant to check RF transmission between sensor and receiver.
2. **Overview**
   A. Receives RF data from sensor.
   B. Uses sensor data to decide whether to turn on TREAD Lamp.
   C. Learn TPM sensor for under inflation monitoring automatically.
   D. Uses sensor information, distance travelled, background noise levels, Auto-learn status, short / open circuit output status, vehicle battery level, internal receiver states to determine if there is a system or a vehicle fault.

Operation
1. General Function
   A. Auto-learn takes place only once per Ignition cycle.
   B. On successful completion, 4 road wheel sensor ID's are latched into memory for monitoring.
   C. Until Auto-learn completes, previously learned sensors are monitored for under inflation / leak warnings.
2. General Conditions to Learn New Sensors:
   A. Receiver must determine that it is confident that sensor is not temporary:
      1) Uses vehicle speed.
      2) Uses confidence reduction of previously learned sensors.
   B. Typical time at driving continuously over 12.4 mph(20 kph) to learn a new sensor is up to 20 minutes.
3. General Conditions to Un-Learn a sensor that is removed:
   A. It takes less than 20 minutes at 12.4 ~ 18.6 mph(20 ~ 30kph).
   B. Confidence reduction is dependent on time which vehicle is driven at speed greater than or equal to 12.4 mph(20 kph).

Suspension System > Tire Pressure Monitoring System > TPMS Receiver > Repair procedures

Replacement

NOTE

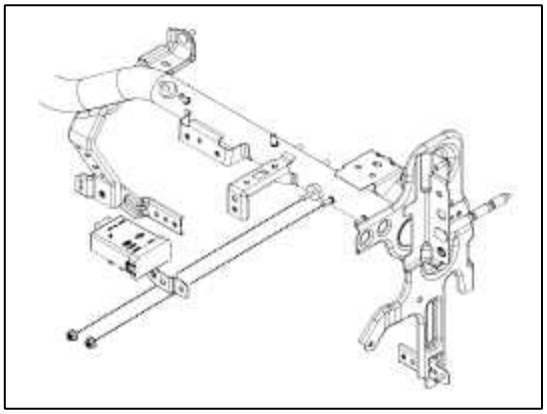
When the receiver first arrives for replacement:
1) It will be in Virgin State.
2) It will not be configured for any specific platform.
3) It will not have any sensor ID's memorized.

CAUTION

It is important to make sure that the correct receiver is used to replace the faulty part i.e. it must be Low Line and not High Line in order to have the correct inflation warning thresholds set.

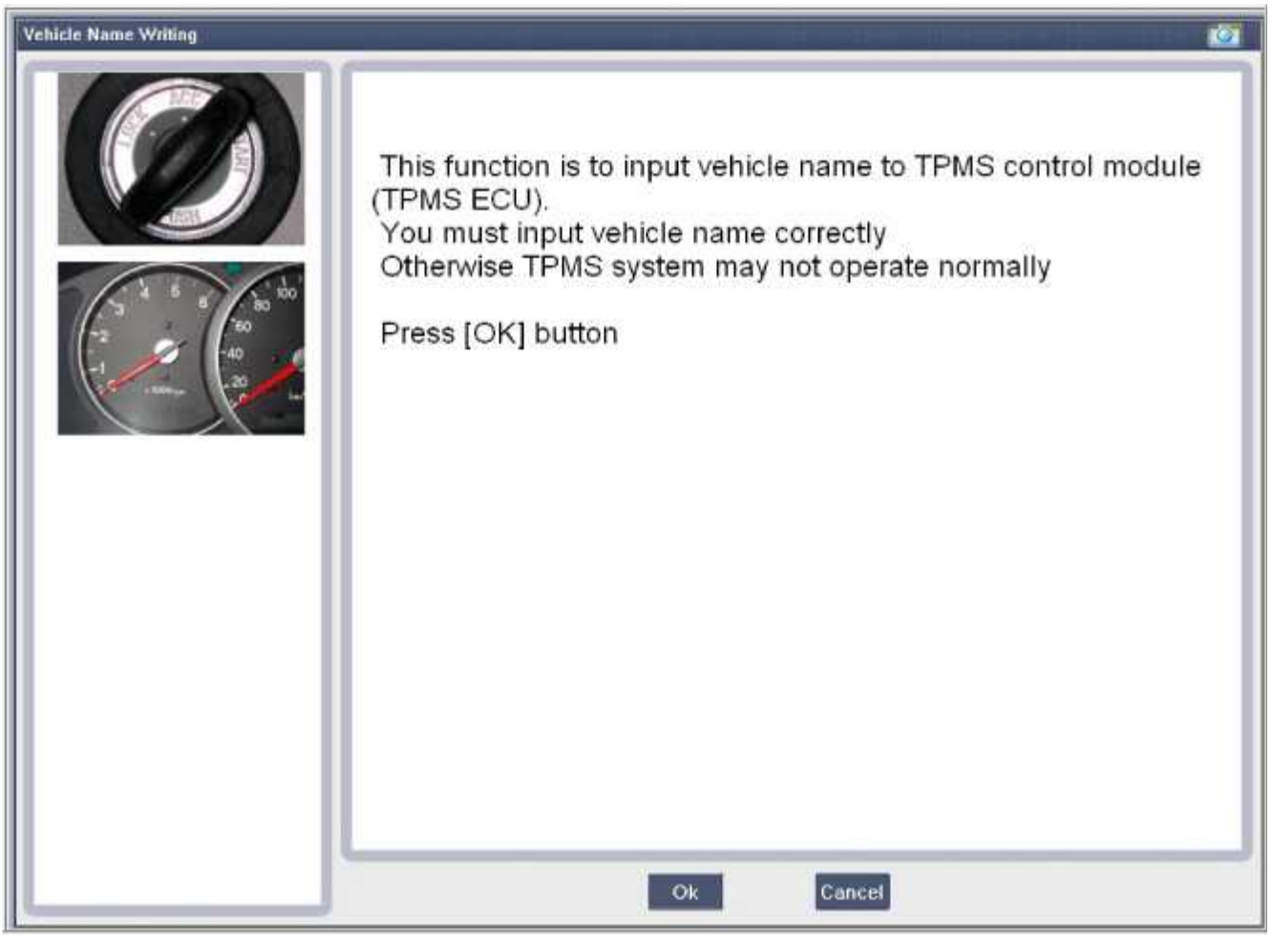
1. Disconnect vehicle battery.

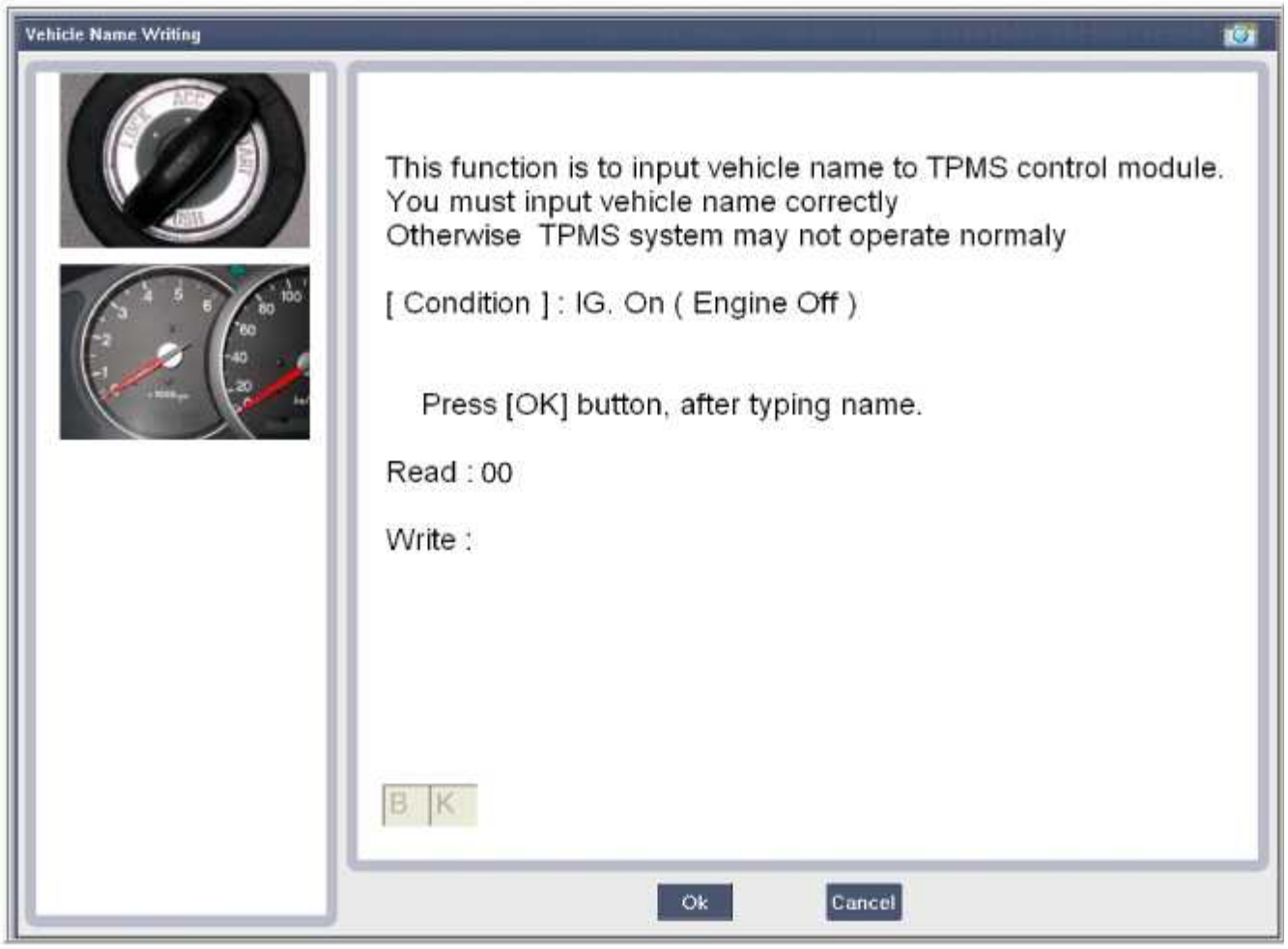
2. Remove the glove box.
   (Refer to BD group - "Crash Pad")
3. Remove the receiver (A) and fit bracket assembly to new part.

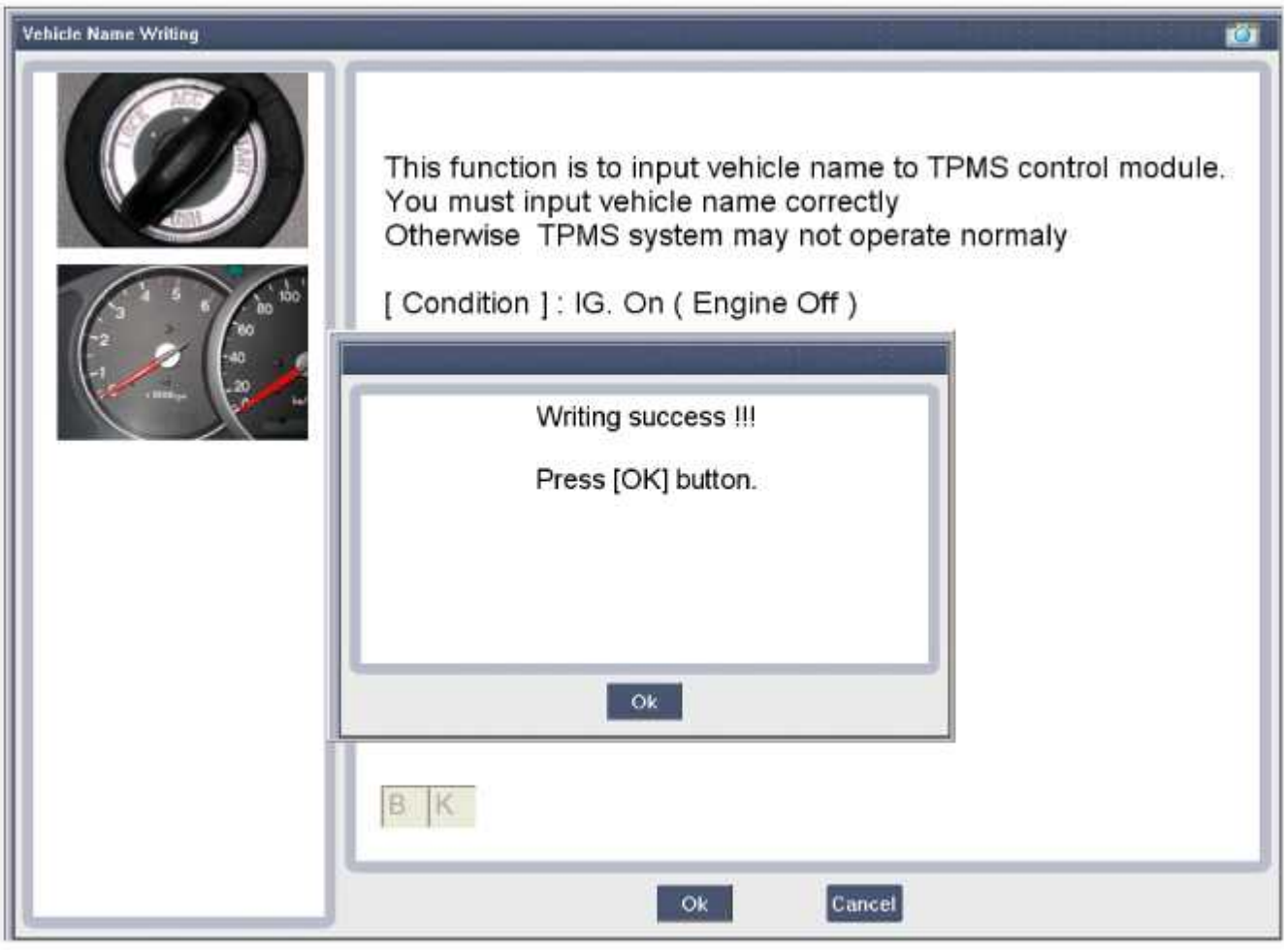


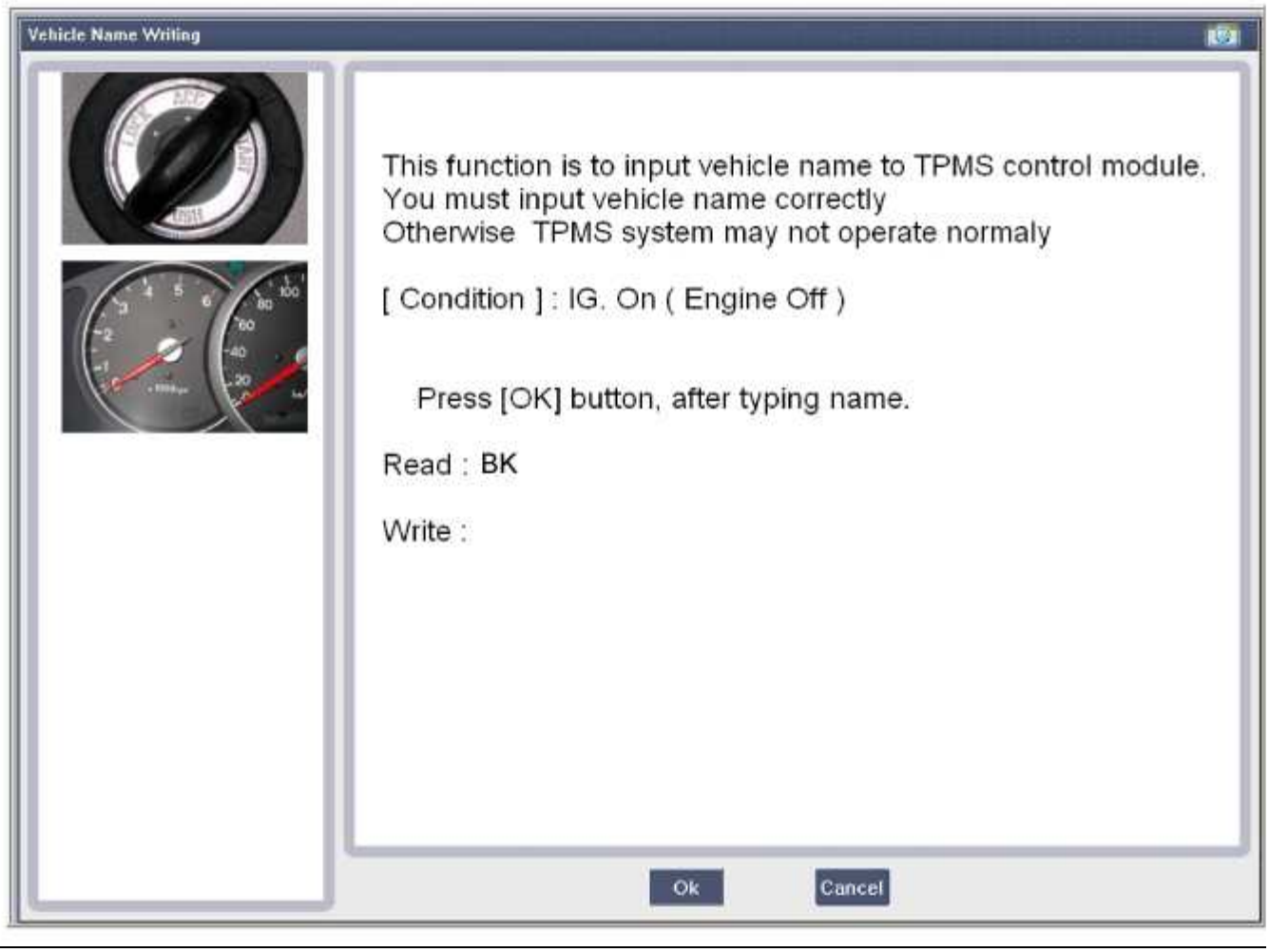
4. Secure new part to vehicle and fit connector.
5. Re-connect battery and turn Ignition on.
6. Check that TREAD Lamp flash rate matches Virgin State indication.

Vechicle Name Writing

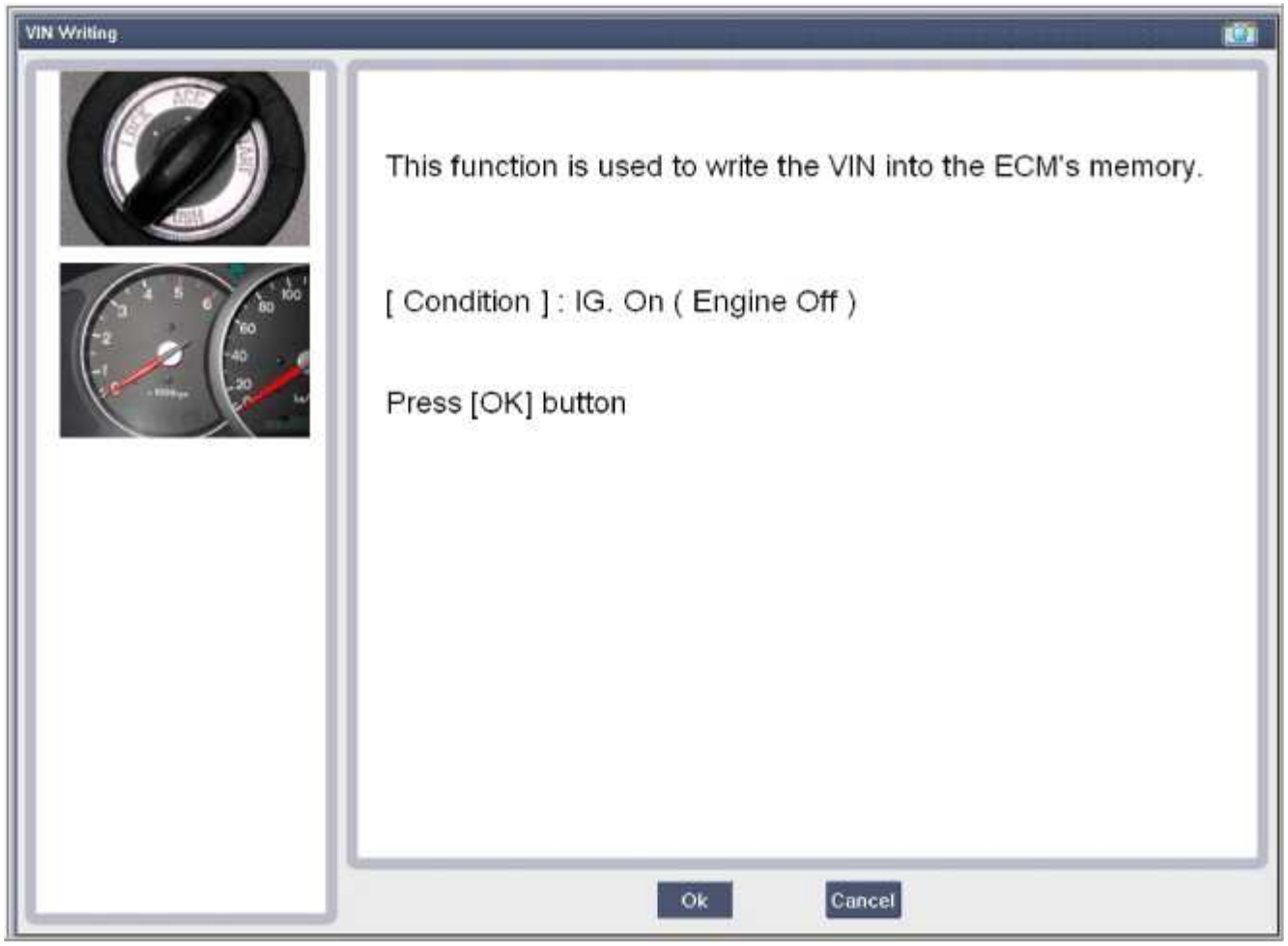


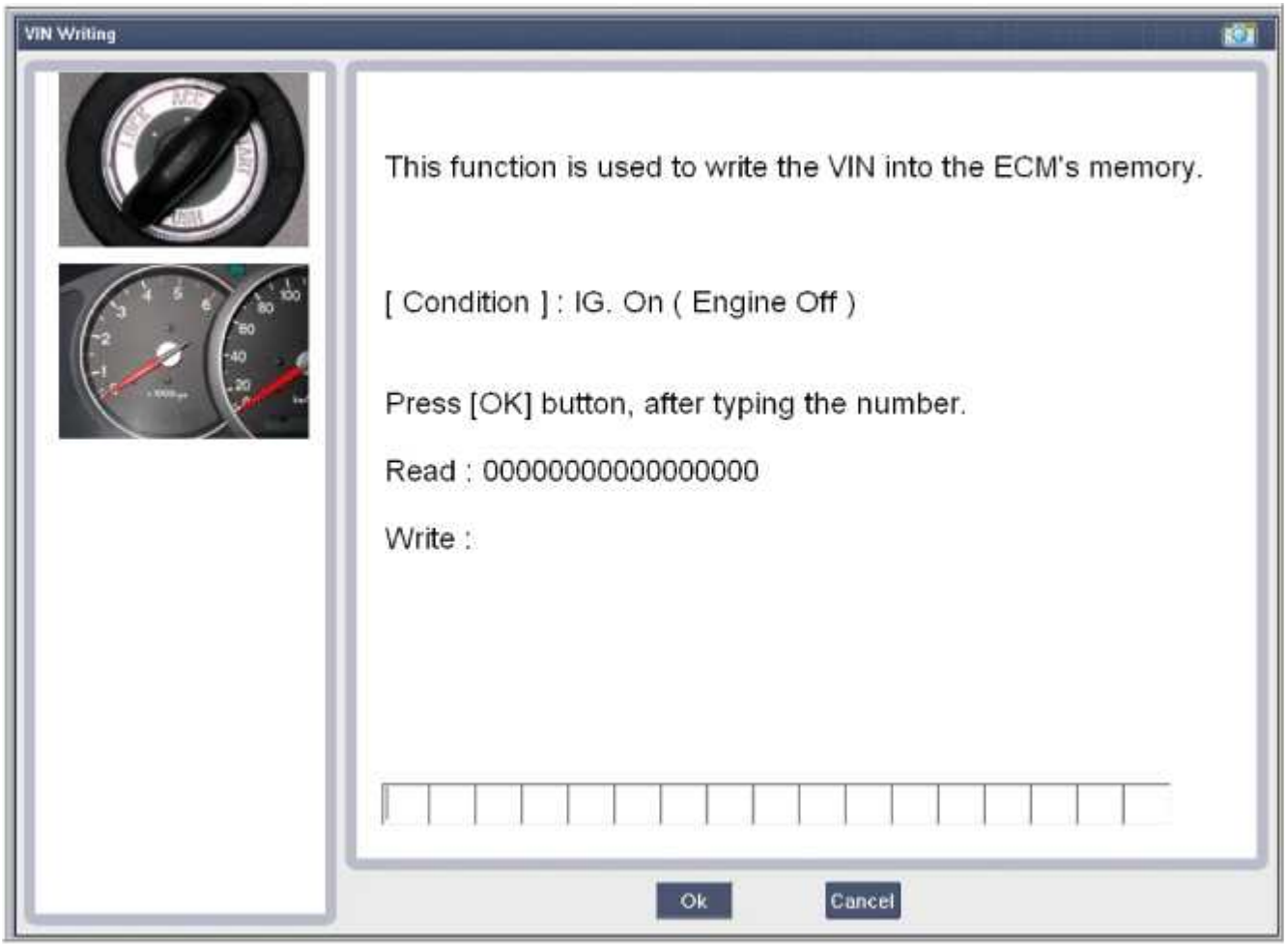

Vehicle Name Writing
This function is to input vehicle name to TPMS control module.
You must input vehicle name correctly
Otherwise TPMS system may not operate normaly
[Condition] : IG. On (Engine Off)
Press [OK] button, after typing name.
Read : 00
Write :
B K
Ok
Cancel

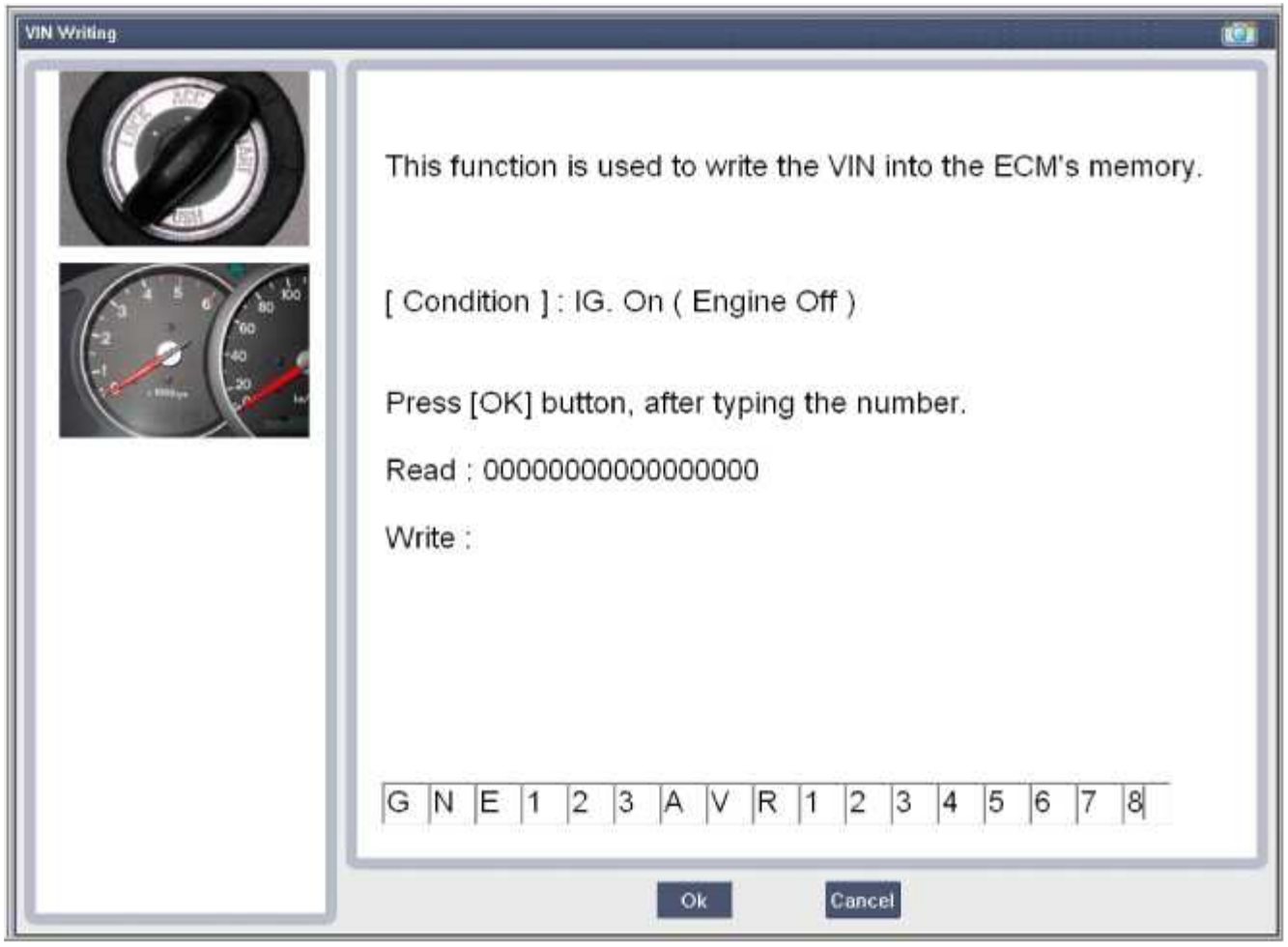

Vehicle Name Writing
This function is to input vehicle name to TPMS control module.
You must input vehicle name correctly
Otherwise TPMS system may not operate normaly
[Condition] : IG. On (Engine Off)
Writing success !!!
Press [OK] button.
Ok
B K
Ok
Cancel

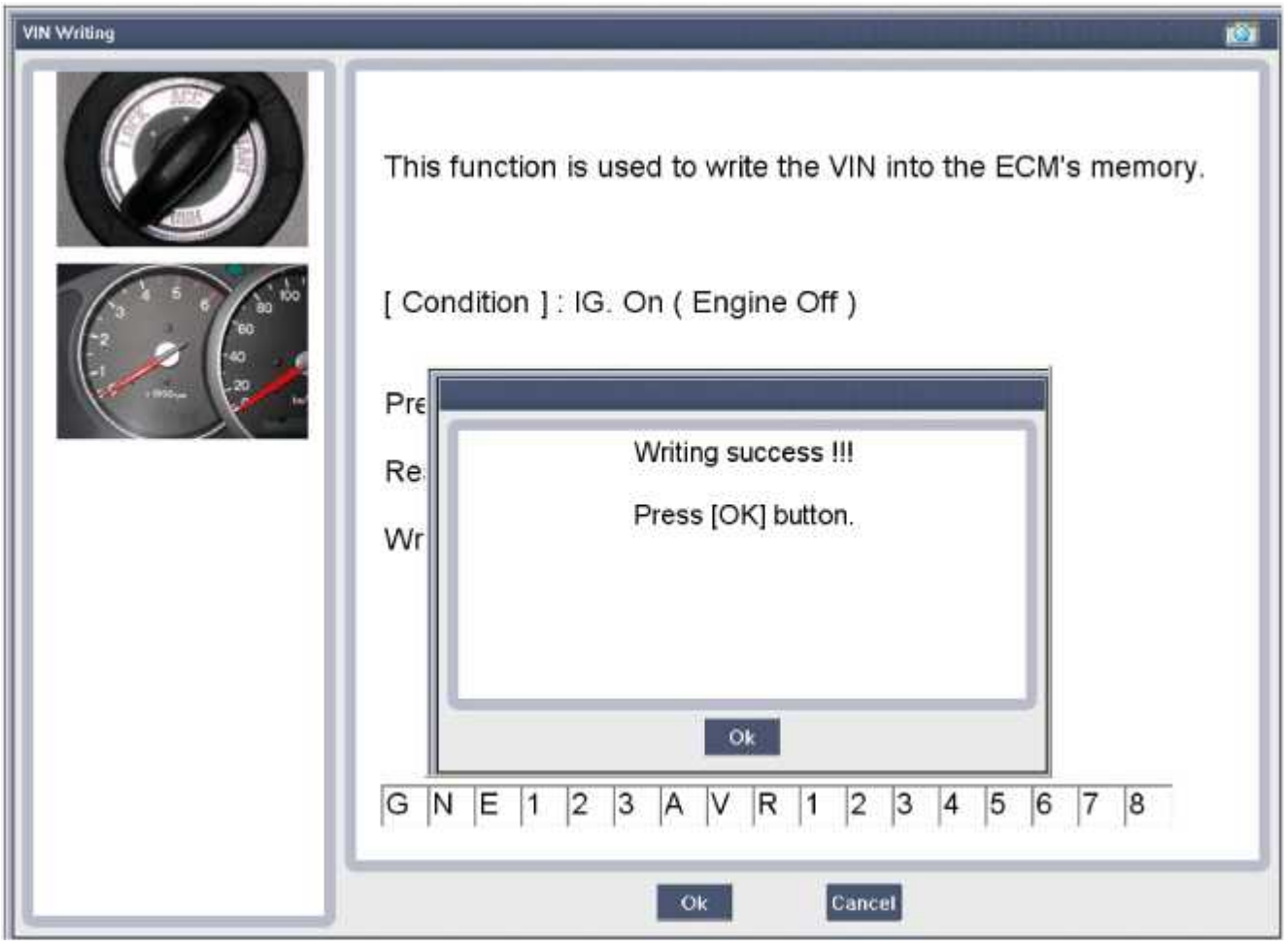

Vehicle Name Writing
This function is to input vehicle name to TPMS control module.
You must input vehicle name correctly
Otherwise TPMS system may not operate normaly
[Condition] : IG. On (Engine Off)
Press [OK] button, after typing name.
Read : BK
Write :
Ok
Cancel

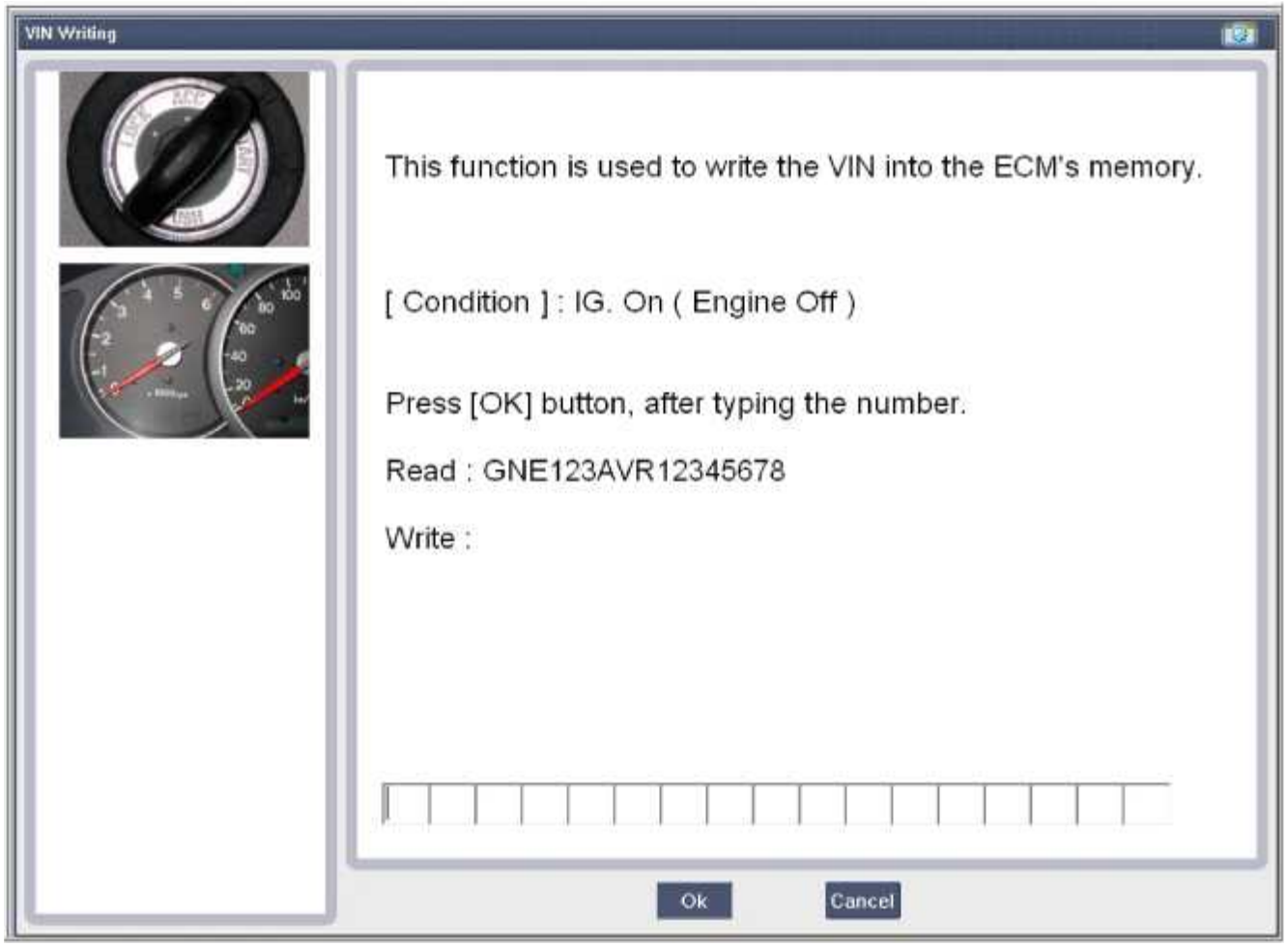
VIN Writing


VIN Writing
This function is used to write the VIN into the ECM's memory.
[Condition] : IG. On (Engine Off)
Press [OK] button
Ok
Cancel


VIN Writing
This function is used to write the VIN into the ECM's memory.
[Condition] : IG. On (Engine Off)
Press [OK] button, after typing the number.
Read : 00000000000000000
Write :
Ok
Cancel


VIN Writing
This function is used to write the VIN into the ECM's memory.
[Condition] : IG. On (Engine Off)
Press [OK] button, after typing the number.
Read : 00000000000000000
Write :
G N E 1 2 3 A V R 1 2 3 4 5 6 7 8
Ok
Cancel


VIN Writing
This function is used to write the VIN into the ECM's memory.
[Condition] : IG. On (Engine Off)
Writing success !!!
Press [OK] button.
Ok
G N E 1 2 3 A V R 1 2 3 4 5 6 7 8
Ok
Cancel


VIN Writing
This function is used to write the VIN into the ECM's memory.
[Condition] : IG. On (Engine Off)
Press [OK] button, after typing the number.
Read : GNE123AVR12345678
Write :
Ok
Cancel