

WHEEL & TIRE**4170-00/4170-09****INDEX****WHEEL TIRE****GENERAL INFORMATION**

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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



GENERAL INFORMATION

1. SPECIFICATION

Description		Specification	Remark
Tire	16 inch	215 / 65R 16	Standard
	17 inch	225 / 60R 17	Optional
	18 inch	225 / 55R 18	Optional
Tire inflation pressure		32psi	-
Wheel	16 inch	6.5 J X 16	Standard
	17 inch	6.5 J X 17	Optional
	18 inch	6.5 J X 18	Optional
Balance weight		Inner: Clip-on type Outer: Adhesive type	- -
Tightening torque of wheel bolt		127.4 ~ 156.8 Nm	17mm X 5 (Length:56.5 mm)

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Modification basis	
Application basis	
Affected VIN	

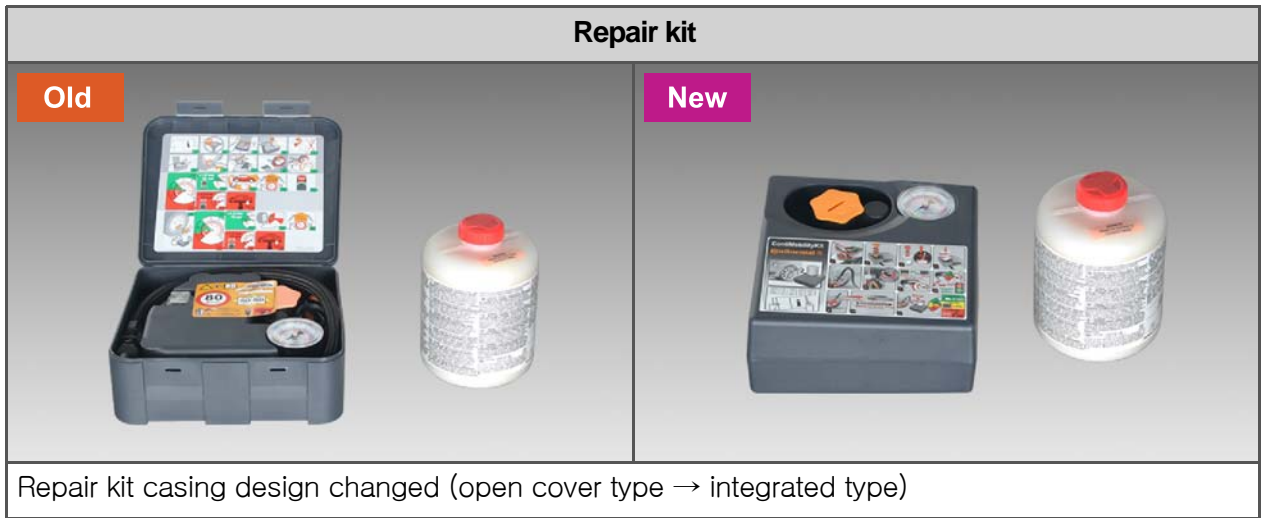
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2. MAJOR CHANGES

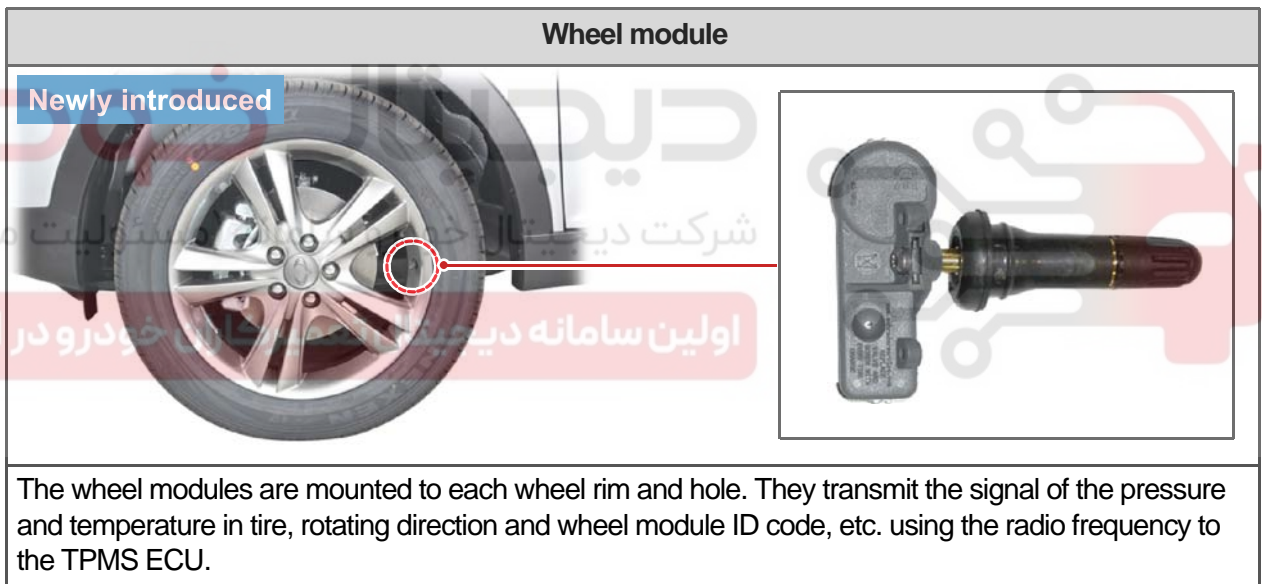
► Wheel assembly changed

Wheel Assembly		
Old		
16-inch Silver	17-inch Silver	18-inch Hyper silver
PN: 41730-34000	PN: 41730-34100	PN: 41730-34220
		
New		
16-inch Silver	17-inch Silver	18-inch Diamond cutting
PN: 41730-34200	PN: 41730-34300	PN: 41730-34400
		
- 16, 17 and 18-inch wheel assembly design changed (For 17-inch: existing 18-inch design used) (For 18-inch: Hyper silver type → Diamond cutting type) - Wheel offset and tire size same as before		

► Repair kit changed



► Newly added TPMS (Tire Pressure Monitoring System)



Modification basis	
Application basis	
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OVERVIEW AND OPERATING PROCESS

1. OVERVIEW

A radial tire uses a cord angle of 90 degrees. That is, the cord material runs in a radial or direct line from one bead to the other across the tread. In addition, a radial tire has a belt overwrap under the tread surface to provide greater structural stability. The belt overwrap of a radial tire distortion while the radial structure enables high speed driving.

Tire supports the weight of the vehicle, reduces the impact from the road and at the same time, transmits the power to propel, brake and steer on the road. It also functions to maintain a vehicle's movement. In order to complete such tasks, a tire must be structured to be a resilient vessel of air.

There is wear limit mark on the tire, which protrudes as a strip shape located approximately 1.6 mm from the groove bottom. This wear limit mark is not seen from the outside so there is additional "▲" mark on the shoulder to let the driver find the wear mark easily. To measure the tire groove depth, measure at any point other than the point which has a wear limit mark.

The tire is worn unevenly according to the driver's driving habit, improper servicing, low tire inflation pressure, changed tire location, etc.

1) Structure of Tire

Tread

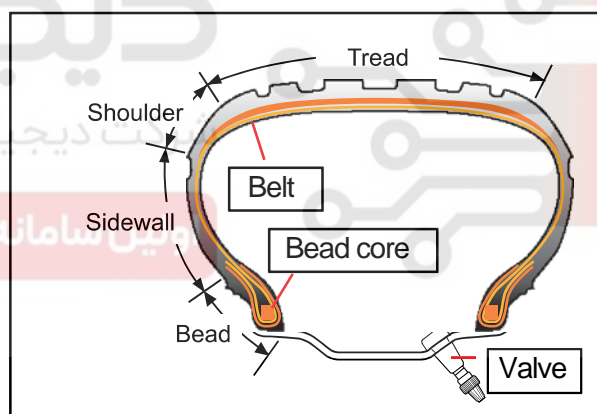
This thick layer of rubber provides the interface between the tire and the road. Wear-resistant rubber is used to protect the carcass and belt against fractures and impacts and to deliver a long driving life.

Shoulder

Located between the tread and sidewall, the shoulder rubber is the thickest so that the design must allow for the easy diffusion of heat generated within the tire while driving.

Sidewall

The part between the shoulder and bead, the flexible sidewall protects the carcass and enhances the ride. A tire's type, size, structure, pattern, manufacturing company, product name and various characters are indicated here.



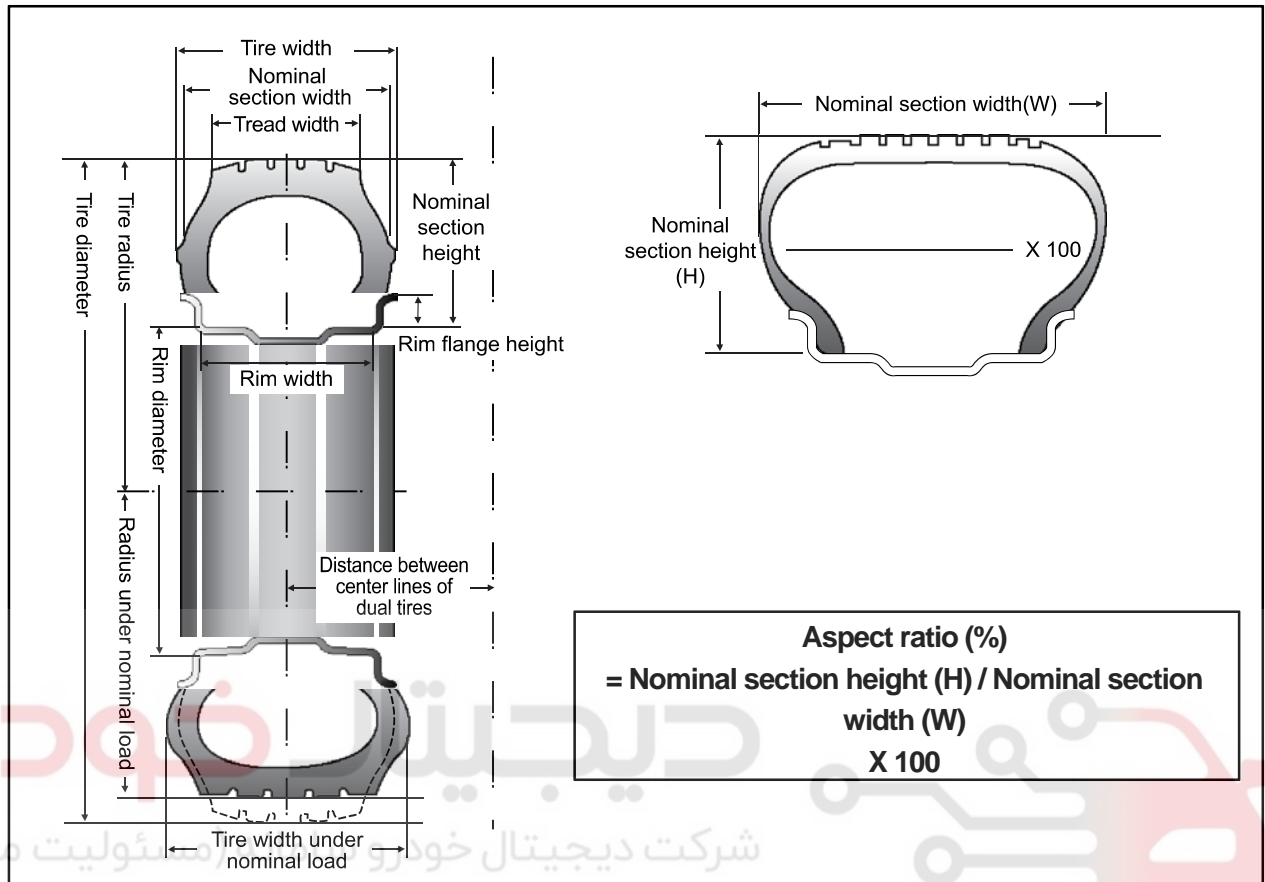
Bead

The bead attaches the tire to the rim and wraps the end of the cord fabric. Comprised of the bead wire, core, flipper and other parts, the bead is generally designed to be slightly tight around the rim so that in the case of a sudden drop in inflation pressure, the tire will not fall off the rim.

Carcass

As the most important framework of a tire, the entire inner layer of cord fabric is called the carcass. The carcass acts to support air pressure, vertical load and absorb shocks.

2) Tire Unit Indication



3) Tire Inflation Pressure (32 psi)

Proper inflation pressure	Excessive inflation pressure	Low inflation pressure
<p>Tread width</p> <p>The contact area between the ground and tire faces the tread layer completely. Thus the driving force and the braking force are optimized, and the tire is worn out evenly resulting in increased life.</p>	<p>Tread width</p> <p>The contact area between the ground and tire is not enough, so the tire is worn out unevenly and the tire is vulnerability to outside influence.</p>	<p>Tread width</p> <p>The contact area between the ground and tire is excessive, so a lot of heat is generated and the tire is worn out unevenly and abnormally.</p>

Modification basis	
Application basis	
Affected VIN	

2. ABNORMAL TIRE SYMPTOM

1) Standing Wave



Specified tire inflation pressure

32psi

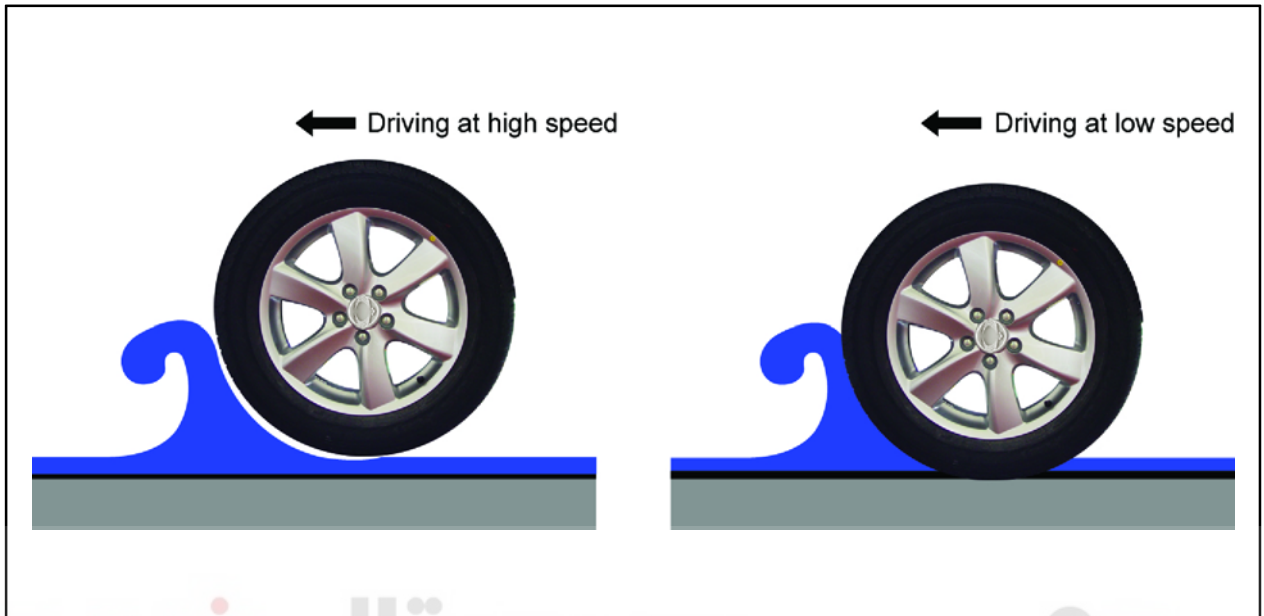
During driving, the rotating tire repeats deformation and restoring movement in its tread. This happens when the tire pressure is low in high speed driving.

However, when the wheel rotating speed is fast, the tire is deformed even before it is restored to its original shape and the trembling wave appears on the tread portion. If this symptom lasts for an extended period of time, the tire can be blown out in a short period of time.

If the standing wave symptom occurs on the tire, rubber on the tread comes off and eventually the tire can be blown out which is very dangerous. When driving at high speed, the inflation pressure should be increased to decrease heat generation due to extension and contraction motion, to decrease hydroplaning and to prevent standing wave.

To prevent this symptom, it is recommended to increase the tire pressure 10 ~ 30 % higher than the specified pressure value in high speed driving.

2) Hydro Planing



When the vehicle is driven on a road surface covered with water at high speed, tires do not contact with the road surface but rotate floating on a thin film of water.

It causes brake failure, lower traction force and losing the steering performance.

To prevent this, increase the tire inflation pressure, use tires with leaf shape tread which is not worn.

However, it is a best measure to drive slowly.

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Modification basis	
Application basis	
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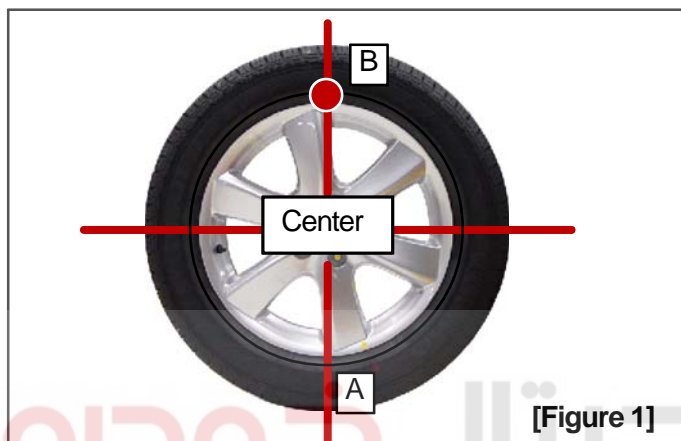
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3. WHEEL BALANCE

If weight is not equally distributed around the wheel, unbalance centrifugal force by the wheel rotation produces vibration. As the centrifugal force is produced proportional to the square of the rotating speed, the wheel weight should be balanced even at high speed. There are two types of the tire and wheel balancing: static and dynamic. Abnormal vibration may also occur due to unbalanced rigidity or size of tires.

1) Static Balance



[Figure 1]

When the free rotation of the wheel is allowed, the heavier part is stopped on the bottom if the wheel weight is unbalanced and this is called "Static Unbalance". Also, the state at which tire's stop position is not same is called "Static Balance" when the wheel is rotated again. If the part A is heavier as shown in the figure 1, add the balance weight of a weight corresponding to unbalanced weight from B to A to maintain the static balance. If the static balance is not maintained, tramping, up and down vibration of the wheels, occurs.

2) Dynamic Balance

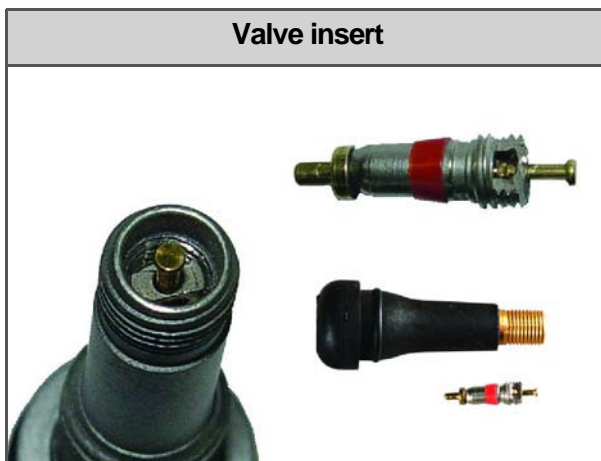


[Figure 2]

The static unbalance of the wheel creates the vibration in the vertical direction, but the dynamic unbalance creates the vibration in the lateral direction. As shown in the figure 2 (a), if two parts, (2) and (3), are heavier when the wheels are under the static balance condition, dynamic unbalance is created, resulting in shimmy, left and right vibration of the wheels, and the torque Fxa is applied in the axial direction. To correct the dynamic unbalance, add the balance weight of a same weight for two points of the circumference of the rim, A and B, as shown in the figure 2 (b), and apply the torque in the opposite direction to the torque Fxa to offset in order to ensure smooth rotation of the wheel.

CONFIGURATION AND FUNCTION

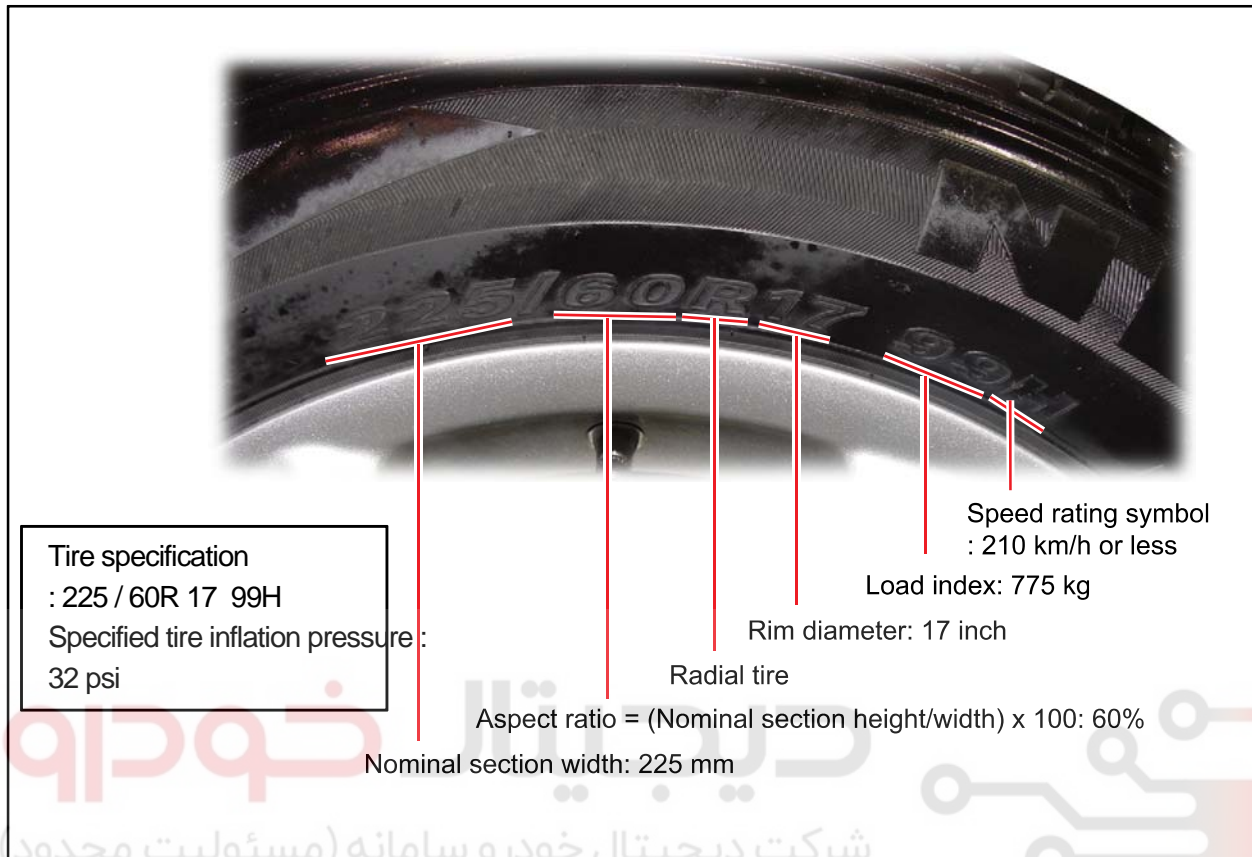
1. CONFIGURATION



Modification basis	
Application basis	
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1) Tire Specification Code (for Radial Tire)



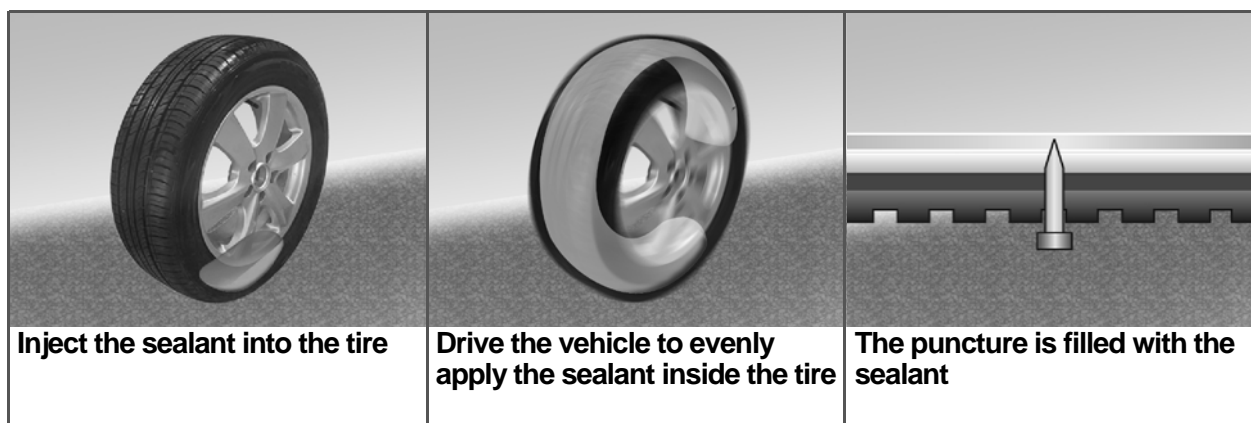
► Speed rating symbol

Rating symbol	Maximum speed (Km/h)
F	80
M	130
N	140
P	150
O	160
R	170
S	180
T	190
U	200
H	210
V	240
Z	240 or higher

► Load index

Rating symbol	Maximum Load (kg)
94	670
95	690
96	710
97	730
98	750
99	775
100	800
101	825
102	850
103	875
104	900
105	925

2. EMERGENCY PUNCTURE REPAIR KIT



Connect the repair kit to the tire and activate the kit, then both air and sealant are injected into the tire automatically by the compressor. Drive the vehicle for short time to apply the sealant around the puncture site. The sealant becomes solid by the heat and vibration and the puncture will be filled with it.

1) Features and Purpose of Service Kit

1. Saving time

If you change the flat tire with the spare tire, it takes about 30 minutes or so. But if you use the repair kit, 10 minutes is enough.

2. No need to be exposed to a dangerous place

Because of the short working time, you don't have to wait for a towing vehicle or change the tire on a dangerous road with passing traffic. Less fuel due to the decreased weight. Most of tire punctures can be repaired by the

3. repair kit

4. Easy to use

According to a survey, most of women drivers

5. said she couldn't change a flat tire. This repair kit is very easy to use, even for the women drivers.



6. Easy to use and carry with compact size and light weight

7. Can be used for most kinds of vehicle tires

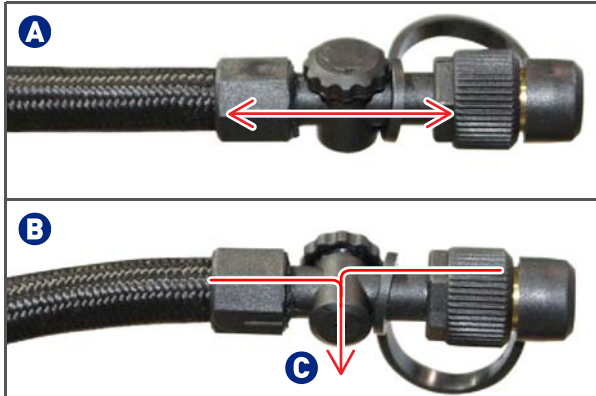
Enable to inject air and measure tire pressure. In addition to flat tire repair, this kit can be used

8. to add air and measure the tire pressure for safety.

It is also possible to air up a tube.

Modification basis	
Application basis	
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How to adjust tire pressure using repair kit



A. When you lock the air pressure control by turning it clockwise, the pressure built up in the repair kit enters into the tire until the tire pressure becomes same as that of repair kit.

B. When unlocking the air pressure control by turning it anticlockwise, the pressure in the tire and repair kit is released to the air.

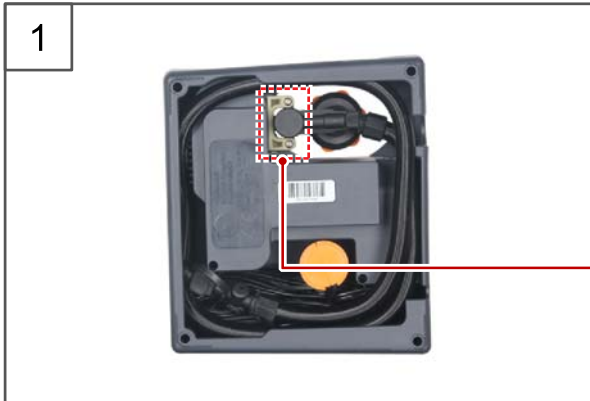
⚠ CAUTION

When releasing the air pressure to the air, the sealant may come out of the (C) spot. Avoid getting sealant on your skin. In case of skin contact, wash thoroughly with soap and water.

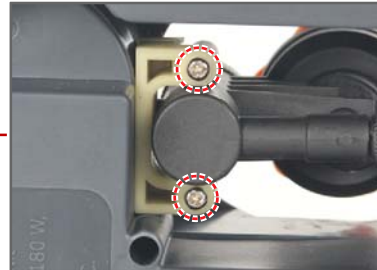
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2) How To Replace Air Hose In Repair Kit



1. Unscrew the 2 mounting screws at rear of the repair kit.



2. Slide the repair kit air hose to the arrow direction to remove it.

3. Install in the reverse order of removal.

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Modification basis	
Application basis	
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REMOVAL AND INSTALLATION

S.G.N.



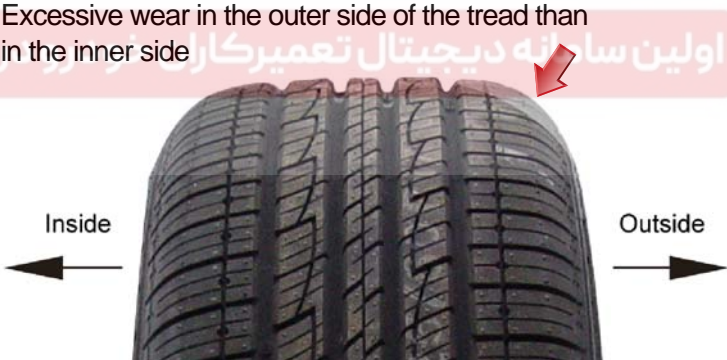

4170-00 TROUBLESHOOTING

Problem	Possible Cause	Action
Uneven tire wear	Incorrect tire pressure	Adjust
	Unbalanced wheel	Adjust
	Improper location change of tire	Change tire location in specified interval
	Incorrect toe adjustment	Adjust
	Incorrect wheel bearing preload adjustment	Adjust
	Malfunction of brake system	Adjust
Tire squeal, vibration	Too low tire pressure	Adjust
	Unbalanced wheel or tire	Adjust
	Heavy vibration of wheel or tire	Repair or replace
	Uneven tire wear	Check and adjust
Premature tire wear	Too high tire pressure	Adjust
	Fast driving with low pressure tire	Adjust
	Overload	Adjust

S.G.N.




4170-00 INSPECTION

1) Appearance Check

Symptom	Possible Cause
<p>Wear at tread edge</p> 	Insufficient tire inflation pressure or overload
<p>Wear at tread center</p> 	Excessive tire inflation pressure
<p>Excessive wear in the outer side of the tread than in the inner side</p> 	Excessive camber or deflection of knuckle arm
<p>Excessive wear in the inner side of the tread than in the outer side</p> 	Insufficient camber

Modification basis	
Application basis	
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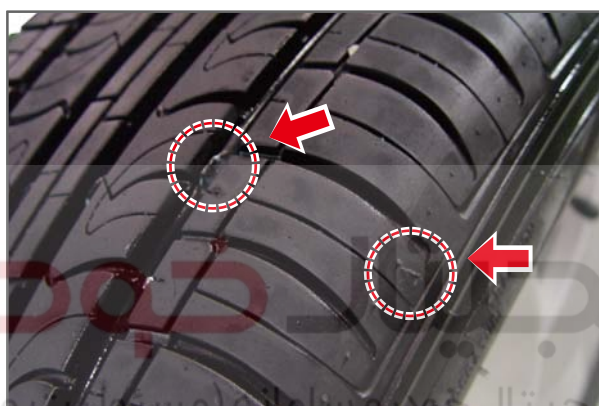
Symptom	Possible Cause
<p>Blade type wear from outer side toward inner side of the tread</p> 	<p>Excessive toe-in Deflection of knuckle arm Difference in tie rod length between left and right sides</p>
<p>Blade type wear from inner side toward outer side of the tread</p> 	<p>Excessive toe-in Deflection of knuckle arm Difference in tie rod length between left and right sides</p>
<p>Corrugation wear of tread</p> 	<p>Poor wheel balance, loose wheel bearing, poor wheel alignment</p>
<p>Flat wear in one part or two to three parts of the tread</p> 	<p>Poor wheel alignment, poor wheel balance, loose wheel bearing, loose ball joint, loose tie-rod end, deflection of axle, eccentric force applied on the brake drum</p>

2) Typical Inspection



1. Tread

Inspect the tread condition on the tire surface and various damages resulting from the foreign materials, crack, stone or nail etc. If there is any damage in the tire, repair or replace it.



2. Wear limit

- Measure the depth of the tire tread. If the depth of the tread is below the specified value, replace the tire.

Wear limit	1.6 mm
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- You can see the protruded part in the groove at the point with mark "▲", which is the indicator of the tread wear limit.
- The limit of the tread wear for all season tires are 1.6 mm, which is the same as the general tires, but the wear limit mark is indicated as '↓'.

CAUTION

- Higher than recommended pressure can cause hard ride, tire bruising or damage and rapid tread wear at the center of the tire.
- Excessive tire wear over the limit of the tread wear (1.6 mm) can cause lower sliding friction due to longer braking distance, easy tire burst by foreign materials, tire hydroplaning, and tough brake and steering wheel handling.

Modification basis	
Application basis	
Affected VIN	

3. Wheel runout

If wheel runout or tire runout is excessive, it could result in abnormal wear of the tire.

Measure the runout with a dial gauge.

- Measure the dial runout and lateral runout on both the inboard and outboard rim flanges.

Specified value	2.66 mm
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- Measure free radial runout on the tire tread.

Specified value	2.03 mm
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CAUTION

- If any measurement exceeds the above specifications, replace the applicable tires or wheels.

4. Tire inflation pressure

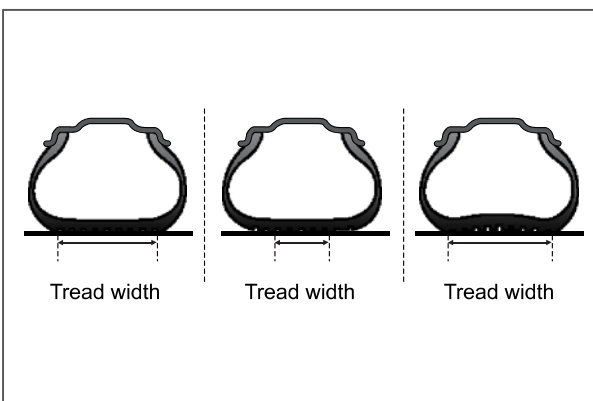
Specified value	32 psi
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- Check the tire inflation pressure by inspecting the tread width.

CAUTION

- Maintaining the specified tire pressure is essential for comfortable riding, driving safety, and long tire life. Incorrect inflation pressures will increase tire wear and will impair safety, vehicle handling, comfortable driving and fuel economy. Always make sure that the tire inflation pressure is correct.





5. Wheel balance

- Check the wheel balance when the wheel is unbalanced or the tire is repaired.
The total weight of the wheel weight should not exceed 150 g.
Ensure that the balance weight installed is not projected over 3mm from the wheel surface.
Use the specified aluminum wheel balance weights for aluminum wheels.
Weight balance can be added by 5 g.
- There are two types of weight balance, tape type and adhesion type.



NOTE

- Make sure to read the manual of the manufacturer thoroughly before using wheel balance tester.



6. Change tire location

To avoid uneven wear of tires and to prolong tire life, inspect and rotate your tires every 5,000 km.



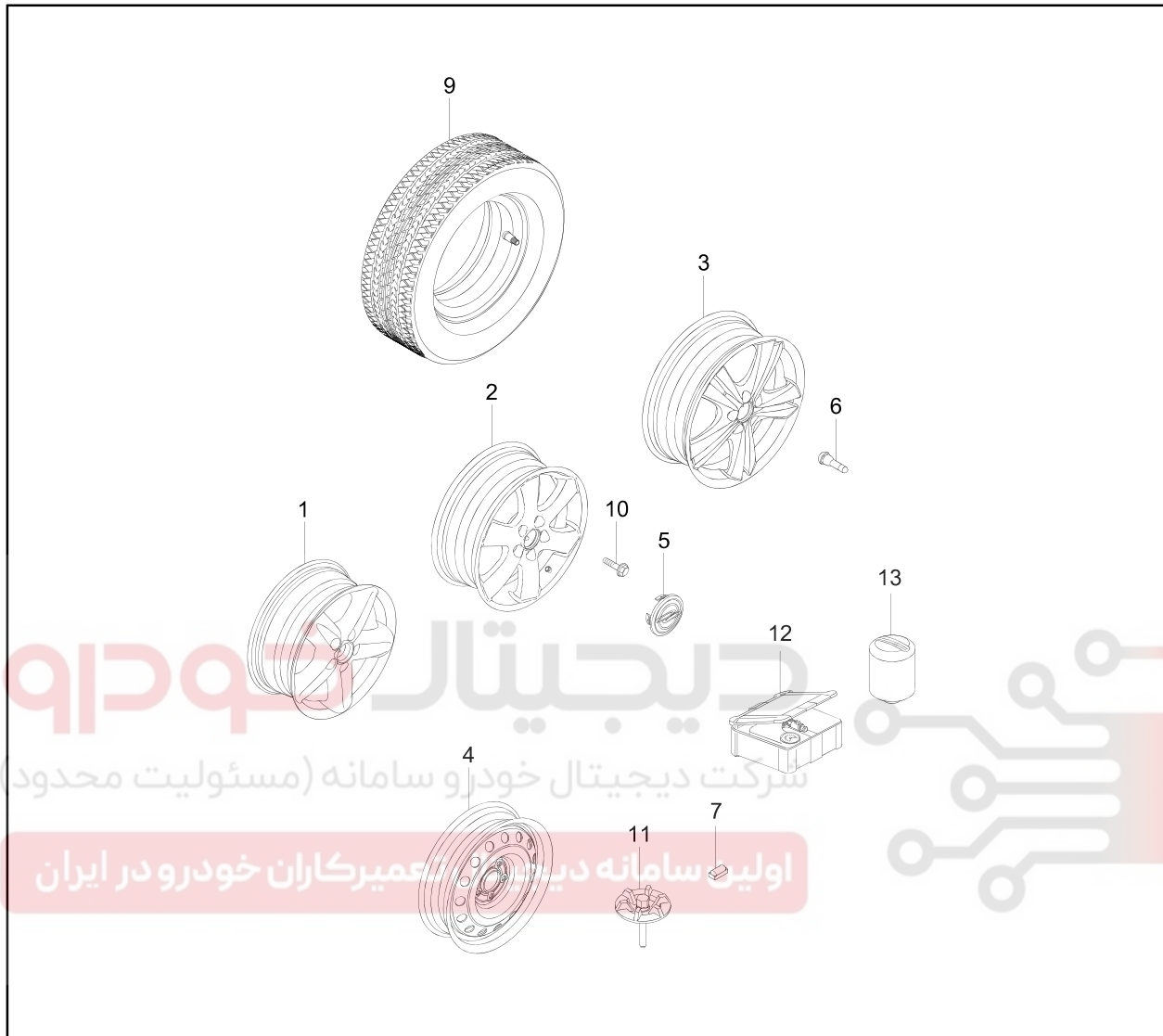
CAUTION

- Mixing tires could cause to lose control while driving. Be sure to use the same size and type tires of the same manufacturer on all wheels.

Modification basis	
Application basis	
Affected VIN	

S.G.N.

4170-09 WHEEL AND TIRE



1. Alloy wheel
2. Alloy wheel
3. Alloy wheel - Hyper
4. Steel wheel
5. Cap assy - Wheel
6. Valve
7. Weight balance - Alloy wheel
9. Tire

10. Wheel bolt
11. Spare tire mounting bolt
12. Repair kit
13. Sealant - repair kit

WHEEL

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Application basis	
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CAUTION

- Tighten up the wheel nuts in the diagonal sequence as shown in the picture. Each nut should be turned a couple of times at a time.
- After changing the tire and driving the vehicle about 1,000 km, retighten the wheel nuts.

Tightening torque 127.4 ~ 156.8Nm



1. Support the vehicle with safety jack and loosen the wheel nuts, then jack up the vehicle
2. Remove all of the wheel nuts.
3. Install in the reverse order of removal.



CAUTION

1. Never apply oil or grease to either wheel studs or nuts as it will cause them to overtighten.
2. If over tightened, the wheel nuts could be damaged. Do not overtighten the wheel nuts by pressing the wheel nut wrench by foot or using an assist pipe.

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Memo

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