
SUSPENSION SYSTEM

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21.1 TIRE AND WHEEL

1 Warning and Precaution

1.1 Warning

In order to avoid possible property loss, personal injury or death, always follow the instructions below before repair:

- (1) Use tire pressure gauge when inflating, and never use the tire pressure indication on meter to inflate. If inflating tires using pressure values displayed from tire pressure monitoring system, inflation pressure may be higher than tire standard value, resulting in a risk of accident.
- (2) The tire pressure is too low, please resume it to normal pressure as soon as possible. Too low tire pressure will increase fuel consumption and tire wear. And seriously worn tire will cause an accident such as flat tire.
- (3) Speed level of new replaced tire must meet the specified values for safe operation; otherwise the tire may blow out.

1.2 Precautions

In order to avoid dangerous operation and damage to the vehicle before repair in this section, always follow the instructions below before repair:

- (1) Be sure to refer to the instruction when installing non-standard tires and rims.
- (2) Use tires with standard specification and type.
- (3) Avoid scratching tires and rims when removing and installing tires.
- (4) Spare tire is not equipped with tire pressure sensor, so there will be malfunction in tire pressure monitoring system when spare tire is replaced in vehicle equipped with tire pressure monitoring system.
- (5) Before assembling the tire, apply glycerin or soapy water to the rim area of tire.
- (6) The four driving tires mounted on the same vehicle must be from the same manufacturer and are not allowed to be mixed.
- (7) Always use torque wrench when installing tire pressure sensor, with a torque of $5 \pm 0.5 \text{ N}\cdot\text{m}$.
- (8) Use tires only with the standard specification and type, because they have excellent reliability and skid resistance. Using a non-standard tire may lead to vehicle malfunction, which may cause an accident, resulting in serious injury or even death.
- (9) Contact surface between rim and tire should be cleaned before installing a new tire.
- (10) When installing wheel bolts, firstly, pre-tighten the bolts by hand, and then tighten them to the specified torque with a torque wrench.
- (11) Do not apply grease to the wheel bolts.
- (12) Some bad driving habits may shorten the tire life:
 - 1) Rapid acceleration;
 - 2) Depressing brake pedal suddenly and firmly;
 - 3) High-speed driving;
 - 4) Turning at excessive speed;
 - 5) Striking curbs or other obstacles;
 - 6) Tire pressure is too high or too low when driving vehicle.
- (13) When removing and installing steering system, suspension system, brake, tire, etc., it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.

2 System Overview

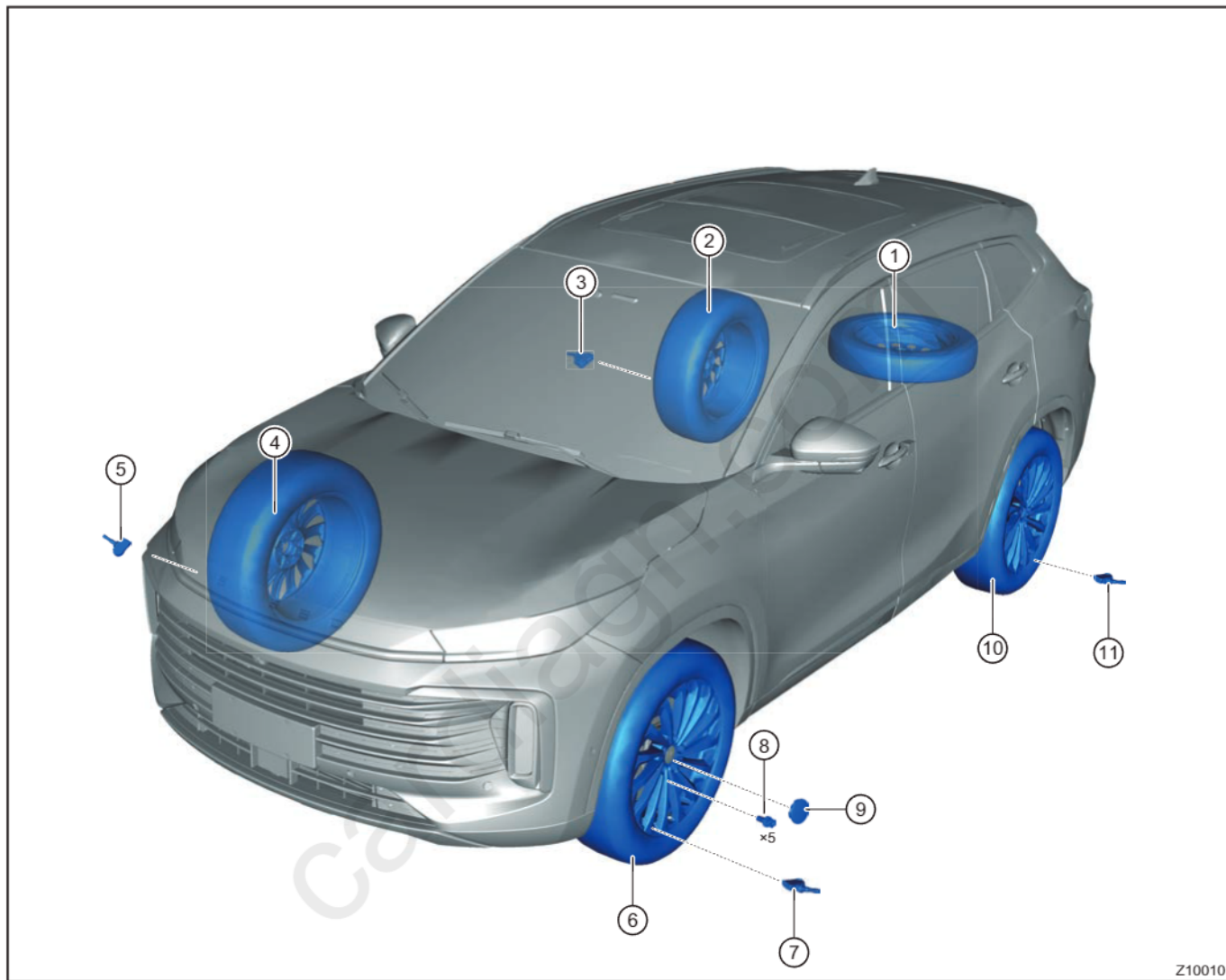
2.1 System Description

Wheel is a rotating component that bears load between tire and axle. It is usually composed of two main components, rim and spoke. Rim is a component for mounting and supporting tire on wheel, and spoke is a

supporting component between axle and rim on wheel. Wheels sometimes contain hubs in addition to above components.

Tire is a rolling toroidal elastic rubber equipment assembled to vehicle on the ground. It is usually installed on metal rim, it can support vehicle body to cushion outside impact, realize contact with road surface and ensure driving performance of vehicle. Tire is often used in complex and harsh conditions, it is under a variety of deformation, load, force and high and low temperature when driving, so it must have high load-bearing performance, traction performance, buffer performance.

2.2 System Component Diagram



Z10010

1	Spare Tire Assembly	7	Front Left Wheel Tire Pressure Sensor
2	Rear Right Wheel	8	Wheel Bolt
3	Rear Right Wheel Tire Pressure Sensor	9	Trim Cover
4	Front Right Wheel	10	Rear Left Wheel
5	Front Right Wheel Tire Pressure Sensor	11	Rear Left Wheel Tire Pressure Sensor
6	Front Left Wheel		

2.3 Component Operation Description

■ Tire

Tire is one of important parts of vehicle. It directly contacts with road surface and works with vehicle suspension to cushion impact of vehicle while driving. Ensure that the vehicle has good seating and riding comforts and good adhesion between wheels and road surface to improve vehicle traction, braking and trafficability and bear weight of vehicle.

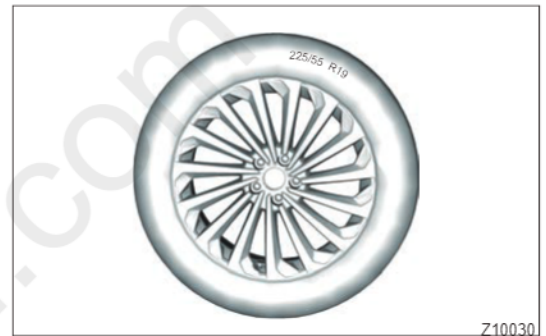


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■ Tire Identification

Letter and number code of tire type, size, load index and speed level are stamped on the side wall of tire as shown in the illustration.

This model is equipped with 3 sizes of tires (225/65R17, 225/60R18, 225/55R19), and different sizes are equipped with different rim shapes, which should be subject to actual vehicle.



Z10030

3 Diagnosis & Testing

3.1 Problem Symptoms Table

Hint:

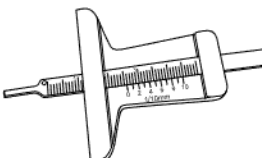
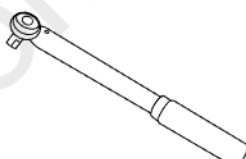
Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Possible Cause
Wear on one side of tire	Wheel alignment (incorrect)
Wear on both sides of tire	Tire pressure (insufficient)
Tire center wear	Tire pressure (excessive)
Serrated wear	Wheel alignment (incorrect)
Severe wear on partial area of tire	Braking (too hard)
Scratches on side wall of tire	Sharp objects on road (scratched)
Excessive tire noise	Tire pressure (incorrect)
	Tire (worn)

4 Removal and Installation

4.1 Tool

■ General Tool

Tool Name	Tool Drawing
Tire Depth Gauge	 S00068
5 - 25 N·m Torque Wrench	 S00079

4.2 Wheel Replacement

■ Precautions Before Tire Replacement

Caution

Spare tire is not equipped with tire pressure sensor, so there will be malfunction in tire pressure monitoring system when spare tire is replaced in vehicle equipped with tire pressure monitoring system.

Warning

Speed level of new replaced tire must meet the specified values for safe operation; otherwise the tire may blow out.

- (1) Remove the wheel.
- (2) Use a tire remover to remove tires according to the instructions.

⚠ Caution

- When removing and installing tire with tire pressure sensor, be sure to strictly refer to the Tire Pressure Monitoring section.
- Always use torque wrench when installing tire pressure sensor, with a torque of $5 \pm 0.5 \text{ N}\cdot\text{m}$.
- When installing wheel assembly with TPMS, align dynamic balance testing mark (light point) on tire with valve core (TPMS) position on rim.
- Before installing air valve, check if air valve hole of wheel is smooth without any burrs, and apply glycerin to air valve rubber surface or soak air valve into glycerin fluid, and then pull or press the locating ring of air valve by force to pass it through the air valve hole and install it into place (it is possible to use soapy water instead of glycerin).
- The four driving tires mounted on the same vehicle must be from the same manufacturer and are not allowed to be mixed.
- Before assembling the tire, apply glycerin or soapy water to the rim area of tire.
- When there is "dark point" mark on rim, align the dynamic balance testing mark on tire with "dark point" mark on rim.
- When there is no "dark point" mark on rim, align the dynamic balance testing mark on tire with the air valve.

(3) Adjust tire pressure to specified value.

⚠ Caution

- Before performing four wheel alignment, check the four tires pressure and adjust the pressure: it is recommended to adjust tire pressure to recommended tire pressure on door frame label.
- The rated inflation pressure of T-type spare tire assembly is 420 kPa, and store spare tire in isolation from 4 loaded wheels.
- Please replace the tires only with standard specification and type.

(4) Check contact surface among air valve, tire and rim for leakage.

(5) Using a dynamic balancer, adjust the wheel balance.

(6) Install the wheel.

Torque: $130 \pm 10 \text{ N}\cdot\text{m}$

⚠ Caution

- Avoid scratching tires and rims when removing tires.
- Contact surface between tire and rim should be cleaned when installing tires.

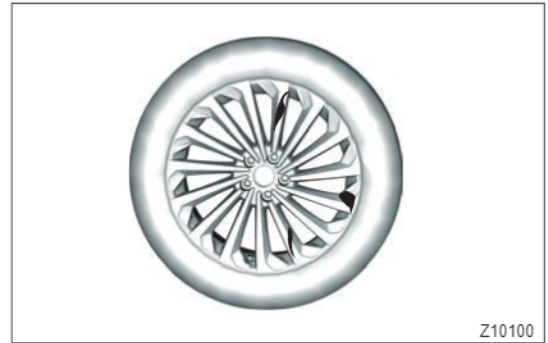
■ Tire Inspection**⚠ Caution**

- Be sure to refer to the instruction when installing non-standard tires and rims.
- Use tires with standard specification and type.

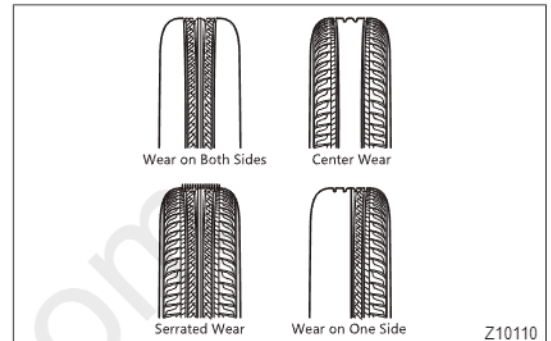
(1) Check if tires are scratched or damaged as shown in the illustration.



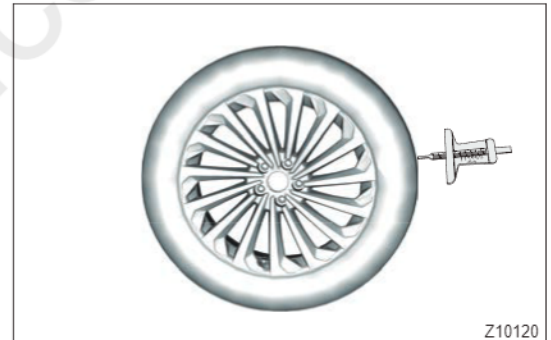
- (2) Check if rims are scratched or damaged as shown in the illustration.



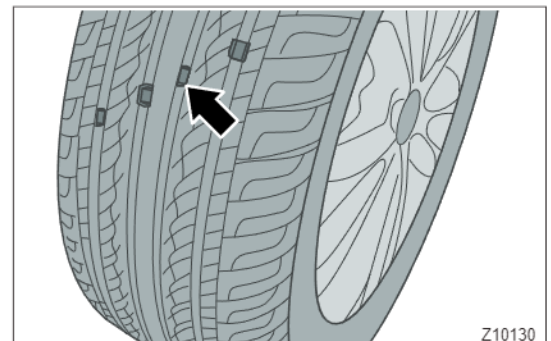
- (3) Check if tires are worn abnormally as shown in the illustration.



- (4) Measure the tread pattern depth with a tire depth gauge. When the depth is less than 1.6 mm, the tire should be replaced.



- (5) Check the tread wear indicators. When tires are worn to the indicating mark, replace them.



- (6) Use tire pressure gauge to check if pressures of all tires (including spare tire) are normal. Inflate tires to specified tire pressure as necessary.

Warning

- Use tire pressure gauge when inflating, and never use the tire pressure indication on meter to inflate. If inflating tires using pressure values displayed from tire pressure monitoring system, inflation pressure may be higher than tire standard value, resulting in a risk of accident.
- The tire pressure is too low, please resume it to normal pressure as soon as possible. Too low tire pressure will increase fuel consumption and tire wear. And seriously worn tire will cause an accident such as flat tire.

- (7) Check air valve for leakage.



■ Removal

- (1) Stop vehicle at a level surface and apply parking brake.
- (2) Turn off all electrical equipment and the ENGINE START STOP switch.
- (3) Disconnect the negative battery cable.
- (4) Using a tire wrench, loosen the wheel mounting bolts.
- (5) Firmly support and raise the vehicle to a proper height.
- (6) Using a tire wrench, remove 5 wheel mounting bolts (17# socket wrench).



- (7) Remove the wheel.

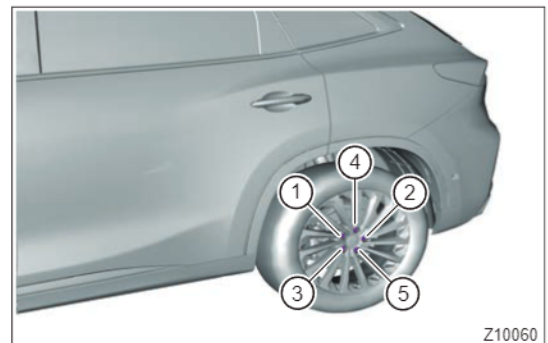
⚠ Caution

When removing and installing the wheel with tire pressure sensor, the tire pressure monitoring section must be strictly referred to.

■ Installation

- (1) Anti-corrosion and anti-rust treatment is conducted on the contact surface between wheel and brake disc.
- (2) Install the wheel and pre-tighten the wheel mounting bolts by hand.
- (3) Using a torque wrench, tighten the wheel mounting bolts evenly to the specified torque in the order shown in the illustration (17# socket wrench).

Torque: 130 ± 10 N m



- (4) Connect the negative battery cable.

■ Tire Inflation

- Do not inflate tires with high tire temperature, which will cause serious damage to the tire, even blowouts, resulting in accidents.

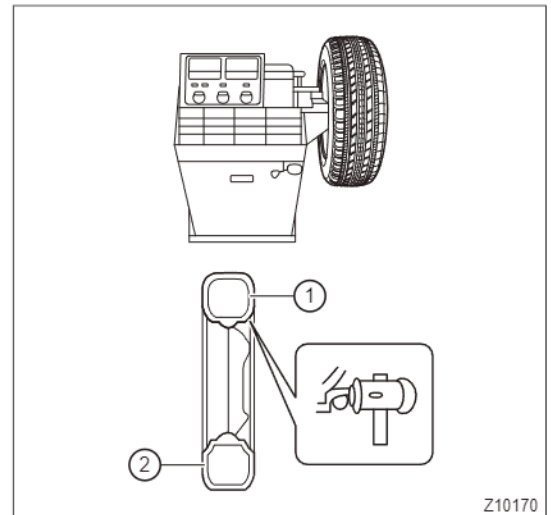
- Do not inflate tires depending on values displayed from tire pressure monitoring system. Tire pressure monitoring system can monitor tire pressure and temperature in real time only when vehicle speed is more than 30 km/h. If inflating tires using pressure values displayed from tire pressure monitoring system, inflation value may be higher than tire standard value, which will cause accidents.
- When vehicle is driving normally, heat is generated in the tire due to friction, which will cause tire pressure to increase. Exposure of tires to the sunlight may also cause an increase in air pressure, resulting in a change in tire pressure. For every 10°C increase in tire temperature, tire pressure will increase by about 0.1 bar.

■ Wheel Balance

⚠ Caution

- **Dynamic balancer must be calibrated before adjusting wheel balance.**
- **Remove impurities inside tread pattern and original balance blocks to ensure wheel balance.**

- (1) Remove the wheel.
- (2) Adjust tire pressure to specified value.
- (3) Install wheel with balance block removed to balancer. Install the balance shaft with mounting surface of wheel facing inward, choose a suitable taper body, and firmly lock the wheels using a locking device (- align the taper body with center hole, otherwise data may be incorrect).
- (4) Turn on the power source of balancer, and input parameters such as the measured distance from rim to balancer, rim width and rim diameter.
- (5) Put down the wheel protector, and proceed to balance test procedure automatically (start button should be pushed for some balancers). When measurement is completed, the unbalanced weight for both sides of tire will be displayed on the balancer automatically, and the wheel brakes automatically until it stops. Do not open the protector before stopping. Failure to do this may lead to an accident.
- (6) According to the measurement result, corresponding balance blocks should be installed on the outside (1) and inside (2) of rim edge as shown in the illustration.



Z10170

- (7) Perform test again after assembly is completed, until the balancer displays 0.
- (8) After dynamic balance is completed, remove the wheel.

⚠ Caution

- Balance block must be installed on aluminum rim.
- Ambient temperature should be higher than 25°C when installing balance block. If temperature cannot be guaranteed, heat the balance block so that the temperature is between 25°C and 38°C when installing it.
- Install balance block properly, weight difference between balance blocks should be 5g.
- **DO NOT** reuse the balance block.
- Both inside and outside of balance block are paste type.
- Requirement for residual imbalance: Outside ≤ 10 g; inside ≤ 10 g.
- Max. outside balance block weight: 110 g.
- Max. inside balance block weight: 110 g.

4.3 Tire Rotation

■ Description

Front and rear tires operate at different loads and perform different steering, driving and braking functions. For these reasons, different wear rate is formed, causing irregular wear patterns. These effects can be reduced by rotating tires at regular time.

Advantages of tire rotation:

- Improving tread life;
- Maintaining traction levels;
- Maintaining a smooth and quiet driveability.

⚠ Caution

Chery recommends that you should rotate tires every 10000 km (Optimal tire rotation mileage is 5000 - 7000 km). However, the best suitable time for tire rotation differs depending on driver's driving habits and road conditions.

■ Rotation Method

- (1) Perform tire rotation as shown in the illustration.

